Project Manual For:

Nunapitchuk Bulk Fuel Upgrade
Project No. 22012

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

Advertising Date: September 7, 2021

This page is blank intentionally.

DIVISION 00 – Bidding and Contract Requirements

END TABLE OF CONTENTS

ALASKA ENERGY AUTHORITY

INVITATION TO BID

for Construction Contract

Date September 7, 2021

Nunapitchuk Bulk Fuel Upgrade
Project No. 22012

Location of Project:	Nunapitchuk, Alaska
Contracting Officer:	Selwin Ray
Issuing Office:	ALASKA ENERGY AUTHORITY (AUTHORITY)

State Funded [X] Federal Aid [x]

Description of Work: This State and Denali Commission funded contract is for a new bulk fuel tank farm, complete with pile supported foundations, fuel dispensing systems, dock, fuel piping, decking, and all electrical work required in 'Section 01 11 13 Work Covered by Contract Documents'. Note that the fuel tanks, foundation piles, and much of the structural decking are Owner Provided. See Section 01 64 00 Owner Furnished Materials.

The Engineer's Estimate is between **$3,000,000.00 – 4,500,000.00**

Base Bid Schedule:
All work shall be substantially completed no later than**: August 30th, 2023**
Final Completion by**: September 30th, 2023**

Accelerated Bid Schedule:
All work shall be substantially completed no later than**: September 30th, 2022**
Final Completion by**: October 30th, 2022**

Bidders are invited to submit sealed bids, in single copy, for furnishing all labor, equipment, and materials and for performing all work for the project described above. Bids will be opened telephonically at 2:00 pm local time, in the Redoubt conference room, 813 West Northern Lights Blvd., Anchorage, Alaska on October 11, 2021. ***Due to the COVID-19 Pandemic, and in coordination with the Governor's Mandate(s), the AIDEA/AEA offices are not open to the public. Therefore, bids may be hand delivered to the designated lock box at the front entrance of the building located at 813 W. Northern Lights Blvd prior to schedule bid opening. It will be the responsibility of the Bidder to contact Selwin Ray phone: 771-3000 or email: sray@aidea.org that they have submitted a bid. Bidders may attend by calling 1-888-585-9008 when prompted enter 508-917-314#. Emailed bid amendments must be addressed to Selwin Ray, Email: sray@aidea.org***

SUBMISSION OF BIDS

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

Bid for Project: **Nunapitchuk Bulk Fuel Upgrade** **Project Number: 22012**	**ATTN: Procurement (Selwin Ray)** **Alaska Energy Authority** **813 West Northern Lights Blvd.** **Anchorage, AK 99503**

Bids, amendments or withdrawals transmitted by mail must be received in the above specified address no later than 7 hours prior to the scheduled time of bid opening. Hand-delivered bids, amendments or withdrawals must be received by the **Front Desk of the Alaska Energy Authority**, prior to the scheduled time of bid opening. Emailed bid amendments must be addressed to **Selwin Ray**, Email:sray@aidea.org

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

NOTICE TO BIDDERS

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

See attached Special Notice to Bidders for this project.

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

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

Phone: (907) 771-3000

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:

Bill Price, Project Manager Phone: (907) 771- 3027 Fax: (907) 771-3044

[3] All questions concerning bidding procedures should be directed to:

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

Phone: (907) 771-3000 Email: sray@aidea.org

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

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

Due to the COVID-19 Pandemic, and in coordination with the Governor's Mandate(s), the AIDEA/AEA offices are not open to the public. Therefore, bids may be hand delivered to the designated lock box at the front entrance of the building located at 813 W. Northern Lights Blvd prior to schedule bid opening. It will be the responsibility of the Bidder to contact Selwin Ray phone: 771-3000 or email: sray@aidea.org that they have submitted a bid. Bidders may attend by calling 1-888-585-9008 when prompted enter 508-917-314#.

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.

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-7, 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."

Special Notice to Bidders

1. A non-mandatory pre-bid meeting is scheduled for **October 4th, 2021 @ 10:30 am. Do to the COVID-19 the pre-bid meeting will be conducted telephonically.** Potential bidders may attend telephonically by calling **1-907-313-5678,** when prompted enter **429-877-907#**. Please note the call-in is limited to participants so if more than one person from companies are attending telephonically, we respectfully request you call in from a conference room speaker phone and have all people together. 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 Contracting Officer, Selwin Ray, at (907) 771-3000 for more information.

   This is not a mandatory meeting, and there will not be a scheduled site visit prior to the bid opening.

PREFERENCES:

2. **ALASKA BIDDER PREFERENCE:** Award will be made to the lowest responsive and responsible bidder after an Alaska bidder preference of five percent (5%) has been applied. The preference will be given to a person who: (1) holds a current Alaska business license at the time designated in the invitation to bid for bid opening; (2) submits a bid for goods or services under the name on the Alaska business license; (3) has maintained a place of business within the state staffed by the bidder, or an employee of the bidder, for a period of six months immediately preceding the date of the bid; (4) is incorporated or qualified to do business under the laws of the state, is a sole proprietorship and the proprietor is a resident of the state, is a limited liability company organized under AS 10.50 and all members are residents of the state, or is a partnership under AS 32.06 or AS 32.11 and all partners are residents of the state; and, (5) if a joint venture, is composed entirely of ventures that qualify under (1) - (4) of this subsection. AS 36.30.170, AS 36.30.321(a) and AS 36.30.990(2)

ALASKA ENERGY AUTHORITY

REQUIRED DOCUMENTS

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

1. **Bid Form (Form 25D-9)**
2. **Bid Schedule**
3 **Bid Security (Form 25D-14)**
4. Any bid revisions must be submitted by the bidder prior to bid opening on the following form:

   Bid Modification (Form 25D-16)

REQUIRED AFTER NOTICE OF APPARENT LOW BIDDER. The apparent low bidder is required to complete and submit the following document within 5 working days after receipt of written notification:

1. **Subcontractor List (Form 25D-5)**

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

1. **Construction Contract (Form 25D-10A)**
2. **Payment Bond (Form 25D-12)**
3. **Performance Bond (Form 25D-13)**
4. **Contractor's Questionnaire (Form 25D-8)**
5. **EEO-1 Certification (25A-304)**
6. **Certificate of Insurance** (from carrier)

FEDERAL EEO BID CONDITIONS

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

1. Definitions. As used in these specifications:

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

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

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

   d. "**Minority**" includes:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

STATE OF ALASKA
ALASKA ENERGY AUTHORITY

EEO-1 CERTIFICATION

Federal-Aid Contracts

Nunapitchuk Bulk Fuel Upgrade
Project No. 22012

This certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor [41 CFR 60-1.7 (b) (1)] and must be completed by the successful Bidder and each proposed Subcontractor participating in this contract.

PLEASE CHECK APPROPRIATE BOXES

The [ ]Bidder [ ] Proposed Subcontractor hereby CERTIFIES:

PART A. Bidders and proposed Subcontractors with 50 or more year-round employees and a federal contract amounting to $50,000 or more are required to submit one federal Standard Report Form 100 during each year that the two conditions exist (50 employees and a $50,000 federal contract).

The company named below (Part C) is exempt from the requirements of submitting the Standard Report Form 100 this year.

[ ] NO (go to PART B) [ ] YES (go to PART C)

Instructions and blank Standard Report Form 100's may be obtained from a local U.S. Department of Labor office, or by writing to:

The Joint Reporting Committee
P.O. Box 779
Norfolk, Virginia 23501

Telephone number: (757) 461-1213

PART B. The company named below has submitted the Standard Report Form 100 this year.

[ ] NO [ ] YES

Note: Bidders and proposed Subcontractors who have not filed the required Standard Report Form 100 and are not exempt from filing requirements will not be awarded this contract or subcontract until Form 100 has been filed for the current year ending June 30.

PART C.

Signature of Authorized Company Representative	**Title**
Company Name	**Company Address (Street or PO Box, City, State, Zip)**
Date	( ) **Phone Number**

ALASKA ENERGY AUTHORITY

PROPOSAL

of

NAME _____

ADDRESS _____

_____

To the CONTRACTING OFFICER, ALASKA ENERGY AUTHORITY:

In compliance with your Invitation To Bid dated **September 13, 2021**, 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

Nunapitchuk Bulk Fuel Upgrade

Project No. 22012

Located at **Nunapitchuk, Alaska**, according to the plans and specifications and for the amount and prices named herein as indicated on the Bid Schedule), 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 after the effective date of Notice to Proceed and to complete work based on the following schedule IAW the Bid Schedule that is awarded:

Base Bid Schedule:

All work shall be substantially completed no later than**: August 30th, 2023**

Final Completion by**: September 30th, 2023**

Or

Accelerated Bid Schedule:

All work shall be substantially completed no later than**: September 30th, 2022**

Final Completion by**: October 30th, 2022**

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

Nunapitchuk Bulk Fuel Upgrade
Project No. 22012

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

There are two Bid Schedules for this project that differ only in completion date as noted below. Only one Bid Schedule will be awarded:

Base Bid Schedule:
All work shall be substantially completed no later than: August 30th, 2023
Final Completion by: September 30th, 2023

Accelerated Bid Schedule:
All work shall be substantially completed no later than: September 30th, 2022
Final Completion by: October 30th, 2022

Bidder is required to bid on all Base Bid Schedule items, including Additive Alternates. Bidder may choose not to bid on the Accelerated Bid schedule. The earlier completion date provided by the Accelerated Bid Schedule is the preferred option of project stakeholders. However, due to funding constraints and other factors, contract award of the Base Bid or the Accelerated Base Bid will be made at the discretion of the Alaska Energy Authority.

The Alaska Energy Authority reserves the right to award some, none, or all of the Additive Alternates. Alternates may be awarded in the best interest of the Alaska Energy Authority. If Accelerated Base Bid is awarded then only the Accelerated Additive Alternates can be awarded.

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; in a lot bid, the lot prices will govern. Conditioned or qualified bids will be considered non-responsive.

Base Bid Schedule (Final Completion by September 30th, 2023):

Base Bid (Final Completion by September 30th, 2023) - Nunapitchuk Bulk Fuel Upgrade

Item	Description	Quant.	Unit	Unit Price	Extended Total Amount
A1	Mobilization / Demobilization	1	LS	$	$
A2	Install, Piles, Thermoprobes, & Construct Platforms	1	LS	$	$
A3	Bulk Fuel Facility & Dispensing	1	LS	$	$
A4	Electrical Systems	1	LS	$	$
A5	Spill Response Equipment & Attendant Kiosk	1	LS	$	$
A6	Transfer Fuel & Decommission Existing Tank Farm	1	LS	$	$
A7	Manifesting, Transport, and Disposal of RCRA Hazardous	6	EA	$	$
A8	Transport and Disposal of State Regulated Non - Hazardous Waste	6	EA	$	$
Total Base Bid (Final Completion by September 30th, 2023)					$

Additive Alternates (Final Completion by September 30th, 2023)

Item	Description	Quant.	Unit	Unit Price	Extended Total Amount
Additive Alternate 1 – Cut-up Decommissioned Tanks & Stack					
ALT 1	Cut-up Decommissioned Tanks & Stack	12	EA	$	$
Additive Alternate 2 – Disposal of Cut-up Decommissioned Tanks					
ALT 2	Disposal of Cut-up Decommissioned Tanks	12	EA	$	$
Total Additive Alternates 1 & 2 (Final Completion by September 30th, 2023)					$

Note: See Section 01 11 13 Work Covered by Contract Documents for detailed descriptions of Bid Items.

Accelerated Bid Schedule (Final Completion by October 30th, 2022):

Accelerated Base Bid (Final Completion by October 30th, 2022) - Nunapitchuk Bulk Fuel Upgrade

Item	Description	Quant.	Unit	Unit Price	Extended Total Amount
A1	Mobilization / Demobilization	**1**	**LS**	**$**	**$**
A2	Install, Piles, Thermoprobes, & Construct Platforms	**1**	**LS**	**$**	**$**
A3	Bulk Fuel Facility & Dispensing	**1**	**LS**	**$**	**$**
A4	Electrical Systems	**1**	**LS**	**$**	**$**
A5	Spill Response Equipment & Attendant Kiosk	**1**	**LS**	**$**	**$**
A6	Transfer Fuel & Decommission Existing Tank Farm	**1**	**LS**	**$**	**$**
A7	Manifesting, Transport, and Disposal of RCRA Hazardous	**6**	**EA**	**$**	**$**
A8	Transport and Disposal of State Regulated Non - Hazardous Waste	**6**	**EA**	**$**	**$**
Total Accelerated Base Bid (Final Completion by October 30th, 2022)					**$**

Accelerated Additive Alternates (Final Completion by October 30th, 2022)

Item	Description	Quant.	Unit	Unit Price	Extended Total Amount
Additive Alternate 1 – Cut-up & Stack Decommissioned Tanks					
ALT 1	Cut-up Decommissioned Tanks & Stack	**12**	**EA**	**$**	**$**
Additive Alternate 2 – Disposal of Cut-up Decommissioned Tanks					
ALT 2	Disposal of Cut-up Decommissioned Tanks	**12**	**EA**	**$**	**$**
Total Accelerated Additive Alternates 1 & 2 (Final Completion by October 30th, 2022)					**$**

Note: See Section 01 11 13 Work Covered by Contract Documents for detailed descriptions of Bid Items.

		Y	N
1. I certify that I am entitled to:	**5% Alaska Bidder Preference**	**[ ]**	**[ ]**

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

Nunapitchuk Bulk Fuel Upgrades
Project No. 22012

DATE BOND EXECUTED: _____

PRINCIPAL (Legal name and business address):	TYPE OF ORGANIZATION:
	[ ] Individual [ ] Partnership [ ] Joint Venture [ ] Corporation
	STATE OF INCORPORATION:

SURETY(IES) (Name and business address):

A.	**B.**	**C.**

PENAL SUM OF BOND:	DATE OF BID:

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

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

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

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

PRINCIPAL

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

Corporate Seal

See Instructions on Reverse

CORPORATE SURETY(IES)

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

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

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

INSTRUCTIONS

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

ALASKA ENERGY AUTHORITY

BID MODIFICATION

Nunapitchuk Bulk Fuel Upgrade
Project No. 22012

Modification Number: _____

Note: All revisions shall be made to the unadjusted bid amount(s).
Changes to the adjusted bid amounts will be computed by the Authority.

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

TOTAL REVISION: $_____

_____
Name of Bidding Firm

_____
Responsible Party Signature **Date**

This form may be duplicated if additional pages are needed.

ALASKA ENERGY AUTHORITY

SUBCONTRACTOR LIST

Nunapitchuk Bulk Fuel Upgrade
Project No. 22012

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

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

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

Check as applicable:

[ ] All Work on the above-referenced project will be accomplished without subcontracts greater than ½ of 1% of the contract amount.

or

[ ] Subcontractor List is as follows:

LIST FIRST TIER SUBCONTRACTORS ONLY

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

CONTINUE SUBCONTRACTOR INFORMATION ON REVERSE

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

Signature of Authorized Company Representative

Title

Company Name

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

Date

( )

Phone Number

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

ALASKA ENERGY AUTHORITY

CONSTRUCTION CONTRACT
Nunapitchuk Bulk Fuel Upgrade
Project No. 22012

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 (based on the Bid Schedule that is awarded):

Base Bid Schedule:
All work shall be substantially completed no later than**: August 30th, 2023**
Final Completion by**: September 30th, 2023**
Or
Accelerated Bid Schedule:
All work shall be substantially completed no later than**: September 30th, 2022**
Final Completion by**: October 30th, 2022**

It is expressly understood and agreed that in case of the failure on the part of the Contractor, for any reason, except with the written consent of the 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 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

Nunapitchuk Bulk Fuel Upgrade
Project No. 22012

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., 2020, 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., 2020.

Principal: _____

Address: _____

By: _____

Contact Name: _____

Phone: ( ) _____

Surety: _____

Address: _____

By: _____

Contact Name: _____

Phone: ( ) _____

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

_____ _____

Alaska Energy Authority Authorized Representative **Date**

See Instructions on Reverse

INSTRUCTIONS

1. This form shall be used whenever a performance bond is required. There shall be no deviation from this form without approval from the Contracting Officer.

2. The full legal name, business address, phone number, and point of contact of the Principal and Surety shall be typed on the face of the form. Where more than a single surety is involved, a separate form shall be executed for each surety.

3. The penal amount of the bond, or in the case of more than one surety the amount of obligation, shall be typed in words and in figures.

4. Where individual sureties are involved, a completed Affidavit of Individual Surety shall accompany the bond. Such forms are available upon request from the Contracting Officer.

5. The bond shall be signed by authorized persons. Where such person is signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of authority must be furnished.

ALASKA ENERGY AUTHORITY

PAYMENT BOND

Bond No. _____

For

Nunapitchuk Bulk Fuel Upgrade
Project No. 22012

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., 2020, 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., 2020.

Principal: _____

Address: _____

By: _____

Contact Name: _____

Phone: ( ) _____

Surety: _____

Address: _____

By: _____

Contact Name: _____

Phone: ( ) _____

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

_____ _____

Alaska Energy Authority Authorized Representative **Date**

See Instructions on Reverse

INSTRUCTIONS

1. This form, for the protection of persons supplying labor and material, shall be used whenever a payment bond is required. There shall be no deviation from this form without approval from the Contracting Officer.

2. The full legal name, business address, phone number, and point of contact of the Principal and Surety shall be typed on the face of the form. Where more than a single surety is involved, a separate form shall be executed for each surety.

3. The penal amount of the bond, or in the case of more than one surety the amount of obligation, shall be typed in words and in figures.

4. Where individual sureties are involved, a completed Affidavit of Individual Surety shall accompany the bond. Such forms are available upon request from the Contracting Officer.

5. The bond shall be signed by authorized persons. Where such persons are signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of authority must be furnished.

ALASKA ENERGY AUTHORITY

CONTRACTOR'S QUESTIONNAIRE

Nunapitchuk Bulk Fuel Upgrade
Project No. 22012

A. FINANCIAL

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

_____

_____

_____

_____

_____

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

_____

_____

B. EQUIPMENT

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

ITEM	QUAN.	MAKE	MODEL	SIZE/ CAPACITY	PRESENT MARKET VALUE

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

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

_____

_____

_____

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

_____

_____

_____

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

_____

_____

_____

C. EXPERIENCE

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

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

_____

_____

_____

_____

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

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

Name of Contractor	**Name and Title of Person Signing**
Signature	**Date**

ALASKA ENERGY AUTHORITY
SECTION 00 70 00
GENERAL CONDITIONS

.

ARTICLE 1 - DEFINITIONS

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

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

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

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

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

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

Approved or Approval - Means written approval by the Contracting Officer or his authorized representative as defined in Article 2.1. 'Approved' or 'Approval' as used in this contract document shall mean that the Authority has received a document, form or submittal from the Contractor and that the Authority has taken "No exceptions" to the item submitted. Unless the context clearly indicates otherwise, approved or approval shall not mean that the Authority approves of the methods or means, or that the item or form submitted meets the requirements of the contract or constitutes acceptance of the Contractor's work. Where approved or approval means acceptance, then such approval must be set forth in writing and signed by the contracting officer or his designee.

A.S - Initials which stand for Alaska Statute.

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

Award - The acceptance, by the AUTHORITY, of the successful bid.

Bid Bond - A type of Proposal Guaranty.

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

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

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

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

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

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

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

Contracting Officer - The person authorized by the Executive Director to enter into and administer the Contract on behalf of the AUTHORITY; who has authority to make findings, determinations and decisions with respect to the Contract and, when necessary, to modify or terminate the Contract. The Contracting Officer is identified on the construction Contract.

Contractor - The individual, firm, corporation or any acceptable combination thereof, contracts with the AUTHORITY for performance of the Work.

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

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

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

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

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

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

Drawings - The Drawings which show the character and scope of the Work to be performed and which have been furnished by the AUTHORITY and are by reference made a part of the Contract Documents.

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

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

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

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

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

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

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

If any Holiday listed above falls on a Saturday, Saturday and the preceding Friday are both legal Holidays. If the Holiday should fall on a Sunday, except (l2) above, Sunday and the following Monday are both legal Holidays. See Title 44, Alaska Statutes.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Shop Drawings - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for the CONTRACTOR to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by the CONTRACTOR to illustrate material, equipment, fabrication, or erection for some portion of the Work. Where used in the Contract Documents, “Shop Drawings” shall also mean “Submittals”.

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

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

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

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

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

Supplier - A manufacturer, fabricator, distributor, material man, or vendor of materials or equipment.

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

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

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

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

ARTICLE 2 – AUTHORIZATION AND LIMITATIONS

2.1 Authorities and Limitations

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

2.1.2 The CONTRACTOR shall perform the Work in accordance with any written order (including but not limited to instruction, direction, interpretation or determination) issued by an authorized representative in accordance with the authorized representative's authority to act for the Contracting Officer. The CONTRACTOR assumes all the risk and consequences of performing the Work in accordance with any order (including but not limited to instruction, direction, interpretation or determination) of anyone not authorized to issue such order, and of any order not in writing.

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

2.2 Evaluations by Contracting Officer:

2.2.1 The Contracting Officer or his authorized representative will decide all questions which may arise as to:

a. Quality and acceptability of materials furnished;

b. Quality and acceptability of Work performed;

c. Compliance with the schedule of progress;

d. Interpretation of Contract Documents;

e. Acceptable fulfillment of the Contract on the part of the CONTRACTOR.

2.2.2 In order to avoid cumbersome terms and confusing repetition of expressions in the Contract Documents the terms "as ordered", "as directed", "as required", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used it shall be understood as if the expression were followed by the words "the Contracting Officer".

When such terms are used to describe a requirement, direction, review or judgment of the Contracting Officer as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise).

2.2.3 The use of any such term or adjective shall not be effective to assign to the AUTHORITY any duty of authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraphs 2.3 or 2.4.

2.3 Means & Methods:

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

2.4 Visits to Site/Place of Business:

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

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.1 Incomplete Contract Documents:

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

3.2 Copies of Contract Documents:

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

3.3 Scope of Work:

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

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

3.4 Intent of Contract Documents:

3.4.1 It is the intent of the Contract Documents to describe a functionally complete Project to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the

intended result will be supplied, without any adjustment in Contract Price or Contract Time, whether or not specifically called for.

3.4.2 Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Regulatory Requirements of any governmental authority, whether such reference be specific or by implication, shall mean the edition stated in the Contract Documents or if not stated the latest standard specification, manual, code or Regulatory Requirements in effect at the time of Advertisement for the Project (or, on the Effective Date of the Contract if there was no Advertisement). However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of the AUTHORITY and the CONTRACTOR, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to the AUTHORITY or any of the AUTHORITY's Consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraphs 2.3.

3.5 Discrepancy in Contract Documents:

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

3.5.2 Discrepancy - Order of Precedence:

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

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

3.6 Clarifications and Interpretations:

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

3.7 Reuse of Documents:

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

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

ARTICLE 4 - LANDS AND PHYSICAL CONDITIONS

4.1 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.l7. The CONTRACTOR may be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are directly attributable to the existence of any underground utility that was not shown or indicated in the Contract Documents and which the CONTRACTOR could not reasonably have been expected to be aware of.

4.7 Survey Control:

The AUTHORITY will identify sufficient horizontal and vertical control data to enable the CONTRACTOR to survey and layout the Work. All survey work shall be performed under the direct supervision of a registered land surveyor when required by paragraph 7.8. Copies of all survey notes shall be provided to the AUTHORITY at an interval determined by the Project Manager. The Project Manager may request submission on a weekly or longer period at his discretion. Any variations between the Contract Documents and actual field conditions shall be identified in the survey notes. Survey notes are to be in a format acceptable to the AUTHORITY.

ARTICLE 5 - BONDS, INSURANCE, AND INDEMNIFICATION

5.1 Delivery of Bonds:

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

5.2 Bonds:

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

5.3 Replacement of Bond and Surety:

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

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

5.4 Insurance Requirements:

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

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

a. Workers' Compensation Insurance: The Contractor shall provide and maintain, for all employees of the Contractor engaged in work under this contract, Workers' Compensation Insurance as required by AS 23.30.045. The Contractor shall be responsible for Workers' Compensation Insurance for any subcontractor who provides services under this contract, to include:

1. Waiver of subrogation against the Authority and Employer's Liability Protection in the amount of $500,000 each accident/$500,000 each disease.

2. If the Contractor directly utilizes labor outside of the State of Alaska in the prosecution of the work, "Other States" endorsement shall be required as a condition of the contract.

3. Whenever the work involves activity on or about navigable waters, the Workers' Compensation policy shall contain a United States Longshoreman's and Harbor Worker's Act endorsement, and when appropriate, a Maritime Employer's Liability (Jones Act) endorsement with a minimum limit of $1,000,000.

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

1. If the CONTRACTOR carries a *Comprehensive General Liability* policy, the limits of liability shall not be less than a Combined Single Limit for bodily injury, property damage and Personal Injury Liability of:

   $1,000,000 each occurrence
   $2,000,000 aggregate

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

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

$1,000,000 for Personal Injury Liability

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

$2,000,000 general aggregate

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

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

$1,000,000 each occurrence

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

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

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

5.4.3 a. In addition to providing the above coverages the Contractor shall, in any contract or agreement with subcontractors performing work, require that all indemnities and waivers of subrogation it obtains, and that any stipulation to be named as an additional insured it obtains, also be extended to waive rights of subrogation against the AUTHORITY and the Owner and to add the ALASKA ENERGY AUTHORITY and the Owner as additional named indemnitees and as additional insured.

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

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

5.5 Indemnification:

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

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

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.1 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 13 – 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 l8.60.075 and all pertinent provisions of the Construction Code Occupational Safety and Health Standards issued by the Alaska Department of Labor.

7.6 Sanitary Provisions:

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

7.7 Business Registration:

Comply with AS 08.18.011, as follows: "it is unlawful for a person to submit a bid or work as a contractor until he has been issued a certificate of registration by the Department of Commerce. A

partnership or joint venture shall be considered registered if one of the general partners or ventures whose name appears in the name under which the partnership or venture does business is registered."

7.8 Professional Registration and Certification:

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

7.9 Local Building Codes:

The CONTRACTOR shall comply with AS 35.l0.025 which requires construction in accordance with applicable local building codes to include the obtaining of required permits.

7.10 Air Quality Control:

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

7.11 Archaeological or Paleontological Discoveries:

When the CONTRACTOR's operation encounters prehistoric artifacts, burials, remains of dwelling sites, or paleontological remains, such as shell heaps, land or sea mammal bones or tusks, the CONTRACTOR shall cease operations immediately and notify the Project Manager. No artifacts or specimens shall be further disturbed or removed from the ground and no further operations shall be performed at the site until so directed. Should the Contracting Officer order suspension of the CONTRACTOR's operations in order to protect an archaeological or historical finding, or order the CONTRACTOR to perform extra Work, such shall be covered by an appropriate Contract change document.

7.12 Applicable Alaska Preferences: Not Applicable.

7.13 Preferential Employment: Not Applicable.

7.14 Wages and Hours of Labor:

7.14.1 One certified copy of all payrolls shall be submitted weekly to the State Department of Labor and, upon request, to the Contracting Officer to assure to assure compliance with AS 36.05.040, *Filing Schedule of Employees Wages Paid and Other Information*. The CONTRACTOR shall be responsible for the submission of certified copies of payrolls of all Subcontractors. The certification shall affirm that the payrolls are current and complete, that the wage rates contained therein are not less than the applicable rates referenced in these Contract Documents, and that the classification set forth for each laborer or mechanic conforms to the Work performed. The CONTRACTOR and his Subcontractors shall attend all hearings and conferences and produce such books, papers, and documents all as requested by the Department of Labor. Should federal funds be involved, the appropriate federal agency shall also receive a copy of the CONTRACTOR's certified payrolls. Regardless of project funding source, copies of all certified payrolls supplied to the State Department of Labor by the CONTRACTOR shall be supplied also to the Project Manager upon request, including submittals made by, or on behalf of, subcontractors.

7.14.2 The following labor provisions shall also apply to this Contract:

a. The CONTRACTOR and his Subcontractors shall pay all employees unconditionally and not less than once a week;

b. wages may not be less than those stated under AS 36.05.010, regardless of the contractual relationship between the CONTRACTOR or Subcontractors and laborers, mechanics, or field surveyors;

c. the scale of wages to be paid shall be posted by the CONTRACTOR in a prominent and easily accessible place at the site of the Work;

d. the AUTHORITY shall withhold so much of the accrued payments as is necessary to pay to laborers, mechanics, or field surveyors employed by the CONTRACTOR or Subcontractors the difference between

1. the rates of wages required by the Contract to be paid laborers, mechanics, or field surveyors on the Work, and

2. the rates of wages in fact received by laborers, mechanics or field surveyors.

7.14.3 Within three calendar days of award of a construction contract, the CONTRACTOR shall file a "Notice of Work" with the Department of Labor and shall pay all related fees. The Contracting Officer will not issue Notice to Proceed to the CONTRACTOR until such notice and fees have been paid to the Department of Labor. Failure of the CONTRACTOR to file the Notice of Work and pay fees within this timeframe shall not constitute grounds for an extension of contract time or adjustment of contract price.

7.l5 Overtime Work Hours and Compensation:

Pursuant to 40 *U.S.C. 327-330* and AS 23.10.060 -.110, the CONTRACTOR shall not require nor permit any laborer or mechanic in any workweek in which he is employed on any Work under this Contract to work in excess of eight hours in any Calendar Day or in excess of forty hours in such workweek on Work subject to the provisions of the *Contract Work Hours and Safety Standards Act* unless such laborer or mechanic receives compensation at a rate not less than one and one half times his basic rate of pay for all such hours worked in excess of eight hours in any Calendar Day or in excess of forty hours in such workweek whichever is the greater number of overtime hours. In the event of any violation of this provision, the CONTRACTOR shall be liable to any affected employee for any amounts due and penalties and to the AUTHORITY for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violation of this provision in the sum of $l0.00 for each Calendar Day on which such employee was required or permitted to be employed on such Work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by this paragraph.

7.16 Covenant Against Contingent Fees:

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

recover the full amount of such commission, percentage, brokerage, or contingent fee.

7.17 Officials Not to Benefit:

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

7.18 Personal Liability of Public Officials:

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

ARTICLE 8 - OTHER WORK

8.l Related Work at Site:

8.1.1 The AUTHORITY reserves the right at any time to contract for and perform other or additional work on or near the Work covered by the Contract.

8.1.2 When separate contracts are let within the limits of the Project, the CONTRACTOR shall conduct his Work so as not to interfere with or hinder the work being performed by other contractors. The CONTRACTOR when working on the same Project with other contractors shall cooperate with such other contractors. The CONTRACTOR shall join his Work with that of the others in an acceptable manner and shall perform it in proper sequence to that of others.

8.1.3 If the fact that other such work is to be performed is identified or shown in the Contract Documents the CONTRACTOR shall assume all liability, financial or otherwise, in connection with this Contract and indemnify and save harmless the AUTHORITY from any and all damages or claims that may arise because of inconvenience, delay, or loss experienced by the CONTRACTOR because of the presence and operations of other contractors.

8.1.4 If the fact that such other work is to be performed was not identified or shown in the Contract Documents, written notice thereof will be given to the CONTRACTOR prior to starting any such other work. If the CONTRACTOR believes that such performance will require an increase in Contract Price or Contract Time, the CONTRACTOR shall notify the Project Manager of such required increase within fifteen (15) calendar days following receipt of the Contracting Officer's notice. Should the Project Manager find such increase(s) to be justified, a Change Order will be executed.

8.2 Access, Cutting, and Patching:

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

their work and will only cut or alter such other work with the written consent of the Project Manager. The duties and responsibilities of the CONTRACTOR under this paragraph are for the benefit of other contractors to the extent that there are comparable provisions for the benefit of the CONTRACTOR in said direct contracts between the AUTHORITY and other contractors.

8.3 Defective Work by Others:

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

8.4 Coordination:

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

ARTICLE 9 - CHANGES

9.1 AUTHORITY's Right to Change

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

9.1.1 In the Contract Documents;

9.1.2 In the method or manner of performance of the Work;

9.1.3 In Authority-furnished facilities, equipment, materials, services, or site;

9.1.4 Directing acceleration in the performance of the Work.

9.2 Authorization of Changes within the General Scope.

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

9.2.1 Directive (pursuant to paragraph 9.3)

9.2.2 A Change Order (pursuant to paragraph 9.4)

9.2.3 AUTHORITY's acceptance of Shop Drawing variations from the Contract Documents as specifically identified by the CONTRACTOR as required by paragraph 6.20.4.

9.3 Directive

9.3.1 The Contracting Officer shall provide written clarification or interpretation of the Contract Documents (pursuant to paragraph 3.6).

9.3.2 The Project Manager may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Time and are consistent with the overall intent of the Contract Documents.

9.3.3 The Project Manager may order the Contractor to correct Defective Work or methods which are not in conformance with the Contract Documents.

9.3.4 The Project Manager may direct the commencement or suspension of Work or emergency related Work (as provided in paragraph 6.19).

9.3.5 Upon the issuance of a Directive to the CONTRACTOR by the Project Manager, the CONTRACTOR shall proceed with the performance of the Work as prescribed by such Directive.

9.3.6 If the CONTRACTOR believes that the changes noted in a Directive may cause an increase in the Contract Price or an extension of Contract Time, the CONTRACTOR shall immediately provide written notice to the Project Manager depicting such increases before proceeding with the Directive, except in the case of an emergency. If the Project Manager finds the increase in Contract Price or the extension of Contract Time justified, a Change Order will be issued. If however, the Project Manager does not find that a Change Order is justified, the Project Manager may direct the CONTRACTOR to proceed with the Work. The CONTRACTOR shall cooperate with the Project Manager in keeping complete daily records of the cost of such Work. If a Change Order is ultimately determined to be justified, in the absence of agreed prices and unit prices, payment for such Work will be made on a "cost of the work basis" as provided in 10.4

9.4 Change Order

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

9.5 Shop Drawing Variations

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

9.6 Changes Outside the General Scope; Supplemental Agreement

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

9.7 Unauthorized Work:

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

9.8 Notification of Surety:

If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Time) is required by the provisions of any bond to be given to a Surety, the giving of any such notice will be the CONTRACTOR's responsibility, and the amount of each applicable bond will be adjusted accordingly.

9.9 Differing Site Conditions:

9.9.1 The CONTRACTOR shall promptly, and before such conditions are disturbed (except in an emergency as permitted by paragraph 6.19), notify the Project Manager in writing of: (1) subsurface or latent physical conditions at the site differing materially from those indicated in the Contract, and which could not have been discovered by a careful examination of the site, or (2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract. The Project Manager shall promptly investigate the conditions, and if the Project Manager finds that such conditions do materially so differ and cause an increase or decrease in the CONTRACTOR's cost of, or time required for, performance of this Contract, an equitable adjustment shall be made and the Contract modified in writing accordingly.

9.9.2 Any claim for additional compensation by the CONTRACTOR under this clause shall be made in accordance with Article 15. In the event that the Contracting Officer and the CONTRACTOR are unable to reach an agreement concerning an alleged differing site condition, the CONTRACTOR will be required to keep an accurate and detailed record which will indicate the actual "cost of the work" done under the alleged differing site condition. Failure to keep such a record shall be a bar to any recovery by reason of such alleged differing site conditions. The Project Manager shall be given the opportunity to supervise and check the keeping of such records.

9.10 **Interim Work Authorization**

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

ARTICLE l0 - CONTRACT PRICE; COMPUTATION AND CHANGE

10.1 Contract Price:

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

10.2 Claim for Price Change:

Any claim for an increase or decrease in the Contract Price shall be submitted in accordance with the terms of Article l5, and shall not be allowed unless notice requirements of this Contract have been met.

10.3 Change Order Price Determination:

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

10.3.l Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved (subject to the provisions of subparagraphs 10.9.l through 10.9.3, inclusive).

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

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

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

Where the cost is borne by a subcontractor acting as a first tier contractor, the allowable overhead and profit markup for lump sum change orders shall not exceed 17%. Any lower tier subcontractors, including the CONTRACTOR in this case, for whom the first tier subcontractor performs the work, shall be allowed an overhead and profit markup that does not exceed 10%.

10.3.3 When 10.3.1 and 10.3.2 are inapplicable, on the basis of the "cost of the work" (determined as provided in paragraphs 10.4 and 10.5) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraph 10.6).

10.3.4 Before a Change Order or Supplemental Agreement is approved, the CONTRACTOR shall submit cost or pricing data regarding the changed or extra Work. The CONTRACTOR shall certify that the data submitted is, to his best knowledge and belief, accurate, complete and current as of a mutually determined specified date and that such data will continue to be accurate and complete during the performance of the changed or extra Work.

l0.4 Cost of the Work:

The term "cost of the work" means the sum of all costs necessarily incurred and paid by the CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by the AUTHORITY, such costs shall be in amount no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in subparagraph l0.5:

10.4.1 Payroll costs for employees in the direct employ of the CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by the AUTHORITY and the CONTRACTOR. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include manual workers up through the level of foreman but shall not include general foremen, superintendents, and non-manual employees. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays shall be included in the above to the extent authorized by the AUTHORITY.

10.4.2 Cost of all materials and equipment furnished and incorporated or consumed in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to the CONTRACTOR unless the AUTHORITY deposits funds with the CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to the AUTHORITY. All trade discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to the AUTHORITY, and the CONTRACTOR shall make provisions so that they may be obtained.

10.4.3 Payments made by the CONTRACTOR to Subcontractors for Work performed by Subcontractors. If required by the AUTHORITY, CONTRACTOR shall obtain competitive quotes from Subcontractors or Suppliers acceptable to the CONTRACTOR and shall deliver such quotes to the AUTHORITY who will then determine which quotes will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of "cost of the work" plus a fee, the Subcontractor' "cost of the work" shall be determined in the same manner as the CONTRACTOR's "cost of work" as described in paragraphs 10.4 through 10.5; and the Subcontractor's fee shall be established as provided for under subparagraph 10.6.2 clause b. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

10.4.4 Costs of special consultants (including but not limited to engineers, architects, testing laboratories, and surveyors) employed for services necessary for the completion of the Work.

10.4.5 Supplemental costs including the following:

a. The proportion of necessary transportation, travel and subsistence expenses of the CONTRACTOR's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost less market value of such items used but not consumed which remain the property of the CONTRACTOR.

c. Rentals of all construction equipment and machinery and the parts thereof whether rented from the CONTRACTOR or others in accordance with rental agreements Approved by the AUTHORITY and the costs of transportation, loading, unloading, installation, dismantling and removal thereof - all in accordance with terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.

For any machinery or special equipment (other than small tools) which has been authorized by

the Project Manager, the CONTRACTOR shall receive the rental rates in the current edition and appropriate volume of the "Rental Rate Blue Book for Construction Equipment", published by Dataquest, Inc., 1290 Ridder Park Drive, San Jose, CA 95131. Hourly rental rates shall be determined as follows:

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

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

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

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

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

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

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

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

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

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

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

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

d. Sales, consumer, use or similar taxes related to the Work, and for which the CONTRACTOR is liable, imposed by Regulatory Requirements.

e. Deposits lost for causes other than negligence of the CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by the CONTRACTOR in connection with the performance and furnishing of the Work provided they have resulted from causes other than the negligence of the CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and Approval of the AUTHORITY. No such losses, damages and expenses shall be included in the "cost of the work" for the purpose of determining the CONTRACTOR's fee. If, however, any such loss or damage requires reconstruction and the CONTRACTOR is placed in charge thereof, the CONTRACTOR shall be paid for services a fee proportionate to that stated in paragraphs 10.6.2.a and 10.6.2.b.

g. The cost of utilities, fuel and sanitary facilities at the site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

I. Cost of premiums for additional bonds and insurance required because of changes in the Work and premiums for property insurance coverage within the limits of the deductible amounts established by the AUTHORITY in accordance with Article 5.

10.5 Excluded Costs:

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

10.5.1 Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing agency, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph l0.4.l or specifically covered by paragraph l0.4.4 all of which are to be considered administrative costs covered by the CONTRACTOR's fee.

10.5.2 Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.

10.5.3 Any part of CONTRACTOR's capital expenses including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.

10.5.4 Cost of premiums for all bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph l0.4.5.i above).

10.5.5 Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of Defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.

10.5.6 Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph l0.4.

10.6 CONTRACTOR's Fee:

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

10.6.l A mutually acceptable fixed fee; or if none can be agreed upon.

10.6.2 A fee based on the following percentages of the various portions of the "cost of the work":

a. For costs incurred under paragraphs 10.4.l and 10.4.2, the CONTRACTOR's fee shall be twenty percent;

b. For costs incurred under paragraph 10.4.3, the CONTRACTOR's fee shall be ten percent; and if a subcontract is on the basis of "cost of the work" plus a fee, the maximum allowable to CONTRACTOR on account of overhead and profit of all Subcontractors and multiple tiers thereof shall be fifteen percent;

c. No fee shall be payable on the basis of costs itemized under paragraphs l0.4.4, 10.4.5 and 10.5;

d. The amount of credit to be allowed by the CONTRACTOR to the AUTHORITY for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in CONTRACTOR's fee by an amount equal to ten percent of the net decrease; and

e. When both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 10.6.2.a through 10.6.2.d, inclusive.

10.7 Cost Breakdown:

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

10.8 Cash Allowances:

It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be done by such Subcontractors

or Suppliers and for such sums within the limit of the allowances as may be acceptable to the Contracting Officer. CONTRACTOR agrees that:

10.8.1 The allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and

10.8.2 CONTRACTOR's cost for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.

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

10.9 Unit Price Work:

10.9.1 Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Contract. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by the CONTRACTOR will be made by the AUTHORITY in accordance with paragraph 10.10.

10.9.2 Each unit price will be deemed to include an amount considered by the CONTRACTOR to be adequate to cover the CONTRACTOR's overhead and profit for each separately identified item. If the "Basis of Payment" clause in the Contract Documents relating to any unit price in the bid schedule requires that the said unit price cover and be considered compensation for certain work or material essential to the item, this same work or material will not also be measured or paid for under any other pay item which may appear elsewhere in the Contract Documents.

10.9.3 Payment to the CONTRACTOR shall be made only for the actual quantities of Work performed and accepted or materials furnished, in conformance with the Contract Documents. When the accepted quantities of Work or materials vary from the quantities stated in the bid schedule, or change documents, the CONTRACTOR shall accept as payment in full, payment at the stated unit prices for the accepted quantities of Work and materials furnished, completed and accepted; except as provided below:

a. When the quantity of Work to be done or material to be furnished under any item, for which the total cost of the item exceeds 10% of the total Contract Price, is increased by more than 25 percent of the quantity stated in the bid schedule, or change documents, either party to the Contract, upon demand, shall be entitled to an equitable unit price adjustment on that portion of the Work above 125 percent of the quantity stated in the bid schedule.

b. When the quantity of Work to be done or material to be furnished under any major item, for which the total cost of the item exceeds 10% of the total Contract Price, is decreased by more than 25 percent of the quantity stated in the bid schedule, or change documents either party to the Contract, upon demand, shall be entitled to an equitable price adjustment for the quantity

of Work performed or material furnished, limited to a total payment of not more than 75 percent of the amount originally bid for the item.

10.10 Determinations for Unit Prices:

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

ARTICLE 11 - CONTRACT TIME; COMPUTATION AND CHANGE

11.1 Commencement of Contract Time; Notice to Proceed:

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

11.2 Starting the Work:

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

11.3 Computation of Contract Time:

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

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

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

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

11.4 Time Change:

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

11.5 Extension Due to Delays:

The right of the CONTRACTOR to proceed shall not be terminated nor the CONTRACTOR charged with liquidated or actual damages because of delays to the completion of the Work due to unforeseeable causes beyond the control and without the fault or negligence of the

CONTRACTOR, including, but not restricted to the following: acts of God or of the public enemy, acts of the AUTHORITY in its contractual capacity, acts of another contractor in the performance of a contract with the AUTHORITY, floods, fires, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather and delays of Subcontractors or Suppliers due to such causes. Any delay in receipt of materials on the site, caused by other than one of the specifically mentioned occurrences above, does not of itself justify a time extension, provided that the CONTRACTOR shall within twenty four (24) hours from the beginning of any such delay (unless the Contracting Officer shall grant a further period of the time prior to the date of final settlement of the Contract), notify the Project Manager in writing of the cause of delay. The Contracting Officer shall ascertain the facts and the extent of the delay and extend the time for completing the Work when the findings of fact justify such an extension.

11.6 Essence of Contract:

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

11.7 Reasonable Completion Time:

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

11.8 Delay Damages:

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

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

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

For each calendar day that the work remains incomplete after the expiration of the Contract Time, liquidated damages in the amount as stated in 00800, Supplemental Conditions shall be assessed to the CONTRACTOR. If no money is due the CONTRACTOR, the AUTHORITY shall have the right to recover said sum from the CONTRACTOR, the surety or both. The amount of these deductions is to reimburse the AUTHORITY for estimated liquidated damages incurred as a result of the CONTRACTOR's failure to complete the work within the time specified. As liquidated

damages, such deductions are not to be considered as penalties.

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

ARTICLE l2 - QUALITY ASSURANCE

12.1 Warranty and Guaranty:

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

12.2 Access to Work:

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

12.3 Tests and Inspections:

12.3.l The CONTRACTOR shall give the Project Manager timely notice of readiness of the Work for all required inspections, tests or Approvals.

12.3.2 If Regulatory Requirements of any public body having jurisdiction require any Work (or part thereof) to specifically be inspected, tested or approved, the CONTRACTOR shall assume full responsibility therefore, pay all costs in connection therewith and furnish the Project Manager the required certificates of inspection, testing or approval. The CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with AUTHORITY's acceptance of a Supplier of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for Approval prior to the CONTRACTOR's purchase thereof for incorporation in the Work. The cost of all inspections, tests and approvals in addition to the above which are required by the Contract Documents shall be paid by the CONTRACTOR. The AUTHORITY may perform additional tests and inspections which it deems necessary to insure quality control. All such failed tests or inspections shall be at the CONTRACTOR's expense.

12.3.4 If any Work (including the work of others) that is to be inspected, tested or Approved is covered without written concurrence of the Project Manager, it must, if requested by the Project Manager, be uncovered for observation. Such uncovering shall be at the CONTRACTOR's expense unless the CONTRACTOR has given the Project Manager timely notice of CONTRACTOR's intention to cover the same and the Project Manager has not acted with reasonable promptness in response to such notice.

12.3.5 Neither observations nor inspections, tests or Approvals by the AUTHORITY or others shall relieve the CONTRACTOR from the CONTRACTOR's obligations to perform the Work in accordance with the Contract Documents.

12.4 Uncovering Work:

12.4.1 If any Work is covered contrary to the written request of the Project Manager, it must, if requested by the Project Manager, be uncovered for the Project Manager's observation and replaced at the CONTRACTOR's expense.

12.4.2 If the Project Manager considers it necessary or advisable that covered Work be observed inspected or tested, the CONTRACTOR, at the Project Manager's request, shall uncover, expose or otherwise make available for observation, inspection or testing as the Project Manager may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is Defective, the CONTRACTOR shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) and the AUTHORITY shall be entitled to an appropriate decrease in the Contract Price. If, however, such Work is not found to be Defective, the CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction.

12.5 AUTHORITY May Stop the Work:

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

12.6 Correction or Removal of Defective Work:

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

12.7 One Year Correction Period:

If within one year after the date of Substantial Completion of the relevant portion of the Work or such longer period of time as may be prescribed by Regulatory Requirements or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be Defective, the CONTRACTOR shall promptly, without cost to the AUTHORITY and in accordance with the Project Manager's written instructions, either correct such Defective Work, or, if it has been rejected by the Project Manager, remove it from the site and replace it with conforming Work. If the CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, the AUTHORITY may have the Defective Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by the CONTRACTOR. In special circumstances where a particular item of equipment is placed in continuous service for the benefit of the

AUTHORITY before Substantial Completion of all the Work, the correction period for that item may begin on an earlier date if so provided in the Specifications or by Change Order. Provisions of this paragraph are not intended to shorten the statute of limitations for bringing an action.

12.8 Acceptance of Defective Work:

Instead of requiring correction or removal and replacement of Defective Work, the Project Manager may accept Defective Work, the CONTRACTOR shall bear all direct, indirect and consequential costs attributable to the Project Manager's evaluation of and determination to accept such Defective Work (costs to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals). If any such acceptance occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and the AUTHORITY shall be entitled to an appropriate decrease in the Contract Price. If the AUTHORITY has already made final payment to the CONTRACTOR, an appropriate amount shall be paid by the CONTRACTOR or his Surety to the AUTHORITY.

12.9 AUTHORITY May Correct Defective Work:

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

ARTICLE 13 - PAYMENTS TO CONTRACTOR AND COMPLETION

13.1 Schedule of Values:

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

13.2 Preliminary Payments:

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

13.3 Application for Progress Payment:

The CONTRACTOR shall submit to the Project Manager for review an Application for Payment filled out and signed by the CONTRACTOR covering the Work completed as of the date of the Application for Payment and accompanied by such supporting documentation as is required by the Contract Documents. Progress payments will be made as the Work progresses on a monthly basis.

13.4 Review of Applications for Progress Payment:

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

13.5 Stored Materials and Equipment:

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

13.6 CONTRACTOR's Warranty of Title:

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

13.7 Withholding of Payments:

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

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

13.7.2 The Contract Price has been reduced by Change Order,

13.7.3 The AUTHORITY has been required to correct Defective Work or complete Work in accordance with paragraph l2.9.

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

13.7.5 Claims have been made against the AUTHORITY or against the funds held by the AUTHORITY on account of the CONTRACTOR's actions or inactions in performing this Contract, or there are other items entitling the AUTHORITY to a set off.

13.7.6 Subsequently discovered evidence or the results of subsequent inspections or test, nullify any previous payments for reasons stated in subparagraphs 13.7.l through 13.7.5.

13.7.7 The CONTRACTOR has failed to fulfill or is in violation of any of his obligations under any provision of this Contract.

13.8 Retainage:

At any time the AUTHORITY finds that satisfactory progress is not being made it may in addition to the amounts withheld under 13.7 retain a maximum amount equal to l0% of the total amount earned on all subsequent progress payments. This retainage may be released at such time as the Project Manager finds that satisfactory progress is being made.

13.9 Request for Release of Funds:

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

13.10 Substantial Completion:

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

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

13.11 Access Following Substantial Completion:

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

13.12 Final Inspection:

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

13.13 Final Completion and Application for Payment:

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

13.14 Final Payment:

13.14.1 If on the basis of the Project Manager's observation of the Work during construction and final inspection, and the Project Manager's review of the final Application for Payment and accompanying documentation - all as required by the Contract Documents; and the Project Manager is satisfied that the Work has been completed and the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the AUTHORITY will process final Application for Payment. Otherwise, the Project Manager will return the Application for Payment to the CONTRACTOR, indicating in writing the reasons for refusing to process final payment, in which case the CONTRACTOR shall make the necessary corrections and resubmit the final Application for Payment.

13.14.2 If, through no fault of the CONTRACTOR, Final Completion of the Work is significantly delayed, the Project Manager shall, upon receipt of the CONTRACTOR's final Application for Payment, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by the AUTHORITY for Work not fully completed or corrected is less than the retainage provided for in paragraph 13.9, and if bonds have been furnished as required in paragraph 5.l, the written consent of the Surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the CONTRACTOR to the AUTHORITY with the application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

13.15 Final Acceptance:

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

When it is anticipated that restarting, testing, adjusting, or balancing of systems will be required following Final Acceptance and said requirements are noted in Section(s) 01 77 19, such Work shall constitute a continuing obligation under the Contract.

13.l6 CONTRACTOR's Continuing Obligation:

The CONTRACTOR's obligation to perform and complete the Work and pay all laborers, Subcontractors, and material men in accordance with the Contract Documents shall be absolute. Neither any progress or final payment by the AUTHORITY, nor the issuance of a certificate of Substantial Completion, nor any use or occupancy of the Work or any part thereof by the AUTHORITY or Owner, nor any act of acceptance by the AUTHORITY nor any failure to do so, nor any review and Approval of a Shop Drawing or sample submission, nor any correction of Defective Work by the AUTHORITY will constitute an acceptance of Work not in accordance with the Contract Documents or a release of the CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents.

13.l7 Waiver of Claims by CONTRACTOR:

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

13.18 No Waiver of Legal Rights:

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

ARTICLE l4 - SUSPENSION OF WORK, DEFAULT AND TERMINATION

14.lAUTHORITY May Suspend Work:

14.1.1 The AUTHORITY may, at any time, suspend the Work or any portion thereof by notice in writing to the CONTRACTOR. If the Work is suspended without cause the CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both,

directly attributable to any suspension if the CONTRACTOR makes an Approved claim therefore as provided in Article 15. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that suspension is due to the fault or negligence of the CONTRACTOR, or that suspension is necessary for Contract compliance, or that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the CONTRACTOR.

14.1.2 In case of suspension of Work, the CONTRACTOR shall be responsible for preventing damage to or loss of any of the Work already performed and of all materials whether stored on or off the site or Approved remote storage sites.

14.2 Default of Contract:

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

a. fails to begin work in the time specified,

b. fails to use sufficient resources to assure prompt completion of the work,

c. performs the work unsuitably or neglect or refuse to remove and replace rejected materials or work,

d. stops work,

e. fails to resume stopped work after receiving notice to do so,

f. becomes insolvent (except that if you declare bankruptcy, termination will be under Title 11 US Code 362 and/or 365. Your bankruptcy does not relieve the surety of any obligations to assume the Contract and complete the work in a timely manner.

g. Allows any final judgment to stand against him unsatisfied for period of 60 days, or

h. Makes an assignment for the benefit of creditors without the consent of the Contracting Officer, or

i. Disregards Regulatory Requirements of any public body having jurisdiction, or

j. Otherwise violates in any substantial way any provisions of the Contract Documents, or

k. fails to comply with Contract minimum wage payments or civil rights requirements, or

l. are party to fraud, deception, misrepresentation , or

m. for any cause whatsoever, fails to carry on the Work in an acceptable manner.

14.2.2 The Notice to Cure Default will detail the conditions determined to be in default, the time within which to cure the default and may, in the Contracting Officer's discretion, specify the actions necessary to cure the default. Failure to cure the delay, neglect or default within the time specified in the Contracting Officer's written notice to cure authorizes the Authority to terminate the contract. The Contracting Officer may allow more time to cure than originally stated in the Notice to Cure Default if he deems it to be in the best interests of the Authority. The Authority will provide you and your surety with a written Notice of Default Termination that details the default and the failure to cure it.

14.2.3 If the CONTRACTOR or Surety, within the time specified in the above notice of default, shall not proceed in accordance therewith, then the AUTHORITY may, upon written notification from the Contracting Officer of the fact of such delay, neglect or default and the CONTRACTOR's failure to comply with such notice, have full power and authority without violating the Contract, to take the prosecution of the Work out of the hands of the CONTRACTOR. The AUTHORITY may terminate the services of the CONTRACTOR, exclude the CONTRACTOR from the site and take possession of the Work and of all the CONTRACTOR's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by the CONTRACTOR (without liability to the CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which the AUTHORITY has paid the CONTRACTOR but which are stored elsewhere, and finish the Work as the AUTHORITY may deem expedient. The AUTHORITY may enter into an agreement for the completion of said Contract according to the terms and provisions thereof, or use such other methods that in the opinion of the Contracting Officer are required for the completion of said Contract in an acceptable manner.

14.2.4 The Contracting Officer may, by written notice to the CONTRACTOR and his Surety or his representative, transfer the employment of the Work from the CONTRACTOR to the Surety, or if the CONTRACTOR abandons the Work undertaken under the Contract, the Contracting Officer may, at his option with written notice to the Surety and without any written notice to the CONTRACTOR, transfer the employment for said Work directly to the Surety. The Surety shall submit its plan for completion of the Work, including any contracts or agreements with third parties for such completion, to the AUTHORITY for Approval prior to beginning completion of the Work. Approval of such contracts shall be in accordance with all applicable requirements and procedures for Approval of subcontracts as stated in the Contract Documents.

14.2.5 After the notice of termination is issued, the Authority may take over the work and complete it by contract or otherwise and may take possession of and use materials, appliances, equipment or plant on the work site necessary for completing the work.

14.2.6 Rather than taking over the work itself, the Authority may transfer the obligation to perform the work from the contractor to your surety. The surety must submit its plan for completion of the work, including any contracts or agreements with third parties for completion, to the Authority for approval prior to beginning work. The surety must follow the Contract requirements for approval of subcontracts, except that the limitation on percent of work subcontracted will not apply.

14.2.7 On receipt of the transfer notice, the surety must take possession of all materials, tools, and appliances at the work site, employ an appropriate work force, and complete the Contract work, as specified. The Contract specifications and requirements shall remain in effect. However the Authority will make subsequent Contract payments directly to the Surety for work performed under the terms of the Contract. CONTRACTOR forfeits any right to claim for the same work or any part thereof. CONTRACTOR is not entitled to receive any further balance of the amount to be paid under the Contract.

14.2.8 Upon receipt of the notice terminating the services of the CONTRACTOR, the Surety shall enter upon the premises and take possession of all materials, tools, and appliances thereon for the purpose of completing the Work included under the Contract and employ by contract or otherwise any person or persons to finish the Work and provide the materials therefore, without termination of the continuing full force and effect of this Contract. In case of such transfer of employment to the Surety, the Surety shall be paid in its own name on estimates covering Work subsequently performed under the terms of the Contract and according to the terms thereof without any right of the CONTRACTOR to make any claim for the same or any part thereof.

14.2.9 If the Contract is terminated for default, the CONTRACTOR and the Surety shall be jointly and severally liable for damages for delay as provided by paragraph 11.8, and for the excess cost of completion, and all costs and expenses incurred by the AUTHORITY in completing the Work or arranging for completion of the Work, including but not limited to costs of assessing the Work to be done, costs associated with advertising, soliciting or negotiating for bids or proposals for completion, and other reprocurement costs. Following termination the CONTRACTOR shall not be entitled to receive any further balance of the amount to be paid under the Contract until the Work is fully finished and accepted, at which time if the unpaid balance exceeds the amount due the AUTHORITY and any amounts due to persons for whose benefit the AUTHORITY has withheld funds, such excess shall be paid by the AUTHORITY to the CONTRACTOR. If the damages, costs, and expenses due the AUTHORITY exceed the unpaid balance, the CONTRACTOR and his Surety shall pay the difference.

14.2.10 If, after notice of termination of the CONTRACTOR's right to proceed under the provisions of this clause, it is determined for any reason that the CONTRACTOR was not in default under the provisions of this clause, or that the delay was excusable under the provisions of this clause, or that termination was wrongful, the rights and obligations of the parties shall be determined in accordance with the clause providing for convenience termination.

14.3 Rights or Remedies:

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

14.4 Convenience Termination:

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

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

a. Stop Work on the date and to the extent specified in the Notice of Termination;

b. Place no further orders or subcontracts for materials, services, or facilities except as may be necessary for completion of such portion of the Work as is not terminated;

c. Terminate all orders and subcontracts to the extent that they relate to the performance of Work terminated by the Notice of Termination;

d. With the written Approval of the Contracting Officer, to the extent he may require, settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, the cost of which would be reimbursable, in whole, or in part, in accordance with the provisions of the Contract;

e. Submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory exclusive of items the disposition of which had been directed or authorized by the Contracting Officer;

f. Transfer to the Contracting Officer the completed or partially completed record drawings, Shop Drawings, information, and other property which, if the Contract had been completed, would be required to be furnished to the AUTHORITY;

g. Take such action as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to the Contract which is in the possession of the CONTRACTOR and in which the AUTHORITY has or may acquire any interest.

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

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

a. The following costs are not payable under a termination settlement agreement or Contracting Officer's determination of the termination claim:

1. Loss of anticipated profits or consequential or compensatory damages

2. Unabsorbed home office overhead (also termed "General & Administrative Expense") related to ongoing business operations

3. Bidding and project investigative costs

4. Direct costs of repairing equipment to render it operable for use on the terminated work

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

14.4.5 The CONTRACTOR and the Contracting Officer may agree upon whole or any part of the amount or amounts to be paid to the CONTRACTOR by reason of the total or partial termination of Work pursuant to this section. The Contract shall be amended accordingly, and the CONTRACTOR shall be paid the agreed amount.

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

a. All costs and expenses reimbursable in accordance with the Contract not previously paid to the CONTRACTOR for the performance of the Work prior to the effective date of the Notice of Termination;

b. So far as not included under "a" above, the cost of settling and paying claims arising out of the termination of the Work under subcontracts or orders which are properly chargeable to the terminated portions of the Contract;

c. So far as practicable, claims by the contractor for idled or stand-by equipment shall be made as follows: Equipment claims will be reimbursed as follows:

1. Contractor-owned equipment usage, based on the contractor's ownership and operating costs for each piece of equipment as determined from the contractor's accounting records. Under no circumstance, may the contractor base equipment claims on published rental rates.

2. Idle or stand-by time for Contractor-owned equipment, based on your internal ownership and depreciation costs. Idle or stand-by equipment time is limited to the actual period of time equipment is idle or on stand-by as a direct result of the termination, not to exceed 30 days. Operating expenses will not be included for payment of idle or stand-by equipment time.

3. Rented equipment, based on reasonable, actual rental costs. Equipment leased under "capital leases" as defined in Financial Accounting Standard No. 13 will be considered Contractor-owned equipment. Equipment leased from an affiliate, division, subsidiary or other organization under common control with you will be considered Contractor-owned equipment, unless the lessor has an established record of leasing to unaffiliated lessees at competitive rates consistent with the rates you have agreed to pay and no more than forty percent of the lessor's leasing business, measured in dollars, is with organizations affiliated with the lessor.

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

a. All previous payments made to the CONTRACTOR for the performance of Work under the Contract prior to termination;

b. Any claim for which the AUTHORITY may have against the CONTRACTOR;

c. The agreed price for, or the proceeds of sale of, any materials, supplies, or other things acquired by the CONTRACTOR or sold pursuant to the provisions of this section and not otherwise recovered by or credited to the AUTHORITY; and,

d. All progress payments made to the CONTRACTOR under the provisions of this section.

14.4.8 Where the Work has been terminated by the AUTHORITY said termination shall not affect or terminate any of the rights of the AUTHORITY against the CONTRACTOR or his Surety then existing or which may thereafter accrue because of such default. Any retention or payment of monies by the AUTHORITY due to the CONTRACTOR under the terms of the Contract shall not release the CONTRACTOR or his Surety from liability.

14.4.9 The contractor's termination claim may not include claims that pre dated the notice for termination for convenience. Those claims shall be prosecuted by the contractor under Article 15.

14.4.10 The contractor's termination claim may not exceed the total dollar value of the contract as awarded plus agreed upon change orders less the amounts that have been paid for work completed.

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

b. Cost Principles. The Authority may use the federal cost principles at 48 CFR §§ 31.201-1 to 31.205-52 (or succeeding cost principles for fixed price contracts) as guidelines in determining allowable costs under this Subsection to the extent they are applicable to construction contracts and consistent with the specifications of this Contract. The provisions of this contract control where they are more restrictive than, or inconsistent with, these federal cost principles."

ARTICLE l5 - CLAIMS AND DISPUTES

15.1 Notification

15.1.1 The CONTRACTOR shall notify the AUTHORITY in writing as soon as the CONTRACTOR becomes aware of any act or occurrence which may form the basis of a claim for additional compensation or an extension of Contract Time or of any dispute regarding a question of fact or interpretation of the Contract. The AUTHORITY has no obligation to investigate any fact or occurrence that might form the basis of a claim or to provide any additional compensation or extension of Contract Time unless the CONTRACTOR has notified the AUTHORITY in writing in a timely manner of all facts the CONTRACTOR believes form the basis for the claim.

15.1.2 If the CONTRACTOR believes that he is entitled to an extension of Contract Time, then the CONTRACTOR must state the contract section on which he basis his extension request, provide the AUTHORITY with sufficient information to demonstrate that the CONTRACTOR has suffered excusable delay, and show the specific amount of time to which the CONTRACTOR is entitled. The AUTHORITY will not grant an extension of Contract Time if the CONTRACTOR does not timely submit revised schedules under **Section 01 32 16**.

15.1.3 If the matter is not resolved by agreement within 7 days, the CONTRACTOR shall submit an Intent to Claim, in writing, to the AUTHORITY within the next 14 days.

15.1.4 If the CONTRACTOR believes additional compensation or time is warranted, then he must immediately begin keeping complete, accurate, and specific daily records concerning every detail of the potential claim including actual costs incurred. The

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

15.1.5 If the claim or dispute is not resolved by the Project Manager, then the CONTRACTOR shall submit a written Claim to the Contracting Officer within 90 days after the CONTRACTOR becomes aware of the basis of the claim or should have known the basis of the claim, whichever is earlier. The Contracting Officer will issue written acknowledge of the receipt of the Claim.

15.1.6 The CONTRACTOR waives any right to claim if the AUTHORITY was not notified properly or afforded the opportunity to inspect conditions or monitor actual costs or if the Claim is not filed on the date required.

15.2 Presenting the Claim

15.2.1 The Claim must include all of the following:

a. The act, event, or condition the claim is based on

b. The Contract provisions which apply to the claim and provide relief

c. The item or items of Contract work affected and how they are affected

d. The specific relief requested, including Contract Time if applicable, and the basis upon which it was calculated

e. A statement certifying that the claim is made in good faith, that the supporting cost and pricing data are accurate and complete to the best of your knowledge and belief, and that the amount requested accurately reflects the Contract adjustment which the CONTRACTOR believes is due.

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

15.3.1 The Claim, in order to be valid, must not only show that the CONTRACTOR suffered damages or delay but that it was caused by the act, event, or condition complained of and that the Contract provides entitlement to relief for such act, event, or condition.

15.3.2 The AUTHORITY can make written request to the CONTRACTOR at any time for additional information relative to the Claim. The CONTRACTOR shall provide the AUTHORITY the additional information within 30 days of receipt of such a request. Failure to furnish the additional information may be regarded as a waiver of the Claim.

15.4 Contracting Officer's Decision

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

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

15.5 Appeals on a Contract Claim.

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

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

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

15.6 Construction Contract Claim Appeals.

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

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

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

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

15.7 Fraud and Misrepresentation in Making Claims

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

This page is blank intentionally.

SECTION 00 80 00
SUPPLEMENTARY CONDITIONS
MODIFICATIONS TO THE GENERAL CONDITIONS

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 manufacturing process to fulfill the Contract requirements. This may include materials handling, construction procedures, calibration and maintenance of equipment, production process control, material sampling, testing and inspection, and data analysis.

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

SC-2.4–VISITS TO SITE/PLACE OF BUSINESS

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

SC-4.1–AVAILABILITY OF LANDS

At General Conditions Article 4.1, delete "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."

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 first sentence and replace with the following "Horizontal and Vertical control data are provided in the Design Drawings".

SC-5.4.1 – INSURANCE REQUIREMENTS

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

SC-5.4.2a – WORKERS COMPENSATION INSURANCE

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

"a. Workers' Compensation Insurance: The Contractor shall provide and maintain, for all employees of the Contractor engaged in work under this contract, Workers' Compensation Insurance as required by AS 23.30.045. The Contractor shall be responsible for Workers' Compensation Insurance for any subcontractor who provides services under this contract. Coverage shall include:

1. Waiver of subrogation against the Authority.

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

3. If the Contractor directly utilizes labor outside of the State of Alaska in the prosecution of the work, "Other States" endorsement shall be required as a condition of the contract.

4. Whenever the work involves activity on or about navigable waters, the Workers' Compensation policy shall contain a United States Longshoreman's and Harbor Worker's Act endorsement, and when appropriate, a Maritime Employer's Liability (Jones Act) endorsement with a minimum limit of $1,000,000."

SC-5.4.2 b- COMMERCIAL GENERAL LIABILITY INSURANCE

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

"The following parties shall be named as "Additional Insured" under all liability coverages listed above:
The Authority
The Denali Commission

SC-5.4.2d- BUILDER'S RISK INSURANCE

At General Conditions Article 5.4.2.d, delete paragraph "d" in its entirety and replace with the following:

d) 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 – 6.16 – RECORD DOCUMENTS

At Record Documents 6.16, add the following:

A daily work report shall be prepared and submitted by the site Superintendent recording all pertinent daily events and statuses of any ongoing items. All daily reports must include:

a) Summary of general tasks relative to construction progress

b) Weather conditions
c) Names and titles of all laborers onsite (daily basis)
d) Regular labor hours worked (daily basis)
e) Overtime hours worked (as encountered and cumulative)
f) Material quantities delivered (daily and cumulative)
g) General material management items (daily and cumulative)
h) Unsuitable quantities hauled offsite (daily and cumulative)
i) Quantities of pay items installed (daily and cumulative)
j) Any construction issues resulting in delays (reported day of, as encountered)
k) Any equipment issues causing delays (reported day of, as encountered)
l) Safety issues and concerns (reported day of, as encountered)
m) Disputes (reported day of, as encountered)
n) Items that could require a change order (reported day of, as encountered)
o) Requests for information (reported day of, as encountered)
p) Site characteristics that warrant a Change In Conditions (reported day of, as encountered)
q) 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)
r) A minimum of 4 project photos of the work performed that day (daily), unless no new work was performed. Additional photos must be submitted if problematic site conditions are encountered resulting in delays, change of conditions, or any existing site elements that would potentially change the contract cost.
s) Any information required, or outstanding, from owner or owner's representative.

Daily reports must be transmitted to Owner, Owner Representatives and Project Manager daily. Contractor shall submit a draft daily work report to owner prior to construction for review and acceptance.

Additional daily report requirements can be found in specification sections 01 45 00 Quality Control and 01 33 00 – Submittal Procedures, sub section 1.9 - Construction Photographs.

SC-9.4–CHANGE ORDER

B. 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."

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 passed the date listed in the Contract, the AUTHORITY shall deduct $500 from progress payments.

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

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

SC-12.1–WARRANTY AND GUARANTEE

At General Condition Article 12.1, add the following sentence:

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

SC-12.6–CORRECTION OR REMOVAL OF DEFECTIVE WORK

At General Condition Article 12.6, add the following paragraphs:

"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."

END OF SECTION 00 80 00

REQUIRED CONTRACT PROVISIONS

For

FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.

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

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

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

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

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

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

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

6. Training and Promotion:

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

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

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

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

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

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

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

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

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

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

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

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

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

9. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years

following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the AEA and the U.S. DOT.

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

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

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

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

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

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

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

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

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

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

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

1. General:

a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on

any account [except such payroll deductions as are permitted by regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.

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

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

2. Classification:

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

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

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

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

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

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

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

of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

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

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

3. Payment of Fringe Benefits:

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

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

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

a. Apprentices:

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

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

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

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

b. Trainees:

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

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

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

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

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

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

trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

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

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

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

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

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

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

2. Payrolls and Payroll Records:

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

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

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

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

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

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

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

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

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

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

further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

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

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

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

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

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

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

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items so performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR Part 635).

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

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

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

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

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

VIII. SAFETY: ACCIDENT PREVENTION

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

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

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

IX. FALSE STATEMENTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. Title 18, United States Code, Section 1001, states:

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

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

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

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

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

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

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

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

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

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

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

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

c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

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

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

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

participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Certification Regarding Debarment,

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

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

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

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

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

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

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

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

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

This page is blank intentionally.

SECTION 01 11 13
WORK COVERED BY CONTRACT DOCUMENTS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Work Covered by Contract Documents

B. Description of Bid Items

C. Contract Method

D. Work By Others

E. Shutoffs, Disruptions to Service

F. Contractor's Use of Premises

G. Coordination

H. Access for Testing and Inspection

1.2 WORK COVERED BY CONTRACT DOCUMENTS

1. Work under this Contract comprises all labor, materials, transportation, and equipment to construction of a new pile supported bulk fuel tank farm, complete with pile supported platform & catwalks, pre-engineered fuel dock & gangway, all associated dispensing, piping, and electrical work required for a complete fuel system in the community of Nunapichuk, Alaska in accordance with the contract drawings and specifications.

2. **Basic Bid –** Provide all labor, materials and equipment required to construct Bid Schedule A as described in Section 1.3.1 Description of Bid Items below.

3. **Additive Alternates –** Provide all labor, materials and equipment required to construct Additive Alternates as described in Section 1.3.2 Description of Bid Items below.

1.3 DESCRIPTION OF BID ITEMS

1.3.1 Schedule A – Base Bid – Nunapichuk 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. Transportation of Authority provided materials (see Owner Furnished Materials).

3. Mobilization/Demobilization costs for al subcontracted work shall be considered to be included.

4. 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.

5. 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 on Bid Schedule A bid items.

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.

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

C. Bid Item A2: Install Piles, Thermoprobes, & Construct Platforms

1. Activities to complete this task include furnishing all labor, materials, and equipment to complete the foundation system, structural piles, thermoprobes, structural steel, fasteners, boardwalk, platform system, pre-engineered floating dock & gangway, railing, steel supports, bar grating, and miscellaneous system components, as required to provide fuel tank foundations, structural platforms, and catwalk systems in accordance with the contract drawings and specifications.

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

3. Portions of this Bid Item included Owner Furnished Materials. See Section 01 64 00 for additional information.

B. Bid Item A3: Bulk Fuel Facility & Dispensing

1. The unit price Bid for Bulk Fuel Facility Work shall include full payment for all labor, material, transportation, freight, and equipment required to:

   a. Activities to complete this task include transporting and installing owner provided aboveground storage tanks and furnishing and installing specified venting, gauging, water draw, pumps, pressure relief, and other appurtenances, fuel piping, valves, fittings, meters, tags, hose reels, and related appurtenances, all security fencing, and mechanical systems, fire extinguishers, signs and placards, operator training, facility commissioning, and other components as required to provide a complete, fully functional bulk fuel tank farm in accordance with the Contract Drawings and Specifications.

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

3. Portions of this Bid Item included Owner Furnished Materials. See Section 01 64 00 for additional information.

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 electrical systems and controls including control panels, conduit, conductors, lighting, fence & system grounding, motor starters, tank pumps & level switches, and heating. Contractor to coordinate new electrical service to the facility with local power utility. Complete electrical systems as required to provide a complete, fully functional bulk fuel facility 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 & Attendant Kiosk

1. The unit price Bid for Spill Response Equipment & Attendant Kiosk shall include but not be limited to full payment for all labor, material and equipment required to:

a. Provide spill response gear within 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.

b. Provide attendant kiosk within 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 insulation, sheathing, delivery, construction of shelving & desk, partition wall, and placement of the connex van in accordance with the Contract Drawings and Specifications.

2. Paint spill response & attendant connex to match IAW with the coating specification.

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

F. Bid Item A6: Transfer Fuel & Decommission Existing Tank Farm

1. The unit price Bid for Transfer Fuel & Decommission Existing Tank Farm shall include full payment for all labor, material and equipment required to:

a. Decommission existing 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: Existing tank farm is located across the Johnson River from the new tank farm. Contractor to coordinate with tank farm Owner to minimize amount of fuel transfer required and to follow all code mandated procedures and regulations relating to fuel transfers and transportation over bodies of water. See Appendices for additional information on existing tank farm.

c. Decommission existing 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 valves unless tagged for salvage, cutting of all piping into maximum 10 ft lengths and transporting and neatly stacking the cut pieces to a location within the existing tank farm as directed by the Owner and in accordance with the Contract Drawings and Specifications.

2. NOTE: The existing Tank Farm & dispensing system must remain operational until the new Tank Farm is fully operational.

3. 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 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. 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 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. 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.

1.3.2 Additive Alternates – Dismantling and Disposal of Existing Tanks

A. Additive Alternate 1 – Cut-up Decommissioned Tanks & Stack

1. Activities to complete this task include cutting all decommissioned tanks at the existing tank farm into maximum 8-ft by 10-ft flattened pieces. Transport and neatly stack the cut pieces at a location within the existing tank farm as directed by the Owner in accordance with the Contract Drawings and Specifications.

2. Payment for this Bid Item shall be per tank as indicated on the Bid Schedule.

B. Additive Alternate 2 – Disposal of Cut-up Decommissioned Tanks

1. Activities to complete this task include transporting the cut pieces to an existing landfill (if approved by local solid waste authority) or to an alternative, Contractor Provided, Owner approved, offsite disposal area in accordance with the Contract Drawings and Specifications.

2. Payment for this Bid Item shall be per tank transported and disposed of at an approved landfill as indicated on the Bid Schedule.

1.4 CONTRACT METHOD

A. This contract is composed of lump sum and unit bid items as shown on the bid schedule.

1.5 WORK BY OTHERS

A. Other projects may run concurrently with the work. Cooperate with other contractors, force account construction crews and superintendents, agencies and the Owner to minimize conflicts.

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

1.6 SHUTOFFS / DISRUPTIONS TO SERVICE

A. No disruptions in fuel supply or electric power generation will be allowed.

B. Work with the Owner to schedule any other disruptions for a time which minimizes impact on facility operations. Provide not less than 72 hours notice to Owner of activities that will affect Owner operations.

1.7 CONTRACTOR'S USE OF PREMISES

A. Coordinate with Owner prior to placing equipment or supplies at the staging area(s) identified on the Contract Drawings. Do not disturb areas outside of project boundaries.

B. Do not disrupt access to adjacent areas unaffected by the Work. Keep driveways and entrances serving premises clear and available for use at all times. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner operations.

C. Assume full responsibility for protection and safekeeping of products under this Contract.

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

1.8 COORDINATION

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

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

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

D. Coordinate space requirements and installation of components. Utilize spaces

efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

1.9 ACCESS FOR TESTING AND INSPECTION

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

PART 2 – PRODUCTS

Not Used

Part 3 – EXECUTION

Not Used

END OF SECTION

SECTION 01 11 17

INTENT OF DOCUMENTS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Explanation of intent and terminology of the Construction Documents.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 General Conditions: Article 1 Definitions relating to 'Drawings' and 'Specifications'.

B. Section 00 70 00 General Conditions: Article 3 Contract Documents relating to Intent, Amending, and Reuse.

1.3 SPECIFICATION FORMAT AND COMPOSITION

A. Specifications are divided into Divisions and Sections for the convenience of writing and using. Titles are not intended to imply a particular trade jurisdiction. AUTHORITY is not bound to define the limits of any subcontract, and will not enter into disputes between the CONTRACTOR and his employees, including Subcontractors.

B. Pages are numbered independently for each section, and recorded in the Table of Contents. Section number is shown with the page number at the bottom of each page. The end of each section of the specifications is ended by "End of Section". It is Contractor's responsibility to verify that Contract Documents received for bidding and/or construction are complete in accordance with Table of Contents.

C. The language employed in the Contract Documents is addressed directly to the CONTRACTOR. Imperative or indicative language is generally employed throughout and requirements expressed are the mandatory responsibility of the CONTRACTOR, even though the work specified may be accomplished by specialty subcontractors engaged by the CONTRACTOR. References to third parties in this regard shall not be interpreted in any way as to relieve the CONTRACTOR of his or her responsibility under this Contract.

D. These Specifications are of the abbreviated, or "streamlined" type, and may include incomplete sentences.

E. Omissions of words or phrases such as "the Contractor shall", "in conformity therewith", "shall be", "as noted on the Drawings", "according to the Drawings", "a", "an", "the", and "all" are intentional.

F. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings.

1.4 DRAWINGS: CONTENT EXPLANATION

A. Drawings, Dimensions, and Measurements.

1. Contract Documents do not purport to describe in detail, absolute and complete construction information. Drawings are diagrammatic. Contractor shall provide verification of actual site conditions and shall provide complete and operational systems as specified when drawings do not provide full detail.

1.5 COMMON TERMINOLOGY

A. Certain items used generally throughout the Specifications and Drawings are used as follows:

1. Indicated: The term "indicated" is a cross reference to details, notes or schedules on the Drawings, other paragraphs or schedules in the Specifications, and similar means of recording requirements in the Contract Documents. Where terms such as "shown", "noted", "schedules", and "specified" are used in lieu of "indicate", it is for the purpose of helping the reader accomplish the cross reference, and no limitation of location is intended except as specifically noted.

2. Installer: The person or entity engaged by CONTRACTOR, his Subcontractor or sub-subcontractor for the performance of a particular unit of Work at the Project site, including installation, erection, application and similar required operations. It is a general requirement that installers be recognized experts in the work they are engaged to perform.

3. Furnish: Except as otherwise defined in greater detail, the term "furnish" is used to mean"...supply and deliver to the Project site, ready for unpacking, assembly and installation..."

4. Provide: Except to the extent further defined, the term "provide" means to furnish and install, complete and ready for the intended use.

5. Guarantee and Warranty: "Warranty" is generally used in conjunction with products manufactured or fabricated away from the Project site, and "guarantee" is generally used in conjunction with units of work which require both products and substantial amounts of labor at the Project site. The resulting difference is that warranties are frequently issued by manufacturers, and guarantees are generally issued by CONTRACTOR and frequently supported (partially) by product warranties from manufacturers.

1.6 CONFLICTS

A. Report any conflicts to the Project Manager for clarification.

PART 2 – PRODUCTS

Not Used

Part 3 – EXECUTION

Not Used

END OF SECTION

SECTION 01 11 21

CONTRACTOR'S CERTIFICATION OF SUBCONTRACTORS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Procedures for preparing, submitting, and accepting subcontracts.

1.2 RELATED REQUIREMENTS

A. Document 00 10 00 Information to Bidders

B. Document 00 43 00 Subcontractor List

C. Document 00 70 00 General Conditions

D. Section 01 33 00 Submittals: Procedures

1.3 PREPARATION

A. Certification Forms: Use forms provided by AUTHORITY.

B. CONTRACTOR to prepare certification form and submit to the AUTHORITY prior to the start of work. Multiple subcontracts may be included under a single submittal. Where required, attach additional information (cross-referenced to the appropriate subcontract) to the certification form.

C. Substitute certification forms will not be considered.

1.4 SUBMITTAL OF CERTIFICATION

A. CONTRACTOR shall submit the initial and all subsequent certification forms in accordance with the submittal requirements identified under paragraph 1.2 of this Section.

1.5 CONSIDERATION OF CERTIFICATION

A. Following receipt of submittal and within a reasonable period of time AUTHORITY shall review for each of the following:

1. Completeness of forms and attachments.

2. Proper execution (signatures) of forms and attachments.

B. Submittals which are not complete or not properly executed will be returned to the CONTRACTOR under a transmittal letter denoting the deficiencies found. CONTRACTOR shall correct and resubmit per paragraph 1.4 of this Section.

1. Subcontractors will be required to leave the project site until properly executed subcontract is in place.

2. Payment will not be made for work performed by a non-certified subcontractor.

1.6 ACKNOWLEDGMENT OF CERTIFICATION

A. Submittals which have been examined by AUTHORITY and are determined to be complete and properly executed shall be acknowledged as such by signature of designated AUTHORITY representative on the face of each certification form.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

ALASKA ENERGY AUTHORITY	SUBCONTRACTOR CERTIFICATION	ALASKA ENERGY AUTHORITY

Note: The Contractor shall provide this form for ALL subcontractors working on this project. This form is applicable to all projects, including Small Procurement Contracts, and must be completed in full.

PROJECT: Nunapichuk Bulk Fuel Upgrade PROJ. #: _____

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

   Yes☐ **No**☐

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

   Yes☐ **No**☐

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

   Yes☐ **No**☐

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

   Yes☐ **No**☐

c. Does the evidence of insurance list the Department as an "Additional Insured" or "Certificate Holder"?

Yes ☐ **No** ☐

d. Does the evidence of insurance commit to providing 30 day written notice of cancellation or reduction of any coverage?

Yes ☐ **No** ☐

e. Insurance Expiration dates:

Comprehensive or Commercial General Liability: _____

Automobile: _____ Workers' Compensation: _____

(Other): _____

9. Copies of the following professional certifications, licenses, and registrations are attached (circle all that apply):

Business License (mandatory)
Contractor License (mandatory)
Land Surveyor's License
Electrical Administrator's License (mandatory for electrical subs)
Mechanical Administrator's License (mandatory for mechanical subs)
Engineer/Architect
Other: _____

10. Exceptions to any of the above are explained as follows: _____

_____

CERTIFICATION (to be completed and signed by PRIME CONTRACTOR): I certify all the above to be true and correct.

Signature: _____

Printed Name: _____

Company: _____

Date: _____

AUTHORITY'S APPROVAL/DISAPPROVAL

The subject subcontract is **APPROVED**. Nothing in this approval should be construed as relieving the Prime Contractor of the responsibility for complete performance of the work or as a waiver of any right of the Approval to reject defective work.

Signature: _____ Date: _____
Project Manager

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

_____

Signature: _____ Date: _____
Project Manager

SECTION 01 20 13

APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

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

1.2 RELATED REQUIREMENTS

A. Section 00 72 13 General Conditions

B. Section 01 33 00 Submittal

C. Section 01 29 73 Schedule of Values.

D. Section 01 77 19 Closeout Requirements.

E. Section 01 78 39 Project Record Documents.

1.3 FORMAT

A. Application for Payment form as provided by AUTHORITY or Contractor's form containing same information.

1.4 PREPARATION OF APPLICATIONS

A. Type required information on Application for Payment form approved by AUTHORITY.

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

C. Submit names of individuals authorized to be responsible for information submitted on Application for Payment.

D. Indicate breakdown of costs for each item of the Work on accepted schedule of values. Provide dollar value in each column for each line item for portion of Work performed and for stored products.

E. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of Work.

F. Include 10% retainage on each pay request. Retainage shall be eligible for payment on Contractor's final pay request.

G. Prepare Application for Final Payment as specified in Section 01 77 19 Closeout Requirements.

1.5 SUBMITTAL PROCEDURES

A. Submit one copy of each Application for Payment at times stipulated in Contract.

B. Submit under AUTHORITY accepted transmittal letter. See Section 01 29 73 Schedule of Values. Identify Contract by the AUTHORITY contract number.

1.6 SUBSTANTIATING DATA

A. When 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 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 with each Application for Payment.

1. Updated construction schedule as required by Section 01 33 00 Submittals.

2. Updated Schedule of Values as required by Section 01 29 73 Schedule of Values.

3. Evidence of transmittal of certified payrolls, if required, to the Labor Department.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 01 25 13

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Requests for substitution of products.

1.2 RELATED REQUIREMENTS

A. Section 00 02 00 Invitation For Bids: Substantial Completion Date.

B. Section 00 70 00 General Conditions

C. Section 00 80 00 Supplementary Conditions

D. Section 01 33 00 Submittals

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

1.3 SUBSTITUTION SUBMITTAL PERIOD

A. All product substitution requests will be considered only within 15 days after date established in Notice to Proceed. Subsequent requests will be considered only in case of product unavailability or other conditions beyond control of CONTRACTOR. (Submit on Substitution Request Form approved by Project Manager)

1.4 OPTIONS

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

B. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not specifically named.

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

1.5 PRODUCTS LIST

A. Within (15) days after date of Notice to Proceed, transmit an electronic copy of a list of products which are proposed for installation, including name of manufacturer.

B. Tabulate products by Specifications section number, title, and Article number

C. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

D. AUTHORITY will reply in writing within fifteen days stating whether there is

reasonable objection to listed items. Failure to object to a listed item shall not constitute a waiver of requirements of Contract Documents.

E. AUTHORITY will contact Engineer to ascertain any extra Professional fees to assess the substitutions and shall so notify CONTRACTOR who will include payment for the professional review cost in the application for substitution.

1.6 LIMITATIONS ON SUBSTITUTIONS

A. Substitutions will not be considered when indicated on Shop Drawings or product data submittals.

B. Substitute products shall not be ordered or installed without written acceptance.

C. AUTHORITY will contact the Engineer to determine acceptability of substitutions.

1.7 REQUESTS FOR SUBSTITUTIONS

A. Submit separate request for each substitution. Document each request with complete data substantiating compliance of proposed substitution with requirements of Contract Documents.

B. Identify product by Specification section and Article numbers. Provide manufacturer's name and address, trade name of product, and model or catalog number. List fabricators and Suppliers as appropriate.

C. Attach product data as specified in Section 01 33 23.

D. List similar projects using product, dates of installation, and names of design Engineer(s) and, name of the facility owner.

E. Give itemized comparison of proposed substitution with specified product, listing variations, and reference to Specification sections and Article numbers.

F. Give quality and performance comparison between proposed substitution and the specified product.

G. Give cost data comparing proposed substitution with specified product, and amount of net change to Contract Price.

H. List availability of maintenance services and replacement materials.

I. State effect of substitution on construction schedule, and changes required in other Work or products.

1.8 CONTRACTOR REPRESENTATION

A. Request for substitution constitutes a representation that CONTRACTOR has investigated proposed product and has determined that it is equal to or superior in all respects to specified product.

B. CONTRACTOR will provide same warranty for substitution as for specified product.

C. CONTRACTOR will coordinate installation of accepted substitute, making such

changes as may be required for Work to be complete in all respects.

D. CONTRACTOR certifies that cost data presented is complete and includes all related costs under this Contract.

E. CONTRACTOR waives claims for additional costs related to substitution which may later become apparent.

1.9 SUBMITTAL PROCEDURES

A. Submit an electronic copy of complete request for substitution.

B. Project Manager will review CONTRACTOR's requests for substitutions with reasonable promptness.

C. During the bidding period, AUTHORITY will record acceptable substitutions in Addenda.

D. After Award of Contract, AUTHORITY will notify CONTRACTOR, in writing, of decision to accept or reject requested substitution within 15 days.

E. For accepted products, submit Shop Drawings, product data, and samples under provisions of Section 01 33 23.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

ALASKA ENERGY AUTHORITY	SUBSTITUTION REQUEST FORM (AFTER AWARD)	ALASKA ENERGY AUTHORITY

Project: Nunapichuk Bulk Fuel Upgrade Project No.: ____

Contractor: _____

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

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

I certify the following:

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

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

Signed: _____ Date: _____
Authorized Contractor Signature

Architect/Engineer Recommendation:

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

Remarks:

Signed: _____ Date: _____
Architect/Engineer

❑ Accepted
❑ Rejected

_____ Date: _____
Project Manager

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 26 57

CHANGE ORDER PROCEDURES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Procedures for processing Change Orders.

1.2 RELATED REQUIREMENTS

A. Section 00 41 15 Bid Schedule

B. Section 00 52 13 Construction Contract: Total amount of Contract Price, as awarded

C. Section 00 70 00 General Conditions:

D. Section 01 20 13 Application for Payment.

E. Section 01 33 00 Submittals: Progress Schedules.

F. Section 01 29 73 Schedule of Values.

G. Section 01 77 19 Closeout Requirements

1.3 SUBMITTALS

A. Submit name of the individual authorized to accept changes, and to be responsible for informing others in C's employ of changes in the Work.

B. Change Order forms will be prepared by AUTHORITY.

1.4 DOCUMENTATION OF CHANGE IN CONTRACT PRICE AND CONTRACT TIME

A. Maintain detailed records of work done on a Cost of the Work basis. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Work. Incomplete or unsubstantiated costs will be disallowed.

B. CONTRACTOR shall submit a complete, detailed, itemized cost breakdown addressing impact on Contract Time and Contract Price with each proposal.

C. On request, provide additional data to support computations:

1. Quantities of products, labor, and equipment.

2. Taxes, insurance, and bonds.

3. Justification for any change in Contract Time

4. Credit for deletions from Contract, similarly documented.

D. Support each claim for additional costs, and for work done on a Cost of the Work basis, with additional information:

1. Origin and date of claim.

2. Dates and times work was performed and by whom.

3. Time records and wage rates paid.

4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

1.5 PRELIMINARY PROCEDURES

A. AUTHORITY may submit a Proposal Request which includes: Detailed description of change with supplementary or revised Drawings and Specifications, the projected time for executing the change, with a stipulation of any overtime work required, and the period of time during which the requested price will be considered valid.

B. CONTRACTOR may initiate a change by submittal of a request to AUTHORITY describing the proposed change with a statement of the reason for the change, and the effect on Contract Price and Contract Time with full documentation.

1.6 CONSTRUCTION CHANGE AUTHORIZATION

A. Shall be in accordance with Article 9 - Changes: in Section 00 70 00 - General Conditions.

1.7 LUMP SUM CHANGE ORDER

A. CONTRACTOR shall submit an itemized price proposal in sufficient detail to fully explain the basis for the proposal. CONTRACTOR and AUTHORITY shall then negotiate an equitable price (and time adjustment if appropriate) in good faith. The Change Order will reflect the results of those negotiations. If negotiations break down, CONTRACTOR may be directed to perform the subject Work under a COST OF THE WORK CHANGE ORDER.

B. The maximum rates of cost markup (to cover both overhead and profit of the CONTRACTOR) shall be in accordance with Article 10- Contract Price, Computation and Change: in Section 00 70 00 – General Conditions.

C. These terms shall also apply to the proposals of subcontracts and allowances.

1.8 UNIT PRICE CHANGE ORDER

A. For pre-determined unit prices and quantities, Change Order will be executed on a lump sum basis.

B. For pre-determined unit prices and undetermined quantities, Change Order will be

executed on an estimated quantity basis; payment will be based on actual quantities measured as specified.

1.9 COST OF THE WORK CHANGE ORDER

A. CONTRACTOR shall submit documentation required in Paragraph 1.4 of this Section on a daily basis for certification by AUTHORITY. AUTHORITY will indicate by signature that the submitted documentation is acceptable. If it is not acceptable, CONTRACTOR and AUTHORITY shall immediately meet to discuss resolution.

B. After completion of the change and within 14 calendar days, unless extended by AUTHORITY, the CONTRACTOR shall submit in final form an itemized account with support data of all costs. Support data shall have been certified by AUTHORITY, as required above in paragraph A.

C. AUTHORITY will determine the change allowable in Contract Price and Contract Time as provided in provisions of the Contract Documents.

1.10 EXECUTION OF CHANGE ORDERS

A. AUTHORITY will issue Change Orders for signatures of parties as provided in Conditions of the Contract.

1.11 CORRELATION OF CONTRACTOR SUBMITTALS

A. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Price as shown on Change Order.

B. Promptly revise progress schedules to reflect any change in Contract Time, revise subs-schedules to adjust times for other items of Work affected by the change, and resubmit.

1. Progress Schedule shall be updated to reflect the changed condition. It shall be identified as a unique single or multiple task activity and shall be linked to it's predecessor and successor activities from the base schedule set of activities. An update to the cash flow schedule shall be made as well and to the extent possible, operational tasks shall be cross referenced to schedule of values categories

C. Promptly enter changes in Project Record Documents.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

ALASKA ENERGY AUTHORITY

CHANGE ORDER REQUEST (PROPOSAL)

Project: Nunapichuk Bulk Fuel Upgrade

Change Order Request Number: _____

From (Contractor): _____

To: _____

Date: _____

A/E Project Number: _____

Re: _____

Contract For: _____

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.

SECTION 01 29 73

SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Procedures for preparation and submittal of Schedule of Values.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 General Conditions

B. Section 01 20 13 Applications for Payment

C. Section 01 33 00 Submittals

1.3 FORMAT

A. Form and content must be acceptable to AUTHORITY.

B. CONTRACTOR's standard form or media-driven printout will be considered on request.

C. Follow the table of contents of Project Manual and the Bid Schedule for listing component parts. Identify each line item by number and title of listed Specification sections.

1.4 CONTENT

A. List installed value of each major item of Work and each subcontracted item of Work as a separate line item to serve as a basis for computing values for progress payments. Round off values to nearest dollar.

B. For each major subcontract, list products and operations of that subcontract as separate line items.

C. Coordinate listings with progress schedule.

D. Component listings shall each include a directly proportional amount of CONTRACTOR's overhead and profit.

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

F. Specific line item Values as indicated below shall be minimum acceptable amounts and must be included on all approved Schedules of Values and Applications for Payment:

1. Bid Items in Section 01 11 13 – Work Covered by Contract.

2 Section 01 77 19 – Closeout Requirements. Value of all required Substantial Completion Submittals and Closeout Submittals shall be $25,000.

3 No progress payments will be made for Substantial Completion Submittals and Closeout Submittals until **all** submittal have been submitted to, and accepted by the AUTHORITY.

G. The sum of values listed shall equal total Contract Price.

1.5 SUBMITTAL

A. Submit a copy of Schedule in electronic format within 15 days after the Notice to Proceed. Subsequent updated Schedule of Values shall be presented for review ten days prior to each Application for Payment.

B. Transmit on an AUTHORITY accepted form transmittal letter. Identify Project by AUTHORITY's title and Project number; identify Contract by AUTHORITY's Contract number.

1.6 SUBSTANTIATING DATA

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

B. Provide an electronic 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 31 19

PROJECT MEETINGS

PART 1 – GENERAL

1.1 REQUIREMENTS INCLUDED

A. CONTRACTOR participation in preconstruction conferences.

B. CONTRACTOR administration of progress meetings and pre-installation conferences.

1.2 RELATED REQUIREMENTS

A. Section 01 11 13 – Work Covered By Contract Documents.
B. Section 01 33 00 – Submittal Procedures.
C. Section 01 45 00 - Quality Control.
D. Section 01 77 19 – Closeout Requirements.
E. Section 01 78 39 – Project Record Documents.

1.3 PRECONSTRUCTION CONFERENCES.

A. AUTHORITY will administer a preconstruction conference (to be held at AUTHORITY's main office located in Anchorage) for execution of Contract and exchange of preliminary submittals.
B. AUTHORITY will administer site mobilization conference at Project site for clarification of CONTRACTOR responsibilities in use of site and for review of administrative procedures.

1.4 PROGRESS MEETINGS

A. CONTRACTOR shall schedule and administer weekly Project meetings throughout progress of the work (unless this requirement is waived by Authority).

B. Attendance: Job superintendent, major Subcontractors and Suppliers; AUTHORITY and Engineers as appropriate to agenda topics for each meeting.

C. Suggested Agenda: Review of Work progress, status of progress schedule and adjustments thereto, delivery schedules, submittals, maintenance of quality standards, pending changes and substitutions, and other items affecting progress of Work.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Procedures.

B. Construction Progress Schedules.

C. Manufacturer's Instructions.

D. Manufacturer's Certificates.

1.2 RELATED REQUIREMENTS

A. Section 01 11 21 CONTRACTOR’s Certification of Subcontractors

B. Section 01 20 13 Applications for Payment

C. Section 01 25 13 Product Options and Substitutions

D. Section 01 26 57 Change Order Procedures

E. Section 01 29 73 Schedule of Values

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

G. Section 01 45 00 Quality Control

H. Section 01 50 00 Construction Facilities and Temporary Controls

I. Section 01 71 23 Construction Surveying

J. Section 01 77 19 Closeout Requirements

K. Section 01 78 39 Project Record Documents

L. Division 02 Existing Conditions

M. Division 03 Concrete

N. Division 05 Metals

O. Division 10 Specialties

P. Division 11 Spill Response Equipment

Q. Division 26 Electrical

R. Division 31 Earthwork

S. Division 32 Exterior Improvements

T. Division 33 Utilities

1.3 PROCEDURES

A. Delivery of Submittals:

1. Within 10 days following Notice to Proceed, CONTRACTOR shall submit to Project Manager & Engineer in electronic format, a Submittal Register (Section 01 33 23 1.12A) as required by the Contract (by Section Number, Paragraph Number, Page Number, and time criteria if required). The schedule must be approved by the Project Manager or Engineer before any submittals required by the Contract will be accepted.

2. A sample submittal register will be provided to the successful bidder upon request.

3. Electronically transfer submittals directly to the Project Manager & Engineer.

4. Minimize the number of submittals. Full divisions must be submitted together (no partial submittals will be accepted).

B. Transmit each item on an AUTHORITY accepted form. Identify Project, CONTRACTOR, Subcontractor, and major Supplier. Identify pertinent Drawing sheet and detail number, and Specification section number, as appropriate. Identify deviations from Contract Documents by submitting a separate Substitution Request Form. Provide a minimum of 8 1/2" x 5 1/2" blank space on the front page for CONTRACTOR, and Engineer review stamps.

C. Submit initial progress schedules and Schedule of Values in electronic format as directed by the Project Manager or Engineer, in accordance with Document 00 72 13 - General Conditions. Form and content shall be reviewed by Engineer, revise and resubmit as required. Submit subsequent updated schedules with each Application for Payment.

D. Comply with progress schedule for submittals related to Work progress. Coordinate submittal of related items.

E. After Project Manager & Engineer Review of submittal, revise and resubmit as required, identifying changes made since previous submittal. The Project Manager will not return the first or revised copies of rejected submittals for re-use. DO NOT submit partial copies of submittals for incorporation into rejected submittal packages which have been kept by the Project Manager. Provide COMPLETE copies for each review.

F. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

G. If drawings, product submittals, samples, mock-ups, or other required submittals are incomplete or not properly submitted, Project Manager will not review the submittal and will immediately return submittal to CONTRACTOR. Project Manager will review a submittal no more than two times (incomplete or improper submittals count as one). CONTRACTOR shall pay all review costs associated with more than two reviews, unless a re-submittal is required due to new comments addressing previously submitted information.

1.4 CONSTRUCTION PROGRESS SCHEDULES

A. Submit horizontal bar Gantt chart. Schedule shall show:

1. Separate bar for each major trade or operation, identifying the duration of each activity and precedent activities.

2. Complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Show each work plan and separate work area as a separate activity or group of activities.

3. Submittal dates for Shop Drawings, product data, and samples, and product delivery dates, including any furnished by AUTHORITY and those under allowances.

4. All required submittals and indicating the date for each required submittal.

5. Show projected percentages of completion for each item of Work and submittal as of time of each Application for Progress Payment.

6. Schedule shall be computer generated; (MS Projects, Sure-Trac, or Primavera); Gantt format with preceding and succeeding operational tasks indicated by relationship arrows. An accompanying cash flow chart shall reflect estimated monthly draw amounts. To the extent possible, operational tasks shall be cross referenced to schedule of values categories.

1.5 SCHEDULE OF VALUES

A. Submit in accordance with Section 01 29 73 Schedule of Values.

1.6 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

A. Submit in accordance with Section 01 33 23 Shop Drawings, Product Data and Samples.

B. Submit signed and sealed engineering design calculations performed by a Professional Engineer licensed in the State of Alaska where the CONTRACTOR is responsible for design as required in the Contract Documents.

1.7 MANUFACTURER'S INSTRUCTIONS

A. When required in individual Specification Section, submit manufacturer's printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and

finishing, in quantities specified for product data.

1.8 QUALITY CONTROL DATA

A. Submit in accordance with Section 01 45 00 Quality Control and individual specification sections.

1.9 CONSTRUCTION PHOTOGRAPHS

A. Provide photographs of construction throughout progress of Work.

B. Submit photographs with daily work reports via email to the Engineer, Owner and Owner's representatives, not less than daily. Photographs may be sent as separate file from daily report.

C. Photographs: Digital color photographs, minimum size 2 megapixels.

D. Take site photographs from differing directions indicating relative progress of the Work on a daily basis.

E. Take photographs as evidence of daily project conditions including but not limited to:

a. Demolition of structures & Utilities
b. Limits of excavation & placement of geotextile
c. Placement and compaction of classified fill
d. Culverts & Drainage Structures
e. Sump placement & connections
f. Pipe bedding
g. Containment liner
h. Finished grading & RipRap slope protection
i. Tank foundations
j. Tank placement
k. Mechanical & Electrical work
l. Fencing

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

ALASKA ENERGY AUTHORITY

SUBMITTAL REVIEW

Project: Nunapichuk Bulk Fuel Upgrade

Submittal Description:

To: Alaska Energy Authority

Submittal Tracking Number:

From:

Submittal File Name(s):

A/E Project Number:

Submittal Type: ☐ **Electronic** ☐ **Hard Copy** ☐ **Initial Submittal** ☐ **Re-Submittal**

No Exceptions	**Approved as Noted**	**Exceptions Noted**	**Exceptions Noted**
☐	☐	☐	☐
Noted	**See Comments**	**Partial Resubmittal Required**	**Full Resubmittal Required**

Authority review is for general conformance with the design concept and Contract Documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the Contract Documents, nor departures therefrom. The Contractor remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for selecting fabrications processes, for techniques of assembly and for performing his work in a safe manner. Contractor to verify all dimensions at job site before ordering materials and equipment. Any deviations from the Contract requirements must be specifically brought to the attention of the Authority in writing and upon the Contract Documents, or by appropriate Change Order.

As requested, we have reviewed the above noted electronic submittal file which we [downloaded from submittal exchange] [received via email on x/x/xx] and [accept the information as submitted.] [accept the information submitted with the following exceptions:] [have the following comments:]

☐ Attachments:

Response From: **Date Received**: **Date Reviewed**:

SECTION 01 33 23

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

A. Procedures for submittals.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 General Conditions

B. Section 01 25 13 Product Options and Substitutions

C. Section 01 33 00 Submittals

D. Section 01 45 00 Quality Control

E. Section 01 77 19 Closeout Requirements

1.3 SHOP DRAWINGS

A. Present drawings in a clear and thorough manner. Label each Shop Drawing with AUTHORITY's Project name and Project number; identify each element of the Shop Drawings by reference to sheet number and detail, or schedule.

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

C. Minimum Sheet Size: 8-1/2"x11". Larger sheets may be submitted in multiples of 8-1/2"x11".

1.4 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, capacities, wiring and piping diagrams and controls, 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.

1.5 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.

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.

1.6 MANUFACTURER'S INSTRUCTIONS

A. Manufacturer's instructions for storage, preparation, assembly, installation, start-up, adjusting, balancing, and finishing under provisions of Section 01 45 00.

1.7 CONTRACTOR REVIEW

A. 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.

B. Coordinate submittals with requirements of Work and of Contract Documents.

C. Notify the Project Manager in writing at time of submittal, of any deviations from requirements of Contract Documents.

D. Do not fabricate products or begin Work which requires submittals until return of submittal with Authority acceptance.

1.8 SUBMITTAL REQUIREMENTS

A. Each submittal to be numbered by Specification Section and Paragraph. Revisions shall be identified by a hyphen after the paragraph, with a number designator. Example: 1st submittal "01 33 23.01" 2nd submittal “01 33 23.02".

B. Transmit submittals in accordance with the required submittal schedule and in such sequence to avoid delay in the Work.

C. Provide 8 1/2" x 5 1/2" blank space on each submittal for Contractor and Engineer stamps.

D. Apply Contractor's stamp, signed or initialed, certifying to review, verification of products, field dimensions and field construction criteria, and coordination of information with requirements of Work and Contract Documents.

E. Coordinate submittals into logical groupings to facilitate interrelation of the items.

F. Submit electronic copies of shop drawings required in the Contract. Contractor may be required to submit, to the Project Manager, four opaque reproductions of full-size

shop drawings at no additional cost to the Owner.

G. Submit electronic copies of product data and manufacturer's instructions required by the contract.

H. Submit number of samples specified in individual Specifications sections.

I. Submit under AUTHORITY's accepted transmittal form letter. Identify Project by title and AUTHORITY's Project number; identify Contract by AUTHORITY's contract number. Identify Work and product by Specification section and Article number.

J. Each submittal shall have as its face document a completed, AUTHORITY furnished, Submittal Summary form.

1.9 RESUBMITTALS

A. After AUTHORITY review of submittal, revise and resubmit as required, identifying changes made since previous submittal. Provide total number of submittals as required for the first submission; if 6 are required and 4 were returned for revisions, submit 6 again. The AUTHORITY and Engineers will not return the first or revised copies of rejected submittals for re-use. DO NOT submit partial copies of submittals for incorporation into rejected submittal packages which have been kept by the AUTHORITY and/or Engineers. Provide COMPLETE copies for each review.

1.10 REVIEW

A. AUTHORITY or authorized agent will review Shop Drawings, product data, and samples and return submittals within (14) working days.

B. AUTHORITY or authorized agent will examine shop drawings for general arrangement, overall dimensions and suitability, and will return to the Contractor marked as follows:

"Submit Specified Item" - denotes that the item specified in the contract documents is required and substitutions are not acceptable.

"Approved" - denotes acceptance of the submittal.

"Approved With Corrections Noted" - denotes review is conditional on compliance with notes made on the submittal.

"Revise and Resubmit" - denotes that revisions are required in the submittal in order for the submittal to be generally consistent with the requirements of the Contract Documents. Required revisions will be identified to the Contractor. 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. Reasons for rejection will be identified to the Contractor. Resubmittal is required.

C. Review by AUTHORITY or authorized agent of shop drawings shall not be construed as a complete check, but will indicate only that the general method of construction and detailing is consistent with the requirements of the Contract Documents. Review

of such drawings shall not relieve the Contractor of the responsibility for errors, dimensions, and detail design.

D. AUTHORITY or authorized agent review will not extend to means, methods, techniques, sequences or procedures of construction (except in the case of construction specific submittals, such as erection plans) 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 with the item functions.

1.11 DISTRIBUTION

A. Duplicate and distribute reproductions of Shop Drawings, copies of product data, and samples, which bear Engineer's stamp, to job site file, record documents file, Subcontractors, Suppliers, and other entities requiring information.

1.12 SCHEDULE OF SUBMITTALS

A. Submittal Register Form to be completed by Contractor and approved by AUTHORITY prior to submittal of any items.

B. Submit shop drawings, product data and samples as required for each specification section.

C. Format.

1. Submittal schedule form as provided by AUTHORITY as outlined in Section 01 45 00 1.7.

Part 2 – PRODUCTS

Not Used

Part 3 – EXECUTION

Not used

END OF SECTION

SECTION 01 42 19

REFERENCE STANDARDS

PART 1 – GENERAL

1.1 REQUIREMENTS INCLUDED

A. Quality assurance.

1.2 RELATED REQUIREMENTS

A. Section 00 72 13 General Conditions: Paragraph 3.4.2.

1.3 QUALITY ASSURANCE

A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

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

C. Obtain copies of standards when required by the Contract Documents.

D. Maintain copy at Project Site during submittals, planning, and progress of the specific work, until Substantial Completion.

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

F. Neither the contractual relationship, duties, nor responsibilities of the parties in Contract nor those of the Project Manager shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Quality Control Program Requirements

B. Workmanship.

C. Manufacturer's Instructions.

D. Manufacturer's Certificates.

E. Manufacturers' Field Services

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 General Conditions: Article 12, inspection and testing required by governing authorities.

B. Section 01 33 00 Submittals: Submittal of Manufacturer’s Instructions.

C. Section 01 78 39 Project Record Documents: Shop Drawings, Product Data, and Samples: Submittal of Manufacturer's Instructions.

D. Individual Specification Sections: Quality Control Requirements.

1.3 QUALITY CONTROL, GENERAL

A. The CONTRACTOR shall assure that all materials and completed construction conform to contract Plans, technical specifications and other requirements, whether manufactured by the CONTRACTOR, or procured from subcontractors or vendors. When required, the CONTRACTOR shall establish, provide, and maintain an effective Quality Control Program that details the methods and procedures that will be used. Although guidelines are established and certain minimum requirements are specified herein and elsewhere in the contract technical specifications, the CONTRACTOR shall assume full responsibility for accomplishing the stated purpose.

1.4 WORKMANSHIP

A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

B. Perform Work by persons qualified to produce workmanship of specified quality.

C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking

1.5 MANUFACTURER'S INSTRUCTIONS

A. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from AUTHORITY before proceeding.

1.6 MANUFACTUERE'S CERTIFICATES

A. When required by individual Specifications section, submit manufacturer's certificate, in duplicate, that products meet or exceed specified requirements.

1.7 MOCKUPS

A. When required by individual Specifications section, erect complete, full-scale mockup of assembly at site, perform required tests, and remove mockup at completion, when approved by AUTHORITY.

1.8 MANUFACTURER'S FIELD SERVICES

A. When required by manufacturer or when specified in respective Specification sections, require manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start up of equipment, test, adjust and balance of equipment as applicable, and to make appropriate recommendations.

B. Require manufacturer's representative to submit written report to AUTHORITY listing observations and recommendations.

1.9 TESTING REPORTS

A. When required by individual Specification sections, provide a qualified third-party testing agency to test the work. Test reports shall be submitted to Authority upon receipt.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01 50 00

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Temporary Utilities: water, sanitation, electrical, heating and communication systems.

B. Temporary Construction Facilities: Field office for the use of CONTRACTOR personnel, storage yards and buildings, worker shelters and access roads.

C. Temporary Controls: air/water pollution controls, erosion control and traffic control.

D. Temporary Fuel Storage and Dispensing: fuel storage, secondary containment and dispensing facilities.

1.2 RELATED REQUIREMENTS

A. Section 01 11 13 Work Covered by Contract Documents

B. Section 01 33 00 Submittals

C. Section 01 57 13 Temporary Erosion & Sediment Control

1.3 DELIVERY, STORAGE AND HANDLING OF TEMPORARY FACILITIES

A. Protect temporary facilities during delivery and storage operations.

B. Maintain temporary facilities in proper and safe condition throughout progress of the work.

1.4 SUBMITTALS

A. Submit an electronic copy of written Plan for providing temporary facilities. Submit plan a minimum of 60 days from receipt of the “Intent to Award letter”.

1. Plan shall include written description of CONTRACTOR’s proposed methods and means of providing temporary utilities during construction activities, as described in the Specifications.

2. Contractor shall receive written approval of the plan by the Engineer prior to beginning any work that could interfere with existing fuel handling and sales operations

PART 2 - PRODUCTS

2.1 TEMPORARY UTILITIES - CONTRACTOR FURNISHED ITEMS

A. Temporary Sanitation Systems

1. CONTRACTOR shall furnish and install all necessary components and systems to provide sewer and solid waste collection services at the field office. Temporary outhouses shall be self-contained units, pit privies are not acceptable.

2. CONTRACTOR furnished items include, but are not limited to, all piping, valves, fittings, structures, insulation, pumps, tanks, fixtures, tie-ins, trash receptacles, hauling operations and service agreements.

3. CONTRACTOR to provide and pay for all temporary sanitation system related components and fees.

B. Temporary Electrical Systems

1. CONTRACTOR shall coordinate with local utility to provide all electrical service necessary for completion of the work. Complete necessary utility paperwork and provide minimum 60 days' notice to local utility for hookup.

2. CONTRACTOR furnished items include, but are not limited to, all conductor, transformers, service meters and masts, distribution panels, controls, electrical and lighting fixtures, tie-ins, and service agreements.

3. CONTRACTOR shall be responsible for providing temporary power to all electrical control panels to ensure that they remain heated from the time of installation to substantial completion.

4. CONTRACTOR to provide and pay for all temporary electrical system related components and fees including hookup.

C. Temporary Heating Systems

1. CONTRACTOR shall furnish and install all necessary components and systems to provide heat at the field office and worker shelters as required.

2. CONTRACTOR furnished items include, but are not limited to, all heaters, fuel tanks, piping, valves, fittings, meters, insulation, pumps, fixtures, tie-ins, and fuel hauling.

3. CONTRACTOR to provide and pay for all temporary heating system related components and fees.

D. Temporary Communication Systems (Telephone, Fax, and Internet)

1. CONTRACTOR shall furnish and install all necessary components and systems to provide telephone, fax and internet service to the field office.

2. CONTRACTOR furnished items include, but are not limited to, all phone lines, phones, fax machines, tie-ins, and service agreements.

3. CONTRACTOR to provide and pay for all temporary communication system related components and fees.

2.2 TEMPORARY CONSTRUCTION FACILITIES CONTRACTOR FURNISHED ITEMS

A. Temporary Construction Facilities (Field Office, Storage Facilities, Worker Shelters)

1. Temporary field office**:** Furnish field office building for use of CONTRACTOR personnel. Field office structure shall meet all requirements of the most current version of the IBC. Provide temporary electrical, heating, telephone, fax and internet services at the field office.

2. Temporary storage facilities: CONTRACTOR shall furnish temporary storage facilities as required to protect materials and equipment during the course of the work. Facilities shall be structurally sound and sufficiently weather tight to protect stored items in accordance with the manufacturer's recommendations.

3. Worker shelters: Worker shelters shall be provided in accordance with applicable laws and regulations.

4. CONTRACTOR to provide and pay for all temporary construction facility related components and fees.

2.3 TEMPORARY CONTROLS CONTRACTOR FURNISHED ITEMS

A. Temporary Controls

1. Furnish all gates, barricades, fences, handrails, guardrails, and security systems required for safe execution and protection of the work.

2. Furnish all Guards, markers, shields, protective clothing, hard hats, hearing protection and other equipment required by health and safety regulations for workers.

3. Furnish erosion controls in accordance with industry accepted Best Management Practices and in accordance with Section 01 57 13.

4. Furnish all required first aid and fire suppression equipment required by laws and regulations.

5. CONTRACTOR to provide and pay for all temporary controls related components and fees.

PART 3 – EXECUTION

3.1 TEMPORARY UTILITIES

A. All work relating to temporary utilities shall be arranged and implemented by the CONTRACTOR.

B. All costs associated with providing temporary utilities shall be borne solely by the CONTRACTOR including hookup.

C. CONTRACTOR shall not connect to any existing utility system unless specific written authorization from the applicable utility company is given.

1. CONTRACTOR shall provide individuals who are qualified to connect to the existing utility system and provide all necessary equipment and materials required for the connection.

2. CONTRACTOR shall at no time exceed the usage allowed by AUTHORITY or other entity governing the utility.

3. CONTRACTOR shall remove all temporary materials and equipment upon completion of construction and repair any damage caused by installation, and restore to like new condition.

D. Water: Provide temporary water for all construction requirements and CONTRACTOR's crews. CONTRACTOR shall maintain sanitary conditions at all times and shall not violate requirements of applicable codes.

E. Sanitation Facilities: Provide and maintain facilities for CONTRACTOR's employees, SubCONTRACTORs and all other onsite employer's employees. Service, clean, and maintain facilities and enclosures.

F. Electricity and Lighting: Provide temporary power for all construction requirements including CONTRACTOR's field office and to ensure safe work conditions and security of site. Provide temporary lighting as required to meet all applicable safety requirements to allow erection, application or installation of materials and equipment, and observation or inspection of the work.

G. Heating: Provide temporary heating systems at the field office and other temporary construction facilities as required by laws and regulations.

H. Communication Systems: Provide temporary communication systems at the field office including telephone, fax, and internet service.

3.2 TEMPORARY CONSTRUCTION FACILITIES

A. Field Office: Contractor shall maintain an on-site field office

1. Field office shall provide sufficient working space and sanitary facilities for Contractor personnel. Provide temporary electrical, heating, water, sewer, telephone, fax and internet services at the field office.

B. Temporary Storage Yard:

1. A temporary storage yard within the community shall be provided by the Contractor for storage of products, equipment, and materials used in the construction of the project.

C. Temporary Storage Buildings:

1. Environmental control systems shall be provided that meet recommendations of

manufacturers of equipment and materials stored.

2. Contractor shall arrange or partition to provide security of contents and ready access for inspection and inventory.

3. Combustible materials (paints, solvents, fuels, etc.) shall be stored in a well-ventilated and remote building meeting applicable safety standards.

D. Access roads:

1. Access roads, if required, shall be constructed within easements, rights-of-way, or Project limits. Alignments for new routes shall be approved by Project Manager.

2. Ground surface disturbed by access road construction shall be restored to original grade upon completion of construction.

3.3 TEMPORARY CONTROLS

A. Air Pollution Controls:

1. Minimize air pollution from construction operations.

2. Burning of waste materials, rubbish, or other debris will not be permitted on or adjacent to the site.

B. Water Pollution Controls:

1. CONTRACTOR shall not cause or permit action to occur which would cause a discharge to an existing waterway. See Section 01 57 13.

C. Erosion Control:

1. As specified in Section 01 57 13.

D. Vehicular and Pedestrian Traffic Controls

1. Comply with Laws and Regulations regarding closing or restricting the use of public thoroughfares. No public or private road or boardwalk shall be closed or impacted, except by written permission of the proper authority. Assure the least possible obstruction to traffic and normal commercial pursuits.

2. Work shall be conducted to interfere as little as possible with public travel.

3. If for any reason it is necessary to cross, close, or obstruct roads, driveways, and walks, whether public or private, Contractor shall provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel.

4. Closures: Contractor shall maintain satisfactory means of exit for persons residing or having occasion to transact business along the route of the Work. If it is necessary to close off a thoroughfare or other access providing sole vehicular access to property for periods greater than 2 hours, provide written

notice to each owner so affected 3 days prior to such closure.

5. Maintenance of traffic is not required if Contractor obtains written permission from owner and tenant of private property, or from the authority having jurisdiction over public property involved, to obstruct traffic at the designated point.

6. Contractor shall not block more than one-half the thoroughfare at any time during crossings.

7. Flaggers and guards, when required by regulation or when deemed necessary for safety, shall be furnished with approved orange wearing apparel and other regulation traffic control devices.

8. Contractor shall not block off emergency vehicle access without written permission from the Owner. Operations shall be conducted with the least interference to fire equipment access, and at no time prevent such access. Contractor shall furnish night emergency contact numbers to Authority.

3.4 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain work areas free of waste materials, debris, and rubbish. Maintain work site in a clean, orderly and organized condition. Materials should be clearly identified, with products covered and labeled. Materials should be identified with generator (CONTRACTOR) name.

B. Collect and remove waste materials, debris, and rubbish from site periodically and dispose of in accordance with all Federal, State and local regulations.

C. CONTRACTOR shall not dispose of hazardous materials such as mineral spirits, oil, chemicals, or paint thinner at the local land fill. Provide acceptable containers for collection and disposal of waste materials, debris and rubbish.

3.5 REMOVAL OF TEMPORARY FACILITIES

A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection, with the exception of temporary bulk fuel storage.

B. Clean and repair damage caused by installation or use of temporary facilities. Restore permanent facilities used during construction to pre-construction condition.

END OF SECTION

SECTION 01 51 19

TEMPORARY FUEL STORAGE AND DISPENSING

PART 1 – GENERAL

1.1 SCOPE OF WORK

A. Requirements for maintaining code-compliant temporary fuel storage and dispensing during the construction of the new facility.

1.2 RELATED REQUIREMENTS

A. Section 01 33 00 – Submittals

B. Section 01 50 00 – Construction Facilities and Temporary Controls

C. Section 02 80 10 – Decommissioning of Fuel Storage Tanks and Piping.

1.3 REFERENCES

A. 18 ACC 75 Article 075 Secondary Containment Requirements for Aboveground Oil Storage and Surge Tanks.

B. 2012 International Fire Code

C. API 2015 Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks.

D. 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response

1.4 SUBMITTALS

A. Contractor shall submit a work plan for approval detailing the location and capacity of storage facilities, demonstrating code-compliance and describing procedure for dispensing and metering.

1.5 PROCEDURES

A. Contractor shall establish and maintain code compliant temporary retail dispensing and bulk fuel storage and transfer equipment if required for the uninterrupted operation of the bulk fuel facility and Corporation bulk fuel & retail fuel sales facility.

B. Contractor shall be responsible for obtaining all temporary storage location permits, permissions and all associated fees in accordance with local, State and Federal Regulations, Statutes and Laws. If the temporary storage site is located on private land, the Contractor shall obtain written permission from the property owner or owners for such temporary storage site(s) and shall furnish AEA with a copy of this permission. The written permission shall specifically provide that the property owner will not hold AEA, the City or Corporation, its employees, agents, or engineers liable for use of or damage to this property.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Secondary containment and spill response equipment and materials shall be provided and stored in accordance with 33 CFR.

B. Liners must withstand 80 mile per hour winds, petroleum emersion, direct sunlight, and -40º F temperatures.

PART 2 – MATERIALS

2.1 LINERS

A. All liners must meet 18 AAC Section 370 requirements.

PART 3 – EXECUTION

3.1 INSTALLATION

A. The temporary facilities shall be adequately protected from vandalism and unauthorized access by installing temporary fencing and appropriate signage and lighting as necessary and required by code.

B. Removal of temporary storage facility shall be in accordance Section 01 50 00 3.5 – Removal of Temporary Facilities.

END OF SECTION

SECTION 01 57 13

TEMPORARY EROSION & SEDIMENT CONTROL

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

A. General Conditions and Supplementary Conditions.

B. Division 31 Specifications.

C. Requirements of Federal, State, and local statutes and regulations dealing with stormwater, pollution and erosion shall be strictly adhered to by the CONTRACTOR.CONTRACTOR

1.2 GENERAL

A. CONTRACTOR shall comply with the storm water construction general permit APDES. If required, the CONTRACTOR shall provide all labor, equipment, materials, and services to prepare, implement, and maintain a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the APDES.

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.

C. CONTRACTOR shall implement and comply with all conditions of the US Army Corps of Engineers Permit. (Available upon written request to the Owner).

1.3 ENVIRONMENTAL PROTECTION

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.

1.4 DEFINITIONS

Repair. Mending or replacement of erosion and control measures to a degree as to meet the intended function as outlined in the ESCP, as determined by the Project Manager.

Repairs to erosion control measure can result from, but is not limited to, any degradation to the items from flooding, sediment deposition, wind, and construction activities.

1.5 SUBMITTALS

A. Hazardous Material Control Plan.

Submit an electronic copy of the HMCP, to the Project Manager for approval. Submit these documents to the Project Manager at least 21 days before beginning

Construction Activity. After the HMCP is approved by the Owner, the CONTRACTOR must sign and certify the approved HMCP.

B. Inspection Reports

The CONTRACTOR shall submit an electronic copy of the routine inspection reports as defined in the Erosion and Sediment Control Plan. Reports shall be submitted to the Project Manager within 24 hours after the report is recorded.

C. Approved SWPPP, if required under section 1.2 above.

PART 2 - EROSION, SEDIMENT, AND POLLUTION CONTROL

2.1 TEMPORARY AND PERMINENT EROSION CONTROL

A. Temporary erosion and pollution control measures that are required at CONTRACTOR-furnished sites are subsidiary.

B. Perform temporary erosion and pollution control measures that are required due to your negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or ordered by the Engineer, or for your convenience, at your own expense.

C. Permanent erosion and pollution control measures will be measured and paid for under other contract items, when shown on the bid schedule.

PART 3 - EXECUTION

3.01 EROSION CONTROL

Best management practices for erosion control shall be observed to prevent construction related erosion impacts to receiving waters.

END OF SECTION

SECTION 01 60 13

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Products.

B. Transportation and Handling.

C. Storage and Protection.

1.2 RELATED REQUIREMENTS

A. Section 01 45 00 Quality Control: Submittal of manufacturers' certificates.
B. Section 01 42 19 Reference Standards.
C. Section 01 64 00 Owner Furnished Materials

1.3 PRODUCTS

A. Products include material, equipment, and systems.

B. Comply with Specifications and referenced standards as minimum requirements.

C. Components required to be supplied in quantity within a Specification section shall be the same, and shall be interchangeable.

D. Do not use materials and equipment removed from existing structure, except as specifically required, or allowed, by Contract Documents.

1.4 TRANSPORTATION AND HANDLING

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

B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.

C. Immediately on delivery, inspect shipment to assure:

1. Product complies with requirements of Contract Documents and reviewed submittals.

2. Quantities are correct.

3. Accessories and installation hardware are correct.

4. Containers and packages are intact and labels legible.

5. Products are protected and undamaged.

1.5 STORAGE AND PROTECTION

A. Handle and store materials for construction, products of demolition, and other items to avoid damage to adjacent facilities and equipment.

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. 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 away.

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

E. Provide Material Safety Data Sheets (MSDS) for all products which may produce unpleasant or noxious odors. CONTRACTOR shall provide for adequate venting if needed.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01 64 00

RECEIPT OF OWNER FURNISHED MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

A. This section describes receipt, unloading, transportation, storage, and handling of materials furnished by the Owner for this project. This includes the following:

TABLE 1

ITEM NUMBER	MATERIAL DESCRIPTION	QTY	UNIT	APPROX. VALUE (EA UNIT)	APPROXIMATE WEIGHT/ DIMENSIONS	FOB POINT & AVAILABILITY DATE
1	Vertical Thermoprobes/ Thermosiphons	90	EA	$2,500	38’ x 4’ Weight – Contact Manufacturer	Nunapichuk, Alaska (See Note 1)
2	30,000 gallon double wall tank	8	EA	$70,000	12’dia x 36’ tank (skids & tank flanges excluded) 40,000lbs	Nunapichuk, Alaska (See Note 1)
3	30k tank ladder & platform assemblies	8 16	EA	$5,000	See tank shop drawings, contact supplier for packaging details	Nunapichuk, Alaska (See Note 1)
4	5,000 gallon dual product fireguard tank	1	EA	$50,000	7’dia x 24’ tank (skids & tank flanges excluded) 24,000lbs	Nunapichuk, Alaska (See Note 1)
5	5k tank ladder & platform assemblies	1 2	EA	$5,000	See tank shop drawings, contact supplier for packaging details	Nunapichuk, Alaska (See Note 1)
6	HP 12x74 (50 ft length)	85	EA	Market	74 lb/ft	Nunapichuk, Alaska (See Note 1)
7	HP 10x57 (40 ft length)	110	EA	Market	57 lb/ft	Nunapichuk, Alaska (See Note 1)
8	3-inch SCH 40 Pipe (40 ft length)	170	EA	Market	7.6 lb/ft	Nunapichuk, Alaska (See Note 1)
9	W8x15 galvanized	75	EA	Total: $27,000	27 pcs @ 12’ length 15 pcs @ 16’ length 1 pcs @ 10’ length 2 pcs @ 16.33’ length 13 pcs @ 40’ length 15 pcs @ 4’ length 2 pcs @ 20’ length Total: 19,000lbs	Nunapichuk, Alaska (See Note 1)

ITEM NUMBER	MATERIAL DESCRIPTION	QTY	UNIT	APPROX. VALUE (EA UNIT)	APPROXIMATE WEIGHT/ DIMENSIONS	FOB POINT & AVAILABILITY DATE
10	1 in. Plate (pile caps)	104	EA	Total: $8,500	14”x14” Total: 5,800lbs	Nunapichuk, Alaska (See Note 1)
11	1 ¾”x 3/16”, 19-w-4 galvanized bar grating	64	EA	Total: $135,000	55pcs @ 4’x20’ 9pcs @ 3’x5’ Total: 58,000lbs	Nunapichuk, Alaska (See Note 1)

Table Notes:

1. Contractor shall receive the Owner Provided items at the location noted above and provide all required loading and transportation to the final installed location. The Owner Provided materials will be transported to Bethel, offloaded, and then transported by Alaska Logistics to Nunapichuk during the 2021 shipping season as schedule and water levels allow. The Contractor shall coordinate with Alaska Logistics to receive the materials in Nunapichuk and direct offloading location.

2. The Owner Provided steel & grating is furnished at the nominal dimensions noted in the table. Contractor shall modify provided steel as required to construct the project IAW with Contract Documents at no additional cost to the Project.

3. All other material required for the proper execution and construction of the project shall be provided by the Contractor.

4. See Shop Drawings for tank and thermoprobe details.

1.2 DELIVERY OF OWNER FURNISHED MATERIAL

A. Material furnished by the Owner shall be delivered and transferred to the Contractor at FOB points specified in the Table above.

B. Coordinate with supplier for storage and acceptance receipt.

1.3 ACCEPTANCE OF OWNER FURNISHED MATERIAL

A. The Contractor shall (1) receive and accept the materials at the delivery point specified; (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 Owner. Delinquency in signing material receipts may result in delayed progress payments.

B. All material furnished by the OWNER 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 OWNER and Engineer within 5-days of receipt of material as to the number culled and reason for culling.

C. If the OWNER fails to deliver the materials set forth in Table 1, 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.

1.4 RECEIPT, TRANSPORTING AND STORING OWNER FURNISHED MATERIAL

A. The Contractor shall receive, transport, and protect all material in accordance with the manufacturer’s instructions. All material, which is not installed immediately upon receipt,

shall be stored in accordance with the manufacturer's instructions in a temperature controlled environment (above freezing).

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 of 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 OWNER 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.

1.5 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 received 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 OWNER and shall meet the material purchase specifications.

1.6 STORAGE OF OWNER FURNISHED MATERIAL

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

1.7 EXCESS MATERIALS

All materials furnished by the OWNER in excess of those actually used in the construction of the project shall be stored in accordance with the manufacturer's instructions until the OWNER collects them. The Contractor shall provide a complete list of excess materials to the Owner and Engineer.

PART 2 - PRODUCT (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 71 23

CONSTRUCTION SURVEYING

PART 1 GENERAL

1.1 SCOPE OF WORK

A. This section is intended to establish a standard minimum level of acceptable field survey specifications and procedures to properly control the construction project.

B. The CONTRACTOR shall furnish all labor and materials necessary to perform all surveying and construction staking essential for the completion of construction in conformance with the drawings, specifications, and other Contract Documents. The CONTRACTOR shall perform all the necessary calculations required to accomplish the work.

C. It is the CONTRACTOR's responsibility to ensure proper survey methods and procedures are followed. The CONTRACTOR, at no additional expense to the Owner, shall correct any errors resulting from the survey. Any method conflicting with these survey specifications shall be approved by the Project Manager prior to its use.

D. All survey work performed shall be under the direct supervision of a Professional Land Surveyor registered in the State of Alaska.

1.2 RELATED SECTIONS

A. Section 01 78 39 Project Record Documents

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROJECT CONTROL

A. General: The Owner will provide reference horizontal and vertical control data to facilitate construction staking. It is the CONTRACTOR's responsibility to establish and check all survey control prior to any staking activity to ensure that the Project is properly located and constructed according to the Contract Documents. If discrepancies are found, Project Manager shall be notified separately and immediately. The CONTRACTOR is responsible for preserving and protecting all line stakes, grade stakes, reference points, and hubs. In the event of their loss or destruction the CONTRACTOR shall pay all costs for their replacement. The CONTRACTOR shall replace any monument that exists within the construction limits if it is disturbed or removed due to construction project activity. All monumentation disturbed or removed shall be replaced with the same type of monument or a monument approved by the Project Manager.

B. Horizontal Control Accuracy: The maximum permissible linear error allowed in establishing horizontal control is 1:5000 feet. The maximum error allowed in unadjusted angular closure shall be calculated by the formula "30 multiplied by

the square root of N" where the term "N" signifies the number of transit setups in the traverse and "30" signifies 30 seconds.

C. Vertical Control

1. Elevations shall originate from the datum provided in the Contract Drawings. All level circuits run to establish temporary benchmarks (TBM) shall have an accuracy no less than the value computed by the equation "0.1 feet multiplied by the square root of the distance in miles." Foresights and backsights shall be balanced. The maximum sighting distance shall not exceed 300 feet. All leveling circuits establishing TBMs shall be adjusted using recognized standard surveying adjustment methods. Side shots to establish elevations on TBMs shall not be allowed.

2. A minimum of two known benchmarks shall be used when establishing TBMs to verify correct elevation information. A sufficient number of TBMs shall be set to control the Project with a maximum spacing of 800 feet. A TBM shall not be located further than 200 feet outside the construction limits of the Project. All TBMs shall be located and be comprised of sufficient material such that their integrity will not be compromised throughout the life of the Project.

3.2 FIELD NOTES

A. The CONTRACTOR shall supply uniform, hard backed, write in rain survey field books. The OWNER has the right to inspect the field books at any time during the Project. All field books shall be identified on the outside spine. Each book shall be indexed and its contents referred to by page number. The date, weather condition, survey crew personnel, and instruments used shall be shown at the beginning of each day's notes. All field books containing field notes shall be sealed and signed by a Registered Professional Land Surveyor on the title page of each field book. Copies of all field books used in the process of work shall be submitted to the Project Manager upon completion of the work.

B. All observations shall be recorded directly into project field books. All field books shall be in pencil. All field notes and drawings shall be completed and reduced before acceptance by the Project Manager. Control sketches and traverse data shall be graphic and show measured and recorded distances. The source of record shall be stated. Stationing shall increase from the bottom of the page to the top. Notes shall be neat, legible, precise and sufficiently detailed. The Project Manager may stop all survey work until the notes are brought into conformance with this specification. A copy of each day's field notes shall be reduced and available to the Project Manager by 12:00 PM the following workday. The Project Manager may issue a stop work order at the CONTRACTOR's expense if the field notes are not delivered, when requested, within this time frame.

C. Erasures of errors in field books will not be accepted. A line shall be drawn through those portions of notes in error, leaving the original note legible, and the correction shall be noted above the original entry. Corrections shall be initialed by the party chief and dated. Where appropriate, a note explaining the error shall be included.

D. Failure on the part of the CONTRACTOR to keep and maintain complete and accurate field notes as required herein shall be sufficient reason to withhold payment for those items of work where survey is required. No final Project

payment will be made to the CONTRACTOR until copies of the field books have been submitted to and approved by the Project Manager.

3.3 PARTY CHIEF'S DAILY DIARY

A. The survey party chief shall keep a factual daily diary of all work performed by the survey crew on this Project. The diary shall contain the following information: date, crew, type and location of work performed, work accomplished, orders from the Project Manager and signature.

B. This record shall be kept on the Project Site and submitted to the Project Manager upon request. A copy of the diary shall be submitted to AUTHORITY upon completion of the Project.

3.4 MISCELLANEOUS CONSTRUCTION STAKING

A. The CONTRACTOR shall provide sufficient stakes for the adequate control of all structures and incidental construction not specifically covered above. A staking diagram with respect to fuel line stations and measurements for pay quantities shall be maintained in the field notes. Other items such as horizontal and vertical control shall be shown in the field book and shall be governed by procedures established in previous articles of this specification.

3.5 ELECTRONIC DATA COLLECTION AND RADIAL SURVEYS

B. When electronic data collection is used for radial stakeout, the following criteria shall be maintained and submitted:

1. A standard field book containing: date, weather conditions, instrumentation used, crew, project description and sketch, listing of turning points and control points used, and other information needed to reconstruct the survey activity.

2. A printout of the unedited output from the data collector or a copy of the field book entries to include: code descriptors, horizontal circle information, vertical circle information based on zenith angle and slope distance expressed in feet. Also, a sheet containing the explanation of the codes used to identify the various shots.

3. A printout of the reduced and adjusted (ratios of error and magnitude of misclosure shown) data represented by x, y, and z coordinates, plus necessary descriptive information.

4. A plot and or line drawing showing the control points, point occupied, and the radial observations at a scale large enough to read the point number, elevation, point descriptions, and coordinates.

5. If cross sectional data is collected by radial methods a printout/plot of the following data is required:

   a. Each point identified as it relates to the fuel line centerline station.

   b. The distance offset from centerline of the fuel line.

   c. The elevation and description of the shot.

   d. A cross section line plot of each station with the individual shots averaged out to produce the final interpolated cross section.

   e. The vertical angle and distance to the TBM's used for control and the

instrument height, and the height of the prisms.

3.6 AS-BUILT SURVEYS, FIELD NOTES AND PROJECT RECORD DOCUMENTS

A. As-built survey measurements shall be recorded on a clean set of design drawings deemed the Project Record Documents and shall show changes and improvements which vary from the dimensions, lines, grades, locations and materials as shown on the Contract Drawings. The as-builts shall also include swing ties to all pertinent existing structures, in accordance with Section 01 78 39.

B. Survey measurements shall be taken, field notes shall be kept, and accuracies shall be attained in accordance with the specifications of this section.

C. Provide an electronic file, suitable for insertion into AutoCAD, with as-built features indicated by horizontal position, description, and elevation, based on Project coordinates. Electronic data collection used to obtain as-built information does not relieve the CONTRACTOR's obligation to maintain Project Record Documents or the obligation to obtain swing ties.

D. A copy of all survey field notes shall be submitted with each pay request. Pay requests shall not be processed until the survey notes are received by the Project Manager and the Project Manager is provided evidence that the Project Record Documents are current and in the required condition.

E. Project Record Documents shall be redlined and kept current. They shall be kept ready for review for when the Project Manager, at his/her option, requests that the Project Record Documents be submitted with the survey field notes for the pay request.

F. Project Record Documents shall be submitted along with a copy of the field notes to the Project Manager at the completion of construction activity, in accordance with Section 01720 Project Record Documents, of these Specifications.

G. A completed FEMA Elevation Certificate (EC) FEMA form 086-0-33 shall be submitted prior to the substantial completion inspection.

PART 4 - BASIS OF MEASUREMENT AND PAYMENT

4.1 BASIS OF MEASUREMENT

A. There is no measurement for this item.

4.2 BASIS OF PAYMENT

A. All costs associated with these items shall be subsidiary to Civil Site Work bid items.

END OF SECTION

SECTION 01 77 19

CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Administrative provisions for Substantial Completion and for Final Acceptance.

B. Closeout Procedures.

C. Final Cleaning.

D. Project Record Documents.

E. Warranties and Bonds.

F. Spare Parts and Maintenance Materials.

1.2 RELATED REQUIREMENTS

A. Division 00 Bidding and Contract Requirements

B. Document 00 70 00 General Conditions: Fiscal provisions, and additional administrative requirements.

C. Section 01 78 39 Project Record Documents

1.3 SUBSTANTIAL COMPLETION SUBMITTALS

A. Submit the following prior to requesting a Substantial Completion Inspection:

1. Project Record Documents:

2. Complete and Owner Approved Operation & Maintenance Data (O&M Manual).

3. Spare Parts and Maintenance Materials

1.4 SUBSTANTIAL COMPLETION

A. Substantial Completion shall be considered by AUTHORITY when:

1. Written notice is provided 7 days in advance of inspection date.

2. List of items to be completed or corrected is submitted.

3. Equipment and systems have been tested, adjusted, balanced and are fully operational.

4. Operation of system has been demonstrated to AUTHORITY Personnel.

5. Certificates of Inspection for required inspections have been submitted.

6. Project Record Documents for the Work or the portion of the Work being accepted are submitted and approved.

7. Spare parts and maintenance materials are turned over to AUTHORITY.

B. Should AUTHORITY inspection find Work is not substantially complete, Agency will notify CONTRACTOR in writing, listing observed deficiencies.

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

D. When AUTHORITY finds Work is substantially complete AUTHORITY will prepare a certificate of Substantial Completion in accordance with provisions of General Conditions.

1.5 FINAL COMPLETION

A. When CONTRACTOR considers Work is complete, submit written certification:

1. Contract Documents have been reviewed.

2. Work has been inspected for compliance with Contract Documents.

3. Work has been completed in accordance with Contract Documents, and deficiencies listed with certificate of Substantial Completion have been corrected.

4. Work is complete and ready for final inspection.

B. Should AUTHORITY inspection find Work incomplete, AUTHORITY will promptly notify CONTRACTOR in writing listing observed deficiencies.

C. CONTRACTOR shall remedy deficiencies and send a second certification of Final Completion.

D. When AUTHORITY finds Work is complete, AUTHORITY will consider closeout submittals.

1.6 REINSPECTION FEES

A. Should status of completion of Work require more than two reinspections by AUTHORITY due to failure of Work to comply with CONTRACTOR's responsibility, AUTHORITY will deduct the cost of reinspection from final payment to CONTRACTOR as provided in the Contract Documents.

B. Reinspection fees shall not exceed $5,000 for any one reinspection.

1.7 CLOSEOUT SUBMITTALS

A. Project Record Documents:

B. Warranties and Bonds:

C. Operations and Maintenance Manuals:

D. Evidence of Payment: In accordance with Conditions of the Contract.

E. Consent of Surety to Final Payment.

F. Certificate of Release.

1.8 STATEMENT OF ADJUSTMENT OF ACCOUNTS

A. Submit final statement reflecting adjustments to Contract Price indicating:

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 reinspection fees.
9. Other adjustments to Contract Price.
10. Total Contract Price as adjusted.
11. Previous payments.
12. Sum remaining due.

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

1.9 APPLICATION FOR FINAL PAYMENT

A. Submit application for final payment in accordance with provisions of the General Conditions of the Contract.

1.10 FINAL CLEANING

A. Execute final cleaning prior to Substantial Completion inspection.

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

C. Remove waste, debris and surplus materials from the site.

1.11 ADJUSTING

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

1.12 PROJECT RECORD DOCUMENTS

A. Comply fully with the requirements of Section 01 78 39 Project Record Documents.

1.13 SPARE PARTS AND MAINTENANCE MATERIALS

A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual Specification Sections & Design Drawings.

B. Deliver to Project site and place in location as directed, obtain receipt prior to final payment.

1.14 WARRANTIES

A. As a condition precedent to Final Payment, all guaranties and warranties as specified under various sections of the Contract Documents shall be obtained by the CONTRACTOR and delivered to the AUTHORITY, in duplicate giving a summary of guarantees attached and stating the following in respect to each:

1. Character of Work affected.

2. Name of Subcontractors.

3. Period of Guarantee.

4. Conditions of Guarantee.

B. Delivery of said guarantees and/or warrantees shall not relieve the CONTRACTOR from any obligations assumed under any other provision of the Contract.

C. If, within any guarantee period, repairs or changes are required in connection with the guaranteed Work, which in the opinion of the AUTHORITY is rendered necessary as the result of the use of materials, equipment or workmanship, which are defective, or inferior, or not in accordance with the terms of the Contract, the CONTRACTOR shall, upon receipt of notice from the AUTHORITY, and without expense to the AUTHORITY, proceed within seven (7) calendar days to:

1. Place in satisfactory conditions in every particular all of such guaranteed Work, correct all defects therein, and make good all damages to the structure or site.

2. Make good all Work or materials, or the equipment and contents of structures or site disturbed in fulfilling any such guarantee.

3. If the CONTRACTOR, after notice, fails to comply without the terms of the guarantee, the AUTHORITY may have the defects corrected and the CONTRACTOR and CONTRACTOR’s Surety shall be liable for all expenses incurred in connection therewith, including Engineer’s fees.

1.15 OPERATIONS AND MAINTENANCE DATA (O&M MANUALS)

A. Provide two final O&M manuals specific to each facility.

B. Prior to O&M manual development, contact the Authority for a sample O&M. The submitted O&M manual must follow the Authority provided draft format.

C. Submit data in bound 8-1/2 x 11 inch text pages, ring binders with durable plastic covers. Include an electronic copy with all submittals.

D. Prepare binder cover with printed title “OPERATIONS AND MAINTENANCE DATA”, title of project, and subject matter of binder.

E. Binder contents shall be divided with plastic page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

F. Contents: Prepare a table of contents for each volume, with each Product or system description identified, enclosed in a plastic text sheet sleeve, in three parts as follows:

1. Part 1: Directory, listing names, addressees and telephone numbers of A/E, Contractor, subcontractors, and major equipment suppliers.
2. Part 2: Operation and maintenance instructions, arranged by system process flow and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of suppliers. Identify the following:
   a. Significant design criteria.
   b. List of equipment.
   c. Parts list for each component.
   d. Operating instructions.
   e. Maintenance instructions for equipment and systems.
3. Part 3: Project documents and certificates, including the following:
   a. Shop drawings and Product data.
   b. Pressure test reports.
   c. Certificates.
   d. Copies of Warranties and Bonds.

G. Submit one (1) draft copy of completed volumes five (5) working days prior to Substantial Completion inspection. Revise and resubmit as necessary.

H. Submit two (2) sets of revised final approved manuals within 15 days of Substantial Completion inspection or date of approval of draft operations and maintenance manuals.

END OF SECTION

ALASKA ENERGY AUTHORITY

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project: Nunapichuk Bulk Fuel Upgrade

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 designate portion thereof for the use for which it is intended, as expressed in the Contract Documents.

1. Operating manuals and procedures were completed and instructions of operating personnel performed on _____.
2. Record drawings are competed and delivered to the Authority.
3. Emergency systems tested and fully operational.
4. All other tests required by Specifications have been performed.
5. All systems are fully operational.

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 REQUIREMENTS INCLUDED

A. Maintenance of Record Documents and Samples.

B. Submittal of Record Documents and Samples.

1.2 RELATED REQUIREMENTS

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

B. Section 01 33 00 Submittals

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

D. Section 01 77 19 Contract Closeout Procedures

1.3 MAINTENANCE OF DOCUMENTS AND SAMPLES

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

1. Contract Drawings.

2. Specifications.

3. Addenda.

4. Change Orders and other modifications to the Contract.

5. Reviewed Shop Drawings, product data, and samples.

6. Survey and field records.

7. Field test records.

8. Inspection certificates.

9. Manufacturer's certificates.

B. Prior to Substantial Completion, provide original or legible copies of each item maintained by CONTRACTOR as listed in 1.3 A above.

C. Delegate responsibility for maintenance of Record Documents to one person on CONTRACTOR's staff.

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

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

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

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

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

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

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

K. Upon request by AUTHORITY and at time of each Application for Payment submit complete collection of record documents to AUTHORITY for review and duplication as desired.

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

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

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

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

1.4 RECORDING

A. Record information on a set of black line opaque Drawings, and in a copy of a Project manual.

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

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

selection.

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

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

1. Measured depths of elements of foundation in relation to finish first floor datum, accurate to the nearest inch.

2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements, accurate to the nearest inch.

3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.

4. Field changes of dimension and detail.

5. Changes made by modifications.

6. Details not on original Contract Drawings.

7. References to related Shop Drawings and modifications.

8. Clearly label all changes and show dimensions to establish size and location. All identifications shall be sufficiently descriptive to relate reliably to Specifications.

F. Specifications: Legibly mark each item to record actual construction, including:

1. Manufacturer, trade name, and catalog number of each product actually installed, particularly optional items and substitute items.

2. Changes made by Addenda and modifications.

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

1.5 SUBMITTALS

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

B. Transmit with cover letter in duplicate, listing:

1. Date.

2. Authority’s Project title and number.

3. CONTRACTOR's name, address, and telephone number.

4. Number and title of each record document.

5. Signature of CONTRACTOR or authorized representative.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 02 32 00
GEOTECHNICAL INVESTIGATIONS

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

A. Section 00 73 13 Supplementary Conditions.

B. Section 31 23 00 Excavation and Fill.

1.2 SOIL REPORTS

A. Existing Geotechnical Conditions:

1. A geotechnical exploration was completed for this project in 2019 consisting of three geotechnical boreholes advanced in the vicinity of the proposed project. See geotechnical report located in the Appendices for additional information.

2. Site photos are available upon request.

3. Contractor is encouraged to visit the site and acquaint himself with site conditions before submitting a Bid, and the submission of a Bid shall be prima facie evidence that he has done so.

4. Prior to bidding, Contractor may make his own 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 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 -40º F temperatures.

1.7 DECOMMISSIONING AND DISPOSAL REQUIREMENTS

A. The existing fuel storage tanks and pipeline taken out of service as a result of this project shall be decommissioned by the Contractor. Photos are available upon request. See also Section 01 11 13 Work Covered by Contract Documents.

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 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 owners 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 & Coastguard Regulations. 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 05 12 00

STRUCTURAL STEEL

PART 1 – GENERAL

1.1 SCOPE OF WORK

A. This Section includes fabrication and erection of structural steel work, as shown on 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 drawings.

2. This section applies, but is not limited to foundation structures, steel platforms, supports, stairways, braces, and other miscellaneous steel fabrications.

1.2 RELATED REQUIREMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Section 09 9000 Painting and Coatings

C. Section 09 9700 Hot Dip Galvanized Coatings

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data or manufacturer's specifications and installation instructions for following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).

1. Structural steel, including certified copies of mill reports covering chemical and physical properties.

2. Structural steel coating system.

C. Shop drawings including complete details and schedules for fabrication and assembly of structural steel members, procedures, and diagrams.

1. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols and show size, length, and type of each weld.

D. Welders' certifications.

1.4 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following (latest addition), except as otherwise indicated:

1. American Institute of Steel Construction (AISC) "Code of Standard Practice for Steel Buildings and Bridges."

2. AISC "Specifications for Structural Steel Buildings," including "Commentary."

3. American Welding Society (AWS) D1.1 "Structural Welding Code - Steel."

B. Qualifications for Welding Work: Qualify welding procedures and welding operators in accordance with AWS "Qualification" requirements.

1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.

2. If recertification of welders is required, retesting will be Contractor's responsibility.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site at such intervals to ensure uninterrupted progress of work.

B. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration. If bolts and nuts become dry or rusty, clean and re-lubricate before use.

1. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. At Contractor's expense, repair or replace damaged materials or structures as directed.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Metal Surfaces, General: For fabrication of work that will be exposed to view, use only materials that are smooth and free of surface blemishes including pitting, rust and scale seam marks, roller marks, rolled trade names, and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating, and applying surface finishes.

B. Structural Steel Shapes, Plates, and Bars: Per Structural Drawings.

C. Unfinished Threaded Fasteners: Per Structural Drawings.

D. Electrodes for Welding: Per Structural Drawings.

2.2 FABRICATION

A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings.

1. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.

2. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

B. Connections: Weld or bolt shop connections, as indicated.

C. Bolt field connections, except where welded connections or other connections are indicated. Use ASTM A 325, Type 3, corrosion resistant bolts.

D. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work.

E. Assemble and weld built-up sections by methods that will produce true alignment of axes without warp.

F. Holes for Other Work: Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members, as shown on final shop drawings.

G. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame-cut holes or enlarge holes by burning. Drill holes in bearing plates.

2.3 STEEL COATING

A. Coat miscellaneous steel structures in accordance with Section 09 9000 Painting and Coatings specifically exposed piles, unless otherwise noted on Contract Drawings or Specifications as galvanized. All steel used in this project is intended to have a coating system.

B. Hot-dip Galvanizing: Galvanize all structural steel shapes, plates, bolts and hardware where specified in the Contract Drawings in accordance with Section 09 9700, ASTM A 123, and ASTM A 153. This includes, but is not limited to the following: handrails; bolts; fasteners; grip strut; bar grate, clamps, and hardware; gate and fence components; ladders; stairs and catwalks. Piles shall not be Hot-dip galvanized.

2.4 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 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. The contractor shall have a QC program that will visually inspect welded connections.

B. The owner or owner's representative reserves the right to contract an independent testing firm to test welded connections.

C. Contractor shall provide access for owner's testing agency representatives (if hired by the owner) to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.

D. 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.

E. Shop Welding: Contractor shall inspect and test during fabrication of structural steel assemblies, as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.

2. Perform visual inspection of all welds.

3. Perform tests of full penetration welds as follows.

a. Ultrasonic Inspection: ASTM E 164.

F. Field Welding: Contractor shall inspect and test during erection of structural steel as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.

2. Perform visual inspection of all welds.

END OF SECTION

SECTION 05 5000

METAL FABRICATIONS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Miscellaneous steel framing and supports.

B. Loose bearing and leveling plates.

C. Steel weld plates and angles.

D. Structural-steel door frames.

E. Miscellaneous steel trim.

F. Pipe guards.

G. Metal floor plate and supports.

H. Abrasive metal treads and thresholds.

1.2 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel

B. Section 06 1000 - Rough Carpentry

C. Section 09 9000 - Painting

1.3 SUBMITTALS

A. Product Data:

B. Shop Drawings: Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.

2. Products: Subject to compliance with requirements, provide one of the products specified.

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

4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.

B. Ferrous Metals:

1. Steel Plates, Shapes, and Bars: Per Structural Drawings.

2. Round steel tubing and pipe are sized differently. Tubing is designated by OD and wall thickness. Pipe is designated by nominal pipe size and weight or schedule number. See Evaluations.

3. Steel Pipe: Per Structural Drawings.

2.3 FASTENERS

A. General: 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. Provide stainless-steel fasteners for fastening aluminum. Select fasteners for type, grade, and class required.

2.4 MISCELLANEOUS MATERIALS

A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI #79.

B. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.

1. Products:

a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.

b. Carboline Company; Carbozinc 621.

c. ICI Devoe Coatings; Catha-Coat 313.

d. International Coatings Limited; Interzinc 315 Epoxy Zinc-Rich Primer.

e. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.

f. Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.

g. Tnemec Company, Inc.; Tneme-Zinc 90-97.

C. Galvanizing Repair Paint: SSPC-Paint 20, high-zinc-dust-content paint for regalvanizing welds in steel.

2.5 FABRICATION

A. General: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.

1. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.

2. Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. Remove welding flux immediately. Finish exposed welds smooth and blended.

3. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.

4. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

5. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, not less than 24 inches o.c.

B. Miscellaneous Framing and Supports: Provide steel framing and supports not specified in other Sections as needed to complete the Work. Fabricate units from steel shapes, plates, and bars of welded construction. Cut, drill, and tap units to receive hardware, hangers, and similar items.

C. Miscellaneous Steel Trim: Fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

1. Exterior Miscellaneous Steel Trim: Galvanize

2.6 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Finish metal fabrications after assembly.

B. Steel and Iron Finishes:

1. Hot-dip galvanize exposed elements to comply with ASTM A 123/A 123M or ASTM A 153/A 153M as applicable.

2. Hot-dip galvanize items as indicated to comply with ASTM A 123/A 123M or ASTM A 153/A 153M as applicable.

C. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with requirements indicated below for environmental exposure conditions of installed metal fabrications:

1. Exteriors “Commercial Blast Cleaning."

D. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting," for shop painting.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, with edges and surfaces level, plumb, and true.

1. Fit exposed connections accurately together. Weld connections that are not to be left as exposed joints but cannot be shop welded. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication.

2. Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.

B. Touch up surfaces and finishes after erection.

1. Painted Surfaces: Clean field welds, bolted connections, and abraded areas and touch up paint with the same material as used for shop painting.

2. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

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.

1.2 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.

1.3 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. Grating Pacific
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. 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. Band all cut edges and openings of bar grating including transformer cableway openings.

C. Form from materials of size, thickness, and shapes indicated, but not less than that needed to support indicated loads.

D. Fit exposed connections accurately together to form hairline joints.

E. Fabricate toe plates for attaching in the field.

2.6 METAL BAR GRATINGS

A. Welded Steel Grating:

1. Bearing Bar Spacing: See Structural Drawings.

2. Bearing Bar Depth: See Structural Drawings.

3. Bearing Bar Thickness: See Structural Drawings.

4. Crossbar Spacing: See Structural Drawings.

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 except as indicated in the drawings. Where welding is required use galvanizing repair paint as described in section 2.4 after welds have been cleaned.

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 09 9000

PAINTING

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Painting of exterior surfaces.

B. Surface preparation, priming, and coats of paint are in addition to shop priming.

1.2 RELATED REQUIREMENTS

1.3 DELIVERY, HANDLING, AND STORAGE

A. All materials shall be new and be delivered to the project site in unopened containers. Paints shall be stored in a suitable protected area that is heated or cooled as required to maintain temperatures within the range recommended by the paint manufacturer.

B. Paint containers shall bear labels that plainly show the following:

1. Name or title of material.

2. Federal Specification number, if applicable.

3. Manufacturer's name.

4. Manufacturer's stock number and date of manufacture.

5. Color name and number.

6. Contents by volume, for major pigment and vehicle constituents.

7. Thinning instructions.

8. Application instructions.

1.4 SUBMITTALS

A. Submit product data and samples.

B. The following specific information shall be provided:

1. Data: For each paint system used, Supplier shall obtain from each manufacturer, a Paint System Data Sheet, Technical Data Sheets, and paint colors available (where applicable) for each product used in the paint system, except for products applied by equipment manufacturers. Required information shall be submitted on a system-by-system basis. Supplier shall also provide copies of the paint system submittals to the

coating applicator.

2. Shop Drawings: Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

C. Color samples.

1. Color wheel of manufacturer's complete color line including standard white colors.

D. Colors:

1. As selected by the AEA Project Manager.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Standard Paint: Manufacturers offering products complying with the requirements of these specifications include the following: Alternate suppliers will be considered, subject to review of the Engineer.

1. Paints:

a. Devoe Coatings

b. Sherwin Williams

2.2 MATERIALS

A. General: All products submitted shall conform to federal, state, and local requirements limiting the emission of volatile organic compounds. Specific information may be secured through the local office of the Air Pollution Control Officer.

B. Color Pigments: Pure, non-fading, applicable types to suit the substrates and service indicated.

C. Paint Coordination: Provide finish coats that are compatible with prime paints used. Review other sections of these Specifications in which prime paints are to be provided to ensure compatibility. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify the Engineer in writing of any anticipated problems arising from using specified coating systems with substrates primed by others.

D. Material Quality:

1. Provide the best quality grade of the various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying the manufacturer's identification as a standard, best grade product will not be acceptable. Proprietary names used to designate colors or materials are not intended to imply that products of the named manufacturers are required to the exclusion of equivalent products of other manufacturers, but are used to establish the intended

finish type and quality. Equivalent products of other manufacturers may be used upon proper submittal and acceptance; however, proof of replacement materials being readily available at future dates from established, nationally-recognized sources is required.

2. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only within recommended limits.

2.3 COLORS

A. Colors shall be formulated with colorants free of lead and lead compounds.

2.4 EXTERIOR PAINT SYSTEMS

A. Coatings:

1. Prime Coat- Devoe Catha-Coat 302H (3 mils minimum dry finish thickness (DFT)
2. Intermediate Coat – Devoe Bar-Rust 236 (5-6 mils minimum DFT)
3. Top Coat- Devoe Devthane 389 (2-3 mils DFT)

B. Coat Colors: All coats shall be contrasting colors. Top coat color shall be white if not directed otherwise by AEA.

C. Where field touch up of paint is required, wire brush area to bare metal and paint with prime, intermediate and top coats as indicated above.

D. 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.

E. Coat miscellaneous steel as indicated in the drawings and Division 05. Coat exposed pile elements that are not galvanized including cap plates. Coat exposed HP members that are not galvanized.

PART 3 – EXECUTION

3.1 GENERAL

A. All materials of a paint system, including primer and finish coats, shall be produced by the same paint manufacturer. Thinners, cleaners, driers, and other additives shall be as recommended by the paint manufacturer of the particular coating.

B. Paint all exposed surfaces, whether or not designated in "Schedules", except where the natural finish of the material is specifically noted as a surface not to be painted. Where items or surfaces are not specifically mentioned, paint these the same as adjacent or similar materials or areas, or as directed by the Engineer. If color or finish is not designated, Contractor shall notify the Engineer of these items. Engineer will select the color or finish from standard colors available for the materials systems specified.

3.2 EXAMINATION

A. It is the intent of these Specifications that Contractors and their subcontractors employed on the jobsite will leave the surfaces of their work in such a condition that only minor cleaning, sanding, and filling is required prior to surface preparation and painting. It is the responsibility of the Contractor to inspect and provide substrate surfaces that are prepared in accordance with these Specifications and the printed directions and recommendations of the paint manufacturer whose product is to be applied.

3.3 PROTECTION OF MATERIALS NOT TO BE PAINTED

A. Remove, mask, or otherwise protect hardware, lighting fixtures, switch plates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process. Openings in motors shall be masked to prevent paint and other materials from entering the motors.

3.4 INSTALLATION

A. Paint shall not be applied in temperatures exceeding the manufacturer's recommended maximum and minimum allowable, nor in dust, smoke-laden atmosphere, damp or humid weather.

B. Apply water-based paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F and 90 degrees F, unless otherwise permitted by the paint manufacturer's printed instructions.

C. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 45 degrees F and 95 degrees F, unless otherwise permitted by the paint manufacturer's printed instructions.

D. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions.

E. Painting may be continued during inclement weather, only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.

F. Do not apply paint materials when temperature and humidity conditions can reasonably be predicted to change from manufacturer's application limitations prior to the elapse of adequate drying time.

3.5 SAFETY

A. Painting shall be performed in strict accordance with the safety recommendations of the paint manufacturer; with the safety recommendations of the National Association of Corrosion Engineers contained in the publication,

Manual for Painter Safety; federal, state, and local agencies having jurisdiction.

3.6 PAINT MIXING

A. Multiple-component coatings shall be prepared using all of the contents of the container for each component as packaged by the paint manufacturer. No partial batches will be permitted. Multiple-component coatings that have been mixed shall not be used beyond their pot life. Contractor shall provide small quantity kits for touch-up painting and for painting other small areas. Only the components specified and furnished by the paint manufacturer shall be mixed. No intermixing of additional components for reasons of color or otherwise, even within the same generic type of coating, will be permitted.

B. Paint materials shall be kept sealed when not in use.

3.7 LOCATION WHERE PAINTING IS PERFORMED

A. Surface preparation and painting shall be done at the project site, or in the fabrication facility.

3.8 PREPARATION OF SURFACES

A. General:

1. Perform preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified for each particular substrate condition.

2. Remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish painted; or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary for the complete painting of the items and adjacent surfaces. Following completion of painting of each space or area, reinstall the removed items by workmen skilled in the trades involved.

3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program the cleaning and painting so that contaminants from the cleaning process will not fall onto wet, newly-painted surfaces.

B. Preparation of Structural Steel Surfaces:

1. Minimum surface preparation shall be Commercial Blast Cleaned per SSPC-SP6. Remove all oil and grease in accordance with the Solvent Cleaning requirements outlined in this section.

2. Coating Time: Coat any bare steel within 8 hours or before flash rusting occurs.

3. Sharp edges, surface defects, or protrusions shall be ground flat and smooth. Any welded areas shall be sanded before painting.

C. Preparation of Existing Coated Surfaces:

1. Existing coated or primed surfaces to be repainted or final coated shall be detergent washed and freshwater rinsed. Loose, abraded, or damaged coatings shall be cleaned to substrate by Hand or Power Tool, SSPC-SP2 or SSPC-SP3. Surrounding intact coating shall be feathered. One spot coat of the specified primer shall be applied to bar areas overlapping the prepared existing coating. One full finish coat of the specified primer or finish coat(s) shall be applied overall. If an aged, plural-component material is to be top coated, contact the coating manufacturer concerned for additional surface preparation requirements.

2. In the case of an application of a cosmetic coat the exact nature of the existing coatings is not known in all cases; and, while it is assumed that they have oxidized sufficiently to prevent lifting or peeling when over coated with the paints specified, the compatibility shall be checked by application to a small area prior to starting the painting. If lifting or other problems occur, request disposition from the Engineer.

D. Solvent Cleaning: Solvent cleaning shall consist of removal of foreign matter such as oil, grease, soil, drawing and cutting compounds, and any other surface contaminants by the use of solvents, emulsions, cleaning compounds, steam cleaning, or similar materials and methods which involve a solvent or cleaning action. This method conforms with SSPC-SP1.

3.9 APPLICATION OF PAINT

A. General:

1. Manufacturer's written instructions for applying each type of paint or protective coating shall be furnished to the Engineer prior to application. Cleaned surfaces and all coats shall be inspected prior to the succeeding coat. Schedule such inspection with the Engineer in advance. Apply all coatings in strict accordance with the paint manufacturer's recommendations, as reviewed by the Engineer. Sufficient time shall be allowed between coats to assure thorough drying of previously applied paint.

2. Apply additional coats when undercoats, stains, or other conditions show through the final coat of paint until the paint film is of uniform finish, color, and appearance. Give special attention to ensure that all surfaces including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

B. Application:

1. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.

2. Paint the back sides of access panels and removable or hinged covers, locker doors, etc., to match the exposed surfaces.

3. Finish exterior doors and frames, on tops, bottoms, and side edges, the same as the exterior faces, unless otherwise indicated.

4. Sand lightly between each succeeding enamel or varnish coat.

5. Omit the first coat (primer) on metal surfaces that have been shop primed and touch-up painted, unless otherwise indicated.

6. Use foam brushes or rollers on metal doors and frames and similar surfaces to achieve finishes that are completely void of brush stroke tracks and marks.

7. Back-brush inside surfaces of siding, trim, and miscellaneous wood prior to installation and painting when necessary to avoid material cupping or warping.

8. Units to be bolted together and to structures shall be painted prior to assembly or installation.

C. Film Thickness:

1. Coverage is listed as either total minimum dry film thickness in mils (MDFT) or the spreading rate in square feet per gallon (SFPG). Per coat determinations are listed as MDFTPC or SFPGPC. The number of coats is the minimum required irrespective of the coating thickness. Additional coats may be required to obtain the minimum required paint thickness, depending on method of application, differences in manufacturers; products, and atmospheric conditions. Maximum film build per coat shall not exceed the coating manufacturer's recommendations.

2. Metal and wood surfaces shall be visually inspected to ensure proper and complete coverage has been attained.

3. Particular attention shall be given edges, angles, flanges, etc. Where insufficient film thicknesses are likely to be present, ensure proper millage in these areas.

D. Damaged Coatings:

1. Damaged coatings, pinholes, and holidays shall have the edges feathered and repaired in accordance with the recommendations of the paint manufacturer, as reviewed by the Engineer.

2. Repair of fusion bonded coatings to be as recommended by the original applicator. Liquid repair kits to be provided for this purpose by the applicator, as recommended by the coating manufacturer.

3. All finish coats, including touch-up and damage-repair coats shall be applied in a manner which will present a uniform texture and color-matched appearance.

E. Unsatisfactory Application:

1. If the item has an improper finish color, or insufficient film thickness, the

surface shall be cleaned and top coated with the specified paint material to obtain the specified color and coverage. Specific surface preparation information to be secured from the coating manufacturer and the Engineer.

2. All visible areas of chipped, peeled, or abraded paint shall be hand- or power-sanded feathering the edges. The areas shall then be primed and finish coated in accordance with the Specifications. Depending on the extent of repair and its appearance, a finish sanding and topcoat may be required by the Engineer.

3. Work shall be free of runs, bridges, shiners, laps, or other imperfections. Evidence of these conditions shall be cause for rejection.

4. Any defects in the coating system shall be repaired by the Contractor per written recommendations of the coating manufacturer.

5. Leave all staging up until the Engineer has inspected the surface or coating. Staging removed prior to approval by Engineer shall be replaced.

3.10 SHIPPING

A. In all cases where pre-coated items are to be shipped to the jobsite, all efforts will be made to protect the coating from damage. Coated items shall be battened to prevent abrasion. Contractor shall use non-metallic or padded slings and straps in handling. Items will be rejected for excessive damage, in the opinion of the Engineer.

3.11 SCHEDULING PAINTING

A. Apply the first coat material to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

B. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

3.12 MINIMUM COAT THICKNESS

A. Apply each material at not less than the manufacturer's recommended spreading rate to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.

3.13 PRIME COATS

A. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat to assure a finish coat with no burn-through or other defects due to insufficient sealing.

3.14 CLEANUP

A. All cloths and waste that might constitute a fire hazard shall be placed in closed metal containers or destroyed at the end of each day. Upon completion of the work, all staging, scaffolding, and containers shall be removed from the site or destroyed in a legal manner. Paint spots, oil, or stains upon adjacent surfaces and floors shall be completely removed, from the site or destroyed in a legal manner. Paint spots, oil, or stains upon adjacent surfaces and floors shall be completely removed, and the entire job left clean and acceptable to the Engineer.

B. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

3.15 PROTECTION

A. Protect work of other trades, whether to be painted or not, against any damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting as acceptable to the Engineer.

B. At the completion of work of other trades, touch up and restore all damaged or defaced painted surfaces.

END OF SECTION

SECTION 09 9700

HOT DIP GALVANIZED COATINGS

PART 1 – GENERAL

1.1 SCOPE OF WORK

A. Work includes providing all labor, equipment, plant, transportation, supplies, materials, and engineering to provide galvanized coatings on all steel members, sections, fabricated assemblies, and hardware specified on the Plans.

B. This specification applies to components indicated in the Contract Documents to be galvanized including but not limited to:

1. Pipe supports, clamps, and associated hardware.

2. Nuts, bolts, washers, and other hardware where specified.

3. All other components called out as galvanized in the Contract Documents.

1.2 RELATED REQUIREMENTS

A. Section 05 1200 Structural Steel

B. Section 09 9000 Painting and Coating

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. No later than 3 weeks prior to galvanizing, submit an electronic of a Certificate of Compliance which states that all galvanizing complies with ASTM A 123 or A 153 as appropriate, and the requirements set forth herein.

1.4 QUALITY ASSURANCE

A. Inspection shall be carried out at the galvanizer's plant by a Contractor's representative, or at some other place as agreed between Contractor, fabricator and galvanizer. AEA reserves the right to reject unacceptable galvanizing at the Project site. Inspection rights and privileges, procedures, and acceptance or rejection of galvanized steel material shall conform to ASTM A 123 or A 153 as applicable. Inspections and tests shall include the following:

1. Visual examination of samples and finished products.

2. Tests to determine weight or mass of zinc coating per square foot of metal surface.

1.5 TRANSPORT, STORAGE, AND HANDLING

A. Galvanized articles shall be loaded and stored as follows to prevent the formation of wet storage stain:

1. The articles shall be stacked or bundled to allow air between the galvanized surfaces during transport from the supplier. Additionally, the material shall be loaded in such a manner that continuous drainage could occur.

2. In storage, the articles shall be raised from the ground and separated with strip spacers to provide free access of air to most parts of the surface. They shall also be inclined in a manner which will give continuous drainage. Under no circumstances shall galvanized steel be allowed to rest on cinders or clinkers; neither shall it be stored on wet soil or decaying vegetation.

PART 2 – PRODUCTS

2.1 STEEL MATERIALS

A. Structural steel to be galvanized shall conform to Section 05 1200 Structural Steel.

2.2 ZINC FOR GALVANIZING

A. Zinc for galvanizing shall conform to ASTM B 6.

PART 3 – EXECUTION

3.1 FABRICATION

A. Structural steel shall be fabricated generally in accordance with Class (I, II, or III) guidelines as shown in Recommended Details for Galvanized Structures as published by the American Hot Dip Galvanizers Association, Inc.

B. Fabrication practices for products to be galvanized shall be in accordance with the applicable portions of ASTM A 143, A 384 and A 385, except as specified herein. Care shall be taken to avoid fabrication techniques which could cause distortion or embrittlement of the steel. Before fabrication proceeds, the Project Manager shall be notified of potential warpage problems which may require modification in design.

C. All welding slag and burrs shall be removed prior to delivery to the galvanizer.

D. Holes and/or lifting lugs to facilitate handling during the galvanizing process shall be provided at positions as agreed between the designer, fabricator and galvanizer.

E. Unsuitable marking paints shall be avoided and unwanted grease, oil, paint and other deleterious material shall be removed prior to fabrication.

F. Surface contaminants and coatings which would not be removable by the normal chemical cleaning process in the galvanizing operation shall be removed by the fabricator using blast cleaning or some other method.

3.2 SURFACE PREPARATION

A. Surfaces to be galvanized shall be pre-cleaned utilizing a caustic bath, acid pickle and flux. Alternatively, the steel shall be near white blast cleaned to SPCC **–** SP10 and fluxed.

3.3 GALVANIZING

A. Steel members, fabrications, and assemblies shall be galvanized after fabrication, but prior to shipment, by the hot dip process in accordance with ASTM A 123.

B. Bolts, nuts and washers and iron and steel hardware components shall be galvanized in accordance with ASTM A 153. Nuts and bolts shall be supplied in accordance with ASTM A 307, A 325, A 394 and A 563, as applicable.

C. Products shall be safeguarded against steel embrittlement in conformance with ASTM A 143.

D. All articles to be galvanized shall be handled in such a manner as to avoid any mechanical damage and to minimize distortion.

E. Design features which may lead to difficulties during galvanizing shall be pointed out prior to dipping.

F. The composition of metal in the galvanizing bath shall not be less than 98.0% zinc.

3.4 COATING REQUIREMENTS

A. Weight: The weight and thickness of the galvanized coating shall conform with paragraph 6.1 of ASTM A 123 or Table 1 of ASTM A 153, as appropriate.

B. Surface Finish: The galvanized coating shall be continuous, adherent, as smooth and evenly distributed as possible and free from any defect that is detrimental to the stated end use of the coated article.

C. The integrity of the coating shall be determined by visual inspection and coating thickness measurements.

D. Adhesion: The galvanized coating shall be sufficiently adherent to withstand normal handling during transport and erection.

3.6 WELDING

A. Where galvanized steel is to be welded, adequate ventilation shall be provided. If adequate ventilation is not available, supplementary air circulation shall be provided. In confined spaces a respirator shall be used.

B. Welding shall be performed in accordance with the American Welding Society publication D19.0-72, Welding Zinc Coated Steel.

C. All uncoated weld areas shall be touched up.

3.7 TOUCH UP AND REPAIR

A. Mechanical Damage

Areas damaged by welding, flame cutting, or during handling, transport or erection shall be repaired by one of the following methods whenever the damage exceeds 3/16" in width:

1. Cold Galvanizing Compound

a. Surfaces to be reconditioned with zinc-rich paint shall be clean, dry, and free of oil, grease and corrosion products.

b. Areas to be repaired shall be power disc sanded to bright metal. To ensure that a smooth reconditioned coating can be effected, surface preparation shall extend into the undamaged galvanized coating.

c. Touch-up paint shall be an organic cold galvanizing compound having a minimum of 94% zinc dust in the dry film.

d. The paint shall be spray or brush applied in multiple coats until a dry film thickness of 8 mils minimum has been achieved. A finish coat of aluminum paint shall be applied to provide a color blend with the surrounding galvanizing.

e. Coating thickness shall be verified by measurements with a magnetic or electromagnetic gauge.

2. Zinc Based Solder

a. Surfaces to be reconditioned with zinc-based solder shall be clean, dry and free of oil, grease and corrosion products.

b. Areas to be repaired shall be wire brushed.

c. Heat shall be applied slowly and broadly close to, but not directly onto the area to be repaired. The zinc-based solder rod shall be rubbed onto the heated metal until the rod begins to melt. A flexible blade or wire brush shall be used to spread the melt over the area to be covered. The zinc based solder shall be applied in a minimum thickness of 2 mils.

d. Coating thickness shall be verified by measurements with a magnetic or electromagnetic gauge.

B. Wet Storage Stain

Any wet storage stain shall be removed by the galvanizer if formed and discovered prior to leaving the galvanizer's plant. Wet storage stain shall be removed before installation so that premature failure of the coating will not occur. Wet storage stain shall be removed as follows:

1. The objects shall be arranged so that their surfaces dry rapidly.

2. Light deposits are to be removed by means of a stiff bristle (not wire) brush. Heavier deposits are to be removed by brushing with a 5% solution of sodium or potassium dichromate with the addition of 0.1% by volume of concentrated sulfuric acid. This is to be applied with a stiff bristle brush and left for about 30 seconds before thoroughly rinsing and drying. Alternatively a proprietary product such as Oakite Highlite, or equal, which is intended for this purpose may be used according to manufacturer's recommendations.

3. A coating thickness check must be made in the affected areas to ensure that the zinc coating remaining after the removal of wet storage stain is sufficient to meet or exceed the requirements of the specification.

END OF SECTION

SECTION 10 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. See Setback & Signage sheet for additional information.

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 bulk fuel facilities.

B. Spill response storage is in Contractor provided connexs and overpack drums, see Contract Drawings for locations and additional information.

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 Response Connex shall be placed in the location shown on the drawings.

1. Place all spill response equipment, including overpack drums, inside contractor provided Connex.

2. Contractor shall provide shelving within the Connex 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. Spill response Connex shall be standard 20 foot long shipping container, steel construction, not insulated. Connex 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 one set of the following equipment and materials and place within Contractor provided spill response connex.

Quantity	Item/Description
Absorbent Material and Containers	
3 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
13 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	Connex, 20 foot, lockable
AS REQD	Padlocks, keyed-alike (for each gate, enclosure, connex, etc. plus 2 spares)

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

SECTION 26 00 00

ELECTRICAL METHODS AND MATERIALS

PART 1 - GENERAL

1.1 DESCRIPTION AND RELATED WORK

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this Section.

B. This Section applies to Division 26 and is part of all other Division 26 Sections.

C. Related sections include Div 33 and Div 40

1.2 SCOPE

A. Provide labor, products and services required for the complete installation, checkout and startup of all systems shown and specified.

B. Where the work of several crafts is involved, coordinate related work to provide each system in complete and in proper operating order.

C. Cooperate with others involved in the project, with due regard to their work, to promote rapid completion of the entire project.

D. Local Conditions: The Contractor shall thoroughly familiarize himself with the work as well as the local conditions under which the work is to be performed. Schedule work with regard to seasons, weather, climatic conditions and other local conditions which may affect the progress and quality of the work.

E. Utility Coordination: Coordinate work with the serving utility: Alaska Village Electric Cooperative, and provide equipment and installation in accordance with the respective utility requirements. Meet with the serving utilities and coordinate the installation and location of the service. Provide a written statement of approval from each serving utility.

F. Provide commissioning services as specified in Division 01 and 26 08 00 – Commissioning of Electrical and Control Systems.

1.3 CODES AND STANDARDS

A. Codes: Perform work in strict accordance with applicable national, state and local codes; including, but not limited to the latest legally enacted editions of the following specifically noted requirements:
   1. NFPA 70, National Electrical Code - NEC.

2. ANSI-C2, National Electrical Safety Code - NESC.
3. International Building Code - IBC.
4. International Fire Code - IFC.
5. Underwriters Laboratory (UL) or approved equal.

B. Standards: Reference to the following standards infers that installation, equipment and material shall be within the limits for which it was designed, tested and approved, in conformance with the current publications and standards of the following organizations:
1. American National Standards Institute - ANSI.
2. American Society for Testing and Materials - ASTM.
3. American Society of Heating Refrigerating and Air Conditioning Engineers - ASHRAE(Standard 90-75).
4. Institute of Electrical and Electronics Engineers - IEEE.
5. Insulated Cable Engineers Association - ICEA.
6. National Electrical Manufacturers' Association - NEMA.
7. National Fire Protection Association - NFPA.

1.4 MATERIAL QUALITY CONTROL

A. All components, systems and assemblies (i.e.: Control Panels) shall be Listed or Labeled by and Agency acceptable to the State of Alaska Department of Labor, Mechanical Inspections Division. Acceptable Agencies include (but are not limited to) U/L, ETL, FM, CSA/US.

B. It is the CONTRACTOR’s responsibility to verify listing or labeling of all components for which he is responsible for. Any component, system or assembly installed under this contract that is found not to be listed or bear a label will be either replaced or field listed and any associated cost shall be borne in its entirety by the CONTRACTOR.

1.5 SPECIFICATION TERMINOLOGY

A. "Engineer" is the Owner's Representative as defined in the General Conditions of the Contract.

B. Streamlining: In many instances, the products, reference standards, and other itemized specifications have been listed without verbiage. In these cases, it is implied that the Contractor shall provide the products and perform in accordance with the references listed.

C. "Provide" means furnish all products, labor, subcontracts, and appurtenances required and install to a complete and properly operating, finished condition.

D. "Furnish" means to purchase material as shown and specified, and cart the material to an approved location at the site or elsewhere as noted or agreed to be installed by supporting crafts.

E. "Install" means to set in place and connect, ready for use and in complete and properly operating finished condition, material that has been furnished.

F. "Rough-in and connect" means provide an appropriate system connection such as conduit with junction boxes, wiring, switches, disconnects, etc., and wiring connections. Equipment furnished is received, uncrated, assembled, and set in place under the Division in which it is specified.

G. "Accessible" means arranged so that an appropriately dressed man, 6 feet-2 inches tall, weighing 250 pounds, may approach the area in question with the tools and products necessary for the work intended and may then position himself to properly and safely perform the task to be accomplished, without disassembly or damage to the surrounding installation.

H. "Serviceable" means arranged so that the component or product in question may be properly removed, and replaced without disassembly, destruction or damage to the surrounding installation.

I. "Product" is a generic term, which includes materials, equipment, fixtures and any physical item used on the project.

J. "Basis of Design" refers to products around which the design was prepared. Some or all of the particular characteristics of Basis of Design products may be critical to the fit or performance of the completed installation. Such characteristics are often subtle. Where substitutions are made to products that are the Basis of Design, the Contractor is alerted that nominally acceptable substitutions may produce undesirable side effects such as switchboards that no longer fit the space due to increased product dimensions. The Contractor is responsible for resolving all impacts of substitutions. Approval of a substitution request does not relieve the Contractor of complying with the design intent and all Codes.

K. "As Specified" denotes a product, system, or installation that:
   1. Includes all of the salient characteristics identified in the Drawings and Specifications;
   2. Meets all of the requirements of the "Basis of Design"; and
   3. Is produced by a manufacturer listed as acceptable on the Drawings or in the Specifications.

L. "Substitution" is a product, system or installation that is not by a listed manufacturer or does not conform to all salient characteristics identified in the Contract Documents, but which the Contractor warrants meets all specific requirements listed in the Contract Documents.

M. "System Drawing" is a diagrammatic engineered drawing that shows the interconnection and relationship between products to demonstrate how the products interact to accomplish the function intended. Examples of system drawings include control and instrumentation diagrams, and wiring diagrams. Some drawings, such as dimensioned

and complete Fire Suppression Drawings may be both System Drawings and Shop Drawings.

N. "Shop Drawings" are dimensioned working construction drawings drawn to scale to show an entire area of work in sufficient detail to demonstrate service and maintenance clearances and complete coordination of all trades.

O. Reference to a specific manufacturer's product (even as "Basis of Design") does not necessarily establish acceptability of that product without regard to compliance with all other provisions of these specifications.

1.6 DRAWINGS SPECIFICATIONS AND SYMBOLS

A. The Drawings and specifications are complementary. Do not scale the Drawings. Locations of devices, fixtures, and equipment are approximate unless dimensioned.

B. The Drawings are partly diagrammatic and do not show precise routing of conduits or exact location of all products, and may not show in minute detail all features of the installation; however, provide all systems complete and in proper operating order.

C. Drawing symbols used for basic materials, equipment and methods are commonly used by the industry. Special items are identified by a supplementary list of graphical illustrations, or called for on the Drawings or in the specifications.

1.7 PRODUCT AND SYSTEM SUBMITTALS

A. Submittals: Provide submittals for products and systems described in Division 26 and shown on the Drawings to demonstrate compliance with the requirements of the project. Unless specified otherwise in Division 1, submit data not later than 60 days after award of contract or, in any case, to allow sufficient time for review without delaying construction. Furnish equipment submittals in the manner described elsewhere in these specifications. In addition, include data for review, and organize data, as noted below:
   1. Specification reference and/or drawing reference for which literature is submitted for review with an index, following specification format, and item by item identification.
   2. Manufacturer's name and address, and supplier's name, address and telephone number.
   3. Catalog designation or model number.
   4. Rough-in data and dimensions.
   5. Operation characteristics.
   6. Wiring diagrams for the specific system.
   7. Coordination data to check protective devices.
   8. Information required to verify compliance with the short-circuit withstand and interrupting ratings, as shown on the Drawings or further stated in these Specifications.

9. Certification that all data shown on the Drawings or further stated in these Specifications concerning available short-circuit currents has been confirmed with the serving Electric Utility.
10. Working construction drawings (shop drawings).
11. A customized listing of the characteristics identified in the Contract Documents. Indicate whether each item is submitted as "Basis of Design", "As Specified" or "Proposed Substitution". Clearly indicate on product data sheets the data which show the product meets the requirements. Indicate all deviations and mark out all non-applicable items.
12. ALL PROPOSED SUBSTITUTIONS, DEVIATIONS, MODIFICATIONS, OR CHANGESOF ANY TYPE WHATSOEVER FROM THE PRODUCTS OR SYSTEMS SPECIFIED SHALL BE CLEARLY ITEMIZED IN THE SUBMITTAL INDEX. Submittal approval will not include such deviations unless they are specifically itemized and approved. Where deviations of substitute product or system performance have not been specifically noted in the submittal by the Contractor and accepted by the Engineer, provision of a complete and satisfactory working installation of equal quality to system specified is the sole responsibility of the Contractor. Unapproved deviations discovered in the field shall be corrected as directed by the Engineer.
13. DELETE ALL SUPERFLUOUS INFORMATION FROM SUBMITTAL DATA SUCH AS MODEL NUMBERS AND OPTIONS FOR EQUIPMENT CONTAINED ON MANUFACTURER'S DATA SHEETS BUT NOT USED ON THIS PROJECT.
14. Submittals not completely marked as indicated above, in the opinion of the Engineer, will be rejected without review.

B. Electronic Submittals:
   1. Submittals may be in electronic (PDF) format.
      a. Electronic submittals shall follow the organization and formatting required for paper submittals.
         1) Provide electronic bookmarks within the PDF document in place of tabs and sub-tabs.
         2) If individual PDF files are provided for each product or shop drawing sheet, organize files into folders and name files and folders to correspond with applicable specification sections or drawing titles.
      b. If submittal is a scanned document, run the optical character recognition OCR function to ensure the document is searchable and can be copied and pasted.
      c. Electronic submittals may be transmitted via Email, disk or download from a projector construction Website.

C. Coordination:
   1. The Contractor shall create and maintain a master submittal log for all items submitted in Division 26. Submit master submittal log with first submittal.
   2. Prior to submission for approval, the Contractor shall hold a meeting of all trades to review all shop drawings and submittals. All trades shall cross-check all shop drawings and submittals for conflicts, clearances, physical space allocation and routing, discrepancies, dimensional errors, omissions, contradictions, departures

from the Contract requirements, correct electrical/mechanical services and connections, and provisions for commissioning.

3. The Contractor shall revise, correct, and appropriately annotate all submittals prior to submission for approval.

D. Certificate of Coordination: Include with the Submittals a complete letter in the following format:

I _____ (Name), of _____(Firm), certify that the meeting of all trades for coordination of shop drawings and submittals as required by Specifications Section 26 00 00 - Electrical Methods and Materials was held on_____ Date(s). I further certify that, except as noted on the shop drawings and submittals, they are free of conflicts, discrepancies, dimensional errors, omissions, contradictions, and departures from the Contract requirements, and that they provide for proper clearances, physical space allocation and routing, correct electrical/mechanical services and connections, and provisions for commissioning.
SIGNED: _____ DATE: _____
_____ TITLE: _____

E. A current copy of all approved submittals and the submittal log shall be kept at the job site.

F. With prior permission from the Engineer, partial submittals will be considered for review provided that they are complete sections, as listed below:
1. Individual Special Systems (Fire Alarm, Intercom, etc.)
2. Lighting Fixtures, Lamps and Accessories.
3. Switchboards, Panels and Transformers.
4. Transfer Switches
5. Transformers.
6. Controls and Instrumentation

G. Mark submittal literature and shop drawings clearly and bind 8-1/2 by 11 inch literature in three-ring hardback loose-leaf binders by individual sets.

H. Submittal review is for general design and arrangement only and does not relieve the Contractor from any of the requirements of the Contract Documents. Submittals will not be checked for quantity, dimension, fit or proper technical design of manufactured equipment.

1.8 SHOP DRAWINGS REQUIRED

A. The Contract Documents are not intended for nor are they suitable for use as shop drawings. Do not use Contract Drawings for direct fabrication or installation of products or equipment; instead, prepare shop drawings for installation and arrangement of work. Submit shop drawings as requested, specified, or otherwise required demonstrating

proper planning for installation and arrangement of work to the satisfaction of the Engineer. Lay out drawings to scale and show dimensions where accuracy of location is necessary for coordination or communication purposes. Scale shall be appropriate to clearly show all aspects of installation and equipment arrangement. Show work of all trades, including Architectural, Structural, Mechanical, and Electrical items which are pertinent to proper and accurate coordination and conflict resolution.

B. In cases where one or more equipment items in a mechanical or electrical room or space differ in dimensions or configuration from Basis of Design equipment, the working drawing shall show the entire area. The drawing shall be dimensioned to indicate that required aisle ways and maintenance clearances are being maintained to at least the degree shown on the Contract Drawings.

C. Provide shop drawings for all products, systems, system components, and special supports that are not a standard catalog product and which may be fabricated for the Contractor or by the Contractor. In addition provide shop drawings for:
   1. Electrical and telecommunications rooms and spaces, including all equipment. Demonstrate all required clearances and working spaces are provided.
   2. Routing and interdisciplinary coordination of groups of conduits numbering more than one and over two inch trade size.
   3. Where noted on the drawings.
   4. Where noted in Division 26.

D. Record Shop Drawings: Provide a copy of the final, corrected, approved shop drawings for the project, updated to show as-built conditions. Drawings shall indicate exact device locations and conduit and wire routing. Prepare drawings using the latest release of AutoCAD and deliver files to the Engineer. Refer to other specification sections for additional system specific requirements.

1.9 PERMITS, TESTS AND INSPECTIONS

A. Schedule, obtain, and pay for permits and fees required by local authorities and by these specifications.

B. Request for Tests: Notify the Engineer a minimum of 72 hours in advance of tests. In the event the Engineer does not witness the test, certify in writing that all specified tests have been made in accordance with the specifications.

C. Deficiencies: Immediately correct deficiencies that are evidenced during the tests and repeat tests until system is approved. Do not cover or conceal electrical installations until satisfactory tests are made and approved.

D. Operating Tests: Upon request from the Engineer, place the entire electrical installation and/or any portion thereof, in operation to demonstrate satisfactory operation.

1.10 IDENTIFICATION

A. Equipment Labels and Nameplates:
   1. Provide rigid engraved labels and nameplates of 1/16 inch thick laminated plastic.
      a. Label and Nameplate Colors:
         1) Normal Equipment: White letters on a black or gray background (engraved labels).
         2) Emergency Equipment: White letters on a red background.
      b. Securely attach labels with threaded fasteners or pop-rivets. (Adhesive attachment not acceptable.)
      c. Temporary markings not permitted on equipment. Repaint trims, housings, etc., where markings cannot be readily removed. Refinish defaced finishes.
      d. No labeling abbreviations will be permitted without prior approval.
   2. Include item designation and branch circuit designation (panel and circuit number) on disconnects, starters, equipment and device nameplates, e.g., “AHU-2, Circuit LA-30”).
   3. Label and Nameplate Locations:
      a. Provide 1 inch minimum height letters on following equipment:
         1) Service disconnect (red background).
      b. Provide 1/2 inch minimum height letters on following equipment:
         1) Secondary feeder breakers in distribution equipment. Designation as required by load served.
         2) Special equipment housed in cabinets, as designated on plans, on outside of door.
         3) Panelboards, switchboards, motor control centers, as designated on plans, on outside of door.
         4) Service equipment. Provide signage in accordance with NEC Article 110.24(A) indicating maximum available fault current and date of fault current calculation.
      c. Provide 1/4-inch minimum height letters on:
         1) Disconnects and starters for motors or fixed appliances.
         2) Designated electrical equipment.
      d. Provide 1/8-inch minimum height, adhesive labels on switches and receptacles where item controlled is not visible from the switch, or as noted on drawings.
      e. External Power Sources: Provide 1/8-inch white letters on red background on all starters or controllers that receive power from an external source that is not de-energized by operating the associated disconnecting means.

B. Branch Circuit Panelboard Directories: Provide neatly typed schedule (odd numbered circuits on left side or top, even on right side or bottom) under plastic jacket or protective cover to protect the schedule from damage or dirt. Securely mount on inside face of panelboard door. Define briefly, but accurately, nature of connected load (i.e., Lighting Room 2989, Receptacles Janitor Room, Etc.) as approved. Sequentially numbered schedules shall not be used.

C. One-Line Diagram: Provide approved print for the "As-Built" distribution system. Mount behind protective cover (1/8-inch minimum thickness clear Plexiglas) in substantial frame, in accessible location at main switchboard.

D. Empty Conduits: Provide tags with typed description of purpose, and location of opposite end, wired to each end of conduits provided for future equipment.

E. Conduits: Mark conduits entering or leaving panelboards with indelible black magic marker with the circuit numbers of the circuits contained inside. Identify Fire Alarm System conduits with red paint in accordance with Section 26 05 34 Raceway and Boxes for Electrical Systems.

F. Junction Boxes: Mark the circuit numbers of wiring on junction boxes with sheet steel covers. Mark with indelible black marker. On exposed junction boxes in finished areas mark on inside of cover. Paint Fire Alarm System junction boxes with sheet steel covers red. Mark other Special System junction boxes with sheet steel covers with appropriate system designation, e.g., "Intercom", "Clock", "Telecom", etc. Mark with indelible black marker. On exposed junction boxes in finished areas mark on inside of cover.

G. Code Required Markings and Warnings: Provide placards, markings and identification systems required by Code and/or the Contract Documents, such as (but not limited to):
   1. Arc Flash.
   2. "Series Rated Systems".
   3. Conductor insulation color identification.
   4. Special conductor identification and legends.
   5. Emergency systems markings.
   6. Multiple services placards.
   7. Emergency source grounded circuit conductor connected to a grounding electrode at a location remote from the emergency source: Provide a sign at the grounding location identifying all emergency and normal sources connected at that location.
   8. Warning messages shall include an appropriate plain language imperative command, such as "DANGER HIGH VOLTAGE - KEEP OUT
   9. Available Fault Current: Service equipment shall be legibly marked in the field with the maximum available fault current in accordance with NEC Article 110.24(A). The field marking(s) shall include the date the fault calculation was performed and shall be of sufficient durability to withstand the environment involved." Development of the actual fault current will be a joint effort between Contractor and Engineer. Final values will be provided by the Engineer, however field data may be requested from and provided by Contractor.
   10. Where disconnecting means is not within sight of the transformer, provide signage in accordance with NEC Article 450.14 indicating location of remote disconnecting means.

1.11 CLEARANCE STRIPING

A. For electrical equipment located in areas with uncarpeted floors, the clearances dictated by NEC Article 110 shall be indicated by two inches wide colored striping on the floor.

B. Striping shall be of a bright color (typically red or yellow) that contrasts with the floor color, and shall be applied by the most durable process that is commercially available for the particular floor finish. Examples are: epoxy paint on concrete floors, and colored tile segments in composition tile floors. Striping color and method shall be subject to approval by the Engineer.

C. Where practical, on the floor immediately inside the striping, stencil in two inch block letters the statement: "ELECTRICAL CLEARANCE -- STORAGE ILLEGAL INSIDE THIS ZONE." For floor types where painted stenciling is not feasible or sufficiently durable, this message shall instead be posted with a WALL PLACARD below the equipment of the type specified in this Section, with 1/2-inch lettering. Note the specific clearance requirements on the engraved label. Placard shall be of a size needed to provide the required information. Color shall be black letters and symbols on yellow background.

D. A placard placed at either end of a contiguous row of equipment is acceptable where floor marking is not feasible.

1.12 AS-BUILT DRAWINGS

A. Reference requirements stated elsewhere in these Specifications.

B. In addition to 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 and location of items cast in concrete or buried underground. 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. Maintain As-Built Drawings in an up-to-date fashion in conjunction with the actual progress of installation. Accurate progress mark-ups shall be available on-site for examination by the Engineer or his representative at all times.

D. Prepare wiring diagrams for individual special systems as installed. Identify components and show wire and terminal numbers and connections. Include diagrams from the shop drawings and submittals, updated to show as-built condition.

E. Contractor’s red lines (“As-Builts”), shall be prepared in accordance with to the standard of care criteria as defined in this sub-section. The Engineer reserves the right to reject any or all such As-Built Drawings if, in our opinion, these criteria have not been met or if the work is not clear. Costs incurred as a result of the Contractor’s failure to meet these criteria such as, but not limited to, resubmittals, meetings, site visits and written correspondence, shall be reimbursed by the Contractor as additional services. The acceptable standard of care includes the following:

1. Full size As-Built Drawings shall be neatly marked-up by the Contractor to show actual installation conditions using the symbols, line types and abbreviations as shown in the contract document's legends and abbreviations. Red shall be used to show items to be added, green for items to be removed and blue for general clarification comments not to be drafted.
2. Line work shall be drawn using a straight edge and all notes shall be neatly printed and legible. Leaders and sheet notes shall be used where necessary using a similar style to that shown throughout the Drawings.
3. Under slab and otherwise inaccessible piping, ducting, and other components shall be accurately dimensioned to the nearest one-inch increment. Complete and submit As-Built Drawings that include inaccessible components, such as plumbing and heating piping and electrical conduit on underfloor plans involving slab on grade floor construction, for review prior to pouring of the slab.
4. Where equipment is furnished having different dimensions then those shown, the Drawings shall be modified to show the dimensions of the equipment provided.
5. Where equipment is shown in more than one drawing location, (i.e., plan and section), revised equipment arrangement shall be shown in all drawing locations.

F. At completion of project, deliver the As-Built Drawings to the Engineer and obtain written receipt.

1.13 OPERATING INSTRUCTIONS

A. Prior to final acceptance, instruct an authorized representative of the Owner for eight hours on the proper operation and maintenance of electrical systems and equipment provided under this contract. This requirement is for several systems, and is in addition to special training specified in other sections. Make available a qualified technician for each component of the installation for this instruction. Give these operating instructions after the operation and maintenance manuals have been furnished to the Owner. Submit written certification, signed by the Contractor and an authorized representative of the Owner, that this has been completed.

1.14 OPERATION AND MAINTENANCE MANUALS

A. Provide Operation and Maintenance Manuals in the manner described elsewhere in these specifications. In addition, organize manual and include data and narrative as noted below.
   1. Final Manuals shall be provided not later than one week prior to requesting inspection for Substantial Completion.
   2. Submit all 8-1/2 by 11 inch literature and equipment data in hard-back, three-ring, loose leaf binders by individual sets. Cardboard or paper binders are unacceptable.
   3. Provide electronic format (Adobe PDF) files for Operation and Maintenance Manuals.

B. Provide a separate chapter for each section of the electrical specifications with sub-chapters for each class of equipment or system. Provide a table of contents for each

chapter, and each major item in each chapter, to indicate the page number of each. Provide a summary of product warranty terms and duration for each piece of equipment. Label all pages to assure correct placement in manual. Identify each piece of equipment with its associated specification description.

C. Operating Sequence Narrative:
   1. In each chapter, describe the procedures necessary for personnel to operate the system and equipment covered in that chapter.
   2. Describe procedures for start-up, operation, emergency operation, and shutdown of each system. If a particular sequence is required, give step-by-step instructions in that order.
   3. Describe all seasonal adjustments that should be accomplished for each system.
   4. Provide the above descriptions in typewritten, simple outline, narrative form.

D. Maintenance Instructions:
   1. Provide complete information for preventive maintenance for each product, including recommended frequency of performance for each preventive maintenance task.
   2. Provide instructions for minor repair or adjustments required for preventive maintenance routines, limited to repairs and adjustments that may be performed without special tools or test equipment and which require no extensive special training or skills.
   3. Provide information of a maintenance nature covering warranty items, etc., that are not discussed in the manufacturers literature or the operating sequence narrative.
   4. Provide complete information data for spare and replacement parts for each product and system. Properly identify each part by part number and manufacturer.

E. Manufacturers' Brochures: Include manufacturers' descriptive literature covering products used in each system, together with illustrations, exploded views and renewal parts lists. Highlight all applicable items and instructions, or mark-out non-applicable items.

F. Shop Drawings: Provide a copy of corrected, approved shop drawings for the project, updated to show as-built condition, either with the manufacturers' brochures or properly identified in a separate subsection.

G. Operation and Maintenance Manuals shall be fully corrected to include review comments prior to final submission to the Owner.

1.15 PROJECT COMPLETION AND DEMONSTRATION

A. Tests: During final inspection, conduct operating tests for approval. Demonstrate installation to operate satisfactorily in accordance with requirements of Contract Documents. 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. Have instruments available for measuring light intensities, voltage, and current values and for the demonstration of continuity, grounds, or open circuit conditions. Furnish personnel to assist in taking measurements and making tests.

In the event that systems are not complete and fully operational at the time of final inspection, all costs of any subsequent inspections shall be borne by the Contractor at no additional cost to the Owner.

B. Certificate of Completion: Submit at time of request for final inspection, a complete letter in the following format:

I, (Name), of (Firm), certify that the electrical work is complete in accordance with Contract Plans and Specifications, and authorized change orders (copies of which are attached hereto) and will be ready for final inspection as of (Date). I further certify that the following Specifications requirements have been fulfilled:

1. Megger readings performed, copies of logs attached.
2. Operating manuals completed and instruction of operating personnel performed, (Date) (Signed)Owner's Representative
3. Record document drawings up-to-date, accurate, and ready to deliver to Engineer.
4. Emergency systems tested and fully operational.
5. Alarm System tested and fully operational.
6. Generation System controls tested and fully operational.
7. Ground-fault system performance test complete, copies of logs attached.
8. Other tests required by Specifications have been performed.
9. Specified Owner training complete.
10. Systems are fully operational. Project is ready for final inspection.
    SIGNED: DATE:
    TITLE:

1.16 WARRANTY

A. Warranty work shall be promptly coordinated and performed at the Contractor's sole expense. Workmanship, labor and materials (without limitation) in this Division shall be warranted for the longer of the following:

1. As called for in the General Conditions of the Contract.
2. For a minimum period of one year from the date of final acceptance.
3. For the extended warranty period specified in a specific Section under this Division.

B. Where a specific product carries a longer warranty as a standard offering of its manufacturer, extended warranty coverage beyond these requirements shall be retained by the Owner. The Owner will have recourse back to the manufacturer only in these cases, when the warranty as specified in A. above has expired.

PART 2 - PRODUCTS

2.1 GENERAL

A. Electrical Material have been called out on the plans and unless specifically noted are all considered to be candidates for OR EQUAL substitution.

2.2 NAMEPLATES

A. Product Description: Engraved three-layer laminated plastic nameplate, black letters on white background.

2.3 WALL PLACARDS

A. Product Description:
   1. ,080 Aluminum
   2. Single sided
   3. Minimum size: 12”x18”

2.4 WIRE MARKERS

A. Product Description: split sleeve, or tubing type wire markers with circuit or control wire number permanently stamped or printed.

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

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 DEFINITIONS

A. EPDM: Ethylene-propylene-dieneterpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.3 SUBMITTALS

A. Product Data: For each type of product provided.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. American Insulated Wire Corp.; a Leviton Company.
2. General Cable Corporation.
3. Southwire Company.
4. Alcan Wire.

B. Copper Conductors: Stranded, comply with NEMA WC 70.

C. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN and XHHW-2.

2.2 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. O-Z/Gedney; EGS Electrical Group LLC.
2. 3M; Electrical Products Division.

3. Tyco Electronics Corp.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 Specialty Cords and Cables

A. Provide Manufacturer approved cords and cable as shown on the plans.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Stranded Copper.

B. Branch Circuits #6 AWG and smaller: Stranded Copper.

3.2 CONDUCTOR INSULATION AND WIRING METHODS

A. Service Entrance: Type XHHW-2 single conductors in raceway.

B. Feeders: Type XHHW-2 single conductors in raceway.

C. Branch Circuits: Type THHN-THWN, single conductors in raceway.

D. Minimum Conductor Size:

1. Neutral: #10 AWG (#12 AWG minimum for dedicated neutrals and lighting circuits).

2. Ground: #12 AWG.

3. Phase Conductors: #12 AWG.

4. Branch Circuit Homeruns (longer than 75 feet): #10 AWG.

E. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, and strain relief device at terminations to suit application.

F. Class 1 Control Circuits: Type THHN-THWN, in raceway.

G. Class 2 Control Circuits: Type THHN-THWN, in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Provide insulated screw-on type connectors on lighting and receptacle branch circuit splices. Hydraulically-set compression lugs for terminations at panel and switchboard busses.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

D. Below-grade splices shall be made in handholes and shall be made watertight with epoxy resin type splicing kits. Scotchcast or equal.

E. Termination at busses (panel, switchboard, ATS, etc.), and transformers to be made with hydraulically set compression lugs.

3.5 BRANCH CIRCUITS

A. Homeruns greater than 75 feet to first outlet shall be No. 10 AWG minimum. Make no splices in home runs. Wiring from separate raceway systems shall not be intermixed in common junction boxes. Wiring shown in separate raceway systems shall not be combined.

3.6 FEEDERS

A. Make no splices unless shown on the plans.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

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 SUBMITTALS

A. Product Data: For each type of product provided.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. Insulated Conductors: Stranded Copper wire or cable insulated for 600 V.

B. Bare Copper Conductors: Stranded Copper wire or cable.

C. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 2 inches by 12 inches in cross section, unless otherwise indicated; with insulators.

2.2 CONNECTORS

A. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.

B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad, 3/4 inch by 10 feet.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum.

1. Bury at least 30 inches below grade.

B. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.

2. Underground Connections: Welded connectors, except at test wells and as otherwise indicated.

3. Connections to Structural Steel: Welded connectors.

3.2 BONDING

A. Insulated grounding bushings shall be installed to bond all feeder conduits to the switchboard and loadcenter ground bus or panel ground bus at both ends of feeder raceways. Insulated grounding bushings shall also be installed in all feeder pull boxes to bond all conduits together. Jumpers or bonds shall be copper and sized in accordance with Table 250-95 of the National Electrical Code.

3.3 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.

C. Poles Supporting Outdoor Lighting Fixtures: Install grounding conductor with branch-circuit conductors and bond pole.

3.4 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade, unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.

C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.

2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.

3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

D. Grounding for Platform Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns as shown or at distances not more than 60 feet apart.

1. Install tinned-copper conductor not less than No. 2/0 AWG for ground ring and for taps to building steel.

END OF SECTION

SECTION 26 05 33

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes conduit and tubing, surface raceways, wireways, outlet boxes, pull and junction boxes, and handholes.

B. Related Sections:

1. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables.
2. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

1.2 REFERENCES

A. American National Standards Institute:

1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
2. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.
3. ANSI C80.5 - Aluminum Rigid Conduit - (ARC).

B. National Electrical Manufacturers Association:

1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
2. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
3. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
4. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
5. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
6. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
7. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.3 SYSTEM DESCRIPTION

A. Raceway and boxes located as indicated on Drawings, and at other locations as required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Boxes are shown in approximate locations unless dimensioned. Raceways are defined per schedule. Provide raceway and boxes to complete wiring system.

1.4 DESIGN REQUIREMENTS

A. Minimum Raceway Size: 1/2 inch unless otherwise specified.

1.5 SUBMITTALS

A. Section 26 00 00 - Electrical Methods and Materials.

B. Product Data: Submit for the following:
   1. Flexible metal conduit.
   2. Liquidtight flexible metal conduit.
   3. Nonmetallic conduit.
   4. Raceway fittings.
   5. Conduit bodies.
   6. Wireway.
   7. Pull and junction boxes.
   8. Handholes.

C. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 77 19 - Closeout Requirements

B. Project Record Documents:
   1. Record actual routing of conduits larger than 2 inch on the plans.
   2. Update Conduit development drawing and conduit schedules and on plans.
   3. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 13 – Material and Equipment.

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

PART 2 - PRODUCTS

2.1 METAL CONDUIT

A. Manufacturers:
1. Allied Tube & Conduit.
2. EGS/Appleton Electric.
3. Republic Conduit.
4. Thomas & Betts Corporation; a member of the ABB Group.
5. Western Tube and Conduit Corporation.
6. Wheatland Tube Company.
7. Substitutions: Section 26 00 00 - Electrical Methods and Materials.

B. Rigid Steel Conduit: ANSI C80.1.

C. Rigid Aluminum Conduit: ANSI C80.5

D. Fittings and Conduit Bodies:
1. Conduit fitting and body covers to be screw type only, clamp type not permitted.
2. NEMA FB 1; material to match conduit.

E. Thread Lubricant
1. Kilark or equal

2.2 FLEXIBLE METAL CONDUIT

A. Manufacturers:
1. AFC Cable Systems, Inc.
2. EGS/Appleton Electric.
3. Southwire Company.
4. Substitutions: Section 26 00 00 - Electrical Methods and Materials.

B. Product Description: Interlocked aluminum construction. Interior use only.

C. Fittings: NEMA FB 1.

2.3 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

A. Manufacturers:
1. Anamet Electrical, Inc.
2. Carlon Electrical Products.
3. EGS/Appleton Electric.

4. Southwire Company
5. Substitutions: Section 26 00 00 - Electrical Methods and Materials.

B. Product Description:
1. Interlocked aluminum construction with PVC jacket.
2. Listed for use in Class 1 Division 2 locations.

C. Fittings: NEMA FB 1.

2.4 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:
1. Carlon Electrical Products.
2. Emerson Process Management.
3. Republic Conduit.
4. Western Tube and Conduit Corporation.
5. Wheatland Tube Company.
6. Substitutions: Section 26 00 00 - Electrical Methods and Materials.

B. Product Description: ANSI C80.3; galvanized tubing.

C. Fittings and Conduit Bodies: NEMA FB 1; steel or malleable iron, compression type.

D. Set screw or indenter type fittings and conduit bodies not permitted

2.5 FLEXIBLE COUPLINGS FOR HAZARDOUS LOCATIONS

A. Manufacturers:
1. Kilark
2. Substitutions: Section 26 00 00 - Electrical Methods and Materials.

B. Product Description: UL 213 Raintight rated for Class I Division 1 Groups A, B, C and D.

2.6 SEAL OFF FITTINGS

A. Manufacturers:
1. Kilark
2. Substitutions: Section 26 00 00 - Electrical Methods and Materials.

B. Product Description:
1. Steel,
2. Powder gray epoxy finish
3. 40% wire fill capacity
4. Rated for Class I Division 1 Groups A, B, C and D.

2.7 SEALING COMPOUND, PACKING FIBER

A. Manufacturers:
   1. Kilark
   2. Substitutions: Section 26 00 00 - Electrical Methods and Materials.

B. Product Description:
   1. Listed for use with seals provided
   2. Sealing compound
   3. Fiber fill,
   4. Rated for Class I Division 1 Groups A, B, C and D.

2.8 WIREWAY

A. Manufacturers:
   1. Carlon Electrical Products.
   2. Cooper B-Line, Inc.; a division of Cooper Industries.
   3. Hammond Mfg. Co. Inc.
   4. Hoffman; a brand of Pentair Equipment Protection.
   5. Panduit Corp.
   6. Square D; by Schneider Electric.
   7. Wiremold / Legrand..
   8. Substitutions: Section 26 00 00 - Electrical Methods and Materials

B. Product Description: Oiltight and dust-tight type wireway.

C. Knockouts: Manufacturer's standard.

D. Size and length as indicated on Drawings. If not shown, provide 6x6 wireway, length as required.

E. Cover: Hinged cover with full gaskets.

F. Connector: Flanged.

G. Fittings: Lay-in type with removable top, bottom, and side; captive screws.

H. Finish: Rust inhibiting primer coating with gray enamel finish.

2.9 OUTLET BOXES

A. Manufacturers:
   1. Allied Moulded Products, Inc.
   2. Carlon Electrical Products.
   3. Emerson Electric Co.

4. RACO; Hubbell..
5. Substitutions: Section 26 00 00 - Electrical Methods and Materials.

B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.

1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch male fixture studs where required.

C. Cast Boxes: NEMA FB 1, Type FD, cast feralloy. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.

D. Wall Plates for Unfinished Areas: Furnish gasketed cover.

2.10 PULL AND JUNCTION BOXES

A. Manufacturers:
1. Emerson Process Management.
2. Hoffman; a brand of Pentair Equipment Protection.
3. Kraloy.
4. RACO; Hubbell..
5. Substitutions: Section 26 00 00 - Electrical Methods and Materials.

B. Sheet Metal Boxes: NEMA OS 1, galvanized steel. Interior locations only.

C. Surface Mounted Cast Metal Box: NEMA 250, Type 4X; flat-flanged, surface mounted junction box:

1. Material: Galvanized cast iron.
2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 INSTALLATION

A. Ground and bond raceway and boxes in accordance with Section 26 05 26.

B. Identify raceway and boxes in accordance with Section 26 05 53.

C. Arrange raceway and boxes to maintain headroom and present neat appearance.

D. Outdoor Locations, above grade: Provide rigid steel conduit. Provide cast metal outlet, pull, and junction boxes.

E. Wet and Damp Locations: Provide rigid steel conduit. Provide cast metal outlet, junction, and pull boxes.

F. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes with access. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

G. Exposed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

3.3 RACEWAY GENERAL

A. Raceway routing.
   1. Raceway for follow building and structure lines.
   2. Follow pipeline routing when same or adjacent destination.
   3. Use fuel pipe supports
   4. Do not use pipe for supports
   5. Route along catwalk and ladders.
   6. Provide support where required by code.

B. Provide conductive lubricant when installing threaded conduits.

C. Route conduits along with piping systems: share supports and trenches wherever possible.

D. Arrange raceway supports to prevent misalignment during wiring installation.

E. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

F. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports

G. Do not attach raceway to ceiling support wires or other piping systems.

H. Route exposed raceway parallel and perpendicular to walls.

I. Do not install boxes or access fittings below platform or catwalks.

J. Maintain clearance between raceway and piping systems to allow maintenance on either without removing the other system.

K. Maintain 12 inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.

L. Cut conduit square using saw or pipe cutter; de-burr cut ends.

M. Bring conduit to shoulder of fittings; fasten securely.

N. 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 inserted in fitting. Allow joint to cure for minimum 20 minutes.

O. Install conduit hubs or sealing locknuts to fasten conduit to cast boxes.

P. Install no more than equivalent of three 90 degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2 inch size.

Q. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.

R. Install fittings to accommodate expansion and deflection where raceway crosses, control and expansion joints.

S. Install suitable pull string or cord in each empty raceway except sleeves and nipples.

T. Install suitable caps to protect installed conduit against entrance of dirt and moisture.

U. Close ends and unused openings in wireway.

3.4 INSTALLATION - BOXES

A. Install wall mounted boxes at elevations to accommodate mounting heights as indicated on Drawings (notes or elevations) unless specified in section for outlet device.

B. Adjust box location up to 10 feet prior to rough-in to accommodate intended purpose.

C. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.

D. Do not fasten boxes to ceiling support wires or other piping systems.

E. Support boxes independently of conduit.

F. Install gang box where more than one device is mounted together. Do not use sectional box.

G. Install gang box with plaster ring for single device outlets.

H. Outdoor Locations: Install liquidtight flexible metal conduit not more than 36” at all risers to above grade junction boxes to allow for thermal expansion.

3.5 INTERFACE WITH OTHER PRODUCTS

A. Install conduit to preserve fire resistance rating of partitions and other elements.

B. Do not penetrate conex roof. Where rooftop power is required, route conduit out wall and across to device as required.

C. Locate outlet boxes to allow luminaires positioned as indicated on Drawings.

D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.6 ADJUSTING

A. Section 01 77 19 – Closeout Requirements.

B. Install knockout closures in unused openings in boxes.

3.7 CLEANING

A. Section 01 77 19 - Closeout Requirements

B. Clean interior of boxes to remove dust, debris, and other material.

C. Clean exposed surfaces and restore finish.

END OF SECTION

SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

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 SUBMITTALS

A. Product Data: For each electrical product in the system shown on the drawings and in these specifications.

PART 2 - PRODUCTS

2.1 RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Color for Printed Legend:

1. Power Circuits: White letters on a black field.

C. Legend: Indicate system or service and voltage, if applicable.

D. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

E. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches wide; compounded for outdoor use.

2.2 CONDUCTOR AND CONTROL-CABLE IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

C. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and polyester or nylon tie for attachment to conductor or cable. Uses permanent, waterproof, black ink marker recommended by tag manufacturer.

2.3 UNDERGROUND-LINE WARNING TAPE

A. Description: Permanent, bright-colored, continuous-printed, polyethylene tape.

B. Compounded for permanent direct-burial service.

C. Embedded continuous metallic strip or core.

D. Printed legend shall indicate type of underground line.

2.4 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels: Factory printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment, unless otherwise indicated.

C. Warning label and sign shall include, but are not limited to, the following legends:

D. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."

2.5 EQUIPMENT NAMEPLATES

A. General: Nameplates shall be engraved in 1/16 inches thick phenolic letters, a minimum of 3/16 inches high with white letters on black background for all equipment and signal and communications systems except fire alarm. Provide white letters on a red background for fire alarm.

B. Mounting: Nameplates shall be attached with a minimum of two 6-32 roundhead screws, lockwasher and nuts in exterior locations and contact-type permanent self-adhesive in indoor locations.

2.6 SWITCHBOARDS AND DISTRIBUTION PANELBOARDS

A. General: Provide nameplate which identifies the switchboard/distribution panel and the source panel. (Example: Distribution Panel No. 1/Fed from Main Service Switchboard - Bkr. No. 1.)

B. Overcurrent Devices: Provide nameplate at each overcurrent device that identifies the device number and the load served. (Example: Bkr. No. 1/Panel A.)

2.7 PANELBOARDS

A. Provide nameplate on the front of the panel room which identifies the panel. (Example: Panel A.) Provide a nameplate concealed behind the door which identifies the panel, and the source panel. (Example: Panel A, Fed from Distribution Panel 1-Bkr. No. 2)

2.8 TRANSFORMER

A. Provide nameplate identifying the transformer, the source panel and the panel served. (Example: Transformer T1/Fed from Distribution Panel 1, Bkr. No. 1/Serves Panel A)

2.9 DISCONNECT SWITCHES AND MOTOR STARTERS

A. Provide nameplate which identifies the source panel, load served and the fuse size where applicable. (Example: School Tank Farm, Dispensing Tank, Pump Motor TP-01, 2 HP, RK1 fuses.)

2.10 JUNCTION AND PULL BOX IDENTIFICATION

A. Mark the cover of all junction boxes and pull boxes to identify the system, circuits, or feeders contained within the box. Use red color for fire alarm. Circuits shall be identified by panelboards and specific circuit numbers contained within the junction box.

2.11 ARC FLASH HAZARD LABELS

A. Provide label on all new distribution equipment which designates the appropriate PPE (Personal Protective Equipment) required for the hazard present. Labels to comply with the NEC and NFPA 70E. Submit sample of label to Engineer for review.

2.12 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.

B. Minimum Width: 3/16 inch.

C. Tensile Strength: 50 lb, minimum.

D. Temperature Range: Minus -40 to plus +185 degrees Fahrenheit.

E. Color: Black, except where used for color-coding.

F. Fasteners for Labels and Signs: Stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 APPLICATION

A. Power-Circuit Conductor Identification: For conductors No. 1/0 AWG and larger in vaults, pull and junction boxes, manholes, and handholes use color-coding conductor tape. Identify source and circuit number of each set of conductors. For single conductor cables, identify phase in addition to the above.

B. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use marker tape. Identify each ungrounded conductor according to source and circuit number.

C. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source and circuit number.

D. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, signal, sound, intercommunications, voice, and data connections.

E. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

F. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.

G. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and Operation and Maintenance Manual.

H. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Comply with 29 CFR 1910.145 and apply self-adhesive warning labels. Identify system voltage with black letters on an orange background. Apply to exterior of door, cover, or other access.

I. Equipment with Multiple Power or Control Sources: Apply to door or cover of equipment including, but not limited to, the following:

J. Power transfer switches.

K. Controls with external control power connections.

L. Equipment Requiring Workspace Clearance According to NFPA 70: Unless otherwise indicated, apply to door or cover of equipment but not on flush panelboards and similar equipment in finished spaces.

M. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

3.2 Labeling Instructions:

A. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch high letters on 1-1/2-inch high label; where two lines of text are required, use labels 2 inches high.

B. Outdoor Equipment: Engraved, laminated acrylic or melamine label.

C. Equipment to Be Labeled:

a. Access doors and panels for concealed electrical items.
b. Electrical switchgear and switchboards.
c. Emergency system boxes and enclosures.
d. Disconnect switches.
e. Enclosed circuit breakers.
f. Motor starters.
g. Push-button stations.
h. Contactors.
i. Remote-controlled switches, dimmer modules, and control
j. Devices.
k. Monitoring and control equipment.

3.3 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach nonadhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.

F. System Identification Color Banding for Raceways and Cables: Each color band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

G. Color-Coding for Phase and Voltage Level Identification, 600V and Less: Use the colors listed below for ungrounded conductors.

H. Color shall be factory applied or, for sizes larger than No. 10 AWG if authorities having jurisdiction permit, field applied.

I. Colors for 240/120-Volt Circuits:
L1: Black.
L2: Red.
Neutral: White.
Ground: Green.
Travelers: Yellow.

J. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

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.

E. The following is a partial list of equipment that may be included in this Commissioning:
1. Fuel System Controls
2. 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. Ensure controls installer performs assigned commissioning responsibilities as specified below.
2. Ensure calibration agency performs assigned commissioning responsibilities as specified.
3. Provide instructions and demonstrations for Owner's personnel.

4. Ensure subcontractors perform assigned commissioning responsibilities.
5. Ensure participation of equipment manufacturers in appropriate startup, testing, and training activities when required by individual equipment specifications.
6. Develop startup and initial checkout plan using manufacturer's startup procedures and functional performance checklists for equipment and systems to be commissioned.
7. During verification check and startup process, execute process related portions of checklists for equipment and systems to be commissioned.
8. Perform and document completed startup and system operational checkout procedures, providing copy to Engineer.
9. Coordinate with equipment manufacturers to determine specific requirements to maintain validity of warranties.
10. Provide personnel to assist Engineer during equipment or system verification checks and functional performance tests.
11. 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.
12. 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.
13. Perform verification checks and startup on equipment and systems as specified.
14. Assist Engineer in performing functional performance tests on equipment and systems as specified.
15. Perform operation and maintenance training sessions scheduled by Engineer.
16. 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.

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. Demonstrate system performance and operation to Engineer during functional performance tests including each mode of operation.
7. Provide control system technician to assist during Engineer verification check and functional performance testing.
8. Provide control system technician to assist testing, adjusting, and balancing agency during performance of testing, adjusting, and balancing work.

9. 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 Division 01 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 20
FUEL OIL AND GASOLINE CONTROL PANEL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes pump control system including motor control contactors and overloads where applicable, pump alternation, switches, push buttons, indicating lights, display and control relays.

B. Related Sections:

1. Section 26 00 00 – Electrical Methods and Materials.
2. Section 26 05 19 - Low-Voltage Electrical Power.
3. Section 26 05 33 - Raceway and Boxes for Electrical Systems.

1.2 REFERENCES

A. National Electrical Manufacturers Association:

1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

B. Underwriters' Laboratories

1. UL 508 - Industrial Control Equipment.

1.3 CONTROL PANEL SCOPE

A. Transfer, Dispenser Pump Control and Alarm Panel CP – Provides all of the power, controls and alarms for the operation of the product dispenser (Hose Reel) distribution systems.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Control Panel Engineering Submittal: The CONTRACTOR shall submit a control panel engineering submittal (CPES) for each control panel and enclosure provided. The CPES shall completely define and document the construction, finish, fuses, circuit breakers, internally-mounted hardware, communications hardware, and control system components. All panel drawings shall, as a minimum, be "B" size with all data sheets and manufacturer specification sheets being "A" size. The submittal shall be in conformance with ISA-S20 – Standard Forms for Process Measurement and

Control Instruments, Primary Elements and Control Valves, shall be submitted as a singular complete bound volume or multi volume package within 60 calendar days after Notice to Proceed, and shall have the following contents:

1. A complete index shall appear in the front of each bound volume. All drawings and data sheets associated with a panel shall be grouped together with the panels being indexed by systems or process areas. All panel tagging and nameplate nomenclature shall be consistent with the requirements of the Contract Documents.
2. Scale construction drawings which define and quantify the type and gauge of steel to be used for panel fabrication, the ASTM grade to be used for structural shapes and straps, panel door locks and hinge mechanisms, type of bolts and bolt locations for section joining and anchoring, details and proposed locations for "UNISTRUT" members, stiffener materials and locations, electrical terminal box and outlet locations, electrical access locations, print pocket locations, writing board locations, and lifting lug material and locations.
3. Cutout locations with nameplate identifications shall be shown.
4. The Contract Drawing wiring diagrams shall be edited to identify electrical devices, terminals, and interconnecting wiring. These diagrams shall show interconnecting wiring by lines, designate terminal assignments, and show the physical location of all electrical and control devices.
5. A bill of material which enumerates all devices associated with the control panel.

C. Product Data: Submit catalog information and descriptive literature for components.

D. Test Reports: Submit certified factory test report indicating control panel successfully performs functions specified.

E. Manufacturer's Installation Instructions: Submit instructions on installation and field wiring connections.

F. Manufacturer's Field Reports: Submit certification after installation that control panel has been installed in accordance with manufacturer’s instructions and has been successfully field tested.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 77 19 - Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of control panel and final wiring diagrams and connections.

C. Operation and Maintenance Data: Submit operation and maintenance instructions for components and devices.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with UL 508A and 698A as required.

B. Provide components compatible with functions required to form complete working system.

C. Provide UL 508A and or 698A label on complete assembly.

D. Perform Work in accordance with NEC.

E. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer and Fabricator: Company specializing in manufacturing and assembling products specified in this section with minimum three years' experience.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 13 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspect for damage.

C. Store in areas protected from weather, moisture, or possible damage; do not store directly on ground; handle to prevent damage to wiring and components.

1.9 COORDINATION

A. Coordinate work and component requirements with controlled pumps.

1.10 EXTRA MATERIALS

A. Section 01 77 19 - Closeout Requirements.

B. Furnish the following spare parts for each panel provided under this contract:

1. 6 pilot light LEDs for each tint.
2. 1 24 volt DC power supply for each size utilized.
3. 24 fuses for each type and size utilized.
4. 1 general purpose relay for each type utilized.

PART 2 - PRODUCTS

2.1 CONTROL PANEL ASSEMBLIES

A. Acceptable manufacturers include but are not limited to:
   1. TecPRO, Anchorage, Alaska

2. Dowland-Bach, Anchorage, Alaska
3. Systems Interface, Bothell Washington

2.2 GENERAL

A. Panel construction shall conform to NFPA 70 (NEC) Article 409 and NFPA 79.

B. The control panel controls shall be 120 VAC. Control conductors shall be provided in accordance with the indicated requirements.

C. The control panel shall be the source of power for any 120 VAC instruments, control valves and their controllers interconnected with the control panel. All equipment associated with the control panel shall be ready for service after connection of conductors to equipment, controls, and control panel.

D. Unless indicated otherwise, control panels shall be housed in NEMA-rated enclosures as shown on the Drawings. Control panels shall be wall-mounted.

E. Internal control components shall be mounted on an internal back-panel or side-panel as required.
   1. All interior control or relay panels mounted above ground level shall be NEMA 12.

F. Each source of 'external' voltage shall be isolated by providing disconnecting fused terminal blocks or DIN rail mounted relays. Each control panel shall be provided with identified terminal strips for the connection of all external conductors. The CONTRACTOR shall provide sufficient terminal blocks as shown on the Drawings.

G. Discrete outputs from the control panels shall be provided by electrically isolated contacts rated for 10 amps at 120 VAC.

H. All control panel mounted devices shall be provided as shown on the Drawings or called for in the specifications.

I. Painting: Steel control panels shall be thoroughly cleaned and sand blasted per Steel Structures Painting Council Specification SSPC SP 6 (Commercial Blast) after which surfaces shall receive a prime coat of Amercoat 185, or equal, 3 mils DFT, for a total thickness of the prime plus finish system of 6 mils. The finished color of the outside surfaces shall be ANSI 61 gray paint. Interior of the control panel, back-panel, and side-panels shall have a white finish coat.

2.3 COMPONENTS

A. General: Additional components may be specified on the plans in individual component schedules.

B. Control Panel Enclosure:

1. Furnish NEMA 250 Type 12 enclosure fabricated of 10 gage steel with continuously welded seams.

    a. Dual Door, wall mounted.
    b. Enclosure door gasketed with neoprene.
    c. Heavy-duty three-point latching mechanism.
    d. Power: 120/240 volt, 1 phase, 3 wire service.

2. Identify control panel components with engraved nameplate mounted on inside of panel.
3. Mount components, not mounted on front of panel, on removable back panel secured to enclosure with collar studs.
4. Install wiring in neat, workmanlike manner and group, bundle, support and route horizontally and vertically for neat appearance.
5. Terminate wires leaving panel at terminal strips inside enclosure.
6. Identify terminals and wires in accordance with panel wiring diagrams.
7. Furnish copper grounding plate inside control panel for terminating ground wires.

C. Circuit Breakers:

1. Furnish quick-make, quick-break thermal-magnetic molded case type, individually DIN rail mounted and identified.
2. Furnish individual circuit breakers for each of the following:

    a. Main Circuit Breaker
    b. Lighting
    c. Enclosure environment
    d. Control and instrumentation Circuit(s)

D. Legend Plates for Pilot Devices:

1. Furnish 2x2-1/2 inch plastic legend plate with rounded corners for each selector switch, push button and pilot light.
2. Color: Gray with white lettering.

E. Mounting of Instruments

1. The panel vendor shall provide cut outs, and shall mount all instrument items indicated to be panel-mounted, including any instruments indicated to be furnished by other vendors but installed in the panel.
2. The panel vendor shall also mount behind the panels other instrument accessory items as required for functionality or as indicated.
3. Equipment mounted at the rear of panel shall be installed to allow for commissioning adjustments, servicing requirements, and cover removal.
4. Spare space shall be kept clear of wiring, etc., to give maximum space for future additions.

F. Pilot Devices

1. Pilot devices shall be Allen Bradly Bulletin 800, 30mm, NEMA 4X rated or approved equal.

G. Electrical Requirements
   1. The CONTRACTOR shall provide conduit, wireways, switches, wire, and electrical fittings for all 120 VAC circuits to instruments and other electrical devices as required for a complete and operable installation.
   2. Conduit, wireways, junction boxes and fittings shall include those required between sensors and transmitters and between the junction boxes and instruments.
   3. Each terminal connection shall have a plastic plate with a terminal and instrument tag number. Wiring shall be identified with stamped tubular wire end markers. Terminals shall be DIN rail mounted, rated at 400 VAC, manufactured by Entrelec, or equal.
   4. Each panel shall be provided with a switched 60 watt incandescent T-10 style light fixture, as shown on the Drawings. The fixture shall include a 120-volt receptacle and door switch. The fixture shall be Hoffman model A-LTDB1, or equal.
   5. Wiring Methods: Wiring methods and materials for all panels shall be in accordance with the N.E.C. requirements for General Purpose (no open wiring) unless otherwise indicated.
   6. Signal and Control Circuit Wiring
      a. Wire type and sizes: Conductor shall be flexible stranded copper wire, UL. Wires for instrument signal circuits and alarm input circuits shall be No. 16 AWG Type MTW rated for 300 volts. Wire Insulation Colors:
         1) 120 VAC Power - Black 14 AWG minimum
         2) 120 VAC Neutral - White 14 AWG minimum
         3) 120 VAC Ground - Green 14 AWG minimum
         4) 120 VAC Control - Red 14 AWG minimum
         5) 120 VAC Foreign Power - Yellow 16 AWG minimum
         6) 120 VAC Foreign Neutral - Yellow 16 AWG minimum
         7) DC Positive - Blue 16 AWG minimum
         8) DC Negative - White/Blue 16 AWG minimum

         All 120 VAC power wiring protected by the main circuit breaker and incoming power service shall be No. 12 AWG.
      b. Wire Marking: Wire numbers shall be marked using white numbered wire markers made from heat shrink plastic. Wires shall be marked as shown on the Drawings. Numbers shall read from left to right.
      c. For equipment grounding, panels shall be provided with a 1/4 inch by 1 inch copper ground bus complete with solder-less connector for one No. 4 AWG bare stranded copper cable. The copper cable shall be provided by the CONTRACTOR and be connected to the electrical equipment ground of the 120-volt panel supplying power.
   7. Power Supply Wiring
      a. The panel fabricator shall provide terminal box connections for the main power supply entry as shown on the Drawings.

H. Relays:
   1. DIN rail mounted interposing relays shall have contacts rated at 8 amps, 230 volts, at 20,000 operations. The coils shall be 120 VDC at 0.03 amps. Relays shall be Entrelec model RB121A, or equal, for single pole, and RB122 for 5-amp double pole.
   2. DIN rail mounted general purpose relays shall have square base with contacts rated at 10 amps, 230 volts, at 20,000 operations. The coils shall be 120 VAC at 0.03 amps. Relays shall be 2, 3 or 4-pole 10A as required with power on LED and manual override, Allen Bradley or equal.

I. Each terminal connection shall have a plastic plate with a terminal and instrument tag number. Wiring shall be identified with stamped tubular wire end markers.

J. Each terminal connection shall have a plastic plate with a terminal and instrument tag number. Wiring shall be identified with stamped tubular wire end markers. 120V terminals shall be DIN rail mounted, rated at 400 VAC, manufactured by Entrelec, or equal.

K. Spare Fuses: For each panel, provide the following spare fuses:
   1. A minimum of two spare fuses of each size
   2. One spare fuse for every 5 fused circuits

   Provide the fuses in a spare fuse box mounted on the interior wall of the panel. Fuse box shall be Plano Tackle Systems 1061 Accessory Box, Plano, IL, www.planomolding.com, or equal.

L. 120 VAC Surge Arrestor: A 120 VAC three-stage surge protector shall be provided on the control voltage supply for each panel. The surge protector shall include a first stage inline inductor, a second stage MOV to ground with a thermal fuse, and a third stage array of MOVs to provide a small amount of capacitance. The unit shall be DIN rail-mounted. The MOV shall include green LED to indicate the status of the second stage MOV. Provide two (2) spare units for each panel. The unit shall be rated for 120 VAC and shall be either Advance Surge Suppressor model TSP-WG6-120VAC-10A-01, Control Concepts ‘Isatrol Elite’ model IE-110, or equal.

M. Labor and Workmanship: Panels shall be fabricated, piped, and wired by fully qualified workmen who are properly trained, experienced, and supervised.

2.4 MARKING

A. Control panels shall be marked with the following information that is plainly visible after installation:
   1. Manufacturer’s name
   2. Supply voltage
   3. Short-circuit rating of the main breaker
   4. Name of the project and site
   5. Enclosure rating
   6. Minimum Size of Control Wiring: Number 16.

7. Tag control wiring at both ends in control panel with legible permanent coded wire marking sleeve. Mark with white PVC tubing sleeves with machine printed black marking. Mark in accordance with wire numbers shown on approved shop control wiring diagrams and terminal strip numbers.

2.5 SOURCE QUALITY CONTROL AND TESTS

A. Perform a factory test of completed control panel by demonstrating operation of control functions. Provide certified test results.

B. Factory assemble and test each control and alarm function.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify correct power supply is available.

B. Verify pumps are installed.

3.1 CONTROL PANEL SIGNAL AND CONTROL CIRCUIT WIRING

A. Wiring Installation: All wires shall be run in plastic wireways except (1) field wiring, (2) wiring between mating blocks in adjacent sections, (3) wiring from components on a swing out panel to components on a part of the fixed structure, and (4) wiring to panel mounted components. Wiring run from components on a swing out panel to other components on a fixed panel shall be made up in tied bundles. These bundles shall be tied with nylon wire ties and shall be secured to panels at both sides of the "hinge loop" so that conductors are not strained at the terminals.

B. Wiring run to control devices on the front panels shall be tied together at short intervals with nylon wire ties and be secured to the inside face of the panel using adhesive mounts.

C. Enclosures Wiring: All wiring shall be run in liquidtight flexible conduit (LFMC), unless otherwise noted on the Drawings. All enclosure wiring and raceways shall be installed by the panel builder in the shop.

D. Wiring to rear terminals on panel mount instruments shall be in plastic wireways secured to horizontal brackets above or below the instruments in about the same plane as the rear of the instruments.

E. Shop Drawings shall show conformance to the above wiring installation requirements.

F. Wire Marking: Each signal, control, alarm, and indicating circuit conductor connected to a given electrical point shall be designated by a single unique number as shown on the Contract Drawings. These numbers shall be marked on all conductors at every terminal.

3.2 CALIBRATION, TESTING, AND INSTRUCTION

A. General: Calibration, testing, and instruction shall be performed by the Contractor in the presence of the Owners representative..

B. Inspection and Approval
   1. Panel fabricator shall conduct the following tests prior to arrival of the ENGINEER or before shipment, if the ENGINEER chooses not to witness factory testing.
      a. All status, control, analog and alarm circuits rung out to determine their operability.
      b. All electrical power circuits checked for continuity and where applicable, operability.
      c. Any other test required to place the panel in an operating condition.
   2. It shall be the responsibility of the CONTRACTOR to furnish all necessary testing devices and sufficient manpower to perform the tests required by the ENGINEER.
   3. Field Testing: Each control panel shall be tested again for functional operation in the field after the connection of external conductors and prior to equipment startup.

3.3 INSTALLATION

A. Install control panel at location indicated on Drawings.

B. Install control panel in accordance with manufacturer’s instructions.

3.4 FIELD QUALITY CONTROL

A. Section 01 77 19 - Requirements: Field inspecting, testing, adjusting, and balancing.

B. Start-up control system by energizing system equipment and testing operation of hardware and process control logic under supervision of manufacturer's representative and in presence of Architect/Engineer.

C. Equipment Acceptance:

   1. Adjust, repair, modify or replace system components that fail to perform as specified and rerun tests. Make final adjustments to equipment under direction of manufacturer's representative.
   2. Document adjustments, repairs and replacements in manufacturer’s field services certification.

3.5 MANUFACTURER'S FIELD SERVICES

A. Section 01 45 00 - Quality Control.

B. Furnish services of manufacturer's representative experienced in installation of products furnished under this specification for not less than 2 man days on-site for installation inspection and field testing, and instructing Owner's personnel in maintenance of equipment.

C. Certify that equipment has been properly installed and is ready for start-up and testing.

3.6 DEMONSTRATION

A. Section 01 77 19 - Closeout Requirements: Requirements for demonstration and training.

B. Demonstrate equipment startup, shutdown, routine maintenance, alarm condition responses, and emergency repair procedures to Owner’s personnel.

END OF SECTION

SECTION 26 24 16

PANELBOARDS

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 DEFINITIONS

A. EMI: Electromagnetic interference.

B. RFI: Radio-frequency interference.

C. SPDT: Single pole, double throw.

1.3 SUBMITTALS

A. Product Data: For each type of panelboard, overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:
   a. Bus configuration, current, and voltage ratings.
   b. Short-circuit current rating of panelboards and overcurrent protective devices.
   c. UL listing for series rating of installed devices.
   d. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

2. Wiring Diagrams: Power, signal, and control wiring.

C. Panelboard Schedules: For installation in panelboards.

D. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of electrical service.

2. Do not proceed with interruption of electrical service without Architect's written permission.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers:

1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories: Square D or approved equal.

2. Transient Voltage Suppression Panelboards: Square D or approved equal.

2.2 MANUFACTURED UNITS

A. Enclosures:

1. NEMA 12.

2. Hinged Front Cover: Door within door.

3. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.

4. Directory Card: With transparent protective cover, mounted in metal frame, inside panelboard door.

B. Phase and Ground Buses:

1. Material: Hard-drawn copper, 98 percent conductivity.

2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.

C. Conductor Connectors: Suitable for use with conductor material.

1. Main and Neutral Lugs: Compression type.

2. Ground Lugs and Bus Configured Terminators: Compression type.

D. Withstand Rating: As shown on the plans.

E. Branch circuit breakers as shown on the panel schedules .

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

B. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.4 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low- level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Mount top of trim 74 inches above finished floor, unless otherwise indicated.

B. Mount plumb and rigid without distortion of box.

C. Install overcurrent protective devices.

D. Install filler plates in unused spaces.

E. Arrange conductors in gutters into groups and bundle and wrap with wire ties.

3.2 IDENTIFICATION

A. Create a directory to indicate installed circuit device name and loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

B. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

END OF SECTION

SECTION 26 56 00

EXTERIOR LIGHTING

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. Exterior luminaires.

2. Photoelectric relays.

3. Wall / ceiling mounted luminaries

1.3 DEFINITIONS

A. CRI: Color-rendering index.

B. LED: Light emitting diode

C. Luminaire: Complete lighting fixture, including driver if provided.

D. Pole: Steel light pole support structure.

1.4 SUBMITTALS

A. Product Data: For each luminaire, pole, and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:

1. Physical description of luminaire, including materials, dimensions, effective projected area, and verification of indicated parameters.

2. Details of attaching luminaires and accessories.

3. Details of installation and construction.

4. Luminaire materials.

5. Photometric data based on laboratory tests of each luminaire type, complete with indicated lamps, ballasts, and accessories.
   a. For indicated luminaires, photometric data shall be certified by

a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.

b. Photometric data shall be certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.

6. Photoelectric relays.

7. Drive and/or Ballasts, including energy-efficiency data.

8. Lamps, including life, output, and energy-efficiency data.

9. Materials, dimensions, and finishes of poles.

10. Means of attaching luminaires to supports, and indication that attachment is suitable for components involved.

B. Shop Drawings:

1. Wiring Diagrams: Power and control wiring.

C. Operation and Maintenance Data: For luminaires and poles to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. Comply with IEEE C2, "National Electrical Safety Code."

E. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 LUMINAIRES, GENERAL REQUIREMENTS

A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.

B. Metal Parts: Free of burrs and sharp corners and edges.

C. Sheet Metal Components: Corrosion-resistant aluminum, unless otherwise indicated. Form and support to prevent warping and sagging.

D. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.

E. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and, where applicable, designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.

F. Exposed Hardware Material: Stainless steel.

G. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

H. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:

1. White Surfaces: 85 percent.

2. Specular Surfaces: 83 percent.

3. Diffusing Specular Surfaces: 75 percent.

I. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

J. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

2.2 PHOTOELECTRIC RELAYS

A. Comply with UL 773 or UL 773A.

B. Contact Relays: Single throw, designed to fail in the on position, and factory set to turn light unit on at 1.5 to 3 FC and off at 4.5 to 10 FC with 15-second minimum time delay. Relay shall have directional lens in front of photocell to prevent artificial light sources from causing false turnoff.

1. Adjustable window slide for adjusting on-off set points.
2. Torx or equal

2.3 LED FIXTURES

A. As shown on fixture schedule.

PART 3 - EXECUTION

3.1 LUMINAIRE INSTALLATION

A. Provide luminaires with lamps.

B. Fasten luminaire to structural supports as required by the type pole or surface.

1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

C. Adjust luminaires that require field adjustment or aiming. Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources.

3.2 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

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.

B. **Important Note: Clearing on this project is limited to minimal brush removal. The existing ground is susceptible to equipment damage and must be protected to the extent possible.**

1.2 RELATED REQUIREMENTS

A. Section 31 23 00 Excavation and Fill.

B. Section 31 23 19 Dewatering and Control of Surface Water.

1.3 DEFINITIONS

A. Clearing: Includes cutting all brush, trees and stumps, to within 2 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 may contain miscellaneous debris including connexes, inoperable construction equipment, construction material, 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 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.

2. **Excavation is limited to fence posts and other minor excavation required to complete project elements. The existing ground is susceptible to equipment damage and must be protected to the extent possible.**

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 1.4, 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.
   c. 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 AUTHORITY.

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

A. Classified Fill: There are no known operating borrow sources for classified material in Nunapichuk. Contractor shall be responsible for procuring and transporting all classified fill required for this project. Contractor responsibilities shall include, but not be limited to, procurement of fill, transportation, testing, offloading, storage and placement.

Imported material has historically been available from Bethel.

B. 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.

C. 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.

D. 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. Classified fill material shall consist of mineral soil, free from dirt, muck, frozen chunks, clay balls, roots, organic material, debris, or deleterious material. It shall have a liquid limit no greater than 25 and a plasticity index no greater than 6 as determined by AASHTO T-89 and T-90.

2. Type I classified fill material:

   Type I classified fill material shall conform to the following gradation as determined by AASHTO T-27:

U.S. Standard Sieve Size	Percent Passing, by Weight
4 inch	100
2 inch	85-100
No. 4	20-60
No. 200	4-12

3. Type II classified fill material shall be crushed gravel consisting of sound, tough, durable rock fragments of uniform quality and shall meet the following requirements:

   Degradation Value (ATM T-13): 45 Min
   Percent Fracture (ATM T-4): 50 Min (Single Face)

Type II classified fill material shall conform to the following gradation as determined by AASHTO T-27:

U.S. Standard Sieve Size	Percent Passing, by Weight
1 inch	100
No. 4	35-65
No. 10	25-45
No. 200	4-10

4. 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

C. Pipe Bedding Material: Use Type II classified material.

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 3.5 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 62 16

DRIVEN STEEL PILES

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. The Contractor shall provide and install H-piles and pipe piles as described in the Pile Schedule in the Drawings. Fabricate piles to required lengths including field splicing as required. Provide and install welded thermoprobe pile sleeves, thermosiphons, and condensers as shown in the Drawings.

1.3 SUBMITTALS

A. Product Data: For each type of pile product, accessory, and paint indicated.

B. Shop Drawings: Show fabrication and installation details for piles, including driving points, splices, field-cut holes, and pile caps.

C. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.

D. Include arrangement of static pile reaction frame, test and anchor piles, equipment, and instrumentation. Submit structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

E. Welding Certificates.

F. Qualification Data: For Installer, professional engineer and testing agency.

G. Mill Certificates: For steel pipe piles and steel plate, signed by manufacturer.

H. Pile-Driving Equipment: Include type, make, maximum rated energy, and rated energy per blow of hammer; weight of striking part of hammer; weight of drive cap; details, type, and structural properties of hammer cushion; and details of follower and jetting equipment.

I. Pile-Driving Records: Submit within two days of driving each pile.

J. Pile Locations: Location of all driven piles.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A firm experienced in installing driven piles similar in material, design, and extent indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

B. Installer's responsibility includes providing a qualified professional engineer to prepare pile-driving records.

C. Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.

D. Comply with requirements of the following publications:

E. AISC's “Steel Construction Manual” 13th Edition

F. Welding Standards: Qualify welding procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel."

G. Preinstallation Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver piles to project site in such quantities and at such times to ensure continuity of installation. Handle and store piles at Project site to prevent physical damage.

1.6 PROJECT CONDITIONS

A. Protect structures, underground utilities, and other construction from damage caused by pile driving.

B. Site Information: A geotechnical report has been prepared and is referenced elsewhere in the Project Manual for information only.

PART 2 - PRODUCTS

2.1 STEEL H-PILES

A. Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel: ASTM A 572, Grade 50.

2.3 STEEL PLATE

A. Standard Specification for Carbon Structural Steel: ASTM A36.

2.4 FABRICATION

A. Fabricate and assemble piles in shop to greatest extent possible.

B. Fabricate full-length piles to eliminate splicing during driving, with ends square.

C. Pile-Length Markings: Permanently mark each pile with horizontal lines at 12-inch intervals; mark the distance from pile tip at 60-inch intervals.

PART 3 - EXECUTION

3.1 PILE LOCATION

A. Contractor shall engage and pay for the services of a qualified professional land surveyor to locate the pile locations prior to driving and locating the piles once driven.

B. Contractor shall notify the Owner's contracting representative when pile locations are marked. The Owners contracting representative will inspect locations for approval allowing the pile driving to proceed. No not proceed with driving piles without engineer's written approval.

C. Provide Owners contracting representative at least 7 calendar days' notice prior to desired pile location inspection.

3.2 FIELD ENGINEERING

A. Contractor shall engage and pay for the services of a qualified professional civil or structural engineer registered in the State of Alaska for the purposes of monitoring the pile installation.

3.3 DRIVING EQUIPMENT

A. General: Use pile driving equipment capable of driving the piles, undamaged, to the minimum penetration (embedment depth below gade) shown on the plans, and that has been approved. Use equipment that limits compressive driving stresses to less than 90% of the specified pile yield stress. Vibratory hammers may be used for initial placement and final driving. Use pile driver leads that allow the hammer to move freely along the projected axis of the pile. Do not use followers to drive piles.

B. Pile Hammer: Diesel-powered type capable of consistently delivering driving energy to pile within range recommended by hammer manufacturer for length and weight of pile and character of subsurface material anticipated.

C. Hammer Cushions and Driving Caps: Between hammer and top of pile, provide hammer cushion and steel driving cap recommended by hammer manufacturer for type of pile.

D. Leads: Use fixed or rigid-type pile-driver leads that will hold full length of pile firmly in position and in axial alignment with hammer. Extend leads to within 24 inches of elevation at which pile enters ground.

3.4 PILE DRIVING CRITERIA AND TESTING

A. General: The Contractor shall provide criteria for determining pile acceptance based upon pile driving performance. The Contractor will perform pile testing to calibrate the wave equation analysis, determine actual bearing capacity, hammer system efficiency, pile driving stresses, and pile integrity. Unless otherwise specified in the Contract, the pile driving criteria and testing for acceptance to verify that the nominal axial resistance of the pile has been achieved shall be determined using the following established methods. The final authority for the acceptability of all piling shall be Owners contracting representative.

B. Wave Equation Analysis. The Contractor will establish the pile driving criteria using a Wave Equation Analysis for the Engineer's approval, prior to mobilizing the equipment. The Contractor will provide the Engineer with acceptance curves based on stroke height, blow count, and driving rate relative to each substructure location.

C. Static Load Tests. The Testing Agency shall test a minimum of four piles in accordance with ASTM D 1143, "Standard Test Methods for Deep Foundations Under Static Axial Compression Load". Axial load tests shall be performed a minimum of 72 hours after driving. Axial compression test load shall be 200 percent of the scheduled design load using the "Quick Load Method for Individual Piles". Acceptance of pile test is a cumulative downward pile movement not to exceed 0.2 percent of pile length during the test period. Test piles shall be selected from the test pile list indicated on the Plans, and shall be on opposing quadrants of the building.

3.5 DRIVING PILES

A. General: Continuously drive piles to embedment depth indicated. Establish and maintain axial alignment of leads and pile before and during driving.

B. Driving Tolerances: Drive piles without exceeding the following tolerances, measured at pile heads:

1. Location: 1 inches from location indicated after initial driving, and 2 inches after pile driving is completed.

2. Plumb: Maintain 1 inch in 10 feet from vertical, or a maximum of 3 inches, measured when pile is above ground in leads.

C. Withdraw damaged or defective piles and piles that exceed driving tolerances and install new piles within driving tolerances. Fill holes left by withdrawn piles as directed by Owner's contracting representative.

1. Rejected piles may be abandoned and cut off as directed by Owner's contracting representative.

2. Leave rejected piles in place and install new piles in locations as directed by Owner's contracting representative.

3. Fill holes left by withdrawn piles that will not be filled by new piles using cohesionless soil material such as gravel, broken stone, and gravel-sand mixtures. Place and compact in lifts not exceeding 72 inches.

D. Pile-Driving Records: Maintain accurate driving records for each pile, compiled and attested to by a qualified professional engineer. Include the following data:

1. Drop Hammer:

    a. Project name and number.

    b. Name of Contractor.

    c. Pile location in pile group and designation of pile group.

    d. Sequence of driving in pile group.

    e. Pile dimensions.

    f. Ground elevation.

    g. Elevation of tips after driving.

    h. Final tip elevations of piles after driving pile group.

    i. Records of redriving.

    j. Elevation of splices.

    k. Type, make, model, and rated energy of hammer.

    l. Weight and stroke of hammer.

    m. Cushion material and thickness.

    n. Actual stroke and blow rate of hammer.

    o. Pile-driving start and finish times, and total driving time.

    p. Time, pile-tip elevation, and reason for interruptions.

    q. Number of blows for each 12 inches of penetration, and number of blows per 1 inch for the last 6 inches of driving.

    r. Pile deviations from location and plumb.

    s. Unusual occurrences during pile driving.

2. Vibratory Driven:

a. Project name and number.

b. Name of Contractor.

c. Pile location in pile group and designation of pile group.

d. Sequence of driving in pile group.

e. Pile dimensions.

f. Ground elevation.

g. Elevation of tips after driving.

h. Final tip elevations of piles after driving pile group.

i. Records of redriving.

j. Elevation of splices.

k. Engine power of vibratory driver.

l. Eccentric moment.

m. Amplitude.

n. Frequency.

o. Suspended weight.

p. Non-vibrating weight.

q. Line pull for extraction.

r. Clamping force.

s. Centrifugal force, dynamic force.

t. Pile deviations from location and plumb.

u. Unusual occurrences during pile driving.

E. Pile Refusal: Pile refusal occurs when the hammer requires 15 or more blows to move the pile one inch when the hammer is operating near the maximum allowable driving stress (transferred hammer energy is within 80-90 percent of the specified pile yield stress.) Should pile refusal occur contact the Owner's contracting representative for direction.

3.6 FIELD QUALITY CONTROL

A. Weld Testing: In addition to visual inspection, welds shall be tested and inspected according to AWS D1.1 and the inspection procedures listed below, at testing agency's option. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

1. Liquid Penetrant Inspection: ASTM E 165.

2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.

3. Radiographic Inspection: ASTM E 94, minimum quality level "2-2T."

4. Ultrasonic Inspection: ASTM E 164.

3.7 DISPOSAL

A. Remove withdrawn piles and cutoff sections of piles from site and legally dispose of them off Owner's property.

B. Any excess piling furnished by the Contractor or Owner shall be stockpiled and safely secured on site as directed by the Owner’s contracting representative.

3.8 SPECIAL STRUCTURAL INSPECTION

A. The Owner shall engage and pay for the services of a qualified professional civil engineer registered in the State of Alaska for the purpose of providing Special Structural Inspection of the piling installation. This monitoring is in addition to the field quality control provided by the Contractor.

B. The Contractor shall notify the piling Special Inspector and Engineer a minimum of 14 calendar days prior to start of pile driving.

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.

1.2 REFERENCES

A. The fence and materials shall be in accordance with this Specification, the Contract Drawings and with the following:
   1. FS RR-F-191 – Federal Specifications and Standards. Fencing, Wire and Post, and Fabric

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. 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 ¾-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 Drawing.

D. Testing:

1. Fence post rigidity shall be tested by applying a 50-pound force on the post, perpendicular to the fabric, at 5 feet above ground

2. Post movement measured at the point where the force is applied shall be less than or equal to ¾-inch from the relaxed position.

3. Every tenth post shall be tested for rigidity; when a post fails this test, further tests on the next four posts on either side of the failed post shall be made. Posts failing the rigidity test shall be buried deeper or anchored with a minimum of 1 cubic foot of 2500 psi concrete placed at the base of the post.

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.

3.7 INTERMEDIATE CLIPS

A. Install as detailed in the Contract Drawings.

B. Intermediate clips shall be installed at the mid-span of each bottom tension wire, between posts.

3.8 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.

3.9 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 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 of 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 & DISPENSING SYSTEM

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. Hose Reel Dispensers
5. Pipe Supports.
6. 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 local 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: Seamless carbon steel pipe, Grade B, with plain bevel ends, meeting the requirements of ASTM A106B.

1. 3-inch diameter: Schedule 80

2. All other piping: Schedule 80, except 1 inch diameter and smaller shall be schedule 160.

1. All piping & fittings shall be butwelded or socket welded except where shown on drawings or required for equipment connection.

B. 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.

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. 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-5410-31-2236-FTNL, or approved equal.

3. Ball Valves less than 1-1/2”: 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.

4. Check Valves: Carbon steel, ANSI class 150 lbs., raised face flanged,

swing check valve. Crane No. 147, or approved equal. Smaller than 2", Bonney Forge L1-61 piston check valve or equal.

5. 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 taping with lockable ball valve and threaded plug for blow down.

6. Basket Strainer: Flanged, carbon steel body, bottom clean out, bolted top cover, basket with ¼” perf. mesh, and blow off tapping plug. Mueller Fig. 185 or approved equal. Provide blow off taping with lockable ball valve and threaded plug for blow down.

7. Flex Fittings: ANSI Class 150 lbs., stainless steel annular corrugated inner core with stainless steel braided cover, fixed flanged end by floating flanged end with 18” live length 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.

8. Pressure Relief Valves: For thermal expansion relief, raised face flanged, carbon steel body pressure relief valve set as specified on drawings. PSV’s shall be Hydro-seal Model No. 30FL1CV-00 for 2" and 1FLAXV-00 for 1", and relief pressure set as indicated on project drawings, or equal.

9. 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 910ER, or approved equal.

10. Actuated Ball Valves: Normally Closed, ANSI class 150 lbs, A350LF2 body, buna seats and seals. 350 in-lbs operating torque at -50°F, PTC self-regulating heater, NEMA 7 enclosure without manual override shaft extension, Exxon Beacon 325 severe cold grease, 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 -50°F. 2” ball valve shall be Nutron model#T3-R20R01LZ with RCS model SXR-1023 actuator, no substitutes.

11. 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.

12. Fuel Flow Switches See Electrical Design Drawings.

13. 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.

14. Cam Lock Couplings: Aluminum body cam and groove male fittings with FNTP connection, 150 psi minimum working pressure. Provide dust cap with Buna-N seal for each fitting provided. PT couplings or equal.

15. 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.

16. Strainers: Flanged, carbon steel body, bottom clean-out Y-strainer with #10 mesh and blow-off tapping plug. Mueller Fig. 781, or approved equal.

17. 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: stainliness 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 (Devoe Rustguard 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 (Devoe Gloss Industrial 4308 OAE). Color shall be red (ICI Color Code 9000 – Safety Red) for gasoline piping and green (ICI Color Code 6650 – Medium Green) for diesel 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.

2.6 FUEL DISPENSERS & APPURTENANCES

A. Prefabricated Cabinet Fuel Dispenser: Single product fully contained cabinet fuel dispenser (quantity as required), stainless steel top, sides and front door, Liquid Controls M-5 mechanical meter, internal filter, 1” internal hose retractor, solenoid valve. CG Cabinet Fuel Dispenser Model CG-515-MA, no substitutes.

1. Contractor shall provide a certified specialist for final installation, wiring, and commissioning of the dispenser to ensure a complete and operational system.

2. See Electrical Design for power and control requirements.

B. Dispenser Appurtenances:

1. Retail Dispensing Arctic Hose: Low temperature (-60 deg F) 1 inch fuel dispensing hose, 150 lineal feet per reel, 300 psi working pressure, Goodyear Arctic Ortac, or approved equal. Provide hose swivels & ball stops.

2. Retail Dispensing Facility Breakaway Coupling: UL listed, 1 inch, breakaway fitting, OPW 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, 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.

6. 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.

7. Provide flow restriction orifice plate installed at pump discharge on dispensing tank (typical each product). Coordinate size and flow characteristics with engineer at time of procurement.

C. Coatings: As provided by manufacturer. Bolts, nuts, and washers shall be hot dip galvanized in accordance with ASTM A153 or SS.

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, 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.

Pipe Size	Maximum Support Spacing
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 IAW 3.4.A.2 above 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. Submersible Pumps: 3/4 hp, 208-230v, single phase, explosion proof submersible turbine pump with intake screen, anti-siphon valve, and integral leak detection. Install pump intake to level shown on drawings. Provide Red Jacket NO. P75S1 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 IAW *33 52 13 – Liquid Fuel Piping* 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 are available in the Appendices.

1.2 WORK INCLUDED

A. This section includes the furnishing of all labor, tools, equipment, and materials necessary to, deliver, furnish & install appurtenances, 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, double wall, horizontal, steel, skid mounted, aboveground bulk storage tanks for diesel and gasoline service. (UL 142).

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. (UL142 & 2085).

3. ALL TANK APPURTANCES for OWNER 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.

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. Tanks furnished by Owner do not include any tank appurtenances. 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. Transport and Install Owner Provided external ladder and catwalks for access to tank mounted equipment (see shop 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.
   c. Secondary 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. Submersible Pump: See section “33 52 23 Liquid Fuel Pumps”.

8. Mechanical fill limiter with drop tube, 3-inch threaded connection x 6-inch threaded, Morrison Figure 9095AA, or approved equal.

9. 3 position Float Switches: See “Component Schedule” & “Electrical Equipment Schedule” in the Contract Drawings.

10. See project drawings for further specifications and requirements.

2.3 5,000 GALLON PROTECTED TWO PRODUCT DISPENSING TANK

A. 5,000 gallon tanks are OWNER furnished and Contractor installed. All tank appurtenances shall be provided by the Contractor and installed in the field.

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. Transport and Install Owner Provided external ladder and catwalks for access to tank mounted equipment (see shop drawings).

4. Provide atmospheric and emergency venting for the storage 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. 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 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. Submersible Pump: See section “33 52 23 Liquid Fuel Pumps”.

8. Mechanical fill limiter with drop tube, 2-inch threaded connection x 4-inch threaded, Morrison Figure 9095AA, or approved equal.

9. 4-position Float Switches: See “Component Schedule” & “Electrical Equipment Schedule” in the Contract Drawings.

10. See project drawings for further specifications and requirements.

2.4 TANK COATINGS FOR EXTERNAL TANK SURFACES

A. The tank exterior, saddles, and skids shall be shop coated in accordance with the following specification and in accordance with the coating manufacturer's recommendations.

1. Surfaces to be coated: All exterior surfaces of tanks, including bottom of vertical tanks, nozzles, skids, pipe supports, fittings and pipe.

2. Surfaces not coated: Flange and nozzle faces, penetration threads, flange and manhole bolts.

3. Surface Preparation: All surfaces to be coated shall be sand blasted in accordance with the Structural Steel Painting Council SSPC-SP10, near white blast criteria. Alternate methods of surface preparation which provide equal, or better, surface preparation will be considered. Identify proposed alternate surface preparation methods, if any, on bid.

4. Coatings:

   a. Prime Coat- Devoe Catha-Coat 302H (3 mils minimum dry finish thickness (DFT)

   b. Intermediate Coat – Devoe Bar-Rust 236 (5-6 mils minimum DFT)

   c. Top Coat- Devoe Devthane 389 (2-3 mils DFT)

5. Coat Colors: All coats shall be contrasting colors. Top coat color shall be white.

6. Where field touch up of paint is required, wire brush area to bare metal and paint with prime, intermediate and top coats as indicated above.

7. 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.

B. Coating Application

1. The Contractor shall submit to the Project Manager, for his/her approval, the tank manufacturer's proposed painting schedule. At minimum, this shall include the spreading rate in square feet per gallon for each coat, minimum dry film thickness for each coat, application temperature, curing time and temperature, humidity limits, and paint and paint thinner to be used for the final coat. The painting schedule shall be in accordance with the paint manufacturer's recommendation and this specification, and shall be approved, in writing, by the Project Manager prior to application.

2. If paint is diluted for application by spray gun, the coating shall be built up to the same film thickness achieved with undiluted material. Deficiencies in film thickness shall be corrected by the application of an additional coat(s) of paint.

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 16

UTILITY POLES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood poles.
2. Pole hardware.

B. Related Sections:

1. Section 26 56 00 – Exterior Lighting

1.2 SCOPE

A. Provide primary, secondary, and lighting poles as shown on plans. Light fixtures are not permitted on secondary poles.

B. Verify pole size and quantities with AEA prior to procurement.

C. Coordinate all pole locations with AEA prior to erecting.

1.3 REFERENCES

A. American National Standards Institute:

1. ANSI C135.30 - Zinc-Coated Ferrous Ground Rods for Overhead or Underground Line Construction.
2. ANSI C135.4 - Zinc-Coated Ferrous Eyebolts and Nuts for Overhead Line Construction.
3. ANSI C135.5 - Zinc-Coated Ferrous Eyenuts and Eyebolts for Overhead Line Construction.
4. ANSI C135.6 - Zinc-Coated Ferrous Crossarm Braces for Overhead Line Construction.
5. ANSI O5.1 - Wood Poles, Specifications and Dimensions.

B. ASTM International:

1. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
2. ASTM A475 - Standard Specification for Zinc-Coated Steel Wire Strand.

C. American Wood-Preservers' Association:

1. AWPA C4 - Poles - Preservative Treatment by Pressure Processes.
2. AWPA U1 - Use Category System: User Specification for Treated Wood.

D. Institute of Electrical and Electronics Engineers:

1. IEEE C2 - National Electrical Safety Code.
2. IEEE C135.1 - Standard for Zinc-Coated Steel Bolts and Nuts for Overhead Line Construction.
3. IEEE C135.2 - Standard for Threaded Zinc-Coated Ferrous Strand-Eye Anchor Rods and Nuts for Overhead Line Construction.

1.4 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 pole locations, quantities of each type, and details of pole guy construction.

C. Product Data: Submit data showing materials and construction of hardware.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of poles, guys, anchors, and required horizontal and vertical clearances.

B. Operation and Maintenance Data: Submittals for Project Closeout.

1.6 QUALITY ASSURANCE

A. All construction work shall be done in a thorough and workman-like manner in accordance with the staking sheets, plans and specifications, and the construction drawings.

B. The latest edition of the National Electrical Safety Code (NESC, ANSI C2) shall be followed except where local regulations are more stringent, in which case local regulations shall govern

C. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

A. Installer: Company specializing in performing work of this section with minimum three years’ experience.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 13– Material and Equipment: Requirements for transporting, handling, storing, and protecting products.

B. Protect poles from damage and decay by stacking to allow free circulation of air. Maintain 1 foot minimum spacing between bottom pole and ground or ground vegetation. Do not store poles above decayed or decaying wood.

C. Stack poles stored for more than two weeks on creosoted or decay-resistant skids arranged to support poles without noticeable pole distortion.

D. Handle treated poles with tools to not produce indentations greater than 1 inch deep. Do not drag treated poles along ground. Do not apply tools to section of treated poles between 1 foot above and 2 feet below ground line.

PART 2 PRODUCTS

2.1 POLES

A. Wood Poles: ANSI O5.1, treated Douglas Fir poles of minimum length and class indicated.

B. Select poles for straightness and minimum sweeps and short crooks.

C. All utility poles are to be pressure treated with Penta to a minimum of .45# CF by Assay per RUS Specifications #1728F-700, Specification #1728H-702, and Pole Framing Guide W1.1G (M20).

D. Vendor will be required to supply Certification of Inspection with each purchase order.

E. All utility poles are to be banded.

F. Poles should be marked according to the RUS Pole Framing Guide W1.1G (M20) and include the supplier's code or trademark; independent inspection agency designation or quality assurance mark; plant location and month and year of treatment; code letters denoting the pole species, preservative and required retention; height and class of the pole, and "AEA". The letters shall be not less than 5/8-inch high if burn branded, and not less than 1/8-inch high if on a metal tag.

2.2 POLE HARDWARE

A. Miscellaneous Pole Hardware: Hot-dipped galvanized after fabrication.

B. Ground Rods: ANSI C135.30.

C. Ground Wire: Soft drawn copper conductors, 6 AWG minimum size.

PART 3 EXECUTION

3.1 PREPARATION

A. Plug unused holes in poles using treated wood dowel pins. Treat field-cut gains and field-bored holes with preservative.

B. Cut gains on face of pole, with gained surfaces in parallel planes.

C. Shorten poles when required by cutting from top end. Apply hot preservative to shortened end of pole.

3.2 INSTALLATION

A. Pole setting:

1. All poles shall be set to REA/RUS specifications plus one foot. The minimum depth for setting poles shall be as follows:

Length of Pole (feet)	Setting in Soil (feet)
20	4.0 + 1.0 = 5.0
25	5.0 + 1.0 = 6.0
30	5.5 + 1.0 = 6.5
35	6.0 + 1.0 = 7.0
40	6.0 + 1.0 = 7.0
45	6.5 + 1.0 = 7.5
50	7.0 + 1.0 = 8.0

On sloping ground, the depth of the hole shall be measured from the low side of the hole.

B. Utility Pole setting:

1. All poles shall be set to REA/RUS specifications..
2. 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..
3. Pole backfill shall be thoroughly tamped the full depth. Excess dirt shall be banked around the pole.

C. Lighting Pole setting

1. All poles shall be set to REA/RUS specifications..
2. Poles shall be set per plans. .
3. Pole backfill shall be thoroughly tamped the full depth. Excess dirt shall be banked around the pole.

D. Grading of line:

1. When using high poles to clear obstacles such as buildings, foreign wire crossing, railroads, etc., there shall be no up-strain on pin-type (*) insulators in grading the line each way to lower poles.

E. Dig setting holes large enough to permit use of tampers to full depth.

F. Set poles in straight line or as shown on the plans. Place curved poles with curvature in line with lead pole. Maintain even grade.

G. Set poles plumb. Rake poles located at corners, angles, and dead ends so poles are plumb after line installation.

H. Do not install poles along edge of cuts and embankments or where soil is in danger of washing out.

I. Install ground rods and ground wire. Per RUS Guide drawing

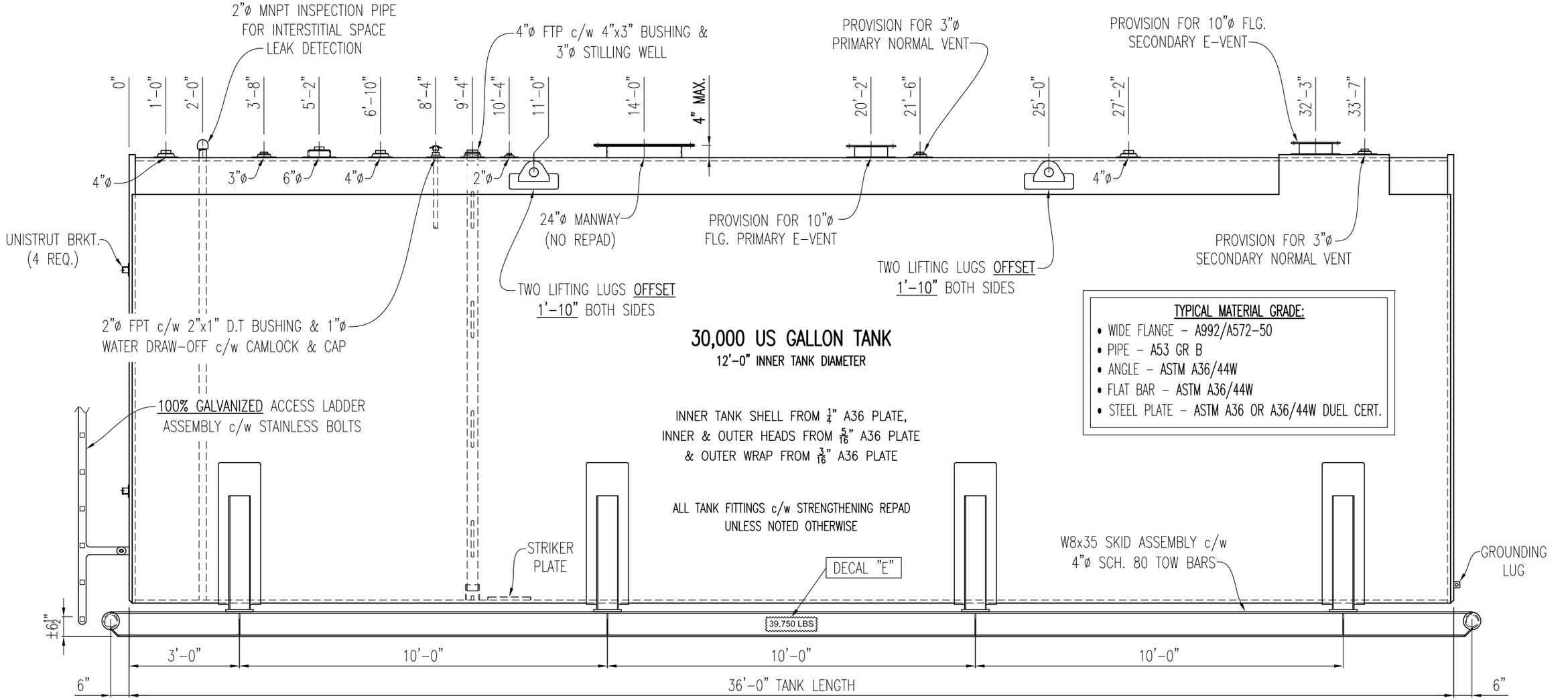
3.3 FIELD QUALITY CONTROL

A. Field test at least one anchor of each capacity installed to rated holding power.

END OF SECTION

Appendix A

Owner Provided Tank Shop Drawings



EMPTY SHIPPING WEIGHT: 39,750 LBS

PAINT NOTES:

SANDBLAST EXTERIOR TO SSPC-SP10 & APPLY ONE COAT OF CATHACOAT 302H (2-3 mils DFT), TWO COATS OF BAR-RUST 236 (4-6 mils DFT EA. / 8-12 mils DFT TOTAL) & ONE COAT OF WHITE DEVTHANE 389H (2-3 mils DFT)

SUFFICIENTLY CONTRASTING COLOURS BETWEEN COATS TO ENSURE COMPLETE COVERAGE

(4) FOUR DIESEL TANKS & (4) FOUR GASOLINE TANKS

REV	DATE	DESCRIPTION	DRAWN BY	APPROVED BY
B	APR 28, 2021	REVISED FITTINGS	RM	JS
A	APR 8, 2021	REVISED FITTINGS, NOTATIONS & DECALS AS PER MARKUPS APRIL 8, 2021	JM	JS
0	APR 7, 2021	FOR APPROVAL	JM	JS

CUSTOMER: ALASKA ENERGY AUTHORITY | P.O. # PO-010085 | TANK # US842 TO US849

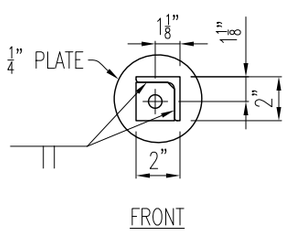
REGAL "ENVIRO-SAFE"

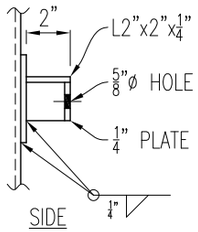
TITLE: SIDE VIEW

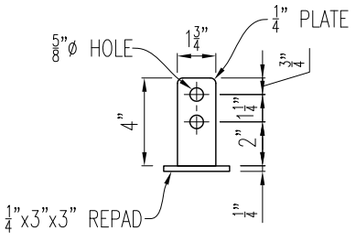
FOR: 30,000 US GALLON HORIZ. CYL. DOUBLE WALL CONTAINED TANK (UL142)

FILE: 02\02\US842 30000 US GAL CYL CTA AEA | DRAWN: JAYDEE | APR 7, 2021 | SCALE: 5/16"=1'-0" | DWG# US842 | SHEET 1 OF 4 | REV B

REGAL TANKS USA INC.
PHONE (360) 707-9948 FAX (360) 707-9949



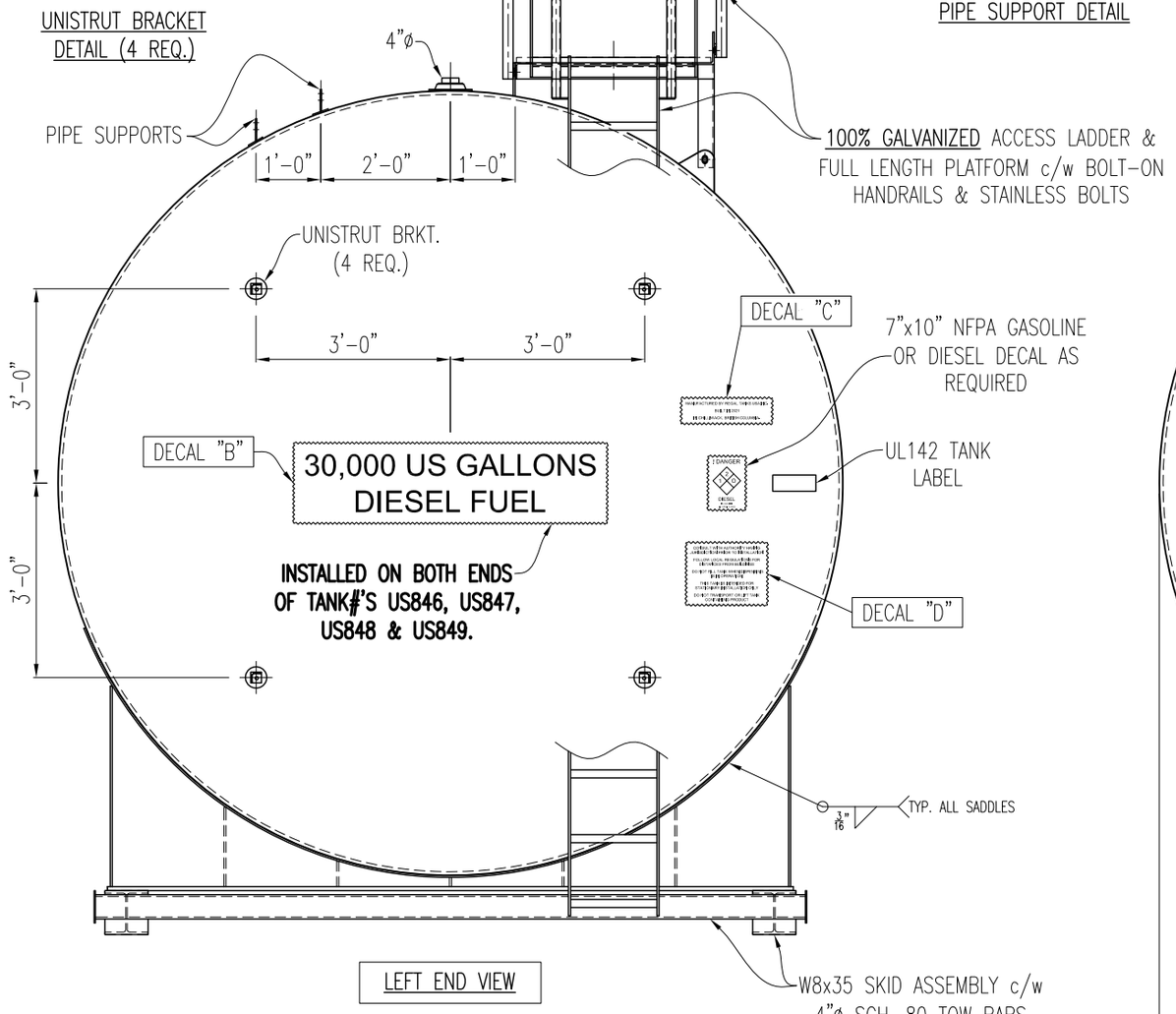




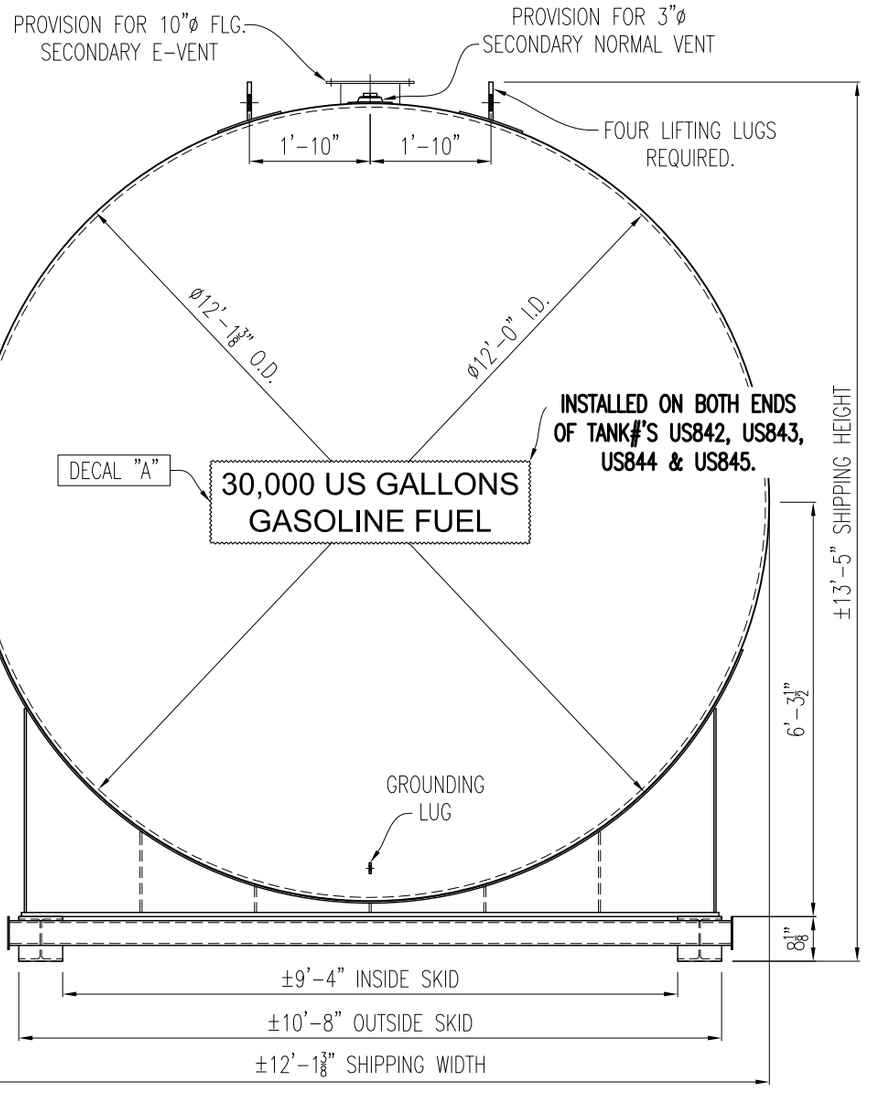
PIPE SUPPORT DETAIL

CUSTOMER: ALASKA ENERGY AUTHORITY		P.O. # PO-010085	TANK # US842 TO US849
REGAL "ENVIRO-SAFE"	TITLE: LEFT & RIGHT END VIEWS		
	FOR: 30,000 US GALLON HORIZ. CYL. DOUBLE WALL CONTAINED TANK (UL142)		
	FILE: 02\02\US842 30000 US GAL CYL CTA AEA	DRAWN: JAYDEE APR 7, 2021	SCALE: 3/8"=1'-0"
		DWG# US842	REV B
		SHEET 2 OF 4	

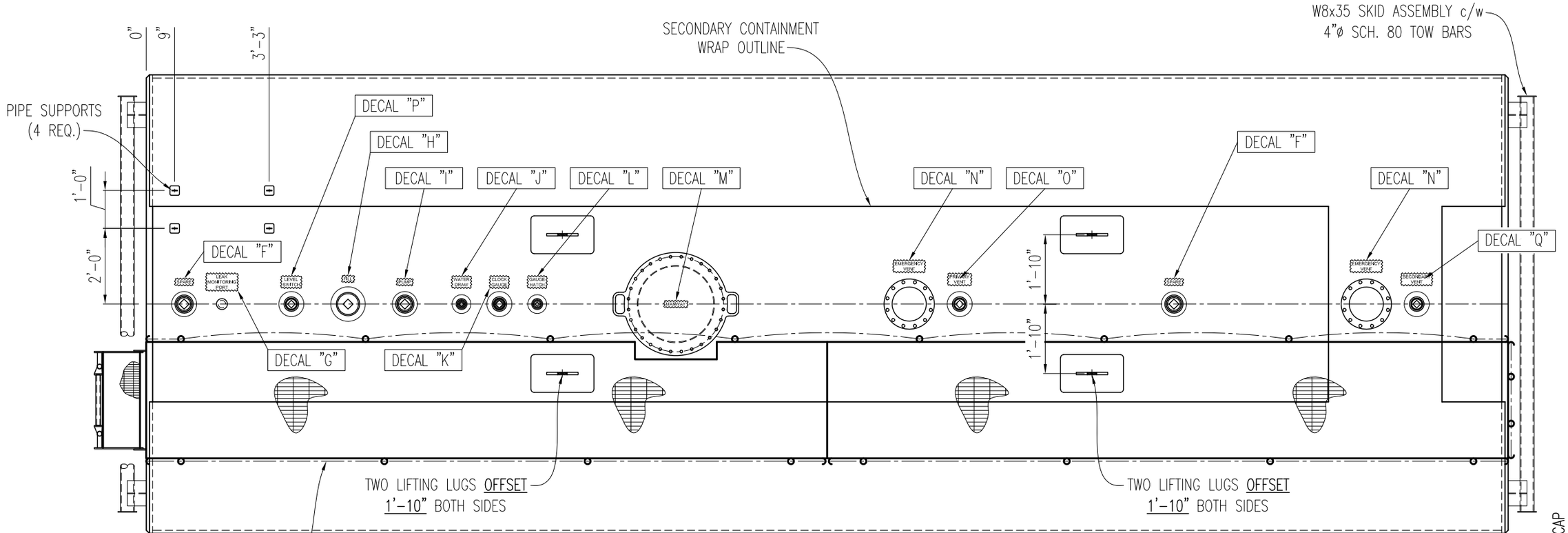
REGAL TANKS USA INC.
PHONE (360) 707-9948 FAX (360) 707-9949

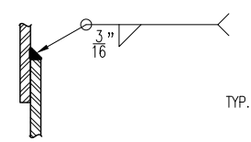


LEFT END VIEW

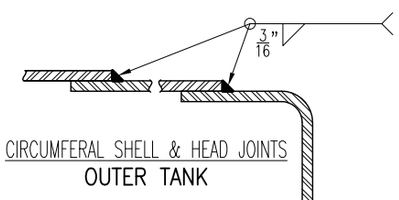


RIGHT END VIEW

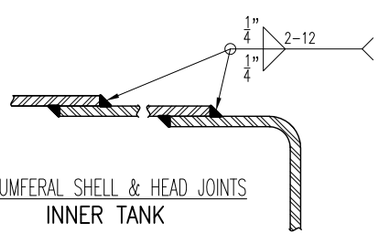




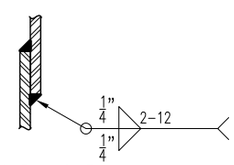
LONGITUDINAL SHELL JOINT
±25° BOTH LEFT & RIGHT TANK CROWN
OUTER TANK



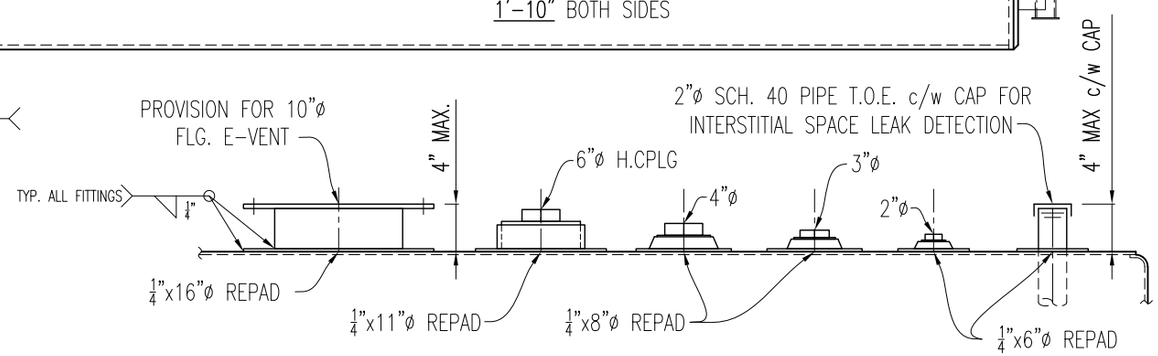
CIRCUMFERAL SHELL & HEAD JOINTS
OUTER TANK



CIRCUMFERAL SHELL & HEAD JOINTS
INNER TANK



LONGITUDINAL SHELL JOINT
±30° ALTERNATING LEFT & RIGHT FROM TANK CROWN
INNER TANK



SEE DWG. 01 FOR NOZZLE SIZES & LOCATIONS

CUSTOMER: ALASKA ENERGY AUTHORITY
P.O. # PO-010085
TANK # US842 TO US849

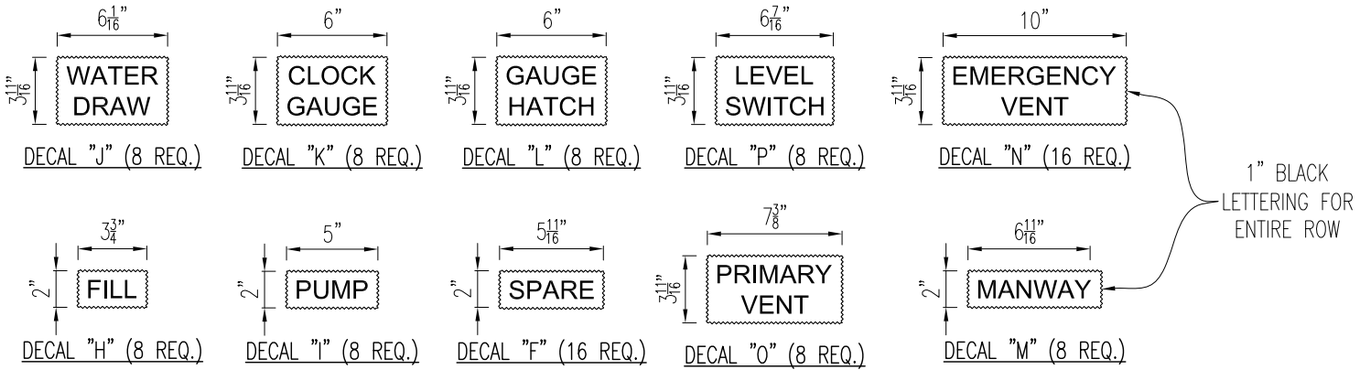
REGAL "ENVIRO-SAFE"

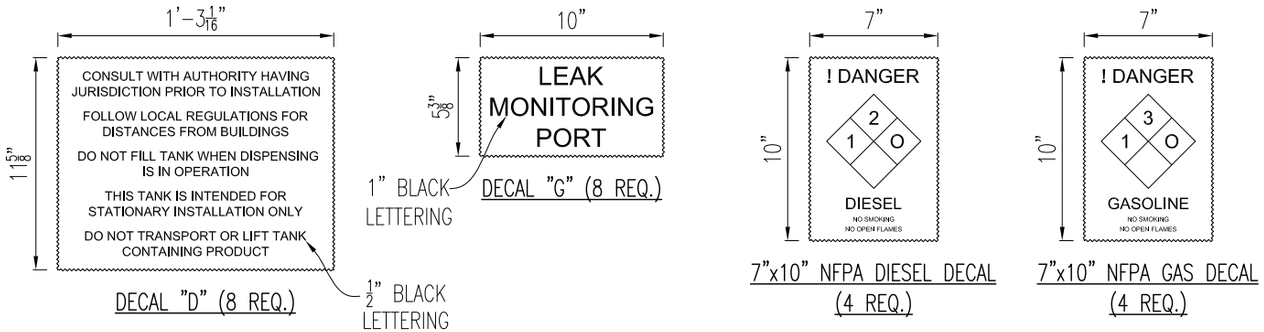
TITLE: TOP VIEW

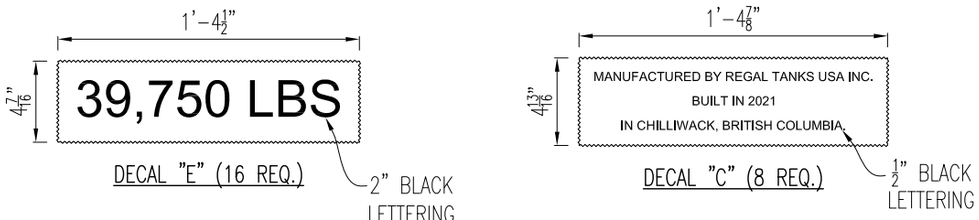
FOR: 30,000 US GALLON HORIZ. CYL. DOUBLE WALL CONTAINED TANK (UL142)

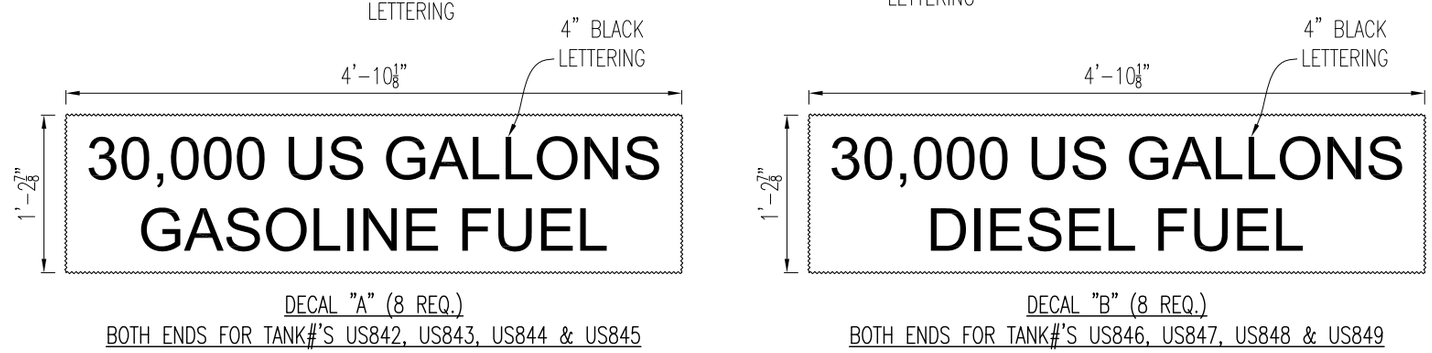
FILE: 02\02\US842 30000 US GAL CYL CTA AEA
DRAWN: JAYDEE
APR 7, 2021
SCALE: 5/16"=1'-0"
DWG# US842
SHEET 3 OF 4
REV B

REGAL TANKS USA INC.
PHONE (360) 707-9948 FAX (360) 707-9949



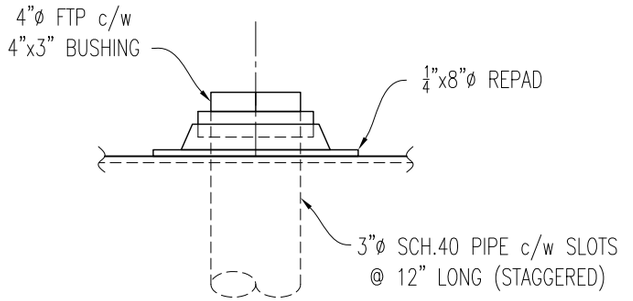


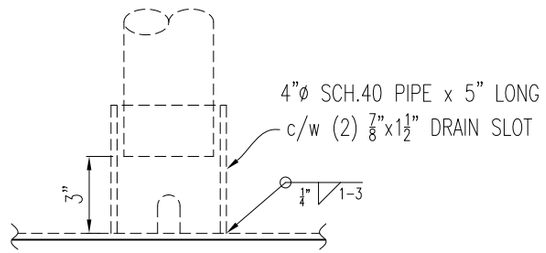




SHIPPED LOOSE NOTE FOR (8) EIGHT TANKS:

- (8) LADDER ASSEMBLIES (GALVANIZED) c/w STAINLESS STEEL BOLTING HARDWARE
- (16) PLATFORM ASSEMBLIES (GALVANIZED) c/w STAINLESS STEEL BOLTING HARDWARE
- (16) LARGE HANDRAIL SEGMENTS, (8) END HANDRAIL SEGMENTS, (8) LEFT "P" SHAPED HANDRAIL SEGMENTS, (8) RIGHT "P" SHAPED HANDRAIL SEGMENTS, (48) STRAIGHT HANDRAIL SEGMENTS c/w STAINLESS STEEL BOLTING HARDWARE
- (8) 1"ø WATER DRAW-OFF SUCTION PIPES c/w 2"x1" D.T BUSHING, 1"ø CAMLOCK & DUST CAP
- TOUCH UP PAINT: ONE GALLON EACH OF CATHACOAT 302H (GREEN), BAR-RUST 236 (GREY), BAR-RUST 236 (OFF-WHITE), DEVTHANE 389H (WHITE)
- (8) 14FT DIP STICKS



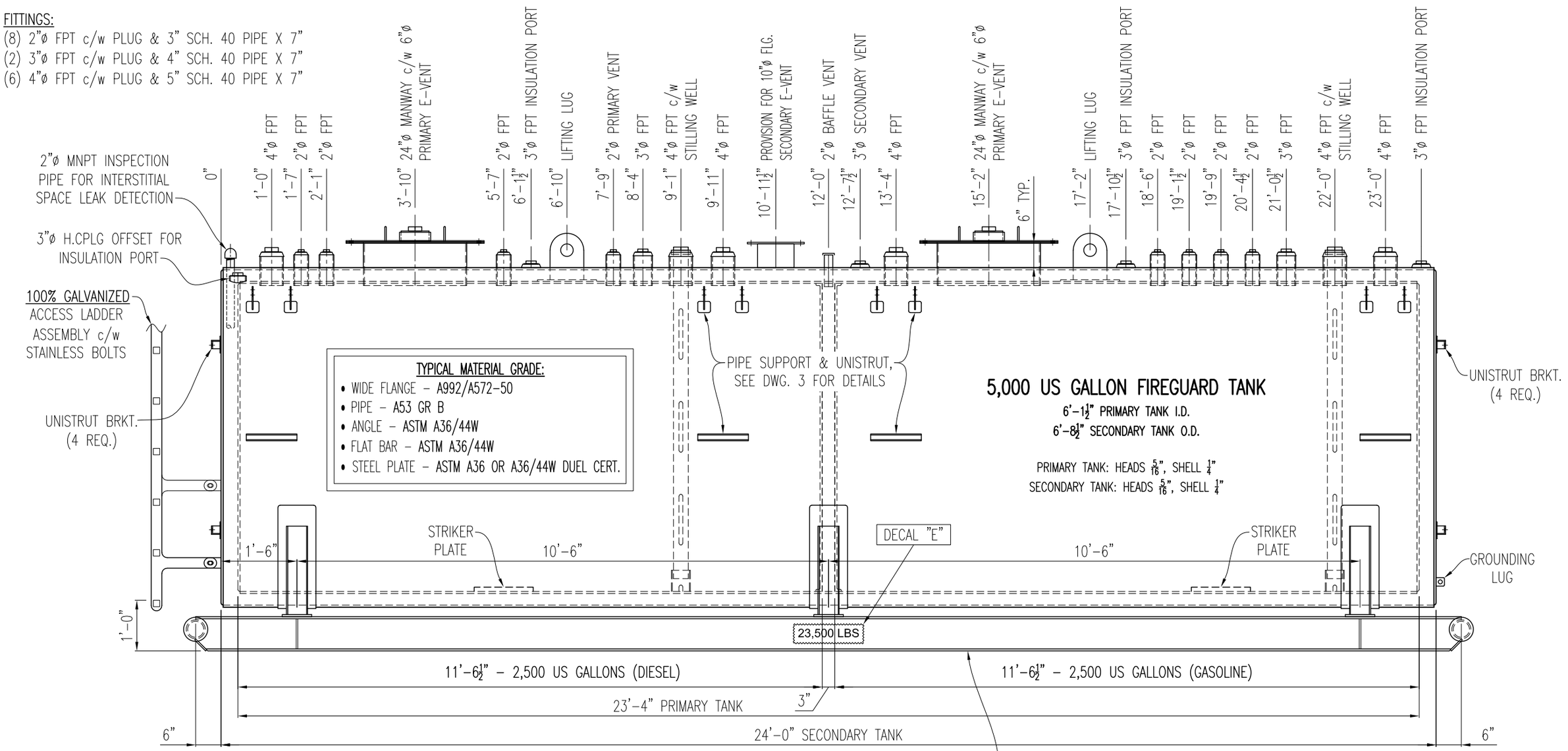


GAUGE CLOCK PORT
STILLING WELL

CUSTOMER: ALASKA ENERGY AUTHORITY
P.O. # PO-010085
TANK # US842 TO US849
TITLE: DECALS, SHIPPED LOOSE NOTE & DETAILS
FOR: 30,000 US GALLON HORIZ. CYL. DOUBLE WALL CONTAINED TANK (UL142)
REGAL "ENVIRO-SAFE"
FILE: 02\02\US842 30000 US GAL CYL CTA AEA
DRAWN: JAYDEE
APR 7, 2021
SCALE: N/A
DWG# US842
SHEET 4 OF 4
REV A

REGAL TANKS USA INC.
PHONE (360) 707-9948 FAX (360) 707-9949

FITTINGS:
(8) 2"ø FPT c/w PLUG & 3" SCH. 40 PIPE X 7"
(2) 3"ø FPT c/w PLUG & 4" SCH. 40 PIPE X 7"
(6) 4"ø FPT c/w PLUG & 5" SCH. 40 PIPE X 7"



EMPTY SHIPPING WEIGHT: 23,500 LBS

PAINT NOTES:

SANDBLAST EXTERIOR TO SSPC-SP10 & APPLY ONE COAT OF CATHACOAT 302H (2-3 mils DFT), TWO COATS OF BAR-RUST 236 (4-6 mils DFT EA. / 8-12 mils DFT TOTAL) & ONE COAT OF WHITE DEVTHANE 389H (2-3 mils DFT)

SUFFICIENTLY CONTRASTING COLOURS BETWEEN COATS TO ENSURE COMPLETE COVERAGE

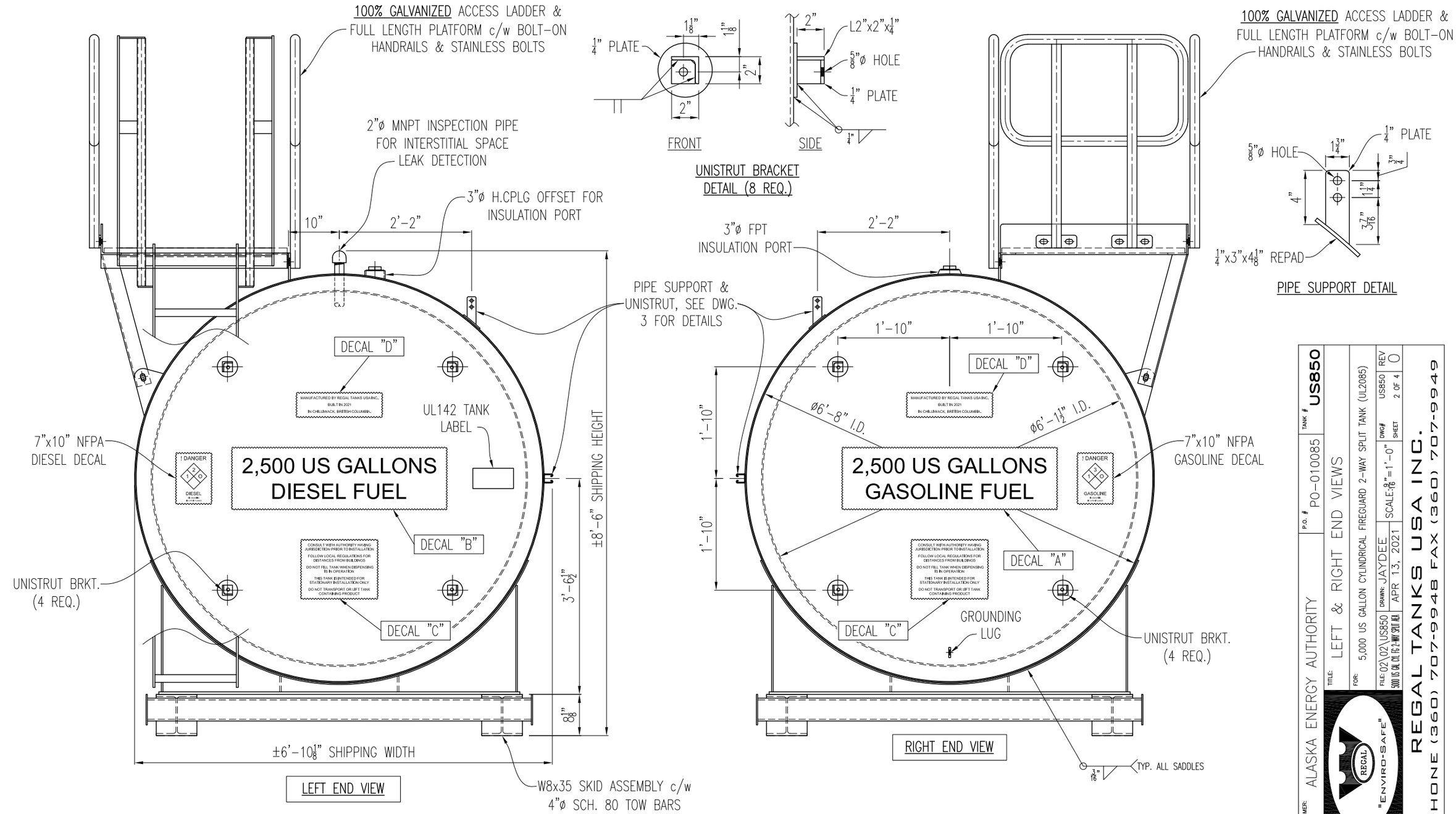
REV	DATE	DESCRIPTION	DRAWN BY	APPROVED BY
0	APR 13, 2021	FOR APPROVAL	JM	JS

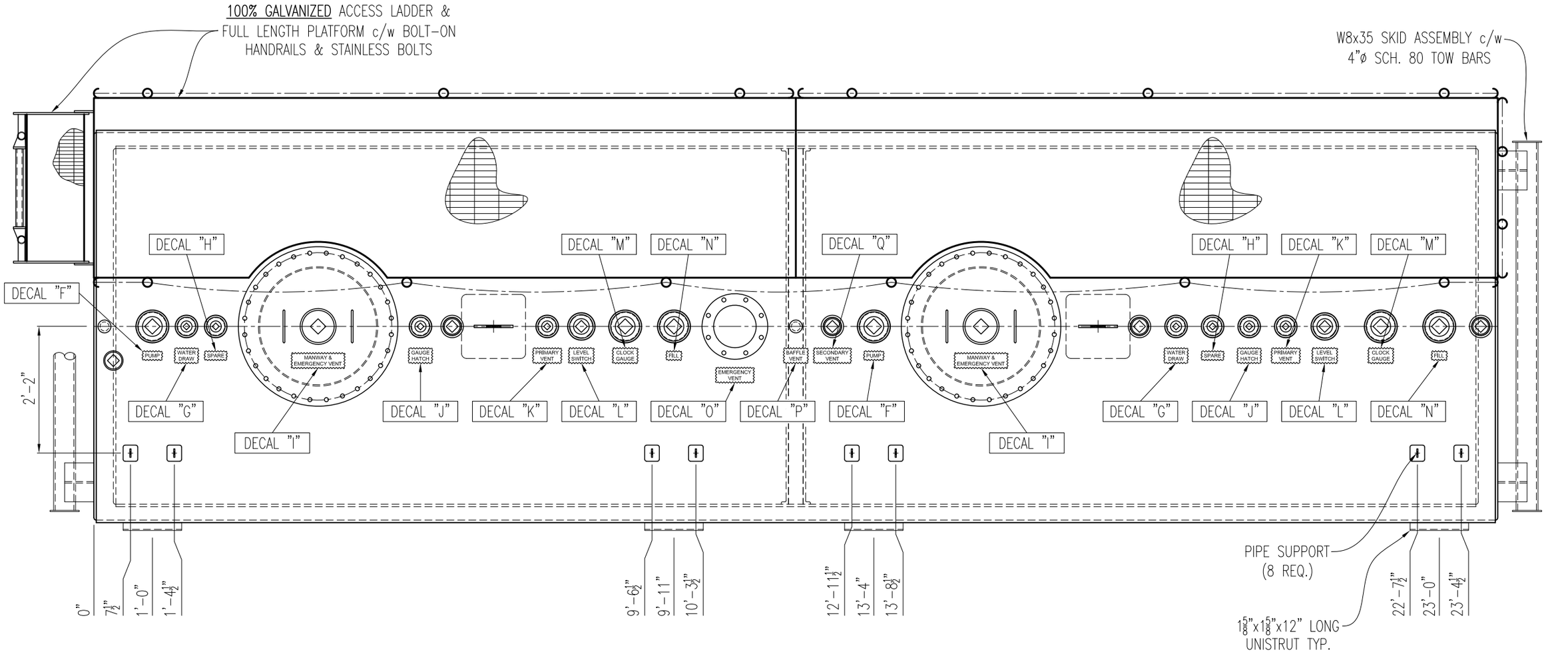
CUSTOMER: ALASKA ENERGY AUTHORITY
P.O. # PO-010085
TANK # US850

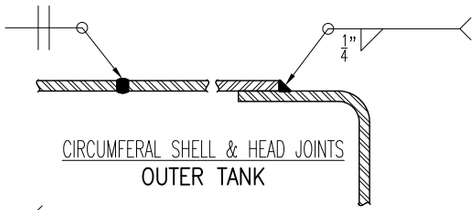
REGAL "ENVIRO-SAFE"

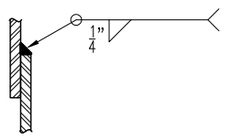
TITLE: SIDE VIEW
FOR: 5,000 US GALLON CYLINDRICAL FIREGUARD 2-WAY SPLIT TANK (UL2085)
FILE: 02\02\US850 5000 US GAL CYL FG 2-WAY SPLIT AEA
DRAWN: JAYDEE
APR 13, 2021
SCALE: 7/16"=1'-0"
DWG# US850
SHEET 1 OF 4
REV 0

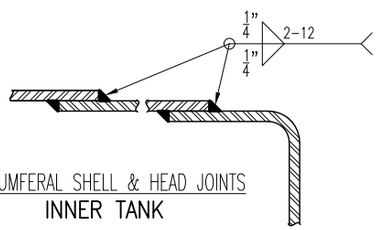
REGAL TANKS USA INC.
PHONE (360) 707-9948 FAX (360) 707-9949

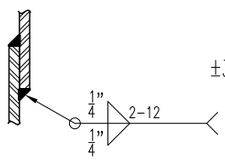

100% GALVANIZED ACCESS LADDER & FULL LENGTH PLATFORM c/w BOLT-ON HANDRAILS & STAINLESS BOLTS
2"ø MNPT INSPECTION PIPE FOR INTERSTITIAL SPACE LEAK DETECTION
3"ø H.CPLG OFFSET FOR INSULATION PORT
10"
2'-2"
PIPE SUPPORT & UNISTRUT, SEE DWG. 3 FOR DETAILS
DECAL "D"
MANUFACTURED BY REGAL TANKS USA INC.
BUILT IN 2021
IN CHILLIWACK, BRITISH COLUMBIA.
UL142 TANK LABEL
7"x10" NFPA DIESEL DECAL
DANGER
DIESEL
2,500 US GALLONS DIESEL FUEL
DECAL "B"
CONSULT WITH AUTHORITY HAVING JURISDICTION PRIOR TO INSTALLATION
FOLLOW LOCAL REGULATIONS FOR DISTANCES FROM BUILDINGS
DO NOT FILL TANK WHEN DISPENSING IS IN OPERATION
THIS TANK IS INTENDED FOR STATIONARY INSTALLATION ONLY
DO NOT TRANSPORT OR LIFT TANK CONTAINING PRODUCT
UNISTRUT BRKT. (4 REQ.)
DECAL "C"
3'-6 1/2"
±8'-6" SHIPPING HEIGHT
8 1/8"
±6'-10 1/8" SHIPPING WIDTH
LEFT END VIEW
W8x35 SKID ASSEMBLY c/w 4"ø SCH. 80 TOW BARS
1 1/8"
1 1/8"
1/4" PLATE
2"
2"
FRONT
2"
L2"x2"x1/4"
5/8"ø HOLE
1/4" PLATE
1/4"
SIDE
UNISTRUT BRACKET DETAIL (8 REQ.)
100% GALVANIZED ACCESS LADDER & FULL LENGTH PLATFORM c/w BOLT-ON HANDRAILS & STAINLESS BOLTS
5/8"ø HOLE
1 3/4"
1/4" PLATE
3/4"
4"
1 1/4"
3 7/16"
1/4"x3"x4 1/8" REPAD
PIPE SUPPORT DETAIL
3"ø FPT INSULATION PORT
2'-2"
1'-10"
1'-10"
1'-10"
1'-10"
ø6'-8" I.D.
ø6'-1 1/2" I.D.
DECAL "D"
MANUFACTURED BY REGAL TANKS USA INC.
BUILT IN 2021
IN CHILLIWACK, BRITISH COLUMBIA.
7"x10" NFPA GASOLINE DECAL
DANGER
GASOLINE
2,500 US GALLONS GASOLINE FUEL
CONSULT WITH AUTHORITY HAVING JURISDICTION PRIOR TO INSTALLATION
FOLLOW LOCAL REGULATIONS FOR DISTANCES FROM BUILDINGS
DO NOT FILL TANK WHEN DISPENSING IS IN OPERATION
THIS TANK IS INTENDED FOR STATIONARY INSTALLATION ONLY
DO NOT TRANSPORT OR LIFT TANK CONTAINING PRODUCT
DECAL "A"
DECAL "C"
GROUNDING LUG
UNISTRUT BRKT. (4 REQ.)
RIGHT END VIEW
3/16"
TYP. ALL SADDLES
CUSTOMER: ALASKA ENERGY AUTHORITY
P.O. # PO-010085
TANK # US850
TITLE: LEFT & RIGHT END VIEWS
FOR: 5,000 US GALLON CYLINDRICAL FIREGUARD 2-WAY SPLIT TANK (UL2085)
FILE: 02\US850 5000 US GAL CYL FG 2 WAY SPLIT.dwg
DRAWN: JAYDEE
APR 13, 2021
SCALE: 3/16"=1'-0"
DWG# US850
SHEET 2 OF 4
REV 0
"ENVIRO-SAFE"
REGAL TANKS USA INC.
PHONE (360) 707-9948 FAX (360) 707-9949











SEE DWG. 01 FOR NOZZLE SIZES & LOCATIONS

CUSTOMER: ALASKA ENERGY AUTHORITY | P.O. # PO-010085 | TANK # US850

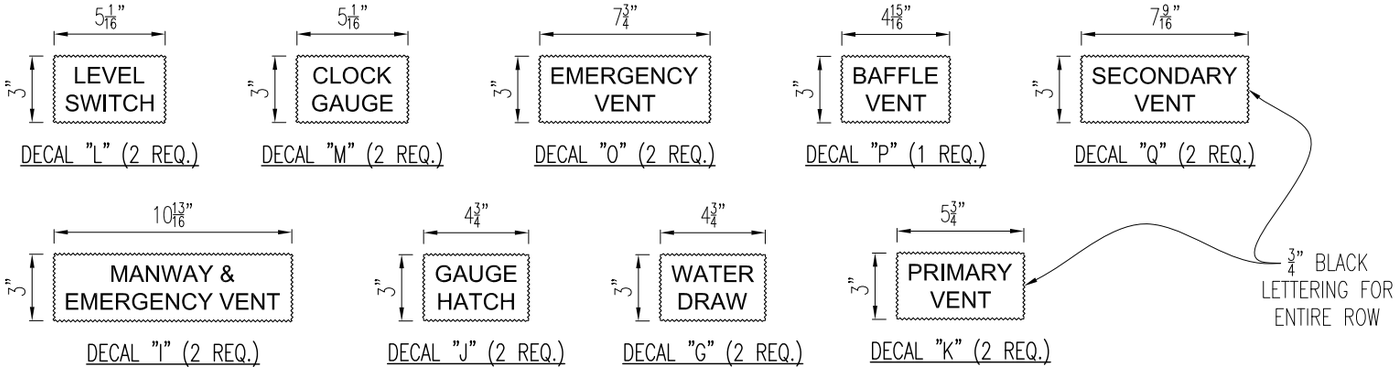
REGAL "ENVIRO-SAFE"

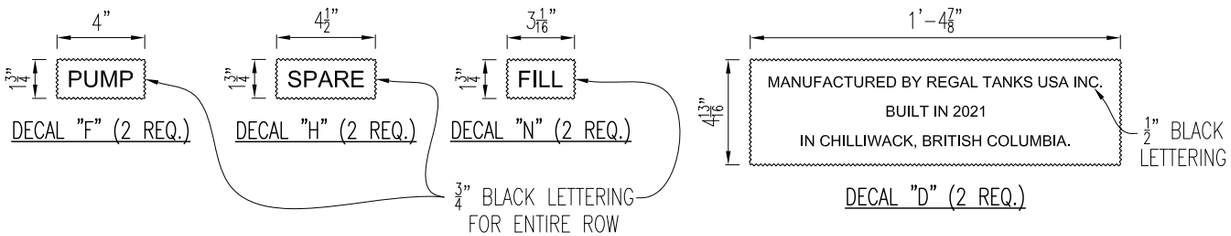
TITLE: TOP VIEW

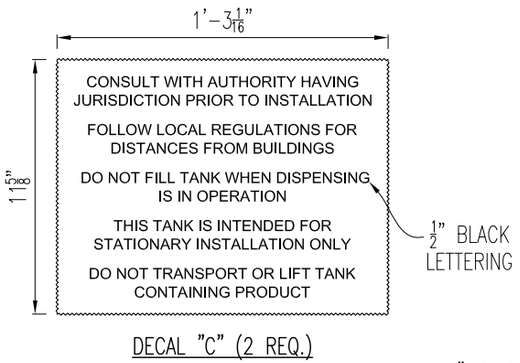
FOR: 5,000 US GALLON CYLINDRICAL FIREGUARD 2-WAY SPLIT TANK (UL2085)

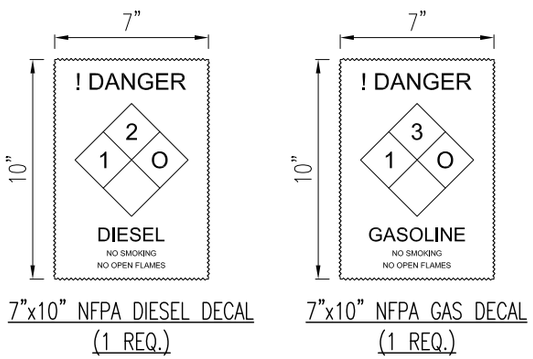
FILE: 02\02\US850 5000 US GAL CYL FG 2-WAY SPLIT AEA | DRAWN: JAYDEE | APR 13, 2021 | SCALE: ½"=1'-0" | DWG# US850 | SHEET 3 OF 4 | REV 0

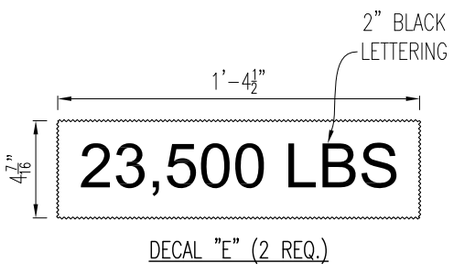
REGAL TANKS USA INC.
PHONE (360) 707-9948 FAX (360) 707-9949

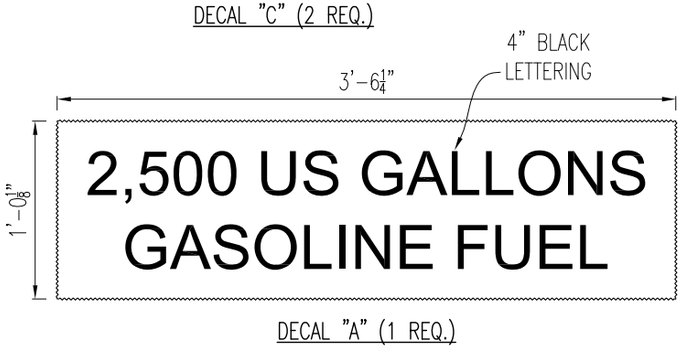


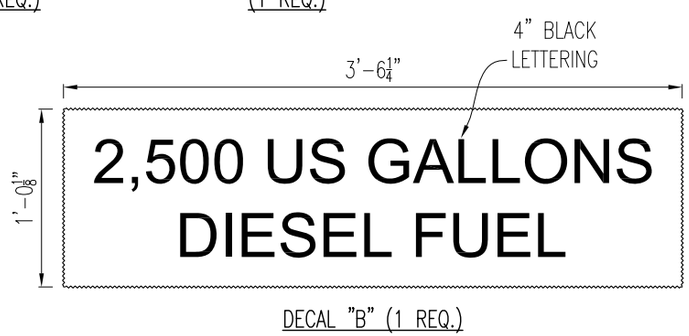






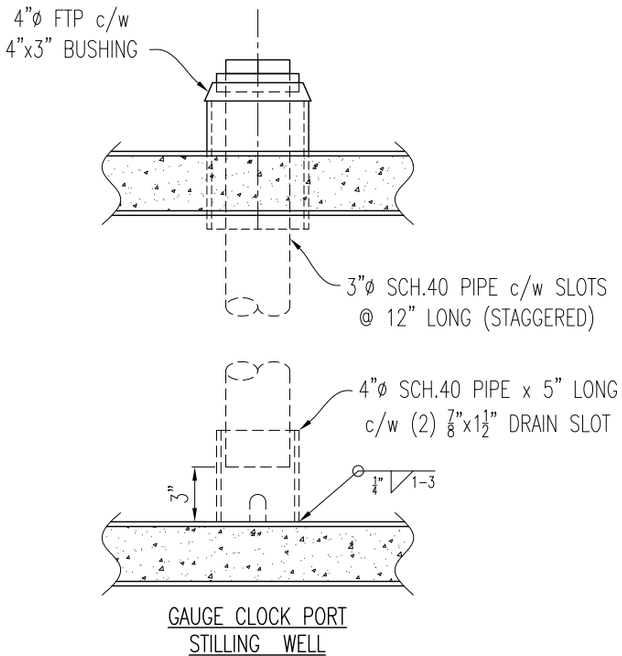






SHIPPED LOOSE NOTE FOR (1) ONE TANK:

- (1) LADDER ASSEMBLIES (GALVANIZED) c/w STAINLESS STEEL BOLTING HARDWARE
- (2) PLATFORM ASSEMBLIES (GALVANIZED) c/w STAINLESS STEEL BOLTING HARDWARE
- (2) LARGE HANDRAIL SEGMENTS, (1) END HANDRAIL SEGMENTS, (1) LEFT "P" SHAPED HANDRAIL SEGMENTS, (1) RIGHT "P" SHAPED HANDRAIL SEGMENTS, (4) STRAIGHT HANDRAIL SEGMENTS c/w STAINLESS STEEL BOLTING HARDWARE
- (8) 1"ø WATER DRAW-OFF SUCTION PIPES c/w 2"x1" D.T BUSHING, 1"ø CAMLOCK & DUST CAP
- TOUCH UP PAINT: ONE GALLON EACH OF CATHACOAT 302H (GREEN), BAR-RUST 236 (GREY), BAR-RUST 236 (OFF-WHITE), DEVTHANE 389H (WHITE)
- (2) 8FT DIP STICKS

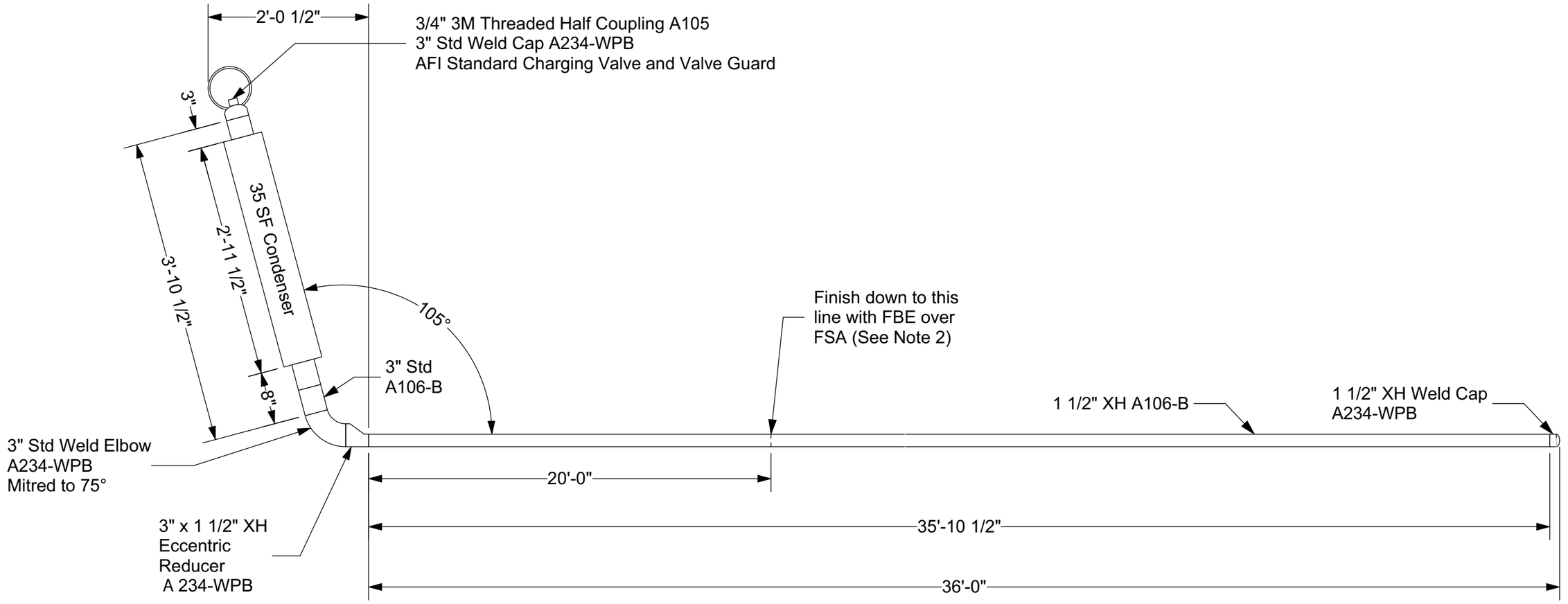


CUSTOMER: ALASKA ENERGY AUTHORITY		P.O. # PO-010085	TANK # US850
"ENVIRO-SAFE"	TITLE: DECALS, SHIPPED LOOSE NOTE & DETAILS		
	FOR: 5,000 US GALLON CYLINDRICAL FIREGUARD 2-WAY SPLIT TANK (UL2085)		
FILE: 02\02\US850 5000 US GAL CYL FG 2-WAY SPLIT AEA	DRAWN: JAYDEE APR 13, 2021	SCALE: N/A	DWG# US850 SHEET 4 OF 4 REV 0

REGAL TANKS USA INC.
PHONE (360) 707-9948 FAX (360) 707-9949

Appendix B

Thermoprobe Shop Drawings



Notes:

1) All pressure containing pipe welds are full penetration v-groove welds except for the fillet weld attaching the 3M half coupling to the evaporator pipe. Welding is performed by welders qualified per ASME Section IX. Applicable welding procedures for this work are 6-GCS-HP/VP1.5, 5-GSA-VP/HP1.5 and 5-GSP2-RW.

2) Finish the top of the assemblies with APC E8-CM1 fusion bond epoxy over 3 mils flame sprayed aluminum applied per AWS C2.2.

3) Charge with R-744 per AFI standard procedure.

4) Protect condenser with 6-inch sonotube for shipment. Wrap sonotube with plastic stretch wrap and crate for shipping.

5) Heat transfer properties are equal to or greater than those published in SOA DOTPF Report No. AK-RD-86-16.

6) Build 90 units.

Nunapitchuk Bulk Fuel Upgrade Project

Shop Drawing
Vertical Thermoprobes for Installation in H-Piles

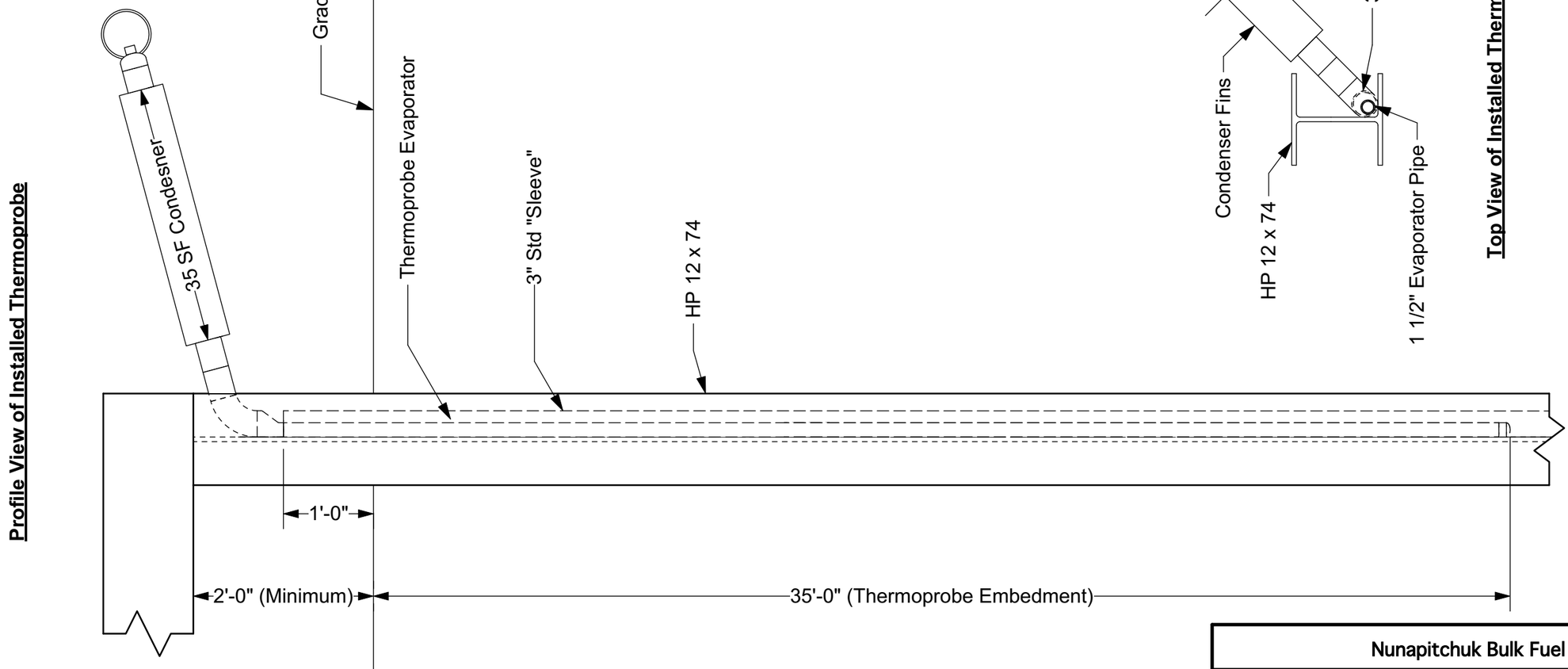
For: Alaska Energy Authority

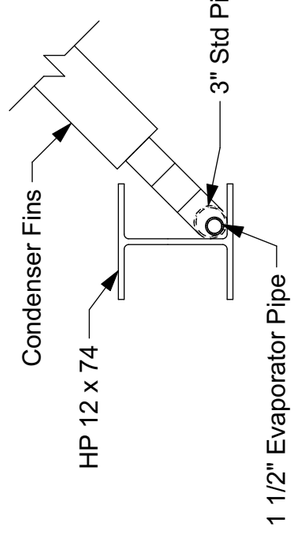
ARCTIC FOUNDATIONS, INC.
5621 Arctic Boulevard
Anchorage, Alaska 99518-1667

MADE IN ALASKA

Job No. 2021-10
No Scale
Drawn By: AW
Checked By: EY
02/22/2021
Drawing # 2021-10-01
Revision # 0

Profile View of Installed Thermoprobe





Top View of Installed Thermoprobe

Notes:

1) Thermoprobes designed as shown have less than three inches of clearance underneath the structure.

2) Thermoprobes must be installed as shown to avoid conflict underneath structure.

3) AFI recommends extending the embedment depth of the thermosyphon sleeve an additional six inches to allow for small variabilities in construction and installation.

Nunapitchuk Bulk Fuel Upgrade Project

Field Drawing
Vertical Thermoprobes for Installation in H-Piles

For: Alaska Energy Authority

ARCTIC FOUNDATIONS, INC.
5621 Arctic Boulevard
Anchorage, Alaska 99518-1667

MADE IN ALASKA

Job No. 2021-10
No Scale
Drawn By: AW
Checked By: EY
02/22/2021
Drawing # 2021-10-02
Revision # 0

Appendix C

Existing Bulk Tank Table & Photos

Existing Bulk Fuel Storage Tank Information & Photos

Nunapitchuk BFU
EXISTING BULK FUEL TANK SUMMARY SHEET

Tank No.	Vert/ Horiz	Single / Double Wall	Diameter (ft)	Length/ Height (ft)	Gasoline (Gallons Gross)	Diesel (Gallons Gross)	Condition	Contractor Action
Tank Farm 1 - Nunapitchuk Limited (NL)								
1	H	S	8	13'-6"	5000		Poor	Decommission
2	H	S	8	13'-6"	5000		Poor	Decommission
3	H	S	9'-6"	41'	21,500		Poor	Decommission
4	V	S	9'-8"	13'-9"		7,500	Poor	Decommission
5	V	S	9'-8"	13'-9"		7,500	Poor	Decommission
6	V	S	11'	13'-9"		10,000	Poor	Decommission
7	V	S	10'	13'-9"		8,000	Poor	Decommission
8	V	S	10'-3"	13'-9"		8,500	Poor	Decommission
9	V	S	11'	13'-9"		10,000	Poor	Decommission
10	V	S	10'-7"	13'-9"		9,000	Poor	Decommission
11	V	S	10'-7"	13'-9"		9,000	Poor	Decommission
12	H	D	11'	37'	26,000		Poor	Decommission
13	H	D	10'	34'-6"	20,000		Excellent	None
14	H	D	10'	34'-6"		20,000	Excellent	None
Tank Farm #1 Total					**77,500**	**89,500**		

Appendix D

Geotechnical Report

October 30, 2019 Project No. 18105833

Karl Hulse, PE
CRW Engineering Group, LLC
3940 Arctic Blvd, Ste. 300
Anchorage, Alaska 99503

GEOTECHNICAL FINDINGS AND RECOMMENDATIONS – BULK FUEL STORAGE FACILITY, NUNAPITCHUK, ALASKA

Karl:

Golder Associates Inc. (Golder) is pleased to present the results of our geotechnical explorations, laboratory testing, and engineering recommendations to CRW Engineering Group, LLC (CRW) for the proposed bulk fuels facility in Nunapitchuk, Alaska (Figure 1). The Alaska Energy Authority (AEA) is developing a new bulk fuel storage facility with an associated dispensing system for the village. CRW is the prime design engineer for the proposed improvements. To support CRW's project design, Golder performed a geotechnical exploration program April 5 through 8, 2019 consisting of three geotechnical boreholes advanced in the vicinity of the proposed development. The work presented in this report was performed in general accordance of our scope of services and associated Letter of Authorization from CRW.

The geotechnical exploration program was conducted in concert with an Alaska Department of Environmental Conservation (ADEC) Village Safe Water (VSW) wastewater treatment lagoon project led by CRW on a shared mobilization basis. Our geotechnical findings and engineering recommendations for the VSW projects are provided in a separate submittal to CRW.

1.0 PROJECT UNDERSTANDING

The proposed development includes seven (7) new 27,000-gallon and two (2) refurbished 20,000-gallon above-grade bulk fuel storage tanks and associated dispensing, fuel piping, and marine headers. An above grade access platform is planned for the dispensing facility to accommodate ATV and local village traffic. The above grade platform abuts the dispensing structure and the primary fuel storage tanks. At this time, pad fill is not planned as part of the project development. For geotechnical purposes, we have based our geotechnical engineering analysis on a nominal 35-year service life for the tanks. Construction may commence in 2020.

The proposed develop site is located at the end of the residential area along the southern margin of the village. The site abuts the Johnson River, along the river's west bank. River geometry indicates the planned development area is along an active channel. River morphology and possible impacts, if any, to the riverbank at the planned development area are undetermined at this time.

2.0 GEOTECHNICAL EXPLORATION PROGRAM

Three geotechnical boreholes were advanced in early April 2019 at this site using a Geoprobe 6620DT drill rig. The boreholes were advanced by equipment owned and operated by GeoTek Alaska, Inc. mobilized from Anchorage, Alaska. Locations for the three boreholes, labeled BH-01 through BH-03 for this submittal, were determined by Golder and CRW prior to the field program based on the approximate location of the proposed developments.

2.1 Field Exploration

Golder geologist Xinlei Na (Leo) managed the field exploration program, field located the test boreholes using hand held GPS instruments, and visually logged the recovered soil samples. The boreholes were advanced to depths of 33 to 51.5 feet below ground surface at the time of the field work (bgs), using a direct push drilling and soil sampling method with a Geoprobe 6620DT. The Johnson River was not safe for over-ice travel at the time of our field work. Personnel access from the airstrip over the river was provided by local residents using boats. All drilling equipment was helicopter mobilized to the drill site. Once onsite, the self-propelled drill rig was able to travel over the frozen ground surface to the borehole locations.

Moderately disturbed but representative soil samples were observed, visually logged and select portions of the recovered soil samples were retained as the borings were advanced. Representative portions of the samples were sealed in double polyethylene bags to preserve their natural moisture contents. Retained soil samples were stored and sealed in 5 gallon pails and were delivered to Alaska Airlines Air Cargo for transport to Golder's Anchorage laboratory.

The soils encountered during the field explorations were classified in the field according to the Unified Soil Classification System (USCS) key provided in Appendix A. Frozen soil and frost classifications are estimated following Golder's classification keys provided in Figures A-1 and A-2. Representative borehole logs based on field and laboratory results are presented as Figures A-3 through A-5.

The boreholes were backfilled with excess soil cuttings at time of the field work. During backfilling, sealed one-inch diameter PVC standpipes were installed in Boreholes BH-01 and BH-03 to the full exploration depths. The standpipes were installed for ground temperature measurements.

2.2 Ground Temperature Measurements

Ground temperatures were measured on May 7, 2019, approximately four weeks after drilling to allow for drilling-induced heat to dissipate and ground temperatures to stabilize. Ground temperatures were measured using Digital Temperature Cables (DTCs) manufactured by BeadedStream LLC. The DTCs were ice-bath calibrated within one year of use at this site. Sensors on the DTCs were at 2-foot intervals to standpipe depth in boreholes BH-01 and BH-03. The DTC was placed into the PVC standpipe and allowed to equilibrate for at least one hour before the ground temperature data was recorded.

3.0 GEOTECHNICAL LABORATORY ANALYSIS

All recovered soil samples were independently re-examined and visually classified in our US Army Corps of Engineers validated Anchorage laboratory to confirm the field classifications. Representative samples were selected for further testing to determine soil index properties including soil moisture content as percent of dry weight, particle size distribution, and pore water salinity.

All soil sample analyses were conducted in accordance with ASTM International (ASTM) recommended procedures except for pore water salinity measurements. Pore-water salinity was determined by conductivity methods in accordance our test procedures. Geotechnical laboratory test results are summarized in Appendix B, Table B-1, and provided on the borehole logs adjacent to the samples tested. Moisture content and salinity results are summarized in Figures B-1 through B-2.

4.0 SITE CONDITIONS

The community of Nunapitchuk is located along the banks of the Johnson River, a tributary that flows northwest to southeast to the Kuskokwim River. Nunapitchuk is located approximately 22 miles west-northwest of Bethel and about 20 miles north of the Kuskokwim River within the Yukon-Kuskokwim Coastal Lowland physiographic division. The region is characterized by marshy lake-dotted plains and low-gradient meandering streams (Wahrhaftig 1965[1]). Nunapitchuk is located within a “sporadic” permafrost zone. Permafrost ground temperatures vary with depth and are generally dependent on the air temperature, snow depth, vegetation, presence of water bodies, and embankments and other manmade structures.

4.1 Regional Geology

Within the broad expanse of the Kuskokwim River delta the surficial geology is divided into groupings of alluvial sediments, silt, reworked silt and undivided surficial deposits as well as estuarine and marine deposits near the outer extents of the delta (Wilson et al. 2013[2]). The community of Nunapitchuk is located within an expansive alluvial deposit. Alluvial deposits in the region are generally constrained to water bodies (i.e. Johnson River) including coastal shorelines and rivers and streams and consist of flood-plain sands (with river bar gravels on a localize basis), estuarine clay-rich silts, and fine-grained windblown (eolian) sand deposits. West of Nunapitchuk is largely mapped as undivided surficial deposits consisting of soils from varying depositional and geomorphic processes. Soils in this geologic unit are derived locally from alluvial sedimentation and eolian and lacustrine deposition. These soils generally consist of organic soils, sand, silty sand, silt and sandy silt. East of Nunapitchuk are the characteristic silt and sandy silt deposits present in Bethel and the surrounding area, a vast and thick deposit of mainly nonmarine fine-grained deposition material with eolian (dune) deposits in some areas (Wilson et al. 2013).

5.0 GEOTECHNICAL ENGINEERING CLIMATE DATA

Our geotechnical analysis is based, in part, on anticipated climate impacts in the Nunapitchuk area through the 2060-2069 period. Publicly available air temperature records near the village indicate historic ranges from -37 to 88 degrees Fahrenheit (°F). Annual precipitation for Nunapitchuk averages about 21 inches with an average of 64 inches of annual snowfall (NOAA 2019[3]).

Specific to the planned development, we derived geotechnical engineering climate indices using data published by the University of Alaska Fairbanks (UAF) Scenarios Network for Alaska & Arctic Planning (SNAP) group. SNAP data for our analysis was accessed in April and May 2019.

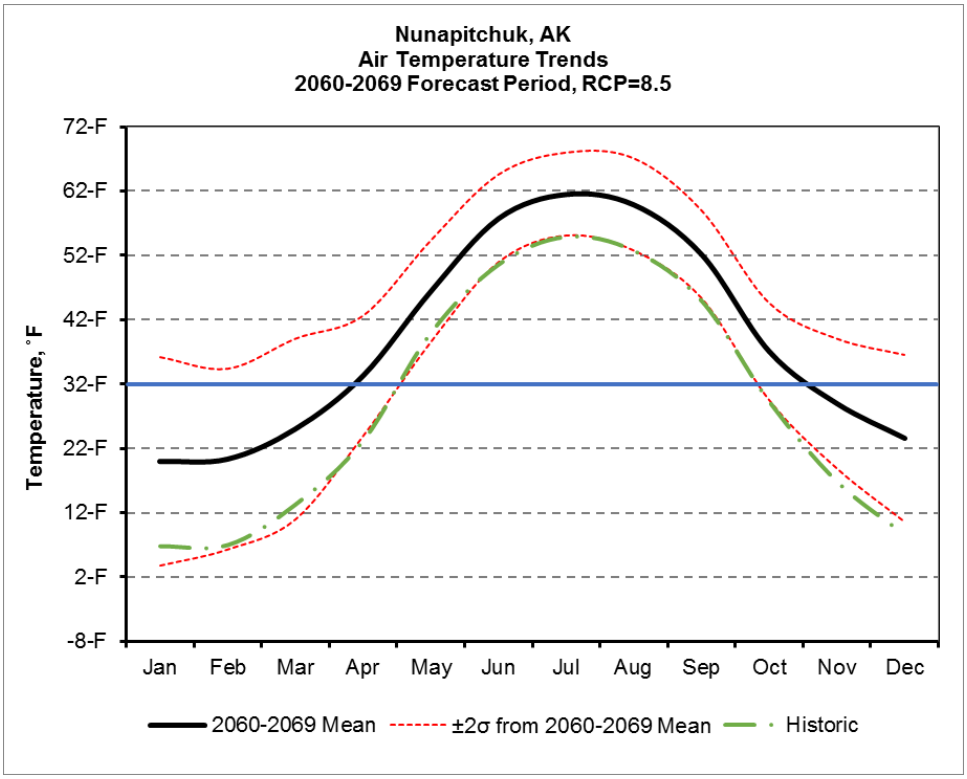
[1] Wahrhaftig, Clyde, 1965, Physiographic divisions of Alaska: U.S. Geological Survey Professional Paper 482, 52 p., 6 sheets, scale 1:2,500,000

[2] Wilson, F.H., Hults, C.P., Mohadjer, Solmaz, and Coonrad, W.L., comps., 2013, Reconnaissance geologic map of the Kuskokwim Bay region, southwest Alaska: U.S. Geological Survey Scientific Investigations Map 3100, 46 p., 1 sheet.

[3] National Oceanic and Atmospheric Administration (NOAA) National Weather Service Forecast Office, Fairbanks, AK. NOWData – part of the Applied Climate Information System. Online: https://w2.weather.gov/climate/xmacis.php?wfo=pafg (accessed May 2019).

The SNAP group provides both historic and forecast climate data for our analysis, primarily as air temperature data. For the desired design life, we relied on SNAP data for the 2060-2069 forecast period based on a five General Circulation Models (GCM) the SNAP group considers most suitable for Alaska. We also relied on a Representative Concentration Path (RCP) of 8.5 [watts/m^2] for the forecast period.

SNAP provided air temperature data for historic and with two standard deviations (2σ) for the forecast period mean air temperatures data. Summary air temperature data for the area is provided in the following plot.



We derived engineering climate indices from the SNAP historic and forecast data, primarily the mean air temperatures and the 2σ variation around the mean data trend. We have developed and estimated mean air temperatures, freeze and thaw indices for our analysis. Engineering climate indices derived by us are summarized below.

Period		Average Air Temperature	Freeze Index	Thaw Index
Historic	Mean	29.0 F	3,580 F-days	2,600 F-days
2060-2069	5 Model Mean	38.8 F	1,270 F-days	3,800 F-days
2060-2069	Mean +2σ	48.8 F	0 F-days	6,160 F-days
2060-2069	Mean -2σ	28.9 F	3,620 F-days	2,530 F-days
RECOMMENDED ENGINEERING DESIGN INDICES			2,440 F-days	4,980 F-days

As noted above, a general warming trend is supported for the area. A nominal 9 to 10 ˚F increase in the mean annual air temperature is estimated between the longer term historic trends and the forecast period. If correct, the mean annual air temperatures for the forecast period will breech 32˚F. The forecast period mean air temperatures indicate a significant reduction in winter cooling capacity with an attendant increase in the summer heating capacity, but not to the same magnitude as the reduction in winter cooling capacity. This infers warmer winters with a reduced freeze period with a warming summer period can be expected through the project's service life. As noted, these are considered decadal trends and localized excursions of air temperatures can and should be expected.

Also, the changes in the air temperature trends will impact ground temperatures but at a damped rate temporally and vertically downward through the soil profile. We would expect ground temperature changes to lag behind air temperature changes with the rate of lag dependent on a wide variety of factors.

6.0 SURFACE AND SUBSURFACE CONDITIONS

6.1 Surface Conditions

Seasonal ground surface frost was present throughout the planned development area at the time of our field work. Surface vegetation was noted but it was still in winter dormant state. No significant ground surface damage or local infrastructure was observed near the exploration area. No fill pad material was encountered during the subsurface investigation and the observed organic mat appeared to represent the original surface.

Based on aerial imagery review, the surface terrain within the planned development area differs from the immediately surrounding areas. Patterned ground geomorphic features indicative of ice-rich permafrost are evident in the terrain surrounding the planned development area. However, the similar terrain features are generally absent at the planned development area. Subsurface conditions did not provide clear evidence for a differing surface terrain geomorphic condition at the planned development area. However, the surface terrain at the planned development area may indicate a relict tundra pond or small lake that was pirated or drained and allowed to refreeze.

6.2 Subsurface Conditions

The subsurface conditions observed in the boreholes are summarized below and are based on the results from laboratory testing, visual field classification of the recovered soil, and drilling action at the time of the field work. Representative sample and site photographs are presented in Appendix C.

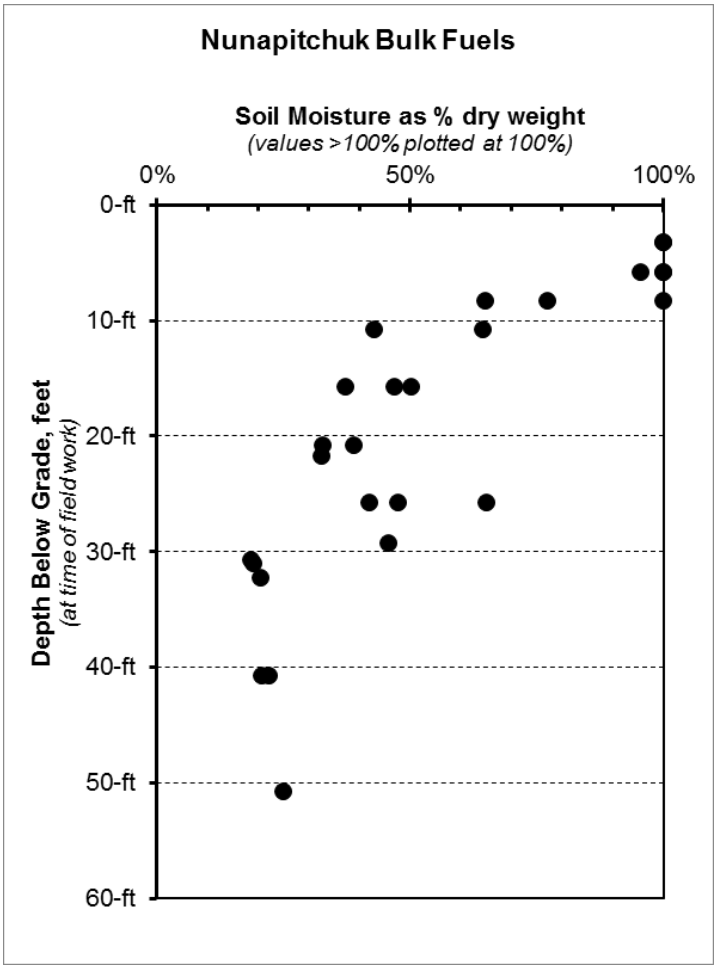
6.2.1 Boreholes BH-01 through BH-03

Boreholes BH-01, BH-02 and BH-03 were advanced to 51.5, 42, and 33 feet bgs, respectively. Subsurface conditions consisted of frozen peat from ground surface to 1.5 to 2.5 feet bgs; bonded frozen silt, sandy silt and silty sand from 1.5 to approximately 30 feet bgs with varying estimates of visible ice content. A distinct contact with a bonded frozen sand and sand with silt was encountered at approximately 30 feet bgs and continued through the depth of our borings. Sealed one-inch diameter schedule 40 PVC standpipe was installed to the exploration depths for ground temperature monitoring in boreholes BH-01 and BH-03. No unfrozen soil, unbounded permafrost, or groundwater was observed during drilling.

6.3 Soil Properties

Moisture contents in the recovered mineral soils ranged from 18 to in excess of 200-percent on a dry weight basis with increased moisture contents in zones of organic soils or with greater visible ice content. The following plot summarizes soil moisture contents with soil moistures in excess of 100-percent of dry weight plotted at 100-percent. The geotechnical laboratory data provided in Appendix B should be reviewed for unconstrained soil moistures.

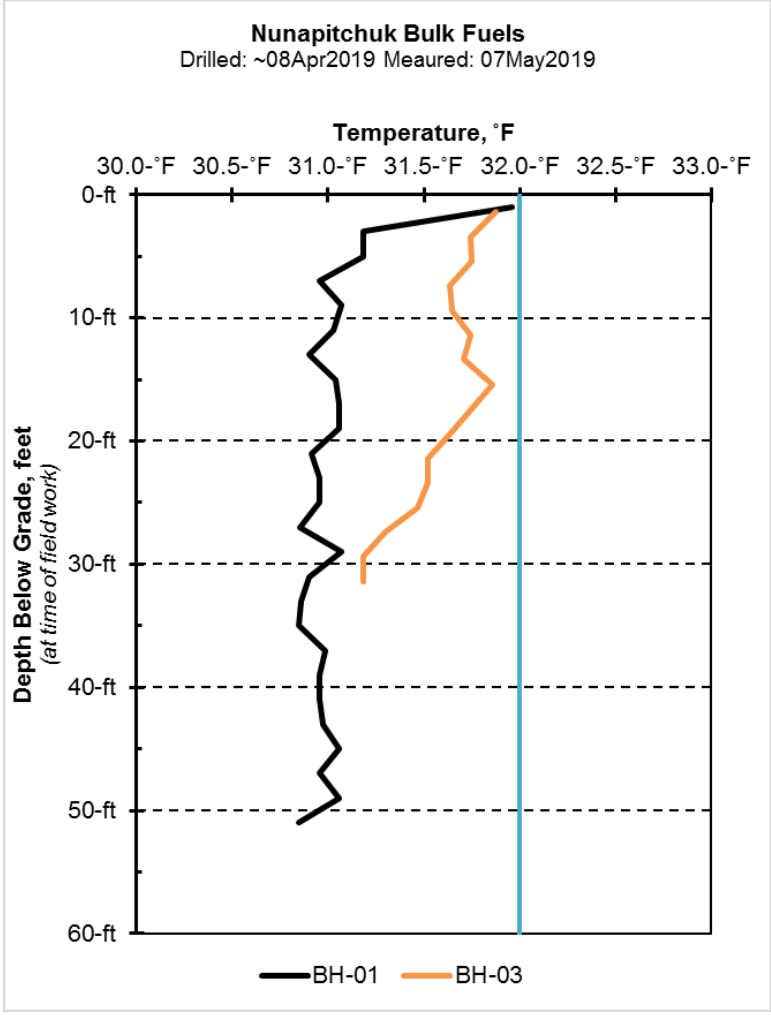
As noted in the summary plot, soil moistures were considerably lower in the sandy soils encountered below 30 feet bgs. The soil moisture contents in the zone are considered near, but above, thawed state saturation concentrations. Thus, we consider all frozen soils encountered the test borings as ice-rich material with the potential for creep dominated behavior.



Pore water salinities were measured from samples distributed throughout the site and showed very low concentrations, essentially no pore water salinity (Appendix B, Figure B-2). Accordingly, freezing point depression conditions due to solutes in the permafrost are not considered a significant geotechnical design constraint at this site.

6.4 Ground Temperatures

The measured ground temperatures indicate frozen material with an average temperature (below the seasonal thaw zone) of a relatively consist 31°F. Based on our experience in the village, the ground temperatures measured at this site are slightly warmer, by about 0.5˚F, than encountered elsewhere in the village. As noted previously, the surface terrain geomorphology is not considered indicative of massive ground ice features and massive ice was not encountered in the boreholes advanced at this site. Of additional note are the slightly warmer permafrost temperatures that were measured in borehole BH-03 relative to borehole BH-01. The cause of this ground temperature variation is undetermined but most likely attributed to borehole BH-03's closer proximity to the Johnson River. If so, continued ground warming influence from the Johnson River can be expected. Thus, the bulk fuel tanks should be set back a far as feasible from the active riverbank.



7.0 DISCUSSION

The proposed bulk fuel storage tank loads will control the foundation design. We understand each bulk fuel tank will have eight (8) integral foundation bearing points. Based on discussions with CRW, an estimated 35-kip total axial compression load per each bearing point is the design load for the bulk fuel tanks. For geotechnical purposes, we have assumed this total axial compression load will represent the geotechnical sustained axial compression load for foundation creep analysis. We have also assumed all load bearing soils are ice-rich, thus prone to creep behavior under sustained axial compression loads. The 'warm' permafrost conditions at this site will have an elevated risk of creep related movements if the ground temperatures along the foundation members are not maintained per our recommendations.

Lateral loads at the pile caps were not provided to us at this time. For this submittal, we have assumed all lateral loads will be short-term, transient in nature. The final design for the bulk fuel tanks will not result in any applied long-term or sustained lateral load states. For purposes of this submittal we have assumed the transient lateral loads per pile will not exceed 5-kips at the pile cap.

The elevated access walkway and associated structures (dispensing building and smaller dispensing tanks) are expected to impose relatively light axial compression loads. Thus, we have assumed season frost uplift along the foundation members will control the foundation design for these members. Due to the potential for differential movements among all of the planned improvements, we have assumed the civil/mechanical piping design will include flexible members at the appropriate locations.

The status of the riverbank stability near the marine header is undetermined and was not included as part of the geotechnical effort. We recommend the hydrodynamics of the riverbank at and near the proposed development area be reviewed to determine the stability of this area and if stabilization measures are warranted to reduce the risk of erosion or bank slope instability along the planned development area.

The proposed development site consists of ice-rich silty soils overlying frozen, bonded, icy sandy soils. The tundra surface appeared to be intact with minimal damage. Maintaining the tundra surface intact and healthy will be critical to the bulk fuel tank foundation performance assuming pad fill and rigid insulation are not provided with the site development package.

The current ground temperatures are considered to be very warm permafrost for geotechnical purposes. Even minor damage to the insulating tundra mat can dramatically impact the underlying permafrost thermal balance. If the thermal balance is damaged, significant thaw-related strains will occur with the potential for adverse impact to bulk fuel tank foundation performance.

An adfreeze pile supported foundation system can be used for the bulk fuel tanks provided the underlying permafrost soils are maintained at their current thermal states throughout the planned service life of the structures. Maintaining the ground temperature regime will require use of subgrade cooling along the foundation members.

The operational period of passive cooling systems is directly correlated with air temperatures. As noted previously, warming air temperature trends are forecast and should be expected throughout the intended design life of the planned improvements. The uncertainty with forecast air temperatures increases with time, thus a wider range of air temperatures should be anticipated nearer the end of the development's intended service life. To address this potential uncertainty, the operational effectiveness of passive subgrade cooling systems can be

extended through use of mechanical chillers coupled with above grade heat exchangers. If needed based on routine ground temperature monitoring along the foundation piles, the passive cooling system can be augmented to accommodate mechanical cooling while maintaining their passive cooling capabilities. The heat exchangers systems can be included with original installation or at a later time based on ground temperature data.

8.0 GEOTECHNICAL RECOMMENDATIONS

Geotechnical recommendations are based, in part, on several baseline assumptions, including:

- Pad fill and rigid insulation within and around the planned development footprints are not being considered due to cost
- Winter construction means and methods that fully protects the existing tundra mat will be used
- A crane will be used as part of the contractor's construction program
- Ground temperature monitoring along select foundation piles will be conducted, either manually or by datalogger instrumentation

8.1 Bulk Fuel Tanks

Based on our review of the field data, a pile supported foundation is recommended for the bulk fuel storage tanks. A driven H-pile with passive subgrade cooling is recommended for the bulk fuel storage tank foundations. Two pile/passive subgrade cooling options are provided. Both options are based on HP12x74 (or greater unit weight) driven piles. The structural engineer will need to evaluate the axial and lateral stability for these piles. Larger dimensioned H-piles or pipe piles can be considered if needed, pending the structural engineer's analysis.

8.1.1 Option 1

HP12x74 driven piles embedded at least 45 feet below grade and at least 15 feet into the frozen fine grained sand layer expected to start near 30 feet bgs. If drive shoes are planned, they must be flush to the pile flanges and web. The piles will also require passive subgrade cooling. The passive subgrade cooling for this option should be AFI Thermoprobes with a nominal 3-inch diameter Extra Strong wall evaporator and a minimum 70 square foot (SF) foot condenser sections installed as standalone units within 3 to 4 horizontal feet from the H-piles.

The Thermoprobes should be embedded at least five (5) feet into the underlying fine grained sand layer. A potable water saturated soil, sand and potable water slurry, or cement grout is recommended for Thermoprobe backfill if installed directly in the soil. If the Thermoprobes are installed in a sleeve, grout backfill between the Thermoprobe and the sleeve is required. All piles should have this passive cooling geometry.

This option will facilitate the pile caps located nearer to existing grade. This will allow for improved lateral resistance along the piles and reduced the risk of snow drifted impacts along the tanks and impacts to the subgrade cooling system operational effectiveness and efficiency.

Depending on the bulk fuel tank layout a common Thermoprobe geometry may be suitable between adjacent tank foundation piles. The condenser sections should extend entirely above the top of the tank, thus lateral bracing to the tank system should be considered to reduce the risk of the wind-driven probes hitting the tank shells.

8.1.2 Option 2

HP12x74 embedded at least 45 feet below grade and at least 15 feet into the frozen sand layer. With this option, all piles will require passive subgrade cooling installed directly alongside the piles. Passive subgrade cooling for this option should consist of AFI Thermoprobes with a nominal 1.5-inch diameter evaporator and a minimum 35 square foot (SF) condenser sections.

The condenser section will most likely require sloping to no more than 80 degrees from vertical to accommodate the pile and pile cap geometry. Sloping condensers should be oriented normal to the expected prevailing winter wind direction remain free of snow and possible wind blocking due to changing vegetation around the tanks.

The Thermoprobes for this option should be installed in an appropriate steel sleeve permanently attached to the H-pile prior to driving. An appropriate plow will be required at the base of each sleeve to reduce the potential of damage during installation. A cement grout backfill is recommended between the Thermoprobe and the sleeve. The Thermoprobe should be embedded at least five (5) feet into the underlying fine grained sand layer expected to start about 30 feet bgs. We also recommend an appropriate additional free end length to the standpipe that extends below the anticipated Thermoprobe embedment depth be provided.

This option will almost certainly require the foundation pile caps elevated a greater distance above grade relative to Option 1. The increased pile cap elevation is expected in order to accommodate a clear blow through area around the sloping condensers. It is also reasonable to assume changing vegetation patterns may result in taller brush and shrubs round the tanks during the intended design life. Thus, provisions for maintaining a clear blow through area around the condensers may pose an operational cost over time. The elevated pile caps for this option will result in an increased lateral deflection on the piles relative to Option 1.

8.2 HP12x74 Lateral Loads and Estimated Deflections

For both options, a point of fixity at 4 feet below the tundra surface can be applied assuming functional passive subgrade cooling systems are installed per our recommendations. For our lateral analysis, we have assumed the pile cap elevation for Options 1 and 2 will be 2.5 and 5 feet above finish grade (existing ground), respectively. Estimated lateral deflections at the ground surface are 0.5 and 0.8-inch along the strong axis orientation for the 2.5 and 5 foot pile cap elevations, assuming a point of fixity at 4 feet below grade. Estimated deflections assume a free head pile cap state. This also assumes all axial compression loads act vertically on the piles with no eccentric axial load states will occur at the pile cap.

An estimated total creep-related settlement per pile of 1-inch over 25 years is anticipated with either option, based on a 35-kip axial compression load.

Placement of sleeves along driven piles can induce twist or off-plumb orientation due to pile asymmetry. To reduce this risk, particularly for Option 2, general symmetry of the pile plan view geometry is advised. This may be accomplished by adding an additional standpipe as a redundancy for the Option 2 Thermoprobe or as a smaller dimensioned standpipe for ground temperature monitoring. Ground temperature monitoring is necessary along select bulk fuel foundation piles. Ground temperature can be monitored through steel access standpipe permanently welded to each Hpile. A nominal ¾ or 1-inch diameter steel standpipe is advised. It has been our experience that a single smaller dimensioned standpipe necessary for Option 1 should impose a lower risk of Hpile twist or off-plumb orientation during driving.

8.3 Decking

We have assumed a crane will be mobilized to install the bulk fuel tank piles. If so, driven pipe or Hpile foundations are recommended for the elevated decking and ancillary facilities. We recommend an 8-inch diameter, standard wall or an HP10x42 pile for the decking. Either option should be embedded at least 7 feet into the underlying frozen fine grained sand layer expected to start around 30 feet bgs. This should result in a minimum embedment depth of 37 feet below existing grade. Passive subgrade cooling systems are not mandatory for the decking foundations provided an appropriate clear blow through area is maintained between finish grade and the base of the decking.

It is possible the decking perimeter foundation piles may experience increased thermal distress relative to the interior foundation piles. The thermal distress can be related to albedo change, snow drifting, deck edge effects, perimeter vegetation, and other impacts. To reduce the adverse impacts to the perimeter foundation piles, deeper embedment, similar to the bulk fuel tanks, or installation of subgrade cooling can be considered.

8.4 Ground Temperature Monitoring

Ground temperatures should be monitored on a routine basis on select bulk fuel tank foundation piles. The temperature monitoring can be conducted manually using ice-bath calibrated instrumentation or by use of dedicated dataloggers. Dataloggers can be configured for on-site dataloggers or Web-enable data access. Ground temperatures should be measured at no greater than 5-foot intervals along the designated piles. If manual measurements are being considered, we recommend measurement be conducted at least twice annually, once prior to fall freezeup and again prior to spring breakup. These periods are intended to capture the approximate warmest and coldest ground temperature periods. Accurate temperature records and an updated record of the temperatures should be maintained and provided to the owner and design team for review and comment on a scheduled basis.

In addition, an annual infrared thermal image of each passive cooling condenser is also advised. The thermal imaging should be conducted annually after several initial early winter cold air temperature periods. The thermal imaging will provide a qualitative confirmation the passive cooling systems operational status. Proper labeling of each condenser image is recommended for the project record.

8.5 Constructability Considerations

All piles should be installed with a single acting diesel or vibratory hammer suitable for the soil, permafrost and pile systems. A WAVE or similar analysis is advised to determine the appropriate pile hammer energy suitable for the intended pile and installation means and methods. The foundation piles should be installed to the tolerances provided on the contract documents, but for geotechnical purposes the pile at the pile cap elevation should be within ± 3-inches and within ¼-inch of plumb within 4 vertical feet. The installed Hpile strong axis orientations must conform to the structural engineer's plans. Piles may be installed with free or fixed leads but the contractor means and methods will be required to meet the installation tolerances provide with the project plans.

Full time observation by the design team is strongly recommended for the bulk fuel tank foundation installation. Full time observation will permit rapid assessment of as-built conditions. Regardless, installation records must be maintained for each installed pile. The records should include the contractor's means and methods, embedment depths, blow per foot (drive hammer) or rate of installation (vibratory installations), environmental conditions and other factors. We will coordinate with CRW on the desired pile installation as-built records.

We also recommend conducting axial compression load test on one installed bulk fuel tank foundation pile. The load test should follow the recommended procedure in ASTM D-1143 for a test load applied incrementally to 70-kips.

9.0 USE OF REPORT

This report was prepared exclusively for CRW for use in the design of the new bulk fuel storage site in Nunapitchuk, Alaska. If there are significant changes in the nature, design, or location of the pad, we should be notified so that the data interpretation and characterization can be reviewed with respect to the proposed changes and a written modification or verification of the changes be provided.

There are possible variations in subsurface conditions between explorations and also with time. Therefore, inspection and testing by a qualified geotechnical engineer should be included during construction to provide corrective recommendations adapted to the conditions revealed during the work.

Unanticipated soil conditions are commonly encountered and cannot fully be determined by a limited number of explorations or soil samples. Such unexpected conditions frequently result in additional project costs in order to build the project as designed. Therefore, a contingency for unanticipated conditions should be included in the construction budget and schedule.

The work program followed the standard of care expected of professionals undertaking similar work in Alaska under similar conditions. No warranty expressed or implied is made.

10.0 CLOSING

Thank you for the opportunity to assist with this project. If you have comments or questions, please contact Tabitha Voeller at 865-2522 or Richard Mitchells at 865-2537.

Golder Associates Inc.

Alex Zinck (for)
Tabitha A. Voeller
Staff Engineering Geologist

Richard Mitchells, PE
Principal

Attachments: Figure 1: Vicinity Map
Appendix A: Inferred Borehole Logs
Appendix B: Summary Laboratory Data
Appendix C: Representative Site Photographs

Path: \\Anchorage\Public\Geomatics\CRW\Nunapitchuk\99_PROJECTS\18105833 CRW Nunapitchuk Lagoon Sites\001\02_PRODUCTION\DWG\ | File Name: 18105833.000.001.dwg

LEGEND

BH-## 2019 GOLDER BOREHOLE NAME & LOCATION

REFERENCE(S)

WORLD IMAGERY ACQUIRED IN 2016-05-31. SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.

CLIENT
CRW ENGINEERING GROUP, LLC

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-30
DESIGNED	-
PREPARED	APG
REVIEWED	TAV
APPROVED	RAM

PROJECT
BULK FUEL STORAGE SITE

NUNAPITCHUK, ALASKA

TITLE
BOREHOLE LOCATION MAP

PROJECT NO.	CONTROL	REV.	FIGURE
18105833		A	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

1 in

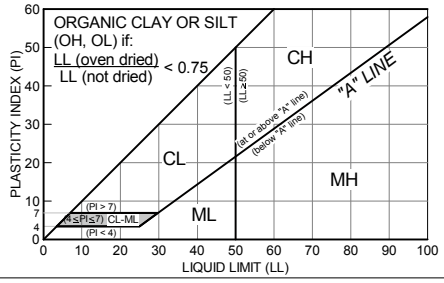
0

APPENDIX A

Borehole Logs

UNIFIED SOIL CLASSIFICATION (adapted from ASTM D2487)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES AND GROUP SYMBOLS USING LABORATORY TESTS			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND	
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	CLEAN GRAVELS <5% FINES	$C_U \geq 4$ AND $1 \leq C_C \leq 3$	GW	WELL-GRADED GRAVEL	If soil contains ≥15% sand, add "with sand"
			$C_U < 4$ AND/OR [$C_C < 1$ OR $C_C > 3$]	GP	POORLY GRADED GRAVEL	
		GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR MH	GM	SILTY GRAVEL	
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL	
	SANDS ≥50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	CLEAN SANDS <5% FINES	$C_U \geq 6$ AND $1 \leq C_C \leq 3$	SW	WELL-GRADED SAND	If soil contains ≥15% gravel, add "with gravel"
			$C_U < 6$ AND/OR [$C_C < 1$ OR $C_C > 3$]	SP	POORLY GRADED SAND	
		SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR MH	SM	SILTY SAND	
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND	
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT <50	PLASTICITY CHART		CL	LEAN CLAY	If soil contains coarse-grained soil from 15% to 29%, add "with sand" or "with gravel" for whichever type is prominent, or for ≥30%, add "sandy" or "gravelly"
				ML	SILT	
				OL	ORGANIC CLAY OR SILT	
	SILTS AND CLAYS LIQUID LIMIT ≥50			CH	FAT CLAY	
				MH	ELASTIC SILT	
				OH	ORGANIC CLAY OR SILT	
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT	



NOTES:
$C_U = \frac{D_{60}}{D_{10}}$ $\quad C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

Gravels or sands with 5% to 12% fines require dual symbols (GW-GM, GW-GC, GP-GM, GP-GC, SW-SM, SW-SC, SP-SM, SP-SC) and add "with clay" or "with silt" to group name. If fines classify as CL-ML for GM or SM, use dual symbol GC-GM or SC-SM. The coefficient of uniformity, C_U, and coefficient of curvature, C_C, equations are given above where $D_{(X\%)}$ is soil particle diameter where X% is % finer. *Optional Abbeviations:* Lower case "s" after USCS group symbol denotes either "sandy" or "with sand" while "g" denotes either "gravelly" or "with gravel"

CRITERIA FOR DESCRIBING MOISTURE CONDITION (adapted from ASTM D2488)

DRY	ABSENCE OF MOISTURE, DUSTY, DRY TO THE TOUCH
MOIST	DAMP BUT NO VISIBLE WATER
WET	VISIBLE FREE WATER, USUALLY SOIL IS BELOW WATER TABLE

COMPONENT DEFINITIONS BY GRADATION

COMPONENT	SIZE RANGE
BOULDERS	GREATER THAN 12 in.
COBBLES	12 in. to 3 in.
GRAVEL	3 in. to #4 Sieve (4.76 mm)
COARSE GRAVEL	3 in. to 3/4 in.
FINE GRAVEL	3/4 in. to #4 (4.76 mm)
SAND	#4 (4.76 mm) to #200 (0.074 mm)
COARSE SAND	#4 (4.76 mm) to #10 (2.0 mm)
MEDIUM SAND	#10 (2.0 mm) to #40 (0.42 mm)
FINE SAND	#40 (0.42 mm) to #200 (0.074 mm)
SILT & CLAY (FINES)	SMALLER THAN #200 (0.074 mm)

RELATIVE DENSITY / CONSISTENCY ESTIMATE USING STANDARD PENETRATION TEST (SPT) VALUES (adapted from Terzaghi and Peck 1967 and NAVFAC DM 7.1)

COHESIONLESS SOILS [a]		COHESIVE SOILS[b]		
RELATIVE DENSITY	$(N_1)_{60}$ (blows/ft)[c]	CONSISTENCY	$(N_1)_{60}$ (blows/ft)[c]	UNCONFINED COMPRESSIVE STRENGTH (TSF)[d]
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.50
COMPACT (MEDIUM DENSE)	10 - 30	FIRM	4 - 8	0.50 - 1.0
		STIFF	8 - 15	1.0 - 2.0
DENSE	30 - 50	VERY STIFF	15 - 30	2.0 - 4.0
VERY DENSE	OVER 50	HARD	OVER 30	OVER 4.0

(a) Soils consisting of gravel, sand, and silt, either separately or in combination possessing no characteristics of plasticity, and exhibiting drained behavior.
(b) Soils possessing the characteristics of plasticity, and exhibiting undrained behavior.
(c) Refer to ASTM D1586 for a definition of N value. $(N_1)_{60}$ is the N value corrected for hammer energy and overburden pressure, and is detailed in ASTM D6066. N values may be affected by a number of factors including: material size, sampler size, hammer weight and type, depth, drilling method, and borehole disturbance. N values are only an approximate guide for cohesive soil and do not apply to frozen soil.
(d) Undrained shear strength, s_u= 1/2 unconfined compression strength, U_c. Note that Torvane (TV) measures s_u and pocket penetrometer (PP) measures U_c

SAMPLER ABBREVIATIONS

AR Air Rotary cuttings	**GB** Grab sample (disturbed from surface/test pit)	**SC** Soil core (continuous sampler)
AS Auger Sample, cuttings	**LS** LPT sampler (3-in. OD split spoon, 300 or 340-lb hammer)	**SS** SPT sampler (2-in. OD, 140-lb hammer)
CS Chunk/block sample (undisturbed from surface/test pit)	**MS** Modified Shelby tube	**TO** Thin-walled, open (Shelby tube)
DO Drive Open (split spoon other than SS or MC)	**R** Refusal when driving	**TP** Thin-walled, piston
DP Direct Push (Geoprobe)	**RC** Rock core	**WS** Wash sample

DESCRIPTIVE TERMINOLOGY FOR PERCENTAGES (ASTM D2488)

DESCRIPTIVE TERMS	RANGE OF PROPORTION
TRACE	0 - 5%
FEW	5 - 10%
LITTLE	10 - 25%
SOME	30 - 45%
MOSTLY	50 - 100%

LABORATORY TEST AND NOTES ABBREVIATIONS / SYMBOLS

Con	Consolidation	**PID**	Photoionization Detector	**TXCD**	Triaxial, Consolidated Drained
Dd	Dry Density	**PM**	Modified Proctor (D1557)	**TXCU**	Triaxial, Consolidated Undrained
K	Thermal Conductivity	**PP**	Pocket Penetrometer (Field)	**TXUU**	Triaxial, Unconsolidated Undrained
MA	Sieve and Hydrometer	**PTLD**	Point Load	**W_L**	Liquid Limit (LL)
NP	Non-plastic	**SA**	Sieve Analysis	**W_P**	Plastic Limit (PL)
OLI	Organic Loss	**SpG**	Specific Gravity	**Ω**	Soil Resistivity (Res.)
P200	Passing #200 Sieve (D1140)	**TC**	Thaw Consolidation/Strain	▼	Water Level
pH	Soil pH	**TV**	Torvane (Field)	▽	Water Level at time of drilling
PI	Plasticity Index (D4318)				

GOLDER

SOIL CLASSIFICATION / LEGEND

Figure A-1

FROZEN SOIL CLASSIFICATION (ASTM D4083)

1. DESCRIBE SOIL INDEPENDENT OF FROZEN STATE	CLASSIFY SOIL BY THE UNIFIED SOIL CLASSIFICATION SYSTEM				
2. MODIFY SOIL DESCRIPTION BY DESCRIPTION OF FROZEN SOIL	MAJOR GROUP		SUBGROUP		
	DESCRIPTION	DESIGNATION	DESCRIPTION		DESIGNATION
	Segregated ice not visible by eye	N	Poorly bonded of friable		Nf
			Well bonded	No excess ice	Nbn
				Excess ice	Nbe
	Segregated ice visible by eye (ice less than 25 mm thick)	V	Individual ice crystals or inclusions		Vx
			Ice coatings on particles		Vc
			Random or irregularly oriented ice formations		Vr
			Stratified or distinctly oriented ice formations		Vs
			Uniformly distributed ice		Vu
3. MODIFY SOIL DESCRIPTION BY DESCRIPTION OF SUBSTANTIAL ICE STRATA	Ice greater than 25 mm thick	ICE	Ice with soil inclusions		ICE+soil type
			Ice without soil inclusions		ICE

FROST DESIGN SOIL CLASSIFICATION [1]

FROST GROUP	GENERAL SOIL TYPE	% FINER THAN 0.02 mm BY WEIGHT	TYPICAL USCS SOIL CLASS
NFS (non-frost suceptable)	(a) Gravels Crushed stone Crushed rock	0 to 1.5	GW, GP
	(b) Sands	0 to 3	SW, SP
NFS [PFS[3]][2]	(a) Gravels Crushed stone Crushed rock	1.5 to 3	GW, GP
F1 [S1][2]	Gravelly soils	3 to 6	GW, GP, GW-GM, GP-GM, GW-GC, GP-GC
F1	Gravelly soils	6 to 10	GM, GC, GM-GC, GW-GM, GP-GM, GW-GC, GP-GC
F2 [PFS[3]/S2][2]	Sandy soils	3 to 6	SW, SP, SW-SM, SP-SM, SW-SC, SP-SC
F2	(a) Gravelly soils	10 to 20	GW, GP, GW-GM, GP-GM, GW-GC, GP-GC
	(b) Sands	6 to 15	SM, SW-SM, SP-SM, SC, SW-SC, SP-SC, SM-SC
F3	(a) Gravelly soils	Over 20	GM, GC, GM-GC
	(b) Sands, except very fine silty sands	Over 15	SM, SC, SM-SC
	(c) Clays, PI>12	--	CL, CH
F4	(a) Silts	--	ML, MH, ML-CL
	(b) Very fine silty sands	Over 15	SM, SC, SM-SC
	(c) Clays, PI<12	--	CL, ML-CL
	(d) Varved clays or other fine-grained banded sediments	--	CL or CH layered with ML, MH, ML-CL, SM, SC, or SM-SC

(1) From Municipality of Anchorage (MOA) Design Criteria Manual (DCM), 2007 and 2014; Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5320-6E; U.S. Army Corps of Engineers (USACE) "Arctic and Subarctic Construction, Runway and Road Design," Technical Manual TM 5-852-3, 1965; and USACE "Military Soils Engineering" Field Manual FM 5-410, 1997
(2) PFS, S1, and S2 frost groups from USACE, EM 1110-3-138, "Pavement Criteria for Seasonal Frost Conditions," April 1984
(3) Possibly frost susceptible, requires lab test for void ratio to determine frost design soil classification. Gravel with void ratio > 0.25 would be NFS; Gravel with void ratio < 0.25 would be S1; Sands with void ratio > 0.30 would be NFS; Sands with void ratio < 0.30 would be S2 or F2

ICE BONDING SYMBOLS

No ice-bonded soil observed

Poorly bonded or friable

Well bonded

DEFINITIONS

Candled Ice is ice which has rotted or otherwise formed into long columnar crystals, very loosely bonded together.

Clear Ice is transparent and contains only a moderate number of air bubbles.

Cloudy Ice is translucent, but essentially sound and non-pervious

Friable denotes a condition in which material is easily broken up under light to moderate pressure.

Granular Ice is composed of coarse, more or less equidimensional, ice crystals weakly bonded together.

Ice Coatings on particles are discernible layers of ice found on or below the larger soil particles in a frozen soil mass. They are sometimes associated with hoarfrost crystals, which have grown into voids produced by the freezing action.

Ice Crystal is a very small individual ice particle visible in the face of a soil mass. Crystals may be present alone or in a combination with other ice formations.

Ice Inclusions are individual ice masses visible in the face of a soil mass. Inclusions may be present alone or in a combination with other ice formations.

Ice Lenses are lenticular ice formations in soil occurring essentially parallel to each other, generally normal to the direction of heat loss and commonly in repeated layers.

Ice Segregation is the growth of ice as distinct lenses, layers, veins and masses in soils, commonly but not always oriented normal to direction of heat loss.

Massive Ice is a large mass of ice, typically nearly pure and relatively homogeneous.

Poorly-bonded signifies that the soil particles are weakly held together by the ice and that the frozen soil consequently has poor resistance to chipping or breaking.

Porous Ice contains numerous voids, usually interconnected and usually resulting from melting at air bubbles or along crystal interfaces from presence of salt or other materials in the water, or from the freezing of saturated snow. Though porous, the mass retains its structural unity.

Thaw-Stable frozen soils do not, on thawing, show loss of strength below normal, long-time thawed values nor produce detrimental settlement.

Thaw-Unstable frozen soils show on thawing, significant loss of strength below normal, long-time thawed values and/or significant settlement, as a direct result of the melting of the excess ice in the soil.

Well-Bonded signifies that the soil particles are strongly held together by the ice and that the frozen soil possesses relatively high resistance to chipping or breaking.

GOLDER

FROZEN SOIL CLASSIFICATION / LEGEND

Figure A-2

RECORD OF BOREHOLE BH-01

PROJECT: Bulk Fuel Storage Site
PROJECT NUMBER: 18105833
LOCATION: Nunapitchuk, Alaska

CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 04/05/2019
EQUIPMENT: Geoprobe 6620DT

DATUM: NAD 83
ELEVATION: n/a
COORDS: 60.88943° N 162.45041° W

DEPTH (ft)	BORING METHOD	DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ 10 20 30 40; SALINITY (ppt) △ WATER CONTENT (%) W_P 10 20 W 30 40 W_L	GROUND TEMPERATURE (°F)) LEGEND: ● 05/07/19 24 28 32 36	NOTES TESTS WATER LEVELS
0	4.75-in. OD Hollow Stem Auger	VEGETATION: Snow covered tundra 0.0 - 1.5 Frozen, brown, PEAT; trace to little silt, well bonded with no excess ice (PT, Nbn)		PT		1.5	1	GB					
		1.5 - 19.5 Frozen, gray, SILT; nonplastic, trace organic material, well bonded with approximately 5-20% visible ice by volume as colorless and white inclusions and stratified formations (ML, Vx-Vs)		ML			2	SS	11 15 15	18/18	■ ○ 115		
5							3	SS	9 12 15	18/18	■ ○ 109		
		Ice inclusion up to 1 inch thick observed at 8.5 feet bgs as white ice Ice inclusion up to 2 inches thick observed at 9 feet bgs as white ice					4	SS	12 17 18	18/18	■ ○ 107		
10							5	SS	16 18 24	18/18	■ ○ 64		
15							6	SS	17 19 23	18/18	■ ○		
20		19.5 - 25.0 Frozen, gray, SILTY SAND; fine-grained sand, some silt, nonplastic, well bonded with approximately 5-10% visible ice by volume as colorless and white inclusions (SM, Vx)		SM		19.5	7	SS	18 28 28	18/18	○ >>		Gravel = 0%, Sand = 50%, Fines = 49.8%
25		25.0 - 31.5 Frozen, gray-brown, SILT; nonplastic, well bonded with approximately 5% visible ice by volume as colorless and white inclusions (ML, Vx)		ML		25.0	8	SS	11 20 24	18/18	■ ○		
30							9	SS	29 47 50/3	16/16	○ >>		
		31.5 - 40.0 Frozen, gray, poorly graded SAND; fine-grained sand, trace silt, well bonded with approximately 2-10% visible ice by volume as colorless and white inclusions (SP, Vx)		SP		31.5							
35													
40		Log continued on next page											

GOLDER

DEPTH SCALE: 1 inch to 5 feet
DRILLING CONTRACTOR: GeoTek Drilling Inc.
DRILLER: J. Beckner

LOGGED: X.Na
CHECKED: 5/29/2019
CHECK DATE: T. Voeller

Figure A-3

RECORD OF BOREHOLE BH-01

PROJECT: Bulk Fuel Storage Site
PROJECT NUMBER: 18105833
LOCATION: Nunapitchuk, Alaska

CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 04/05/2019
EQUIPMENT: Geoprobe 6620DT

DATUM: NAD 83
ELEVATION: n/a
COORDS: 60.88943° N 162.45041° W

DEPTH (ft)	BORING METHOD	DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ 10 20 30 40; SALINITY (ppt) △ WATER CONTENT (%) W_P 10 20 W 30 40 W_L	GROUND TEMPERATURE (°F)) LEGEND: ● 05/07/19 24 28 32 36	NOTES TESTS WATER LEVELS
40		SOIL PROFILE VEGETATION: Snow covered tundra											
	4.75-in. OD Hollow Stem Auger	40.0 - 51.5 Frozen, gray, poorly graded SAND with silt; fine-grained sand, few silt, well bonded with approximately 5-10% visible ice by volume as colorless and white inclusions (SP-SM, Vx)		SP-SM		40.0	10	SS	40 73 76	18 18	>>		Gravel = 0%, Sand = 94%, Fines = 6.0%
45													
50							11	SS	54 78 86	18 18 △	>>		
		Borehole completed at 51.5 ft. Notes: 1) No groundwater observed while drilling. 2) Borehole backfilled with cuttings. 3) Sealed 1-inch Schedule 40 PVC installed to 50.5 feet bgs.											
55													
60													
65													
70													
75													
80													

GOLDER

DEPTH SCALE: 1 inch to 5 feet
DRILLING CONTRACTOR: GeoTek Drilling Inc.
DRILLER: J. Beckner

LOGGED: X.Na
CHECKED: 5/29/2019
CHECK DATE: T. Voeller

Figure A-3

RECORD OF BOREHOLE BH-02

PROJECT: Bulk Fuel Storage Site
PROJECT NUMBER: 18105833
LOCATION: Nunapitchuk, Alaska

CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 04/07/2019
EQUIPMENT: Geoprobe 6620DT

DATUM: NAD 83
ELEVATION: n/a
COORDS: 60.88920° N 162.45048° W

DEPTH (ft)	BORING METHOD	DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40) / SALINITY (ppt) △ / WATER CONTENT (%) (W_P 10 20 W 30 40 W_L)	NOTES TESTS WATER LEVELS
0		VEGETATION: Snow covered tundra										
	1.25-in. OD Direct Push	0.0 - 2.5 Frozen, brown, PEAT; well bonded with approximately 30% visible ice by volume as white inclusions (PT, Vx)		PT			1	GB				
		2.5 - 15.0 Frozen, gray, SILT; nonplastic, trace organic material, well bonded with approximately 10-20% visible ice by volume as colorless inclusions (ML, Vx)		ML		2.5	2	DP		18/18		219
5							3	DP		18/18		95
		Ice inclusion up to 1 inch thick observed at 8 feet bgs as white ice					4	DP		18/18		65
10							5	DP		18/18		
15		15.0 - 16.0 Frozen, gray, poorly graded SAND; fine-grained sand, trace silt, well bonded with no excess ice as colorless ice (SP, Nbn)		SP		15.0 16.0	6	DP		18/18		50
		16.0 - 25.0 Frozen, gray, sandy SILT; some fine-grained sand, nonplastic, well bonded with approximately 5% visible ice by volume as colorless and white inclusions (ML, Vx)		ML			7	DP		18/18		Gravel = 0%, Sand = 39%, Fines = 61.0%
20												
25		25.0 - 30.0 Frozen, gray, SILT; nonplastic, trace organic material, well bonded with approximately 5% visible ice by volume as colorless and white inclusions (ML, Vx)		ML		25.0	8	DP		18/18		
30		30.0 - 42.0 Frozen, gray, poorly graded SAND; well bonded with approximately 5% visible ice by volume as colorless and white inclusions (SP, Vx)		SP		30.0	9	DP		18/16		
35												
40		Log continued on next page										

GOLDER

DEPTH SCALE: 1 inch to 5 feet
DRILLING CONTRACTOR: GeoTek Drilling Inc.
DRILLER: J. Beckner

LOGGED: X.Na
CHECKED: 5/29/2019
CHECK DATE: T. Voeller

Figure A-4

RECORD OF BOREHOLE BH-02

PROJECT: Bulk Fuel Storage Site
PROJECT NUMBER: 18105833
LOCATION: Nunapitchuk, Alaska

CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 04/07/2019
EQUIPMENT: Geoprobe 6620DT

DATUM: NAD 83
ELEVATION: n/a
COORDS: 60.88920° N 162.45048° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) (W_P W W_L 10 20 30 40)	NOTES TESTS WATER LEVELS
40		VEGETATION: Snow covered tundra										
				SP			10	DP		18/18	△ ○	
		Borehole completed at 42.0 ft.										
		Notes: 1) No groundwater observed while drilling. 2) Borehole backfilled with cuttings. 3) No PVC installed.										
45												
50												
55												
60												
65												
70												
75												
80												

GOLDER

DEPTH SCALE: 1 inch to 5 feet
DRILLING CONTRACTOR: GeoTek Drilling Inc.
DRILLER: J. Beckner

LOGGED: X.Na
CHECKED: 5/29/2019
CHECK DATE: T. Voeller

Figure A-4

RECORD OF BOREHOLE BH-03

SHEET 1 of 1

PROJECT: Bulk Fuel Storage Site
PROJECT NUMBER: 18105833
LOCATION: Nunapitchuk, Alaska

CLIENT: CRW Engineering Group, LLC
DRILLING DATE: 04/07/2019
EQUIPMENT: Geoprobe 6620DT

DATUM: NAD 83
ELEVATION: n/a
COORDS: 60.88944° N 162.45006° W

DEPTH (ft)	BORING METHOD	SOIL PROFILE: DESCRIPTION	ICE BOND	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS / 6 in.	REC / ATT (in.)	UNCORRECTED BLOWS / ft ■ (10 20 30 40); SALINITY (ppt) △; WATER CONTENT (%) W_P 10 20 W 30 40 W_L	GROUND TEMPERATURE (°F)) LEGEND: ● 05/07/19 (24 28 32 36)	NOTES TESTS WATER LEVELS
0	1.25-in. OD Direct Push	0.0 - 1.5 Frozen, brown, PEAT; well bonded with approximately 30% visible ice by volume as colorless to white inclusions (PT, Vx)		PT			1	DP		18/18			
		1.5 - 20.0 Frozen, gray, SILT; nonplastic, well bonded with approximately 20% visible ice by volume as colorless and white inclusions (ML, Vx)				1.5	2	DP		18/18			
5							3	DP		18/18		122	
							4	DP		18/18		77	
10				ML			5	DP		18/18			
15							6	DP		18/18			
20		20.0 - 21.5 Frozen, gray, SILTY SAND; fine-grained sand, little to some silt, nonplastic, well bonded with approximately 10-20% visible ice by volume as colorless and white inclusions (SM, Vx)		SM		20.0	7	DP		18/18			
		21.5 - 30.0 Frozen, gray, SILT; nonplastic, well bonded with approximately 5% visible ice by volume as colorless and white inclusions (ML, Vx)		ML		21.5	8	DP		18/18		65	
25							9	DP		18/18			
30		30.0 - 33.0 Frozen, gray, poorly graded SAND; fine-grained sand, trace silt, well bonded with approximately 2% visible ice by volume as colorless and white inclusions (SP, Vx)		SP		30.0	10	DP		18/18			Gravel = 0%, Sand = 95%, Fines = 4.8%
		Borehole completed at 33.0 ft.											
35		Notes: 1) No groundwater observed while drilling. 2) Borehole backfilled with cuttings. 3) Sealed 1-inch Schedule 40 PVC installed to 33 feet bgs.											
40													

GOLDER

DEPTH SCALE: 1 inch to 5 feet
DRILLING CONTRACTOR: GeoTek Drilling Inc.
DRILLER: J. Beckner

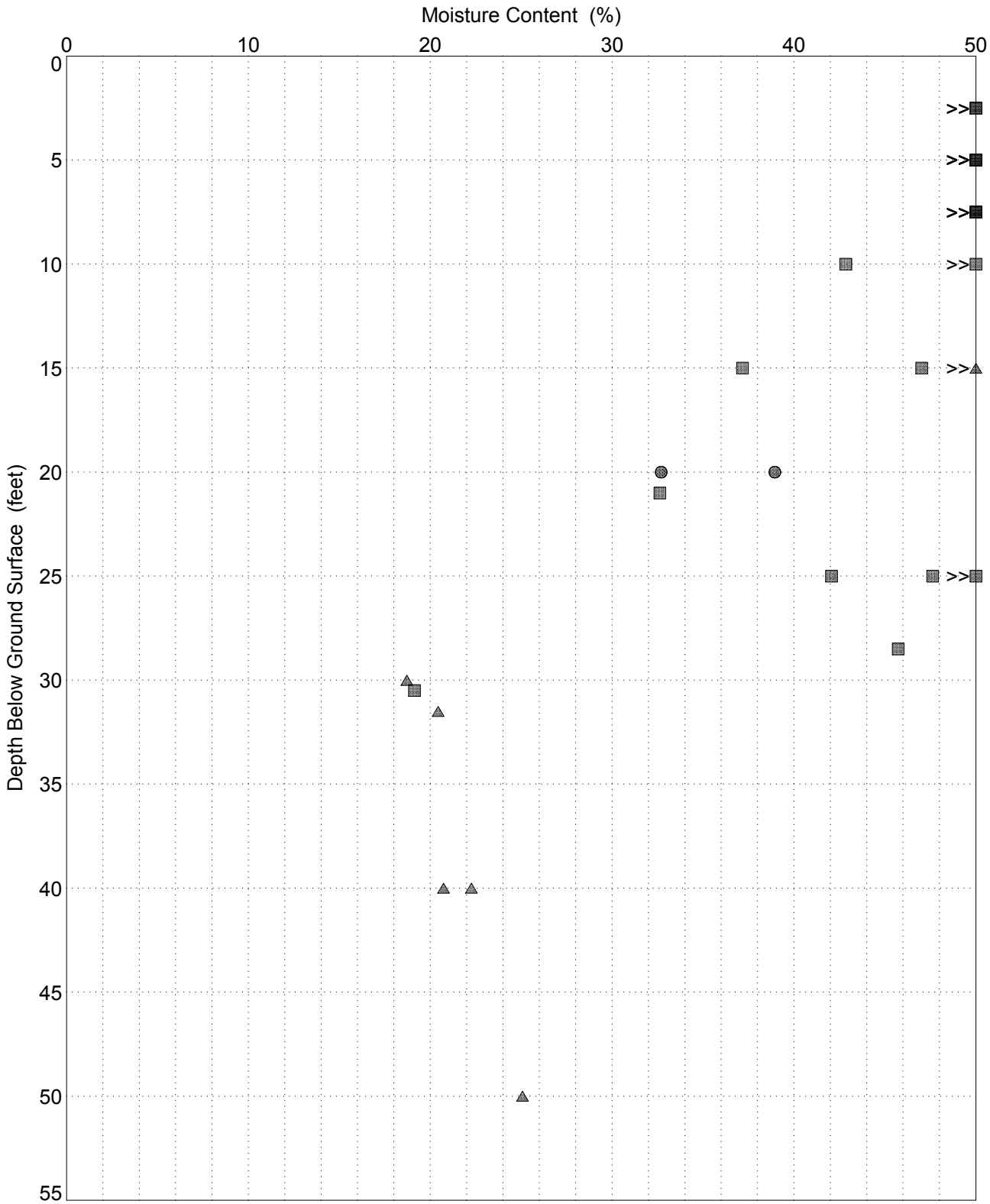
LOGGED: X.Na
CHECKED: 5/29/2019
CHECK DATE: T. Voeller

Figure A-5

18105833 NUNAPITCHUK- BULK FUELS SITE.GPJ LIBRARY-ANC(3-6-19).GLB [ANC BOREHOLE AUTO-THERM&WELL] ttrosper 5/29/19

APPENDIX B

Laboratory Data



☐ **CL,CH,ML,CL-ML** ○ **SM,SC** △ **SP,SW,SP-SM** ◇ **GP,GW,GP-GM** ☆ **GM,GC** ✕ **PT,OL,OH** ⛄ **ICE,ICE+soil** ⛀ **OTHER**

NOTE: FILLED SOIL SYMBOL INDICATES FROZEN AND BONDED CONDITION

CLIENT
CRW ENGINEERING GROUP, LLC

PROJECT
BULK FUEL STORAGE SITE

NUNAPITCHUK, ALASKA

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
PREPARED	TAV
REVIEW	TAV
APPROVED	RAM

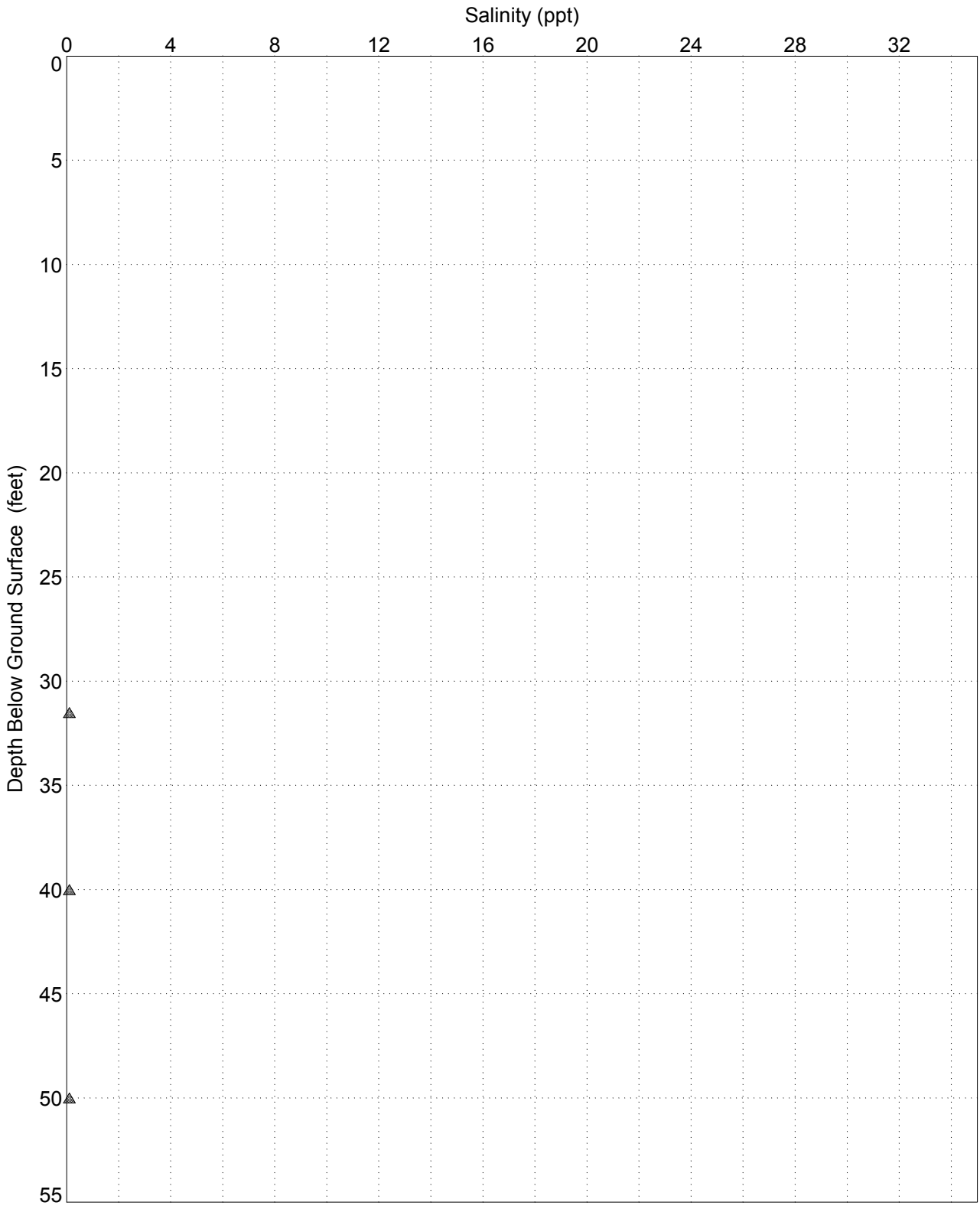
TITLE
MOISTURE CONTENT VS. DEPTH

PROJECT No.	CONTROL	Rev.	FIGURE
18105833		----	B-1

18105833 NUNAPITCHUK- BULK FUELS SITE.GPJ LIBRARY-ANC(3-6-19).GLB [ANC WATER CONTENT] ttrosper 5/29/19

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

0 1 in.



☐ **CL,CH,ML,CL-ML** ○ **SM,SC** △ **SP,SW,SP-SM** ◇ **GP,GW,GP-GM** ☆ **GM,GC** ✕ **PT,OL,OH** ✾ **ICE,ICE+soil** ⊠ **OTHER**

NOTE: FILLED SOIL SYMBOL INDICATES FROZEN AND BONDED CONDITION

CLIENT
CRW ENGINEERING GROUP, LLC

PROJECT
BULK FUEL STORAGE SITE

NUNAPITCHUK, ALASKA

CONSULTANT
GOLDER

YYYY-MM-DD	2019-05-29
PREPARED	TAV
REVIEW	TAV
APPROVED	RAM

TITLE
SALINITY VS. DEPTH

PROJECT No.	CONTROL	Rev.	FIGURE
18105833		----	B-2

18105833 NUNAPITCHUK- BULK FUELS SITE.GPJ LIBRARY-ANC(3-6-19).GLB [ANC SALINITY] ttrosper 5/29/19

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

0 1 in.

GOLDER

TABLE B-1: SAMPLE SUMMARY

Client:	CRW Engineering Group, LLC	**Project No.:**	18105833
Project:	Bulk Fuel Storage Site		
Location:	Nunapitchuk, Alaska	**Reviewed By:**	J. Karp **Date:** 5/7/2019

SAMPLING DATA							CLASSIFICATION AND INDEX TEST RESULTS										
		DEPTH (ft)									GRADATION (%)						
SAMPLE LOCATION	SAMPLE NUMBER	TOP	BOTTOM	RECOVERY (%)	SAMPLE TYPE	BLOWS PER FOOT	NATURAL MOISTURE CONTENT (%)	LIQUID LIMIT (LL) (%)	PLASTIC LIMIT (PL) (%)	PLASTICITY INDEX (PI) (%)	GRAVEL	SAND	FINES (SILT & CLAY)	ORGANIC CONTENT (%)	SALINITY (ppt) [(d) is directly meas.]	DESCRIPTION (USCS)	TESTS / OTHER TESTS
BH-01	1	0.0	1.5		GB												
BH-01	2	2.5	4.0	100	SS	30	115										
BH-01	3	5.0	6.5	100	SS	27	109										
BH-01	4	7.5	9.0	100	SS	35	107										
BH-01	5	10.0	11.5	100	SS	42	64										
BH-01	6	15.0	16.5	100	SS	42	37										
BH-01	7	20.0	21.5	100	SS	56	33				0	50	49.8			SM	
BH-01	8	25.0	26.5	100	SS	44	48										
BH-01	9	30.5	31.5	102	SS	R	19										
BH-01	10	40.0	41.5	100	SS	149	21				0	94	6.0			SP-SM	
BH-01	11	50.0	51.5	100	SS	164	25								0		
BH-02	1	0.0	1.5		GB												
BH-02	2	2.5	4.0	100	DP		219										
BH-02	3	5.0	6.5	100	DP		95										
BH-02	4	7.5	9.0	100	DP		65										
BH-02	5	10.0	11.5	100	DP		43										
BH-02	6	15.0	16.5	100	DP		50										
BH-02	7	21.0	22.5	100	DP		33				0	39	61.0			ML	
BH-02	8	25.0	26.5	100	DP		42										
BH-02	9	30.0	31.5	115	DP		19										
BH-02	10	40.0	41.5	100	DP		22								0		
BH-03	1	0.0	1.5	100	DP												
BH-03	2	2.5	4.0	100	DP												
BH-03	3	5.0	6.5	100	DP		122										
BH-03	4	7.5	9.0	100	DP		77										
BH-03	5	12.5	14.0	100	DP												
BH-03	6	15.0	16.5	100	DP		47										
BH-03	7	20.0	21.5	100	DP		39										
BH-03	8	25.0	26.5	100	DP		65										
BH-03	9	28.5	30.0	100	DP		46										
BH-03	10	31.5	33.0	100	DP		20				0	95	4.8		0	SP	

Golder Associates Inc.
2121 Abbott Road, Suite 100, Anchorage, AK
Tel: (907) 344-6001 Fax: (907) 344-6011 www.golder.com

APPENDIX C

Site Photographs

Project Title: Nunapitchuk Bulk Fuels Site	
PHOTO 1 Photograph taken prior to drilling looking southeast across the proposed bulk fuel storage site. The Johnson River, frozen at the time of the visit, is located along the left edge of the site	
PHOTO 2 Photograph taken prior to drilling looking south-southwest across the proposed bulk fuel storage site.	

Project Title: Nunapitchuk Bulk Fuels Site

PHOTO 3 Helicopter transport of the drilling equipment to the bulk fuels storage site.	
PHOTO 4 Representative sample of peat (left side) and silt (right side) collected from borehole BH-02 from ground surface to 4 feet below ground surface.	

Project Title: Nunapitchuk Bulk Fuels Site	
PHOTO 5 Representative sample of interbedded silty sand and silt collected from borehole BH-02 from the 20 to 23-foot sampling interval.	
PHOTO 6 Representative sample of sand collected from borehole BH-01 from the 50 to 51.5-foot sampling interval.