Project Manual For

AVTEC POWER PLANT TRAINING FACILITY UPGRADE

Solicitation #15139

Alaska Energy Authority
813 W. Northern Lights Blvd
Anchorage, Alaska 99503

Issue Date: June 23, 2015

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Solicitation #15139

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ALASKA ENERGY AUTHORITY

INVITATION FOR QUOTES FOR A SMALL PROCUREMENT (CONSTRUCTION RELATED)

[per AS 36.30.320(a)]

Project Name: AVTEC Power Plant Training Facility Upgrade Solicitation No. 15139 Location: Seward, Alaska	Procurement Agency and Address: Alaska Energy Authority 813 W Northern Lights Blvd Anchorage, AK 99503
Procurement Officer: Rich Wooten, CDT Contract Compliance Specialist	Date of Issuance: June 23, 2015

DESCRIPTION OF WORK, REQUIRED COMPLETION DATE, LISTING OF ATTACHMENTS:

The State of Alaska, Alaska Energy Authority (AEA) is administering a facility upgrade project on behalf of the Alaska Vocational Technical Center (AVTEC). The AVTEC facility consists of a diesel power generation plant located in Seward, Alaska. The facility is used strictly for training rural power plant operators and is not used to produce power for sale to customers.

All work shall be substantially complete by: **August 28, 2015**.

The Project cost estimate is: ☐ under $10,000 ☐ $10,000 - $50,000 ☒ $50,001 - $80,000 ☐ $80,001 - $200,000[1,2]

1. Quotes in excess of $200,000 will be deemed non-responsive. **2.** **Any project in excess of $100,000 must be bonded**.

Davis-Bacon Wages (Title 36.05): are ☒ are not ☐ required on this project.

The following insurance coverages are required: ☒ Workers Comp ☒ General Liability ☒ Automobile

***Bonding Requirements*: Any project in excess of $100,000 must be bonded.**

The undersigned proposes to furnish Payment Bond in the amount of 50% and Performance Bond in the amount of 50% (of the contract), as surety conditioned for the full, complete and faithful performance of this contract. (See Bid Bond Sheet 25D-14, Payment Bond SPC-005 and Performance Bond SPC-006 forms.)

Quotes for furnishing all labor and performing all work for the above Project are invited. To be eligible for consideration, quotes must be received before **3:00 p.m.** local time on **June 30, 2015**. Late quotes cannot be accepted. Disadvantaged Business Enterprises (DBEs) may submit quotes and will not be discriminated against on the grounds of race, color, national origin or sex in consideration for an Award which results from this invitation. Any errors, omissions, or questions pertaining to solicitation procedures or Project requirements, requests for additional documents, or inquiries pertaining to site conditions or scheduled visits must be made to: Rebecca Garrett, Project Manager; Telephone (907) 771-3042. Applicable provisions of AS 36.30 and 2 AAC 12 govern this solicitation.

SUBMITTAL OF QUOTES: Quotes for this Project must be submitted in the manner noted below. All Offerors must familiarize themselves with the *Instructions to Offerors*, page 2 of this form, prior to submitting their quote.

☐ - VERBAL QUOTES SHALL BE GIVEN TO _____ AT THE ABOVE NOTED TELEPHONE NUMBER, PRIOR TO THE STATED DEADLINE. (**See above Bonding Requirements**.)

☒ - WRITTEN QUOTES, INCLUDING AMENDMENTS OR WITHDRAWALS, MUST BE RECEIVED PRIOR TO THE ABOVE NOTED DEADLINE. QUOTES MUST BE SUBMITTED ON FORM SPC-002, QUOTE SUBMITTAL, ATTACHED. (**See above Bonding Requirements**.)

Written quotes may be submitted by Fax, hand delivered, or mailed in a sealed envelope. Confidentiality is only assured for sealed quotes. Mailed quotes must allow time for delivery and the envelope must be marked as follows:

Quote for Project:

Name: AVTEC Power Plant Training Facility Upgrade
Number: 15139
Attn: Rich Wooten, CDT
Fax: (907) 771-3044

Procurement Agency Address:

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

Quote amendments or withdrawals must be made in writing to the individual of the Procurement Agency receiving the quotes, and must be received prior to the time for quote submittal.

ALASKA ENERGY AUTHORITY

INVITATION FOR QUOTES FOR A SMALL PROCUREMENT (CONSTRUCTION RELATED)

INSTRUCTIONS TO OFFERORS

The Authority desires that all Offerors submitting quotes on construction contracts are given a fair and equal opportunity to compete. Offerors are required to follow these instructions:

REVIEW THE PROJECT DOCUMENTS: Most construction Projects in excess of $1,000 will have some type of written documentation prepared expressly for the Work. If you are asked to submit a quote and no written information has been provided, you should ask the procurement Agency for written documentation. If the scope of services have been described to you verbally, and you are selected for Contract Award, you must ensure that the information of the services to be performed (scope of work) is put in writing prior to accepting the Contract. When providing a Quote, carefully review and consider all materials related to the solicitation and work of the contract. **By submitting a quote the Offeror warrants that they are familiar with the Project requirements, have visited or otherwise examined the site, and are aware of the conditions to be encountered.** Offeror's can verify the contents and completeness of their quote documents by contacting the procurement Agency individual named on the front of this form.

SUBMITTING THE QUOTE: The Quote must be submitted in one of the following formats as called for in the Invitation:

1. **ORALLY -** if a verbal quote is solicited, the Offeror must provide, in addition to their quote amount and mailing address -- (1) their valid Alaska Business License number, (2) if applicable, a valid Contractor's Registration number, (3) their status as an Alaskan Bidder (Offeror), (4) their intended use of Alaskan products, (5) the carrier's name and policy number for their Workers' Comp Insurance (or a statement of sole proprietorship, if applicable), and (6) the Employer (Tax) Identification Number or Social Security Number. The Procurement Agency will enter this information on the quote schedule.

2. **WRITTEN -** if a written quote is solicited, the Offeror must complete, in ink or typewritten, the *Small Procurement Quote Submittal*, Form SPC-002. Failure to acknowledge receipt of addenda or to execute the form correctly and completely may disqualify the quote.

NOTE: The *Department of Labor requires an Offeror to be licensed and registered for the required type of work prior to submitting a quote. If the procurement Agency determines the Offeror is improperly registered or licensed, their quote may be deemed nonresponsive.*

SUBCONTRACTOR LISTING: Subcontractors intended to be utilized on this contract must be listed in the response to the solicitation. Work shall not be awarded to any subcontractor without prior approval from the procurement Agency. Subcontractors may be added or removed only as approved by the procurement Agency.

DETERMINATION OF THE LOWEST RESPONSIBLE QUOTE AND CONTRACT AWARD: Following receipt and determination of all **responsive** oral, written or sealed quotes, the procurement Agency will compare the quotes and determine the lowest Offeror. If the procurement Agency discovers a discrepancy between the unit price amount and the extended amount; the unit price amount will prevail. Conditioned quotes, unless expressly requested, will not be considered. When the quote schedule is composed of a basic amount with alternates, the procurement Agency will base its determination of the low quote and the amount of the Contract Award solely upon those quotes, basic and alternates, that are priced within the extent of available construction funds. Alternates will be considered for Award in the order listed, except that if the order of Offerors is not affected, the Award may include any combination of funded alternates, or none, as may be in the best interest of the procurement Agency.

When determining the lowest quote, the procurement Agency will also give a 5% Alaska Offeror's preference and an appropriate Alaska Products preference to quotes designating the applicability of a preference. To qualify for the Offeror's preference (per AS 36.30.170) the Offeror **must** (1) hold a current Alaska Business License, (2) submit the quote under the name appearing on the license, (3) have staffed and maintained a place of business within Alaska for the previous six months and (4) be incorporated or qualified to do business under the laws of the State. In addition, if the Offeror is a partnership or joint venture, all parties must meet the criteria to be eligible for the preference. A booklet fully describing the Alaska Preferences (Bidder, Offeror, Product, Disabilities, Veteran) program is available at **http://doa.alaska.gov/dgs/pdf/pref2.pdf**. A detailed description of the Alaska Products Preference Program is available at **http://www.commerce.state.ak.us/ded/dev/prodpref/prodpref.htm**.

The procurement Agency will make a determination of **responsibility** as required by 2 AAC 12.500. If the lowest Offeror is declared responsible, the procurement Agency will execute the *Notice of Award / Notice to Proceed*, Form SPC-003, and send it to the Offeror for acknowledgement. If the lowest Offeror is found to be nonresponsible, this process will be repeated with the second lowest Offeror -- and so on until the lowest responsive and responsible Offeror is determined.

NOTICE OF AWARD AND PROTEST: A written notice will be provided on all Awards exceeding $ 25,000 (2 AAC 12.400(h)). All protests must be filed with the Commissioner of the procurement Agency (or designee) and copied to the Procurement Officer. Protest procedures are described in AS 36.30.560 and 2 AAC 12.695. The extent of the protest remedy is limited to quote preparation costs (AS 36.30.585).

ALASKA ENERGY AUTHORITY

SMALL PROCUREMENT QUOTE SUBMITTAL (CONSTRUCTION RELATED)

[per AS 36.30.320(a)]

Project Name: AVTEC Power Plant Training Facility Upgrade Solicitation No.: 15139 Location: Seward, Alaska	Procurement Agency and Address: Alaska Energy Authority 813 W Northern Lights Blvd Anchorage, AK 99503
Procurement Officer: Rich Wooten, CDT Contract Compliance Specialist	Date of Issuance: June 23, 2015 Bid Date: June 30, 2015

QUOTE: Offerors must read all attachments to this schedule.

BASIC BID: Furnish all labor and supervision to complete the basic bid scope of work detailed in the Summary of Work and Drawings, for the lump sum of: (a)$ _____

Alaska Bidder's Preference (5% of a.) (b)$_____

Alaska Veteran-Owned Business Preference (5% of a., Not to Exceed $5,000.00) (c)$_____

Alaska Products Preference (attach worksheet(s)) (d)$ _____

Adjusted Basic Bid (a-b-c-d) (e)$ _____

I have reviewed the bid documents, with addenda _____, and understand the scope of services and conditions required for Solicitation No. 15139. I agree to furnish all necessary labor, materials, and equipment for the above amount(s). The Work shall be accomplished in a professional manner acceptable to the Procurement Officer.

Contractor _____ Contractor Reg. No. _____

Authorized Signature _____ Title _____

Address _____

Business License # _____ EIN or SSN _____ Phone # _____

Offeror is Claiming:

☐ Alaska Bidder's Preference ☐ Alaska Products Pref. (worksheet) ☐ Alaska Veteran Preference (SPC-007)

Offeror to Complete this Portion

Procurement Officer: _____

Date of Receipt of Bid: _____

ALASKA ENERGY AUTHORITY

NOTICE OF AWARD (NOA)
SMALL PROCUREMENT CONTRACT
(CONSTRUCTION RELATED)

[per AS 36.30.320]

Project Name: AVTEC Power Plant Training Facility Upgrade Solicitation No. 15139 Location: Seward, Alaska	Procurement Agency and Address: Alaska Energy Authority 813 W Northern Lights Blvd Anchorage, AK 99503
Procurement Officer's Signature:	Date of Issuance:

****

TO:

_____
_____
_____

FOR:

Work related to Basic Bid of: _____,
including the basic quote and alternate quote item(s):
_____
_____
_____

The Contractor Must Submit:

Insurance*	☒
Bonding*	☐
Certified Wages*	☒
Dept. of Labor (Notice of Work)*	☒
Subcontractor List*	☒

* Comments as applicable:

. . . . . .

Your quote in the amount of _____ submitted on _____, is accepted for performance of the Work described in the attached Invitation for Quotes (Form SPC-001), and the quote as submitted on the *Small Procurement Quote Submittal* (Form SPC-002), which are a part of this Contract.

The Contractor must sign, date, and return this document to the *procurement* address shown above. The Procurement Officer will then sign and return a copy to the Contractor, and the Award will be deemed made. The Work of this contract may not commence until the Notice to Proceed (NTP) is issued.

Contractor's Signature of Contract Award Acceptance: _____ Date : _____

NOTICE TO UNSELECTED OFFERORS ON PROJECTS OVER $ 50,000

In accordance with the protest rights afforded under 2 AAC 12.400(d)(2)(B) & (3), a copy of this Notice of Award is hereby provided to those individuals and businesses who submitted a response to the initial solicitation on which this award is made.

ALASKA ENERGY AUTHORITY

NOTICE OF AWARD (NOA)
SMALL PROCUREMENT CONTRACT
(CONSTRUCTION RELATED)

GENERAL CONDITIONS
[Construction Procurement under AS 36.30.320]

These terms, conditions and requirements apply to the Contract Documents describing the Work for the Project. If any provision of these Contract Documents is declared by a court to be illegal or in conflict with any law, the validity of the remaining provisions and the ensuing rights and obligations of the Parties to the contract shall not be affected.

Whenever used in these Contract Documents, the following terms shall have the indicated meaning. Any term not so defined shall have its ordinary meaning.

- **Approved or Approval** - means written approval by the Procurement Officer or authorized representative.
- **Award** - means the written acceptance of the lowest responsive and responsible quote by the Procurement Agency.
- **Contract Documents** - includes the *Invitation for Quotes for a Small Procurement*, Form SPC-001 (with Instructions - if issued), the *Notice of Award / Notice to Proceed*, Form SPC-003, any addenda, written changes, or attachments as noted in the description of the Work.
- **Procurement Officer** - the person authorized to enter into and administer the contract on behalf of the Procurement Agency.
- **Parties to the Contract** - includes the Procurement Agency, the owner Agency representing the State of Alaska, and the Contractor, being the entity contracting with the owner Agency for performance of the Work.
- **Project** - the total construction, of which the Work performed under the Contract is the whole or part.
- **Project Manager** - the Procurement Officer's authorized representative, responsible for Contract administration.
- **Work** - is the act of, and the result from, 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.

1. The Procurement Officer (or authorized representative) has the authority to make findings, determinations and decisions with respect to the contract; to Approve materials, Work and payment therefore; and to modify or terminate the contract on behalf of the Procurement Agency.

2. The Contractor shall have sole responsibility for the means, methods, sequences, or procedures of construction and safety precautions related to the Project. The Contractor shall conduct all Work in such a manner that protects the public and State resources.

3. The Contractor must comply with all applicable laws, regulations, codes, ordinances and written directives issued by the Procurement Officer. In addition, the Contractor must obtain applicable licenses and permits; provide supervision, labor, tools, and new materials (except as may otherwise be provided by the Procurement Agency); and utilize Alaska Products and Wood Products when applicable (see AS 36.05.010 & AS 36.30.322).

4. The Contractor shall not award Work to any subcontractor without prior Approval from the Procurement Officer.

5. The Procurement Agency reserves the right to make written changes to the Contract Documents for modifications within the general scope of the Work.

6. Any act or occurrence, be it a result of an emergency, differing site condition or change order, which may form the basis of a claim for a price or time adjustment must be reported immediately to the Procurement Officer.

7. The Department of Labor and Workforce Development, Wage and Hour Administration, must be notified in accordance with AS 36.05.010 and AS 36.05.030 if the resulting contract for repairs or construction exceeds $25,000. The Contractor must comply with the requirements noted within the Department of Labor packet entitled, "Laborers' & Mechanics' Minimum Rates of Pay." To obtain a copy of the referenced packet, contact the Procurement Agency or the Department of Labor.

8. The primary contractor working on public construction projects with an amount of $25,000 or more must file a Notice of Work and pay a one percent fee based on the estimated value of work performed by the prime contractor and one percent of the value of each subcontractor's price, to the Department of Labor and Workforce Development, Wage and Hour Administration (DOLWD) The maximum fee is $5,000.00. The notice and fees must be filed with the DOLWD before work commences on the project.

   Upon completing the construction project, the primary contractor must file a Notice of Completion (NOC) and make payment of any additional fees due to increases in the contract amounts due the primary contractor. The Notice of Work and Notice of Completion forms are available at:
   http://www.labor.state.ak.us/lss/lssforms.htm

9. The Contractor shall indemnify, save harmless, and defend the Procurement Agency, its agents and its employees in accordance with Appendix B1 below. Furthermore, the Contractor shall, prior to the Award of the contract, provide proof of Workmen's Compensation, General Liability, and Automobile Insurance in amounts as applicable under Appendix B1. These coverages shall remain in force for the duration of the Contract.

10. The Contractor shall remedy all defects in materials or workmanship that develop within a period of one year from the date of final payment.

11. The Procurement Agency will make final payment to the Contractor following approval of completion of all Work and the Contractor's submittal of all releases, warranties, record documents, permits and invoices. Liens or other claims relating to the Project may be withheld from final payment if written notice is first given to the Contractor. Acceptance of the final payment will constitute the Contractor's waiver to future claims.

12. Any dispute arising out of this Contract, which cannot be satisfactorily remedied by the Parties to the Contract, shall be resolved under AS 36.30.620 - 699.

APPENDIX B[1]
INDEMNITY AND INSURANCE

Article 1. Indemnification

The Contractor shall indemnify, hold harmless, and defend the contracting agency from and against any claim of, or liability for error, omission or negligent act of the Contractor under this agreement. The Contractor shall not be required to indemnify the contracting agency for a claim of, or liability for, the independent negligence of the contracting agency. If there is a claim of, or liability for, the joint negligent error or omission of the Contractor and the independent negligence of the Contracting agency, the indemnification and hold harmless obligation shall be apportioned on a comparative fault basis. "Contractor" and "Contracting agency", as used within this and the following article, include the employees, agents and other contractors who are directly responsible, respectively, to each. The term "independent negligence" is negligence other than in the Contracting agency's selection, administration, monitoring, or controlling of the Contractor and in approving or accepting the Contractor's work.

Article 2. Insurance

Without limiting Contractor's indemnification, it is agreed that Contractor shall purchase at its own expense and maintain in force at all times during the performance of services under this agreement the following policies of insurance. Where specific limits are shown, it is understood that they shall be the minimum acceptable limits. If the Contractor's policy contains higher limits, the state shall be entitled to coverage to the extent of such higher limits. Certificates of Insurance must be furnished to the Contracting Officer prior to beginning work and must provide for a notice of cancellation, nonrenewal, or material change of conditions in accordance with policy provisions. Failure to furnish satisfactory evidence of insurance or lapse of the policy is a material breach of this contract and shall be grounds for termination of the Contractor's services. All insurance policies shall comply with, and be issued by insurers licensed to transact the business of insurance under AS 21.

2.1 Workers' Compensation Insurance: The Contractor shall provide and maintain, for all employees engaged in work under this contract, coverage as required by AS 23.30.045, and; where applicable, any other statutory obligations including but not limited to Federal U.S.L. & H. and Jones Act requirements. The policy must waive subrogation against the State.

2.2 Commercial General Liability Insurance: covering all business premises and operations used by the Contractor in the performance of services under this agreement with minimum coverage limits of $300,000. combined single limit per occurrence.

2.3 Commercial Automobile Liability Insurance: covering all vehicles used by the Contractor in the performance of services under this agreement with minimum coverage limits of $300,000. combined single limit per occurrence.

ALASKA ENERGY AUTHORITY

NOTICE TO PROCEED (NTP)
SMALL PROCUREMENT CONTRACT
(CONSTRUCTION RELATED)

[per AS 36.30.320]

Project Name: AVTEC Power Plant Training Facility Upgrade Solicitation No. 15139 Location: Seward, Alaska	Procurement Agency and Address: Alaska Energy Authority 813 W Northern Lights Blvd Anchorage, AK 99503
Authorizing Signature:	Date of Issuance:

****

TO:

_____

_____

_____

. . . . . .

You have successfully met the requirements for submittal of all contract documents to the Procurement Agency and Dept. of Labor and Workforce Development related to the subject Project.

Upon receipt of this document, the Contractor may begin work on the subject project, in accordance with the terms of the contract. The Work of this contract must commence within _____ calendar days following the date of signature **by the Authorizing Signatory** shown above (i.e., the effective date of the Contract) and all Work of the

Contract must be complete on or before _____

Contractor's Signature of Acknowledgment: _____ Date : _____

ALASKA ENERGY AUTHORITY

SMALL PROCUREMENT (CONSTRUCTION RELATED) OFFEROR'S QUESTIONNAIRE

Project Name: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

Solicitation Number: 15139

Project Location: Seward, Alaska

A. FINANCIAL

1. Have you ever failed to complete a contract due to insufficient resources?
   Yes ☐ No ☐ If yes, explain: _____

2. Describe any arrangements you would make to finance this work: _____

B. EQUIPMENT

1. Describe the equipment you have available and would use for this project.

ITEM	QUAN.	MAKE	MODEL	SIZE/ CAPACITY	PRESENT MARKET VALUE

2. What percent of the total value of this contract would you subcontract? _____

3. Would you purchase any equipment for use on this project: Yes ☐ No ☐
If yes, describe type, quantity, and approximate cost: _____

4. Would you rent any equipment for this work? Yes ☐ No ☐
If yes, describe type, quantity, and approximate cost: _____

5. Is your proposal based on firm offers for all materials for this project? Yes ☐ No ☐
If no, please explain: _____

C. EXPERIENCE

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

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

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

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

_____
Name of Respondent

_____ _____
Signature Date

_____
Name and Title of Person Signing

ALASKA ENERGY AUTHORITY

SUBCONTRACTOR LIST

AVTEC Power Plant Training Facility Upgrade
Solicitation No. 15139

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

ALASKA PRODUCTS PREFERENCE WORKSHEET

(See Reverse Side for Instructions)

Project Name: AVTEC POWER PLANT TRAINING FACILITY UPGRADE
Solicitation No. 15139

Bid Phase:_____ Contractor:_____

PRODUCT	MANUFACTURER	CLASS & PREFERENCE PERCENTAGE	TOTAL DECLARED VALUE	REDUCTION AMOUNT

TOTAL _____

INSTRUCTIONS FOR ALASKA PRODUCTS PREFERENCE WORKSHEET

Special Note:

All procurements, except those funded from Federal sources, shall contain Contract provisions for the preference of Alaska products. The products listed by the Bidder or Proposer on this worksheet must have current certifications from the Alaska Products Preference program as of the date specified for bid opening or the proposal due date in order to be considered for the Alaska Products preference. A product with an expired Certification as of the date specified for bid opening or the proposal due date, will not be considered for the Alaska Products preference. In addition, and in accordance with the program, the products must be specified for use on the project. The listing of Certified Products is available from http://www.commerce.state.ak.us/oed/prodpref/prodpref.htm.

BIDDERS INSTRUCTIONS:

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

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

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

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

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

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

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

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

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

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

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

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

C. Forms Completion - ALTERNATE BIDS.

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

(2) On the first entry line enter "ADDITIONAL ALASKA PRODUCTS FOR ALTERNATE BID #_____", and repeat procedures 2 through 5 under part B of these Bidder's instructions except that references to "Basic Bid" shall be replaced with the words "Alternate Bid #_____."

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

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

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

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

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

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

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

ALASKA VETERAN'S PREFERENCE AFFIDAVIT

In response to the Invitation to Bid for:

Project Name: **AVTEC POWER PLANT TRAINING FACILITY UPGRADE**
Solicitation Number: **15139**

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

(a) If a bidder qualifies under AS 36.30.170(b) as an Alaska bidder and is a qualifying entity, a five percent bid preference shall be applied to the bid price (preference may not exceed $5,000). In this subsection, "qualifying entity" means a:

(1) Sole proprietorship owned by an Alaska Veteran;
(2) Partnership under AS 32.06 or AS 32.11 if a majority of the members are Alaska Veteran's;
(3) Limited liability company organized under AS 10.50 if a majority of the individuals are Alaska Veterans.
(4) Corporation that is wholly owned by individuals and a majority of the individuals are Alaska veterans.

(b) To qualify for a preference under this section, a bidder must add value by the bidder itself actually performing, controlling, managing and supervising a significant part of the services provided, or the bidder must have sold supplies of the general nature solicited to other state agencies, governments, or the general public.

(c) In this section, "Alaska Veteran" means an individual who is a:

(1) Resident of this state; and
(2) Veteran; means an individual who:

(A) Served in the:

(i) Armed Forces of the United States, including a reserve unit of the United States armed forces; or
(ii) Alaska Territorial Guard, the Alaska Army National Guard, the Alaska Air National Guard, or the Alaska Naval Militia; and

(B) Was separated from the service under a condition that was not dishonorable.

_____
Authorized Signature

_____ _____
Printed Name Date

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SUBMITTALS

A. Submit the approved DEPARTMENT of Labor Notice of Work.

B. Submit Evidence of Insurance.

C. Submit Insurance Updates.

1.2 DIFFERING SITE CONDITIONS

A. Notify the Project Manager immediately of any differing site conditions.

1.3 CONSTRUCTION MOBILIZATION

A. Coordinate with Project Manager in allocation of mobilization areas of site for access and parking facilities.

B. During construction coordinate use of site and facilities through the Project Manager.

C. Comply with Project Manager instructions of for use of temporary utilities and construction facilities

1.4 CHANGE ORDERS

A. Contract Time

1. All requests for changes in contract time shall be accompanied by a schedule showing impact to the critical path and a detailed explanation as to the necessity of the change.

B. Contract Price (change order)

2. All proposals for additional cost whether they originate from the Authority or the contractor must meet the following requirements, and include all requested backup.

a. Overhead and Profit for all work directly performed by the prime contractor shall be limited to 15%. Overhead shall include all the Non manual labor employees

b. Overhead and profit for all work performed by a subcontractor regardless of tier shall be 10%.

C. For Time and Expense change orders Contractor shall turn in daily cost of work sheets showing labor, equipment, and materials used. Show labor and rental rates, hours and overhead and profit mark up. Submit all material receipts showing cost of materials. Any cost not properly documented will not be paid for by the Authority.

END OF SECTION

Project Overview:

The State of Alaska, Alaska Energy Authority (AEA) is administering a facility upgrade project on behalf of the Alaska Vocational Technical Center (AVTEC). The AVTEC facility consists of a diesel power generation plant located in Seward, Alaska. The facility is used strictly for training rural power plant operators and is not used to produce power for sale to customers.

This solicitation is for a licensed contractor (Contractor) to perform the installation of Owner furnished equipment and materials. All work will be performed on site in Seward, Alaska. The project consists primarily of the following tasks:

- Installation of one new diesel-electric generator.
- Re-connection of three existing diesel-electric generators.
- Installation of new batteries, chargers, and cables.
- Installation of new and modification of existing generation power and control wiring including new conduit and wireway.
- Installation of new and modification of existing station service equipment and wiring.
- Installation of a new switchgear distribution feeder section.
- Installation of a new resistive load bank plus inductive reactor and capacitor.
- Minor modifications to existing switchgear.
- Installation of new and modification of existing fuel equipment and piping.
- Installation of new coolant equipment and piping.
- Installation of new heat recovery simulation equipment and piping.
- Installation of new charge air equipment and piping.
- Modification of existing engine exhaust piping.
- Modification of existing ventilation ducting.
- Installation of a pre-fabricated steel equipment shelter.

The attached drawings (23 sheets total) are provided to portray the scope of the work and the intended final configuration of systems. Since the work involves modification and re-use of existing equipment and materials, some final details will need to be determined in the field. AEA technical staff will provide direction as required.

Services Included

1) Provide at minimum one journeyman electrician with current State of Alaska Certificate of Fitness and with experience in the installation of power and control systems.
2) Provide at minimum one journeyman welder/pipe fitter with current 6G or equivalent pipe welding certificate and with experience in the installation of threaded and welded steel piping, welded steel exhaust tubing, and solder copper piping systems.

3) Provide all small tools required for the work. This refers primarily to hand tools and personal tools. Note that AVTEC has a very substantial tool and equipment inventory and major tools will be furnished by the Owner for use by the Contractor as listed under the Exclusions below.
4) Provide incidental supplies and materials as required. Note that this allowance is for normal consumables such as welding rod, solder, cutting oil, pulling lubricant, etc. (supplies) and for miscellaneous small items that may not have been included in the Owner furnished materials and are determined by the Contractor to be required.
5) Pay for travel expenses, tool transportation, and meals as required.
6) Housing in Seward will be provided by the Owner at no cost to the Contractor.

Exclusions:

1) All materials will be furnished by the Owner at no cost to the Contractor except for incidental materials as described above.
2) Power, heat, and lights as required will be furnished by the Owner at no cost to the Contractor.
3) The following tools/equipment will be furnished on site by the Owner at no cost to the Contractor: electric welder, oxy-acetylene torch set with bottles, T-drill, pipe threader with dies 1/2" through 3", pipe stand with vise, portable band saw, chop saw, hydraulic conduit bender with shoes for both EMT and Rigid/IMC up through 2".
4) Startup and testing will be performed by the Owner and is not part of this scope of work.
5) Exterior site grading, concrete slab/footing installation, snow fence installation, and bollard installation as shown on attached sheet M1.2 will be performed by others prior to the start of this work.
6) The majority of the mechanical demolition work shown on attached sheet M3.1 will be performed by others prior to the start of this work.

Special Conditions:

1) The work is State funded and is subject to Prevailing Wage rates. Certified payroll will be required.
2) Supervision of work will be performed by AEA staff.

Project Schedule

The duration of the work is estimated to take a maximum of 6 weeks. All work must be complete no later than August 28, 2015. All materials will be delivered to the project site by July 6, 2015. Based on this, it is desired to have work begin no sooner than July 6, 2015, and no later than July 20, 2015. Provide a firm start date when the crew will be available to travel to Seward and begin work.

Firm Start Date:_____

Bid Terms:

1) Work will be performed on a lump sum basis. The lump sum bid must include the following items:
   a) Journeyman electrician labor.
   b) Journeyman welder/pipe fitter labor.
   c) All required tools.
   d) All tool transportation, travel expenses, and meals (housing is being provided).

LEGEND

- BUTTERFLY VALVE
- BALL VALVE
- CHECK VALVE
- HOSE END DRAIN VALVE
- GAUGE COCK
- AUTOMATIC AIR VENT
- THERMOMETER
- PRESSURE GAUGE
- TEMPERATURE SENSOR
- FLEXIBLE CONNECTOR
- FLANGED JOINT
- UNION
- ELBOW TURNED UP
- ELBOW TURNED DOWN
- PIPING CONNECTION (TEE)
- CHANGE OF PIPE SIZE
- DIRECTION OF FLOW

ABBREVIATIONS

ø	DIAMETER (PHASE)
A	AMPS
AFF	ABOVE FINISHED FLOOR
BTU	BRITISH THERMAL UNIT
DFR	DIESEL FUEL RETURN
DFS	DIESEL FUEL SUPPLY
EWT	ENTERING WATER TEMPERATURE
EXIST	EXISTING
ECR	ENGINE COOLANT RETURN
ECS	ENGINE COOLANT SUPPLY
FPT	FEMALE PIPE THREAD
GA	GAUGE
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
GRC	GALVANIZED RIGID CONDUIT
HP	HORSEPOWER
HRR	HEAT RECOVERY RETURN
HRS	HEAT RECOVERY SUPPLY
ID	INSIDE DIAMETER
KW	KILOWATT
LT	LIQUID TIGHT
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MIN	MINIMUM
MPT	MALE PIPE THREAD
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OC	ON CENTER
OD	OUTSIDE DIAMETER
PRV	PRESSURE RELIEF VALVE
PSI	POUNDS/PER SQUARE INCH
PSID	PSI DIFFERENTIAL
PSIG	PSI GAUGE
SCH	SCHEDULE
TDH	TOTAL DEVELOPED HEAD
TYP	TYPICAL
UOR	USED OIL RETURN
V	VOLTS
W	WATTS
WG	WATER GAUGE
WPD	WATER PRESSURE DROP

ENGINE COOLANT EQUIPMENT SCHEDULE

R-1	ENGINE COOLANT RADIATOR	SINGLE PASS, VERTICAL CORE, 3" FLANGED CONNECTIONS, EPOXY COATING, EXPANDED METAL GUARD. 3 HP, 208V, 3 PH, MOTOR SUITABLE FOR VFD OPERATION AT 10:1 TURNDOWN RATIO. AEA CUSTOM MODIFIED YOUNG RADIATOR SN# 3000428
DLR-1	HEAT RECOVERY DUMP LOAD RADIATOR	SINGLE PASS, VERTICAL CORE, 2" FLANGED CONNECTIONS, EPOXY COATING, EXPANDED METAL GUARD. 2 HP, 208V, 3 PH, MOTOR. AEA CUSTOM MODIFIED YOUNG RADIATOR.
CAC-3	GEN #3 CHARGE AIR COOLER	SINGLE PASS, VERTICAL ALUMINUM CORE, 4" FLANGED TOP CONNECTIONS, EPOXY COATING, EXPANDED METAL GUARD. 2 HP, 208V, 3 PH, MOTOR. AEA CUSTOM MODIFIED GENERAL THERMODYNAMICS PART # 4507 TBAR C4C W/STEEL(B)[L/X].
CAC-4	GEN #4 CHARGE AIR COOLER	SINGLE PASS, VERTICAL ALUMINUM CORE, 3" FLANGED TOP CONNECTIONS, EPOXY COATING, EXPANDED METAL GUARD. 2 HP, 208V, 3 PH MOTOR SUITABLE FOR VFD OPERATION AT 10:1 TURNDOWN RATIO. AEA CUSTOM MODIFIED DIESEL RADIATOR PART # DR3150-40.
TV-1	COOLANT THERMOSTATIC VALVE	2-1/2" ANSI 125# FLAT FACED FLANGES, CAST IRON BODY, FACTORY SET NON-ADJUSTABLE FIELD REPLACEABLE THERMOSTATIC ELEMENTS, 185F NOMINAL TEMPERATURE, AMOT 2-1/2BOCF18001.
HX-1	POWER PLANT HEAT EXCH.	316 SS PLATES, ALL BRAZED CONSTRUCTION, 1-1/2" NPT PORTS, 120 MBH MIN CAPACITY. AMERIDEX SL-70-70 OR EQUAL. PRIMARY: 20 GPM 195F EWT (50% ETHYLENE) 1.7 PSI MAX WPD, SECONDARY: 20 GPM 177F LWT (50% PROPYLENE) 1.7 PSI MAX WPD
ET-1	COOLANT EXP. TANK	EXISTING 33 GALLON CAPACITY STEEL TANK
ET-2	HEAT RECOV. EXP. TANK	BLADDER TYPE EXPANSION TANK, 4.4 GALLON TANK VOL, 100 PSIG WORKING PRESSURE, 12 PSIG PRE-CHARGE. AMTROL EX-30 OR EQUAL.
P-HR1 P-HR2	HEAT RECOV. PRIM & SEC CIRC PUMPS	20 GPM AT 9' TDH, 1/12HP, 115V, 1ø. GRUNDFOS UP 26-64F, NO SUBSTITUTES, WITH GASKETS, & BOLTS.

FUEL/OIL EQUIPMENT SCHEDULE

P-DF1	DAY TANK FILL PUMP	EXISTING 3/8" OBERDORFER 991-32
P-UO1	USED OIL DRAIN PUMP	EXISTING 3/8" OBERDORFER 991-G1
HAND PUMP	GLYCOL & DIESEL	DOUBLE ACTION PISTON HAND PUMP, ALUM HOUSING, SS PISTON SHAFT & LINER, BUNA-N SEALS, ANTI-SIPHONING VALVE. GPI MODEL HP-100 NO SUBSTITUTES.

WARNING SIGN & INFORMATIONAL PLACARD SCHEDULE:

10"x14"x0.08" ALUMINUM, 3/16" HOLES IN ALL FOUR CORNERS. WHITE NON-REFLECTIVE VINYL BACKGROUND, 3M 3650-10, WITH 3M SERIES 225 HIGH PERFORMANCE VINYL LETTERS, COLOR AS INDICATED, ONE SIDE ONLY. DECALS SIMILAR, NO ALUMINUM BACK PLATE. WARNING LITES OR EQUAL.

WARNING SIGNS - RED LETTERS ON WHITE BACKGROUND.

1. "DANGER - FLAMMABLE, NO SMOKING" (3" HIGH 1/2" STROKE LETTERS-24"x18")
2. "ATTACH STATIC WIRE AND VERIFY TANK CAPACITY PRIOR TO FILLING TANK"
10. "CAUTION: THIS UNIT STARTS AUTOMATICALLY, LOCK & TAG OUT PRIOR TO SERVICE"
11. "DANGER HIGH VOLTAGE, AUTHORIZED PERSONNEL ONLY"
12. "CAUTION HEARING & EYE PROTECTION REQUIRED"
13. "FUEL OIL DAY TANK ALARM"
14. "IN CASE OF FUEL SPILL CALL DEC 1-800-478-9300"
15. not used

INFORMATIONAL PLACARDS - BLACK LETTERS ON WHITE BACKGROUND.

16. "TO MANUALLY FILL DAY TANK IN CASE OF EMERGENCY:
    1) TURN OFF POWER TO THE DAY TANK CONTROL PANEL
    2) MANUALLY OPEN ACTUATOR VALVE AT INTERMEDIATE TANK USING A WRENCH
    3) OPEN NORMALLY CLOSED VALVE BY HAND PUMP
    4) OPERATE HAND PUMP WHILE MONITORING LEVEL GAUGE"
17. "TO CHANGE ENGINE OIL:
    1) LOCK & TAG GENERATOR OUT OF SERVICE
    2) OPEN NORMALLY CLOSED DRAIN VALVE AT GEN
    3) TURN ON PUMP TIMER & PUMP OUT ENGINE OIL
    4) CHANGE FILTER
    5) CLOSE DRAIN VALVE & REFILL ENGINE
    6) RUN ENGINE, SHUT OFF, & CHECK DIPSTICK
    7) TOP OFF & PLACE ENGINE BACK IN SERVICE"
18. not used
19. TANK IS EQUIPPED WITH FILL LIMITER TO SHUT OFF FUEL AT 3'-5" "

INSTALLATION - SECURE EACH SIGN TO WALL OR DOORS WITH STAINLESS STEEL SCREWS.

NOTE: SEE FIRE SUPPRESSION PLANS AND SPECIFICATIONS FOR ADDITIONAL PLACARDS TO BE PROVIDED WITH FIRE SUPPRESSION SYSTEM. INSTALL ALL SIGNS AS INDICATED.

PIPE/TUBING STRUT CLAMP SCHEDULE

PIPE/TUBE	CLAMP #	PIPE/TUBE	CLAMP #
1/2" COPPER	BVT062	1-1/2" STEEL	B2012
3/4" COPPER	BVT087	2" STEEL	B2013
1" COPPER	BVT112	2-1/2" STEEL	B2014
1-1/2" COPPER	BVT162	3" STEEL	B2015
1/2 STEEL	B2008	3" O.D. TUBE	B2045
3/4" STEEL	B2009	4" O.D. TUBE	B2016
1" STEEL	B2010	5" O.D. TUBE	B2018
1-1/4" STEEL	B2011		

NOTES:
1) ALL CLAMP NUMBERS ARE B-LINE. EQUIVALENT EQUALS ACCEPTABLE.
2) ALL COPPER TUBE CLAMPS TO BE CUSHIONED, VIBRA-CLAMP.
3) ALL STEEL PIPE AND TUBE CLAMPS NOT CUSHIONED.

VALVE TAG SCHEDULE:

VALVE TAGS - 3"x5"x.08" ALUMINUM, 3/16" HOLES IN ALL FOUR CORNERS, BLACK GERBER THERMAL TRANSFER FILM PRINTED LETTERS ON GERBER 220 HIGH PERFORMANCE VINYL BACKGROUND, COLOR AS INDICATED, ONE SIDE ONLY. WARNING LITES OR EQUAL.

GREEN (DIESEL FUEL)

21. "NORMALLY OPEN, CLOSE ONLY FOR EMERGENCIES & TEMPORARY MAINTENANCE OF DAY TANK & DEVICES"
22. "NORMALLY CLOSED, OPEN ONLY FOR HAND PRIMING DAY TANK"
23. not used
24. "NORMALLY OPEN, CLOSE ONLY FOR TEMPORARY MAINTENANCE OF ENGINE"

BROWN (USED OIL)

41. "NORMALLY CLOSED, OPEN ONLY FOR ENGINE OIL CHANGE"

PINK (COOLING/ETHYLENE GLYCOL)

51. "NORMALLY CLOSED, OPEN ONLY FOR ADDING COOLANT - ETHYLENE GLYCOL ONLY"
52. "NORMALLY CLOSED, OPEN ONLY ON HIGH COOLANT TEMPERATURE ALARM"
53. "NORMALLY OPEN, CLOSE ONLY ON HIGH COOLANT TEMPERATURE ALARM"
54. "NORMALLY OPEN, HEAT RECOVERY SUPPLY"
55. "NORMALLY OPEN, HEAT RECOVERY RETURN"

ORANGE (HEAT RECOVERY/PROPYLENE GLYCOL)

61. "NORMALLY CLOSED, OPEN ONLY FOR ADDING FLUID - PROPYLENE GLYCOL ONLY"

INSTALLATION - SECURE EACH TAG TIGHT TO VALVE, PIPE, OR DEVICE WITH STAINLESS STEEL CABLE TIES OR SAFETY WIRE THROUGH ALL FOUR CORNERS OR FASTEN TO ADJACENT WALL OR SECTION OF STRUT WITH SCREWS.

NOTE: FOR ALL VALVES NOT INDICATED WITH A SPECIFIC FUNCTION TAG PROVIDE 1-1/2"ø BRASS TAG LABELED "N.O." FOR NORMALLY OPEN VALVES AND 1"ø BRASS TAG LABELED "N.C." FOR NORMALLY CLOSED VALVES. SECURE TAGS TO VALVE OR ADJACENT PIPE WITH BEADED BRASS CHAIN.

SCHEDULE OF DRAWINGS

MECHANICAL DRAWINGS

M1	LEGENDS & SCHEDULES
M1.2	EXTERIOR EQUIPMENT PAD PLANS & DETAILS
M1.3	EXTERIOR EQUIPMENT SHELTER PLAN & DETAILS
M2	MECHANICAL SPECIFICATIONS
M3.1	DEMOLITION & NEW WORK PLANS
M3.2	EQUIPMENT LAYOUT SECTIONS & ELEVATIONS
M4	COOLANT & HEAT RECOVERY PIPING PLAN & ISOMETRICS
M5.1	FUEL PIPING PLAN & DETAILS
M5.2	FUEL SYSTEM & USED OIL PLAN, PIPING DIAGRAM & DETAILS
M5.3	FUEL TANK FABRICATION DETAILS
M5.4	FUEL TANK & ACCESSORIES SPECIFICATIONS
M6.1	EXHAUST, CHARGE AIR TUBING & CRANK VENT PLAN & DETAILS
M6.2	EXHAUST & CHARGE AIR TUBING DETAILS

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

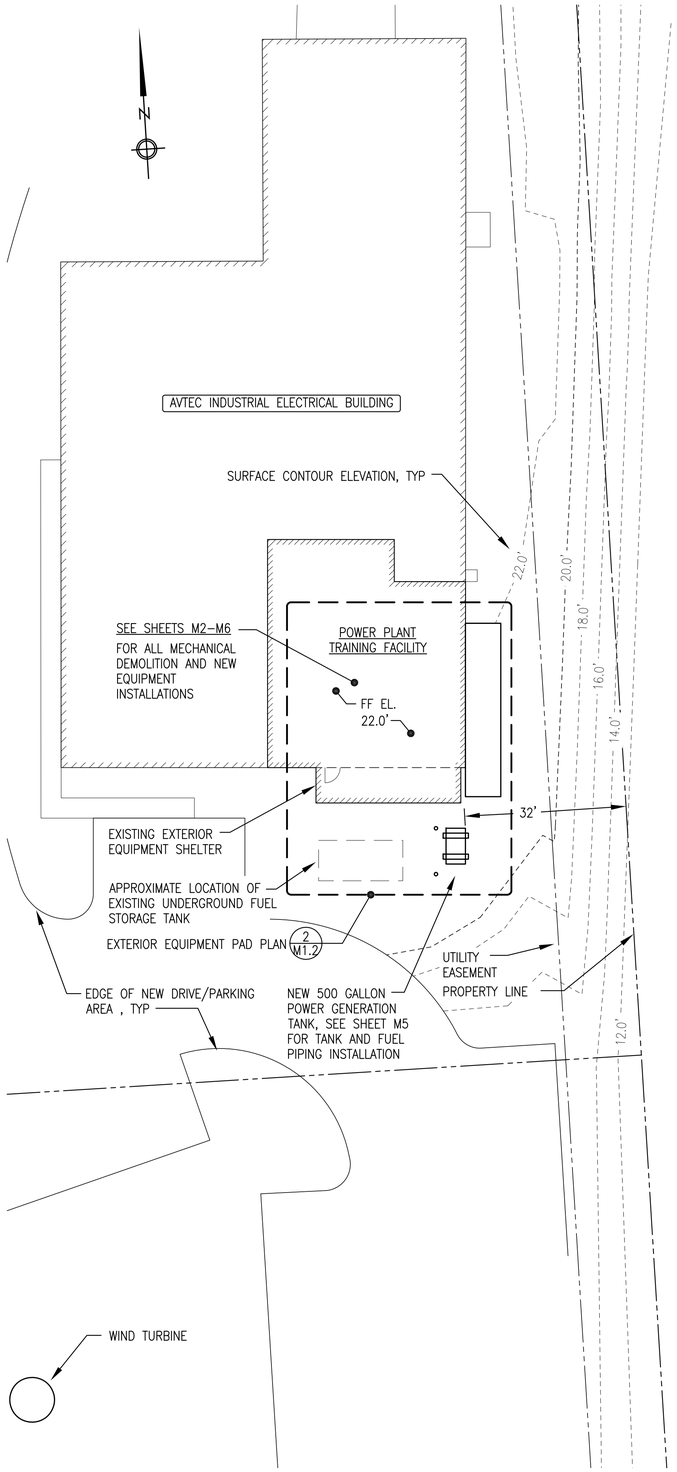
Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

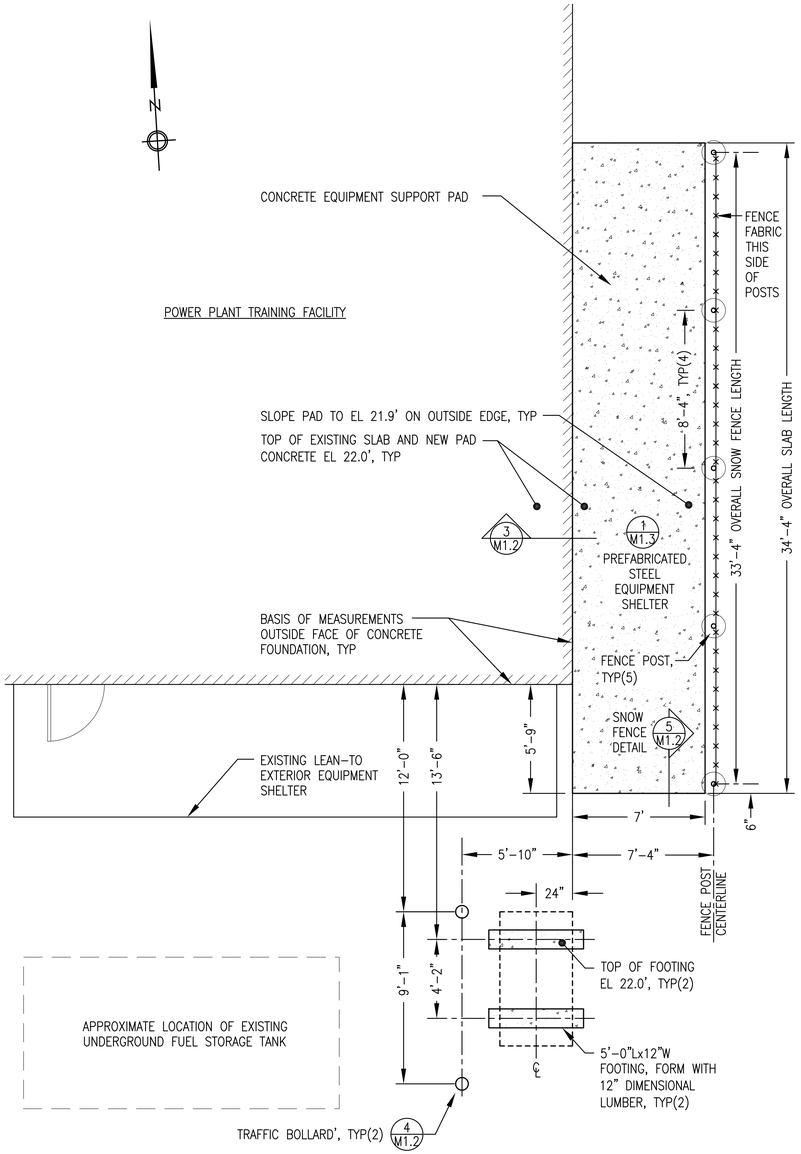
TITLE: LEGENDS & SCHEDULES

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

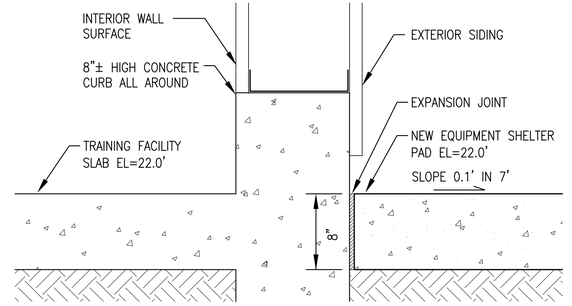
DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: BCG	DATE: 6/23/15
FILE NAME: AVTEC M1-M6	SHEET: M1.1 OF 6
PROJECT NUMBER:	



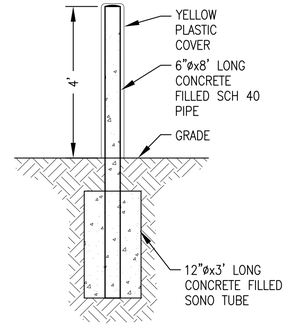
1/M1.2 OVERALL PROJECT SITE PLAN
1"=15'-0"



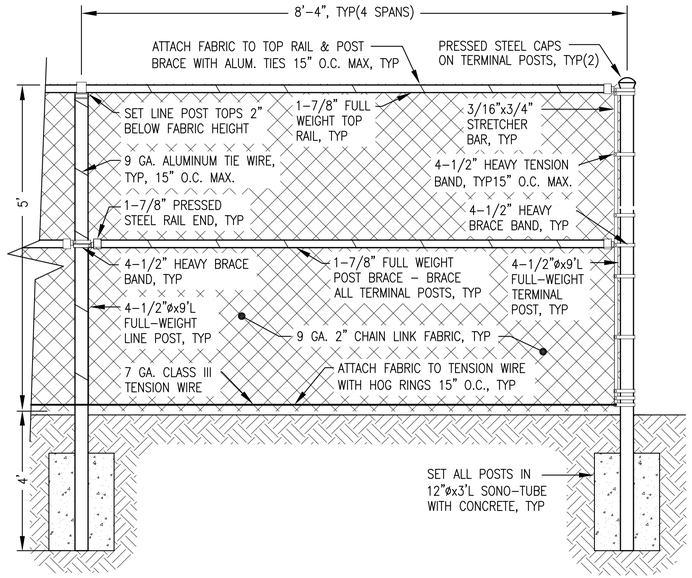
2/M1.2 EXTERIOR EQUIPMENT PAD PLAN
1"=4'-0"



3/M1.2 EQUIPMENT SHELTER PAD SECTION
NO SCALE



4/M1.2 TRAFFIC BOLLARD DETAIL
NO SCALE



5/M1.2 SNOW FENCE DETAIL
NO SCALE

FENCING NOTES:

PROVIDE ALL MATERIALS AND FASTENERS REQUIRED FOR THE COMPLETE SYSTEM IN ACCORDANCE WITH THESE NOTES, THE INSTALLATION DRAWINGS, AND THE CHAIN LINK FENCE MANUFACTURER'S INSTITUTE.

PROVIDE HEAVY–PRESSED STEEL AND MALLEABLE FITTINGS FOR ALL ATTACHMENTS. ALL STEEL AND IRON PARTS ZINC COATED AFTER FABRICATION.

INSTALL FENCE IN A WORKMAN–LIKE MANNER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDED INSTALLATION PRACTICES. POSTS SHALL BE SET VERTICAL AND OF EQUAL HEIGHT. PASS TOP RAIL THROUGH LINE POST TOPS AND JOIN RAIL SECTIONS WITH SLEEVE COUPLINGS. FASTEN TOP RAIL TO TERMINAL POSTS WITH PRESSED STEEL FITTINGS. STRETCH FABRIC TAUT AND SECURELY FASTEN TO TERMINAL POSTS WITH STRETCHER BARS AND FABRIC BANDS AT 15" MAXIMUM INTERVALS. USE CONTINUOUS LENGTHS OF TENSION WIRE BETWEEN TERMINAL POSTS. APPLY SUFFICIENT TENSION TO AVOID SAG BETWEEN POSTS AND TERMINATE TENSION WIRE AT EACH TERMINAL POST. FASTEN FABRIC AT MAXIMUM 15" INTERVALS TO LINE POSTS AND TOP RAIL WITH TIES, AND TO BOTTOM TENSION WIRE WITH HOG RINGS.

SCOPE OF WORK

1) PERFORM SITE SUBSURFACE PREPARATIONS, SEE GENERAL NOTES.
2) FORM AND POUR ONE EACH 34'–4" LONG x 7'–0" WIDE x 8" DEEP EQUIPMENT PAD. BROOM FINISH FOR TRACTION.
3) FORM AND POUR TWO EACH 5'–0" LONG x 12" WIDE x 11" DEEP FOOTINGS.
4) INSTALL TWO EACH TRAFFIC BOLLARDS
5) INSTALL 33'–4" OVERALL LENGTH SNOW FENCE AS INDICATED.

GENERAL NOTES

1) VERTICAL DATUM BASED ON TRAINING FACILITY FINISHED FLOOR = ELEVATION 22.0'.
2) EXCAVATE PAD & FOOTING AREAS TO APPROXIMATELY 6" BELOW EXISTING GRADE TO REMOVE ALL ORGANICS AND DELETERIOUS MATERIALS.
3) AFTER EXCAVATION, SMOOTH DISTURBED GROUND SURFACE AND COMPACT TO 95% MIN. DENSITY.
4) PLACE CLEAN GRAVEL FILL INTO PAD AND FOOTING AREAS IN 8" MAX. LIFTS AND COMPACT TO 95% MIN DENSITY.
5) CONCRETE – TEMCO 6 SACK TYPE 1 MIX DESIGN OR EQUAL, .45 WATER/CEMENT RATIO, ADD 1LB FIBER REINFORCEMENT/YD.

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

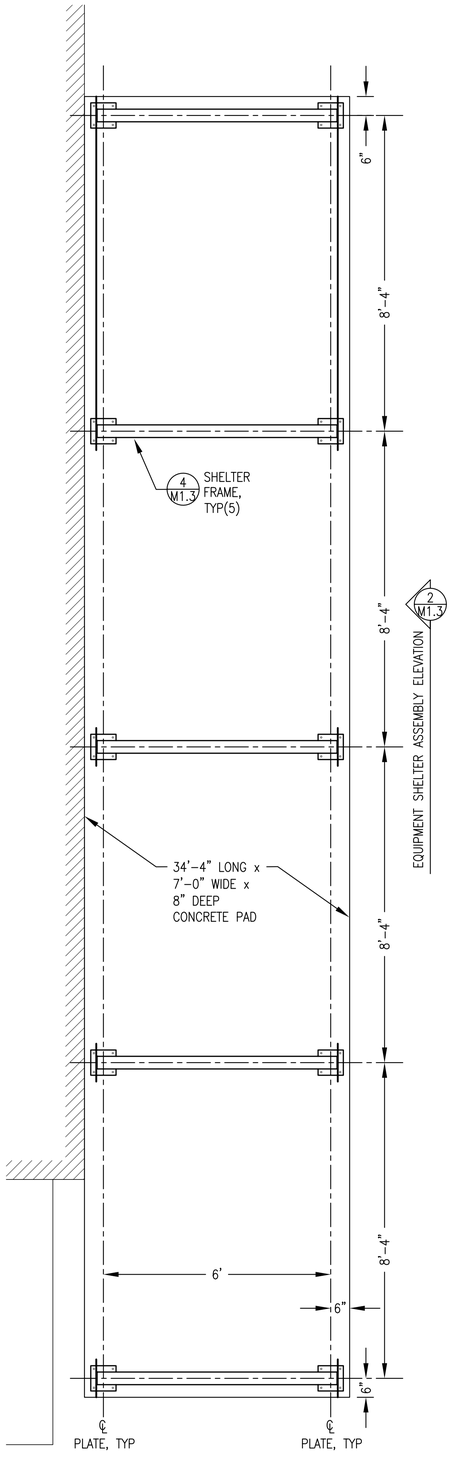
Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

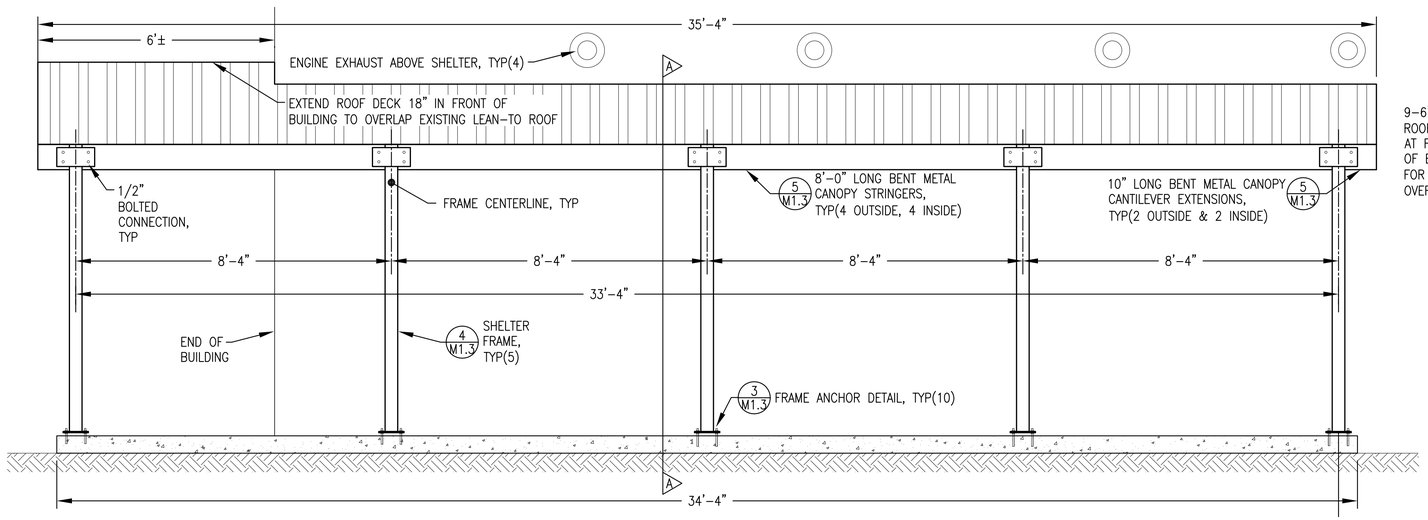
TITLE: EXTERIOR EQUIPMENT PAD PLANS & DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

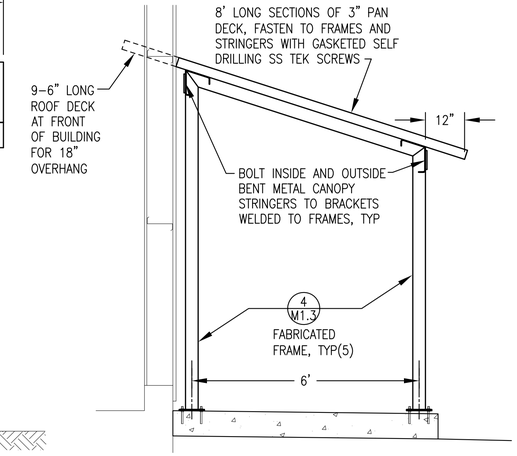
DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: BCG	DATE: 6/23/15
FILE NAME: AVTEC M1–M6	SHEET: M1.2 OF 6
PROJECT NUMBER:	



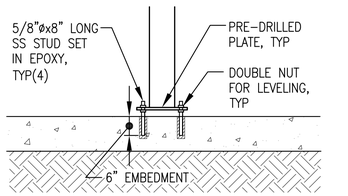
1 M1.3 EQUIPMENT SHELTER FRAMING PLAN
1/2"=1'-0"



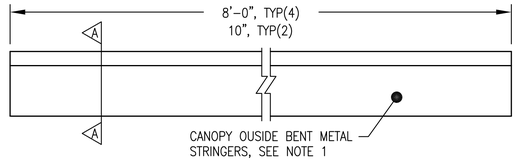
2 M1.3 EQUIPMENT SHELTER ASSEMBLY ELEVATION
1/2"=1'-0"

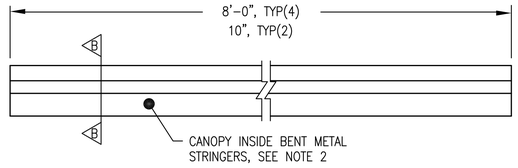


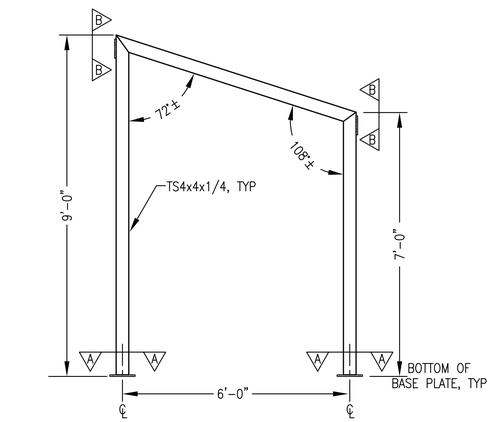
SECTION A–A



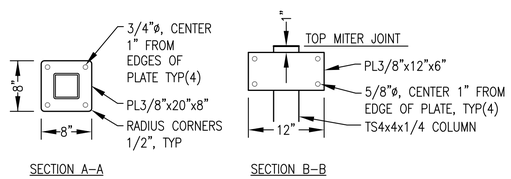
3 M1.3 FRAME ANCHOR DETAIL
1"=1'-0"





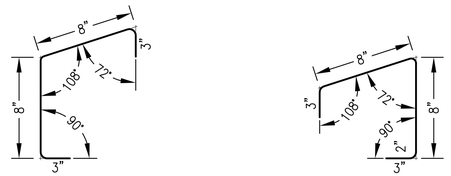


4 M1.3 SHELTER FRAME FABRICATION, TYP(5)
1/2"=1'-0"



SECTION A–A

SECTION B–B



ENLARGED SECTION A–A

ENLARGED SECTION B–B

5 M1.3 BENT METAL STRINGER FABRICATION
1/2"=1'-0"

NOTES:
1. BEND 4 EACH 8' LONG AND 2 EACH 10" LONG OUTSIDE CANOPY STRINGERS FROM 14GA SHEET METAL WITH IDENTICAL SECTION, LENGTHS AS INDICATED.
2. BEND 4 EACH 8' LONG AND 2 EACH 10" LONG INSIDE CANOPY STRINGERS FROM 14GA SHEET METAL WITH IDENTICAL SECTION, LENGTHS AS INDICATED.
3. FIELD DRILL MOUNTING HOLES TO MATCH FRAME BRACKETS.

EQUIPMENT SHELTER SHOP FABRICATION NOTES

1. FABRICATE A TOTAL OF FIVE FRAME ASSEMBLIES AS INDICATED USING ASTM A-500 TUBE AND A36 PLATE.
2. BEND A TOTAL OF EIGHT LONG AND FOUR SHORT CANOPY STRINGER SECTIONS FROM 14 GAUGE PLATE AS INDICATED USING ASTM A36 PLATE.
3. DRILL HOLES FOR ALL BOLTED CONNECTIONS. TEMPORARILY ASSEMBLE AND VERIFY FIT THEN TAKE APART FOR COATING.
5. GRIND ALL FRAMES AND BENT SECTIONS SMOOTH AND ROUND ALL SHARP CORNERS. SANDBLAST IN ACCORDANCE WITH SSPC-SP-10. PRIME WITH ONE COAT OF REINFORCED INORGANIC ZINC PRIMER, DEVOE CATHA-COAT 302, NO SUBSTITUTES, COLOR GREEN, TO 3 MILS DRY FILM THICKNESS. FINISH WITH TWO COATS OF EPOXY, SHERWIN WILLIAMS MACROPOXY 646, NO SUBSTITUTES, COLOR STRUCTURAL GRAY 4031, TO 8 MILS TOTAL DRY FILM THICKNESS.
5. FURNISH TYPE 3" PROFILE 20 GAUGE GALVANIZED PAN DECK CUT TO LENGTH, QUANTITY AND SIZE AS INDICATED BELOW:
   3 EACH 9'-6" LONG BY 24" NOMINAL WIDTH
   15 EACH 8'-0" LONG BY 24" NOMINAL WIDTH
6. BAND ALL FABRICATIONS AND PAN DECK TO PALLETS OR TIMBER DUNNAGE AND CLEARLY LABEL "AVTEC".

EQUIPMENT SHELTER FIELD INSTALLATION NOTES

1. FASTEN STRINGERS TO FRAMES WITH 1/2" STAINLESS STEEL BOLTS.
2. LOCATE ON SLAB AS INDICATED. FASTEN BASE PLATES TO SLAB WITH 5/8" STAINLESS STUDS SET IN EPOXY AS INDICATED. USE DOUBLE NUTS TO LEVEL ALL FRAMES.
3. INSTALL PAN DECK AND FASTEN TO STRINGERS USING 1/4" GASKETED STAINLESS STEEL SELF DRILLING HEX HEAD SCREWS.

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE: EXTERIOR EQUIPMENT SHELTER PLAN & DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: BCG	DATE: 6/23/15
FILE NAME: AVTEC M1-M6	SHEET: M1.3 OF 6
PROJECT NUMBER:	

** GENERAL CONDITIONS **

PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST ADOPTED EDITIONS OF THE INTERNATIONAL FIRE CODE AND THE INTERNATIONAL BUILDING CODE INCLUDING STATE OF ALASKA AMENDMENTS. COMPLY WITH ALL APPLICABLE STATE AND FEDERAL REGULATIONS.

THE DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY SHOW ALL FEATURES OF THE REQUIRED WORK. PROVIDE ALL EQUIPMENT AND MATERIALS REQUIRED FOR A COMPLETE SYSTEM. VERIFY EXISTING FIELD CONDITIONS PRIOR TO STARTING CONSTRUCTION. IMMEDIATELY CONTACT THE ENGINEER FOR CLARIFICATION OF QUESTIONABLE ITEMS OR APPARENT CONFLICTS.

ALL EQUIPMENT AND MATERIALS SHOWN ARE EXISTING UNLESS SPECIFICALLY INDICATED AS NEW. WHERE ADDITIONAL OR REPLACEMENT ITEMS ARE REQUIRED, PROVIDE LIKE ITEMS BY THE SAME MANUFACTURER TO THE MAXIMUM EXTENT PRACTICAL. INSTALL ALL MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS, UNLESS INDICATED OTHERWISE.

PROTECT ALL MATERIALS AND EQUIPMENT DURING THE ENTIRE DURATION OF CONSTRUCTION WORK AGAINST CONTAMINATION OR DAMAGE. REPLACE OR REPAIR TO ORIGINAL MANUFACTURED CONDITION ANY ITEMS DAMAGED DURING CONSTRUCTION. IMMEDIATELY REPORT TO THE ENGINEER ANY ITEMS FOUND DAMAGED PRIOR TO COMMENCING CONSTRUCTION.

PERFORM WORK WITH SKILLED CRAFTSMEN SPECIALIZING IN SAID WORK. INSTALL ALL MATERIALS IN A NEAT, ORDERLY, AND SECURE FASHION, AS REQUIRED BY THESE SPECIFICATIONS AND COMMONLY RECOGNIZED STANDARDS OF GOOD WORKMANSHIP.

DO NOT CUT, DRILL, OR NOTCH STRUCTURAL MEMBERS UNLESS SPECIFICALLY APPROVED BY THE ENGINEER. MINIMIZE PENETRATIONS AND DISRUPTION OF BUILDING FEATURES. WHERE PREVIOUSLY COMPLETED BUILDING SURFACES OR OTHER FEATURES MUST BE CUT, PENETRATED, OR OTHERWISE ALTERED, SUCH WORK SHALL BE CAREFULLY LAID OUT AND PATCHED TO ORIGINAL CONDITION. SEAL ALL EXTERIOR FLOOR AND WALL PENETRATIONS AS INDICATED.

CONTACT THE ENGINEER ONE-WEEK PRIOR TO COMPLETION OF ALL WORK TO SCHEDULE A SUBSTANTIAL COMPLETION INSPECTION. THE ENGINEER WILL GENERATE A PUNCH LIST OF CORRECTIVE ACTION ITEMS DURING THE INSPECTION. WORK WILL NOT BE CONSIDERED COMPLETE UNTIL ALL CORRECTIVE ACTION ITEMS IN THE ENGINEERS PUNCH LIST HAVE BEEN SATISFACTORILY COMPLETED AND PHOTOGRAPHIC OR OTHER POSITIVE DOCUMENTATION HAS BEEN PROVIDED TO THE ENGINEER.

PROVIDE ONE SET OF DRAWINGS CLEARLY MARKED UP WITH ALL AS-BUILT INFORMATION TO THE ENGINEER WITHIN TWO WEEKS OF COMPLETION.

** SPECIAL CONDITIONS **

ENSURE THAT APPROPRIATE SAFETY MEASURES ARE IMPLEMENTED AND THAT ALL WORKERS ARE AWARE OF THE POTENTIAL HAZARDS FROM ELECTRICAL SHOCK, BURN, ROTATING FANS, PULLEYS, BELTS, HOT MANIFOLDS, NOISE, ETC. ASSOCIATED WITH WORKING NEAR POWER GENERATION AND CONTROL EQUIPMENT.

DE-ENERGIZE ALL CIRCUITS AND EQUIPMENT PRIOR TO BEGINNING WORK.

** SUPPORTS AND FASTENERS **

SUPPORT PIPING AND EQUIPMENT AS SHOWN ON PLANS USING SPECIFIED SUPPORTS AND FASTENERS. IF NOT DETAILED ON PLANS, SUPPORT FROM STRUCTURAL MEMBERS WITH PIPE HANGERS, CLAMPS, OR PIPE STRAPS SPECIFICALLY INTENDED FOR THE APPLICATION. DO NOT SUPPORT PIPING FROM CONNECTIONS TO EQUIPMENT. INDEPENDENTLY SUPPORT PUMPS AND EQUIPMENT.

STRUCTURAL STEEL – MISCELLANEOUS SHAPES AND PLATE ASTM A-36. RECTANGULAR TUBING ASTM A-500 GRADE B. STRUCTURAL PIPE ASTM A-53 OR ASTM A-106B. PAINT AS INDICATED.

STRUT – COLD FORMED MILD STEEL CHANNEL STRUT, PRE-GALVANIZED FINISH AND SLOTTED BACK UNLESS SPECIFICALLY INDICATED OTHERWISE. STANDARD STRUT – 12 GA, 1-5/8" x 1-5/8", B-LINE B22-SH-GALV OR EQUAL. DOUBLE STRUT – 12 GA, 1-5/8" x 3-1/4", B-LINE B22A-SH-GALV OR EQUAL. SHALLOW STRUT – 14 GA, 1-5/8" x 13/16", B-LINE B54-SH-GALV OR EQUAL. WHERE STRUT IS WELDED TO TANKS OR STRUCTURES PROVIDE PLAIN (UN-FINISHED BLACK) SOLID BACK STRUT – 12 GAUGE, 1-5/8" x 1-5/8", B-LINE B22-PLN OR EQUAL.

FITTINGS AND ACCESSORIES – PROVIDE FITTINGS, BRACKETS, CHANNEL NUTS, AND ACCESSORIES DESIGNED SPECIFICALLY FOR USE WITH SPECIFIED CHANNEL STRUT. GALVANIZED OR ZINC-PLATED CARBON STEEL EXCEPT FOR EXTERIOR INSTALLATIONS TYPE 304 STAINLESS STEEL IF AVAILABLE.

PIPE CLAMPS – TWO-PIECE PIPE CLAMP DESIGNED TO SUPPORT PIPE TIGHT TO STRUT. B-LINE B20## OR EQUAL. ZINC-PLATED CARBON STEEL INSTALL RUBBER ISOLATION STRIP, B-LINE VIBRA CUSHION OR EQUAL, ON COPPER TUBING AND WHERE INDICATED.

PIPE STRAPS – CARBON STEEL TWO-HOLE PIPE STRAP. B-LINE B2400 OR EQUAL.

FASTENERS – ALL INTERIOR BOLTS, NUTS, AND WASHERS ZINC-PLATED CARBON STEEL. ALL EXTERIOR BOLTS, NUTS, AND WASHERS TYPE 304 OR 301 STAINLESS STEEL.

** INSULATION **

EXHAUST INSULATION – INSULATE EXHAUST PIPES WHERE INDICATED. INSTALL 1-1/2" PRE-FORMED RIGID MINERAL WOOL PIPE INSULATION, ROXUL TECHTON 1200 OR EQUAL. COVER WITH ALUMINUM JACKET.

JACKET – EXTERIOR GRADE EMBOSSED FINISH 0.016" THICK ALUMINUM JACKETING WITH PRE-FORMED ALUMINUM FITTING COVERS, PABCO OR EQUAL.

CHARGE AIR TUBING – INSULATE INTERIOR CHARGE AIR TUBING FROM FLEX AT ENGINE TO FLEX AT WALL THIMBLE. WRAP WITH ASBESTOS FREE SILICA BASED YARN TAPE, LEWCO FT60 OR EQUAL, 3" WIDE. SPIRAL WRAP WITH 50% OVERLAP AND SECURE ENDS WITH HOSE CLAMPS.

** PAINTING AND MARKING **

PAINT ALL EXTERIOR EXHAUST PIPES WITH HIGH TEMPERATURE INERT MULTIPOLYMERIC COATING. WIRE BRUSH TO NEAR WHITE METAL AND WIPE DOWN WITH SOLVENT. PRIME AND FINISH WITH TWO COATS OF HI-TEMP COATINGS 1027, NO SUBSTITUTES, COLOR BLACK.

PAINT ALL OTHER CARBON STEEL PIPE WITH DIRECT TO METAL ALKYD ENAMEL. WIRE BRUSH AND WIPE DOWN WITH SOLVENT. PRIME AND FINISH WITH TWO COATS OF SHERWIN WILLIAMS DTM, NO SUBSTITUTES, COLOR STRUCTURAL GRAY 4031.

PAINT ALL STEEL FABRICATIONS. SANDBLAST OR WIRE BRUSH TO BARE METAL AND WIPE DOWN WITH SOLVENT. PRIME AND FINISH WITH TWO COATS OF SELF PRIMING EPOXY, SHERWIN WILLIAMS MACROPOXY 646, NO SUBSTITUTES, COLOR STRUCTURAL GRAY 4031.

TOUCH UP – FINISH ALL CUT ENDS AND DAMAGED SURFACES OF GALVANIZED AND ZINC PLATED SUPPORTS AND FASTENERS WITH SPRAY ON COLD GALVANIZING COMPOUND, ZRC OR EQUAL. TOUCH UP PAINT ON FABRICATED ITEMS TO MATCH ORIGINAL.

ON COOLANT, HEAT RECOVERY, USED OIL, AND DIESEL FUEL PIPING INSTALL FLOW ARROWS WITH SAME COLOR SCHEME AS VALVE TAGS (SEE VALVE TAG SCHEDULE). SELF ADHESIVE SETON ARROWS ON A ROLL OR EQUAL. ON INSULATED PIPING INSTALL FLOW ARROWS OVER JACKET.

** DIESEL FUEL AND LUBE OIL PIPING AND VALVES **

OIL PIPING (DFR, DFS, UOR) – ASTM A106B SCHEDULE 80 SEAMLESS BLACK STEEL PIPE. BUTT WELD JOINTS FOR ALL PIPE 2" DIAMETER AND LARGER. SOCKET WELD OR THREADED JOINTS FOR ALL PIPING SMALLER THAN 2" DIAMETER WITH MINIMUM 3000# FORGED STEEL FITTINGS. PERFORM PIPE WELDING WITH EXPERIENCED WELDER WITH CURRENT API OR EQUIVALENT CERTIFICATION FOR PIPE WELDING IN ALL POSITIONS.

PROVIDE SPIRAL WOUND METALLIC GASKETS AND COAT WITH ANTI SEIZE COMPOUND PRIOR TO ASSEMBLING FLANGED JOINTS. REAM THREADED PIPE ENDS AND THOROUGHLY COAT MALE PIPE ENDS WITH HERCULES GRIPP PIPE JOINT COMPOUND PRIOR TO ASSEMBLING. TEST ALL FUEL OIL PIPING JOINTS WITH MINIMUM 50 PSIG AIR, WITH EACH JOINT SOAKED WITH A FOAMING SOAPY WATER SOLUTION, AND VISUALLY INSPECT EACH JOINT FOR LEAKS.

SMALL HOSES – FUEL RATED HOSE, EATON WEATHERHEAD H569 OR EQUAL. SIZE AS INDICATED ON DRAWINGS. PROVIDE RE-USABLE PLATED STEEL JIC SWIVEL ENDS, STRAIGHT OR 90° AS REQUIRED, WITH NPT ADAPTERS.

FLANGED BALL VALVES – REDUCED PORT CARBON STEEL UNI-BODY, ANSI 150# RF FLANGED ENDS, STAINLESS STEEL BALL AND TRIM, LOCKABLE HANDLE, 150 PSIG MINIMUM WORKING PRESSURE. PBV OR APOLLO, NO OTHER SUBSTITUTES.

THREADED BALL VALVES – CARBON STEEL BODY, THREADED ENDS, STAINLESS STEEL BALL AND TRIM. PBV OR APOLLO, NO OTHER SUBSTITUTES.

THREADED CHECK VALVES – BRONZE BODY, THREADED ENDS, SWING CHECK STYLE, 150 PSIG MINIMUM WORKING PRESSURE. MILWAUKEE 510-S OR HAMMOND EQUAL, DOMESTIC ONLY.

THREADED PRESSURE RELIEF VALVES – BRONZE BODY, HARD SEAT, MPT INLET X FPT OUTLET, SIZE AND PRESSURE SETTING AS INDICATED, KINGSTON 103SS OR EQUAL.

FUSIBLE LINK VALVES – BRASS BODY, FPT ENDS, 165F FUSIBLE HEAD. FIROMATIC 200F (1/2") OR EQUAL.

SOLENOID VALVES– 1/2" THREADED END BRASS BODY, 1/2" NPT CONDUIT CONNECTION, 120VAC, SS CORE, MOLDED EPOXY COIL ENCLOSURE, INTERNAL PILOT OPERATED, 150 PSI DIFFERENTIAL OPENING PRESSURE, LIQUID TIGHT AND FULL MODULATION AT 0 PSI DIFFERENTIAL.
NORMALLY CLOSED – ASCO CAT. NO. 8210G94, NO SUBSTITUTES.
NORMALLY OPEN – ASCO CAT. NO. 8210G34, NO SUBSTITUTES.

ELECTRIC ACTUATOR VALVES – LOW TEMPERATURE ACTUATED BALL VALVE ASSEMBLY RATED TO -50 DEG F. TYPE 304 STAINLESS STEEL FABRICATED COUPLING BRACKET, SHAFT, AND FASTENERS CONFIGURED TO ALLOW WRENCH ACCESS FOR MANUAL OPERATION OF VALVE WITHOUT REMOVING ACTUATOR. DG VALVE, OR EQUAL. LOW TEMP BALL VALVE, 150# RF FLANGED ENDS, NUTRON, NO SUBSTITUTES. ELECTRIC ACTUATOR WITH OPERATING VOLTAGE, NEMA RATING, AND TORQUE AS INDICATED. CONFIGURE WITHOUT MANUAL OVERRIDE SHAFT EXTENSION. FURNISH WITH PTC SELF REGULATING HEATER, AUXILIARY SWITCH SET (AUXILIARY SWITCHES 3 & 4), AND EXXON BEACON 325 SEVERE COLD LUBRICANT. RCS, NO SUBSTITUTES.

1" BALL VALVE – 151 IN-LB OPERATING TORQUE @ -50 DEG F. NUTRON MODEL T3-R10R01LZ-06, NO SUBSTITUTES.

1" 120VAC NEMA 7 ACTUATOR – 600 IN-LBS TORQUE, 10 SECOND STROKE TIME, 0.50 LOCKED ROTOR AMPS. RCS MODEL SXR-1023, NO SUBSTITUTES.

** DIESEL FUEL AND LUBE OIL EQUIPMENT AND SPECIALTIES **

THREADED STRAINERS – "Y" TYPE BRONZE BODY, SCREWED ENDS, GASKETED CAP, 20 MESH STAINLESS STEEL SCREEN, 200 PSIG WORKING PRESSURE, MUELLER #351M OR EQUAL.

DAY TANK METER – BRASS BODY AND WORKING CHAMBER, ANODIZED ALUMINUM PISTON, 300 PSIG MAXIMUM OPERATING PRESSURE, 3/4" MPT INLET AND OUTLET, ACCURATE TO +/-1% AT 8 GPH, MAXIMUM CONTINUOUS FLOW OF 265 GPH, O-RINGS AND SEALS COMPATIBLE WITH #1 DIESEL FUEL. ELSTER 20 OR EQUAL.

DAY TANK GAUGE – MAGNETIC OPERATED SPIRAL GAUGE FOR #1 DIESEL FUEL, DIE-CAST ZINC HEAD, 1-1/2" MPT CONNECTION, ZINC-PLATED STEEL GUIDE ROD, BRASS CENTER SHAFT, EPOXY COATED CORK FLOAT, HERMETICALLY SEALED SIDE-VIEW DIAL, 25 PSIG MAXIMUM OPERATING PRESSURE, GUIDE ROD (OPERATING) LENGTH AS INDICATED ON DRAWINGS. ROCHESTER MODEL 8660 WITH SIDE-VIEW DIAL #5025S00570.

CLOCK-TYPE LIQUID LEVEL GAUGE – ALUMINUM BODY, 2" MPT CONNECTION, STAINLESS STEEL FLOAT SIZED TO PASS THROUGH 2" BUNG OPENING, CLOCK-STYLE GAUGE WITH READOUT IN FEET AND INCHES UP TO 12 FEET, ACCURATE WITHIN 1/4" OVER FULL SCALE. MORRISON FIGURE 818 OR EQUAL.

PRESSURE/VACUUM WHISTLE VENTS – ALUMINUM BODY AND HOOD, STAINLESS STEEL SCREENS AND FLOAT, BRASS INTERNALS, VITON SEALS. 2" FPT CONNECTION, 8 OZ/SQUARE INCH PRESSURE SETTING, 1 OZ/SQUARE INCH VACUUM SETTING. HIGH INTENSITY WHISTLE ALARM ON RISE OF FLOAT AT ADJUSTABLE LEVEL. MORRISON FIGURE 922 OR EQUAL.

VENT CAPS – ALUMINUM BODY, STAINLESS STEEL SCREEN, FPT CONNECTION, SIZE AS INDICATED. MORRISON FIGURE 155 OR EQUAL.

** GLYCOL PIPING, VALVES, AND SPECIALTIES **

GLYCOL PIPING (COOLANT AND HEAT RECOVERY) – ALL 2-1/2" AND LARGER PIPING SCH 40 STEEL WITH WELDED AND THREADED JOINTS UNLESS SPECIFICALLY INDICATED OTHERWISE. ALL 2" AND SMALLER PIPE TYPE "L" HARD DRAWN COPPER WITH SOLDER JOINTS UNLESS SPECIFICALLY INDICATED OTHERWISE.

PROVIDE FLEXIBLE HOSE FOR CONNECTION TO ALL ENGINES. HYDROSTATICALLY TEST ALL PIPING AT 100 PSIG MINIMUM FOR ONE HOUR WITH NO NOTICEABLE WATER LEAKS OR PRESSURE DROP EXCEPT AS CAUSED BY TEMPERATURE CHANGE. ISOLATE ENGINES AND RADIATORS PRIOR TO PRESSURE TESTING. FLUSH PIPING WITH FRESH WATER PRIOR TO PLACING IN SERVICE.

STEEL PIPE – SEE DIESEL FUEL PIPING FOR STEEL PIPE SPECIFICATIONS.

COPPER PIPE – TYPE "L" HARD DRAWN COPPER TUBE WITH WROUGHT COPPER FITTINGS. ALL JOINTS SOLDERED WITH 95/5 TIN/ANTIMONY SOLDER OR SILVER SOLDER EXCEPT ON T-DRILL CONNECTIONS USE COPPER BRAZING ROD. REAM ALL CUT ENDS AND THOROUGHLY CLEAN PIPE ENDS AND FITTINGS PRIOR TO SOLDERING.

PROVIDE ANSI 150# BRONZE COMPANION FLANGES FOR TRANSITION TO STEEL PIPING OR FLANGED VALVES AND EQUIPMENT. INSTALL FULL FACED 1/8" THICK NITRILE RUBBER GASKETS. COAT FLANGE FACES WITH ANTI SEIZE COMPOUND PRIOR TO ASSEMBLING.

ENGINE COOLANT HOSES – SIZE AS INDICATED ON DRAWINGS. WIRE REINFORCED CORRUGATED RUBBER HOSE, PARKER ####, NO SUBSTITUTES. INSTALL WITH STAINLESS STEEL T-BOLT CLAMPS.

BUTTERFLY VALVES – LUG STYLE DUCTILE IRON BODY, ANSI 150# FLANGE PATTERN ENDS, STAINLESS STEEL STEM WITH BRONZE BUSHING, BRONZE DISC, EPDM SEATS, LOCKING HANDLE. BRAY SERIES 31 OR EQUAL.

BALL VALVES – THREADED OR SOLDER END BRONZE BODY, CHROME PLATED BRONZE OR BRASS BALL, TFE OR VITON PACKING AND SEAT RING, MINIMUM 200 PSIG WOG RATING. DOMESTIC ONLY, HAMMOND OR MILWAUKEE, NO SUBSTITUTES. ON 2" AND SMALLER VALVES PROVIDE FULL PORT BALL. ON VALVES LARGER THAN 2" PROVIDE LARGE PORT BALL.

SWING CHECK VALVES – THREADED OR SOLDER END BRONZE BODY, SWING CHECK STYLE, MINIMUM 200 PSIG WOG RATING. DOMESTIC ONLY, HAMMOND OR MILWAUKEE, NO SUBSTITUTES.

DRAIN VALVES – BRONZE BODY, 3/4" FPT BY 3/4" MALE HOSE ENDS WITH CAP AND JACK CHAIN. WATTS B6000CC, OR EQUAL. INSTALL AT ALL DRAIN AND FILL CONNECTIONS AND WHERE INDICATED.

GAUGE COCK – BRASS BODY, MPT BY FPT ENDS, T-HANDLE. LEGEND VALVE ITEM 101-531 (1/4") OR ITEM 101-532 (3/8"), OR EQUAL. INSTALL ON ALL AIR VENTS, PRESSURE GAUGES, SMALL HOSE CONNECTIONS, AND WHERE INDICATED.

PRESSURE RELIEF VALVES – THREADED END BRONZE BODY, NON-FERROUS INTERNAL COMPONENTS, ASME LABELED, 3/4" NPT CONNECTIONS, 500 MBH MINIMUM CAPACITY, SETPOINT AS INDICATED. WATTS 174A OR EQUAL.

GLYCOL FILTER: SCREW-ON CANISTER STYLE FILTER ELEMENT WITH 3/8" NPT CONNECTIONS ON HEAD, WIX #24019 (NAPA 4019) HEAD WITH #24069 (NAPA 4069) ELEMENT.

AUTOMATIC AIR VENTS – BRASS BODY, SELF-CLOSING FLOAT OPERATED VALVE, SCREW ON CAP, 1/4" NPT CONNECTION. MAID-O-MIST AUTO AIR VENT NO. 75 OR EQUAL. PROVIDE WITH BALL VALVE ISOLATION.

EXPANSION TANK CAP – 2-1/2 PSIG PRESSURE, 1-1/2 OZ. VACUUM, 2" NPT CONNECTION. CIM-TEK 60001 OR EQUAL.

** INSTRUMENTATION **

PRESSURE GAUGE – 2-1/2" DIAL SIZE, DRY TYPE, STAINLESS STEEL CASE, TUBE, AND SOCKET, 1/4" NPT BOTTOM CONNECTION. TRERICE NO. 700SS-25, NO SUBSTITUTES
0-15 PSI 700SS-25-02-L-A-080
0-100 PSI 700SS-25-02-L-A-110

THERMOMETER – 3" DIAL SIZE BIMETAL TYPE, STAINLESS STEEL CASE AND STEM, 1% OF FULL SCALE ACCURACY, ADJUSTABLE ANGLE AND SWIVEL HEAD, 2-1/2" STEM LENGTH, 20-240F FAHRENHEIT ONLY RANGE. TRERICE B836-02-05F, NO SUBSTITUTES. PROVIDE WITH 3/4"NPT BRASS THERMOWELL.

SEE ELECTRICAL EQUIPMENT SCHEDULE FOR TEMPERATURE AND PRESSURE TRANSMITTERS.

** SYSTEM STARTUP **

PRIOR TO STARTING FUEL AND OIL PUMPS, PRIME CAVITIES WITH LUBE OIL THEN ENERGIZE MOMENTARILY TO VERIFY PROPER ROTATION.

FUEL OIL PIPING – AFTER PRESSURE TESTING PRIME ALL PIPING WITH HAND PRIMING PUMP, FILL FILTERS WITH DIESEL FUEL, AND BLEED OFF AIR PRIOR TO STARTING STARTING PUMPS.

VERIFY OPERATION OF ALL FUEL PUMP CONTROLS INCLUDING TIMER AND LEVEL ALARMS.

ENGINE COOLANT PIPING – AFTER PRESSURE TESTING AND FLUSHING, FILL SYSTEM WITH A SOLUTION OF EXTENDED LIFE ETHYLENE GLYCOL, SHELL ROTELLA ELC, NO SUBSTITUTES, PREMIXED TO A RATIO OF 50% ETHYLENE GLYCOL TO 50% WATER.

HEAT RECOVERY PIPING – AFTER PRESSURE TESTING AND FLUSHING, BLEED AIR RESERVOIR ON EXPANSION TANK AS REQUIRED TO MAINTAIN 10 PSIG RESIDUAL WITH SYSTEM EMPTY. FILL SYSTEM WITH A PRE-MIXED SOLUTION OF HEAVY DUTY (EXTENDED LIFE) 50% PROPYLENE GLYCOL AND 50% WATER, DOWFROST HD, SAFE/T/THERM HD, OR EQUAL. FILL TO 20 PSIG MINIMUM WITH SYSTEM COLD. VENT AIR FROM ALL HIGH POINTS PRIOR TO STARTING CIRCULATING PUMP. CYCLE PUMP ON AND OFF AND VENT HIGH POINTS UNTIL ALL AIR HAS BEEN PURGED FROM PIPING. ADD ADDITIONAL PRE-MIXED GLYCOL SOLUTION AS REQUIRED TO BRING SYSTEM PRESSURE TO 30 PSIG MINIMUM AT EXPANSION TANK AT NORMAL OPERATING TEMPERATURE (180F).

AS COOLING SYSTEM COMES UP TO NORMAL OPERATING TEMPERATURE VERIFY OPERATION OF THERMOSTATIC VALVE. SET VARIABLE FREQUENCY DRIVES TO SPECIFIED TEMPERATURES. VERIFY OPERATING SETPOINTS BY READING THERMOMETERS IN PIPING MAINS.

** SEQUENCE OF OPERATION **

DAY TANK WILL HAVE AUTOMATIC FILL CONTROLS WITH REDUNDANT HIGH AND LOW LEVEL ALARMS AND TIMERS. SEE DAY TANK CONTROL PANEL DRAWINGS FOR DETAILED SEQUENCE.

MOTORIZED AIR INTAKE DAMPER WILL OPEN ANY TIME AN ENGINE IS RUNNING OR THE EXHAUST FAN OPERATES. DAMPER MOTOR WILL BE NORMALLY CLOSED SPRING RETURN AND WILL CLOSE ON LOSS OF POWER IN LESS THAN 30 SECONDS.

EXHAUST FAN EF-1 WILL OPERATE ON A CALL FOR COOLING THROUGH A LINE VOLTAGE THERMOSTAT TO MAINTAIN GENERATING ROOM TEMPERATURE, 75F, ADJUSTABLE.

RADIATOR VARIABLE FREQUENCY DRIVE WILL MODULATE FAN SPEED TO MAINTAIN ENGINE COOLANT RETURN TEMPERATURE OPERATING SETPOINT. FAN WILL OPERATE AT A MINIMUM SPEED OF 10%, ADJUSTABLE. FAN WILL SHUT OFF WHEN ENGINE COOLANT RETURN TEMPERATURE IS BELOW THE MINIMUM SETPOINT. NORMAL OPERATING SETPOINT IS 180F AND MINIMUM SETPOINT IS 20F BELOW OPERATING SETPOINT.

CHARGE AIR COOLER CAC-3 & CAC-4 FANS WILL OPERATE CONTINUOUSLY ANY TIME ASSOCIATED ENGINE RUNS AND STOP WHEN ENGINE STOPS. A VARIABLE FREQUENCY DRIVE ON CAC-4 WILL OPERATE AT FULL SPEED FOR 30 SECONDS UPON STARTUP AND THEN WILL MODULATE FAN SPEED TO MAINTAIN ENGINE INTAKE MANIFOLD AIR TEMPERATURE OPERATING SETPOINT. MINIMUM FAN SPEED = 10%, ADJUSTABLE. SETPOINT = 90F, ADJUSTABLE.

HEAT RECOVERY PUMPS P-HR1 AND P-HR2 AND DUMP LOAD RADIATOR DLR-1 FAN WILL OPERATE UNDER MANUAL CONTROL.

WHEN THE SYSTEM PRESSURE IN THE HEAT RECOVERY PIPING DROPS BELOW 15 PSIG FOR A MINIMUM OF 15 MINUTES, A RED LAMP "HEAT RECOVERY LOSS OF PRESSURE" LOCATED IN THE SWITCHGEAR MASTER SECTION WILL ILLUMINATE.

WHEN THE HEAT RECOVERY RETURN TEMPERATURE IS EQUAL TO OR GREATER THAN THE HEAT RECOVERY SUPPLY TEMPERATURE FOR A MINIMUM OF 1 HOUR, AN AMBER LAMP "NO LOAD ON HEAT RECOVERY" LOCATED IN THE SWITCHGEAR MASTER SECTION WILL ILLUMINATE. WHEN THE HEAT RECOVERY SUPPLY TEMPERATURE IS A MINIMUM OF 1°F GREATER THAN THE HEAT RECOVERY RETURN TEMPERATURE THE LAMP WILL TURN OFF.

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

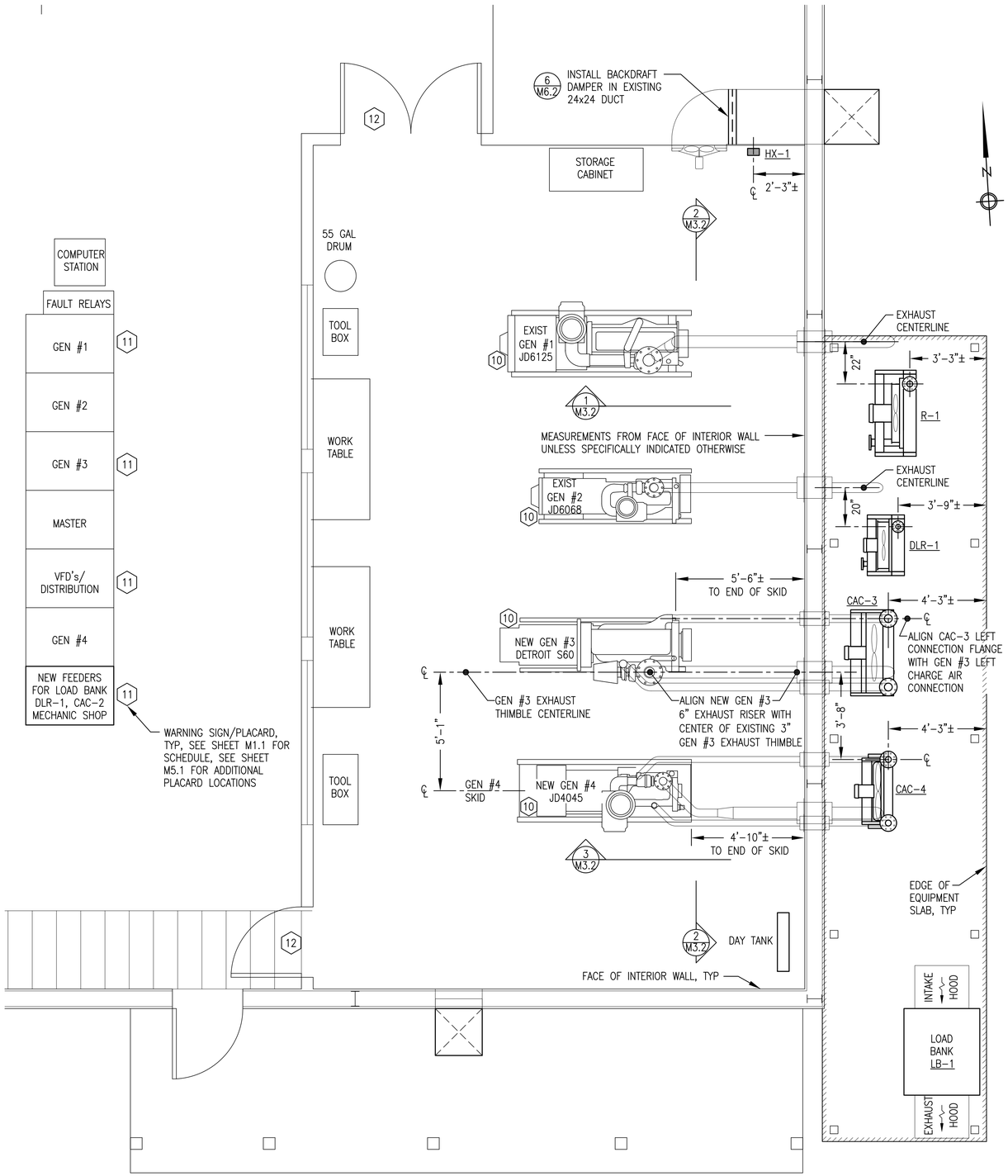
Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT:
AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE:
MECHANICAL SPECIRFICATIONS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: BCG	DATE: 6/23/15
FILE NAME: AVTEC M1-M6	SHEET: M2 OF 6
PROJECT NUMBER:	



1 M3.1 NEW MECHANICAL EQUIPMENT LAYOUT PLAN
3/8"=1'-0"

2 M3.1 MECHANICAL EQUIPMENT DEMOLTION PLAN
1/4"=1'-0"

DEMOLITION GENERAL NOTES:

1) SEE ELECTRICAL PLANS FOR ADDITIONAL DEMOLITION.
2) SEE SHEET M5.1 FOR PARTIAL DEMOLITION OF EXISTING FUEL SYSTEM.
3) TAKE ALL PRECAUTIONS TO MINIMIZE DAMAGE TO GENERATORS & GENERATION EQUIPMENT BEING REMOVED DURING DEMOLITION. TARP GENERATORS AND SEAL ALL EXPOSED CONNECTIONS PRIOR TO REMOVING FROM PLANT. TURN ALL REMOVED EQUIPMENT OVER TO AVTEC FOR FINAL DISPOSITION.
4) DRAIN ALL PIPING PRIOR TO DEMOLITION. SAVE GLYCOL AND DIESEL FUEL FOR RE-USE IN NEW SYSTEMS. TURN USED OIL OVER TO AVTEC FOR FINAL DISPOSITION.

DEMOLITION SPECIFIC NOTES:

1. REMOVE ALL EXISTING SOUTH & EAST WALL ENGINE COOLANT MAIN PIPING, ENGINE COOLANT BRANCH CONNECTIONS, HEAT RECOVERY PIPING, HEAT EXCHANGER, PUMPS, RADIATORS & ALL ASSOCIATED EQUIPMENT THIS AREA. LEAVE ALL WALL-MOUNTED STRUT IN PLACE. SAVE EXPANSION TANK FOR REUSE. MOVE COMPRESSED AIR PIPING UP ON EAST WALL TO APPROXIMATE ELEVATION 9' AFF, JUST BELOW EXHAUST THIMBLES.
2. EXISTING GEN #1, GEN #2 AND ASSOCIATED EXHAUST PIPING TO REMAIN.
3. REMOVE EXISTING POSITION #3 (LABELED GEN #4) COMPLETE SKID UNIT.
4. REMOVE EXISTING POSITION #4 (LABELED GEN #3) ENGINE ONLY, SKID AND GENERATOR END TO REMAIN.
5. REMOVE GEN #4 (POSITION #3) 3" EXHAUST PIPING AND WALL THIMBLE. WALL OPENING TO REMAIN AND BE ENLARGED FOR NEW 6" EXHAUST PIPING.
6. CUT OFF EXISTING GEN #3 (POSITION #4) 6" EXHAUST PIPING JUST BEFORE ELBOW DOWN AND REMOVE RISER WITH GENERATOR.
7. EXISTING 50 GALLON DIESEL FUEL DAY TANK TO BE RELOCATED. SEE SHEET M5.1 FOR NEW LOCATION AND FUEL SYSTEM AND USED OIL PIPING MODIFICATIONS.
8. REMOVE EXISTING HEAT RECOVERY ARCTIC PIPE WALL PENETRATIONS, INFILL AND PATCH INTERIOR SHEATHING AND EXTERIOR SIDING.
9. TEMPORARILY REMOVE STORAGE CABINET FROM GENERATION ROOM DURING CONSTRUCTION. SEE LAYOUT PLAN FOR NEW LOCATION.

ISSUED FOR CONSTRUCTION JUNE 2015

STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE: DEMOLTION & NEW WORK PLANS

Gray Stassel Engineering, Inc.
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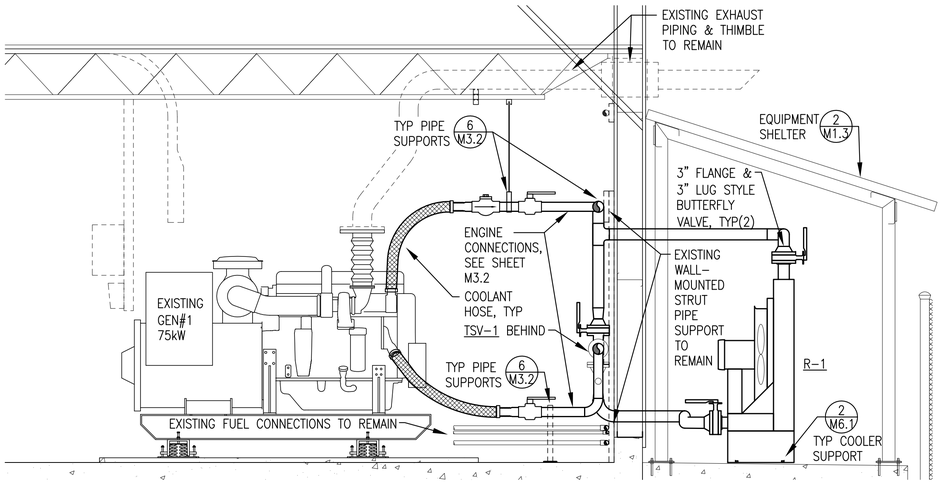
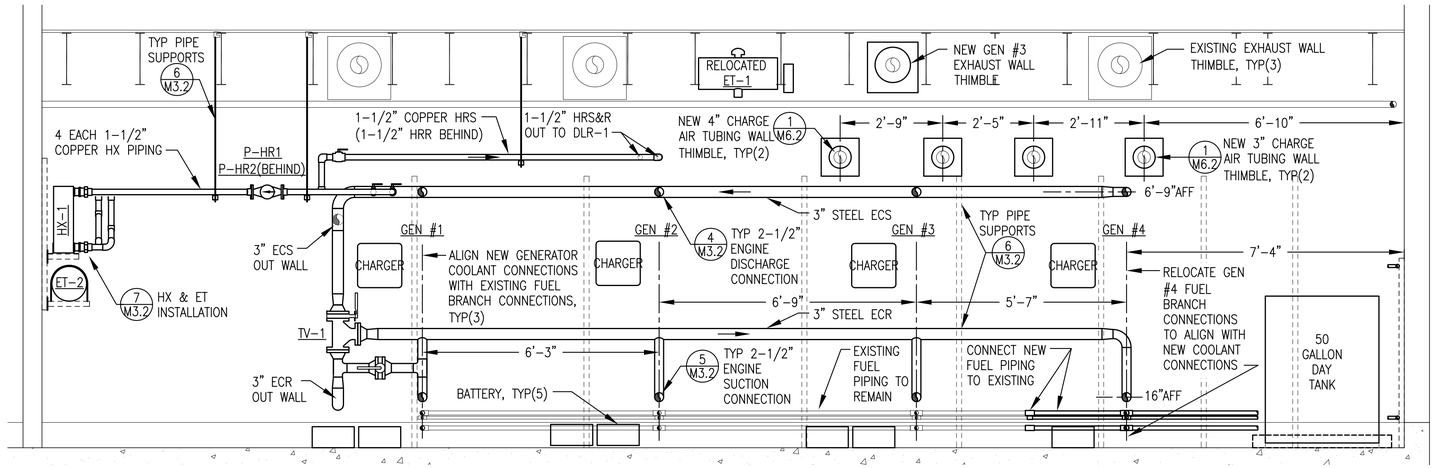
DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: BCG	DATE: 6/23/15
FILE NAME: AVTEC M1-M6	SHEET: M3.1 OF 6
PROJECT NUMBER:	



1 M3.2 PARTIAL SECTION THROUGH GENERATOR #1 & RADIATOR R-1
3/4"=1'-0"



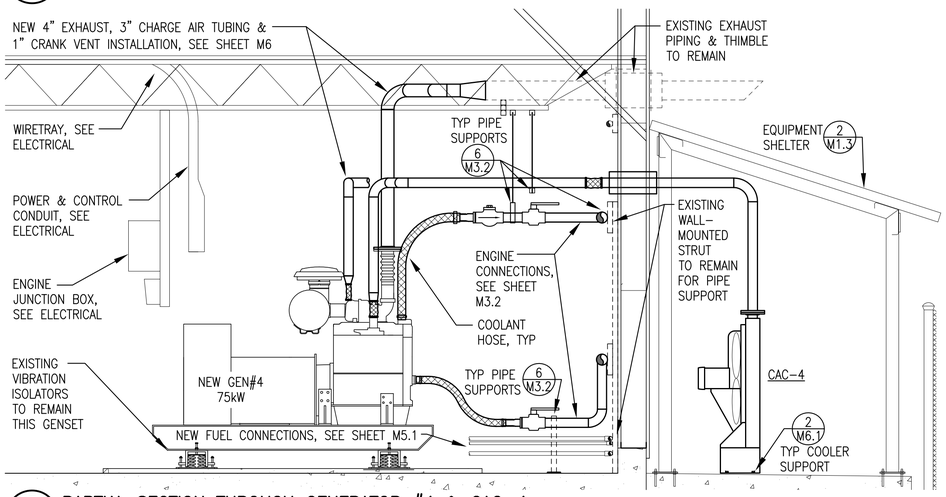
2 M3.2 BACK WALL ELEVATION
3/4"=1'-0"

NOTES:
1) MAIN PIPING 3". ALL MAIN & BRANCH PIPING NOT INSULATED.
2) ALL PIPING SCHEDULE 40 STEEL. ALL LINE SIZE VALVES THREADED END.

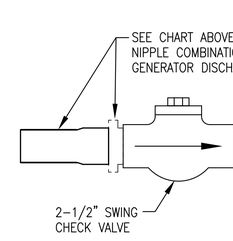
GENERATOR	DISCHARGE BUSHING	DISCHARGE KING NIPPLE
GEN #1	NONE	2-1/2" BARB x 2-1/2" MPT, BRASS
GEN #2	2-1/2"x2"	1-3/4" BARB x 2" MPT, CUSTOM CRIMP, BRASS
GEN #3	NONE	2-1/2" BARB x 2-1/2" MPT, BRASS
GEN #4	NONE	2-3/8" BARB x 2-1/2" MPT, CUSTOM CRIMP, BRASS

NOTES:
1) MAIN PIPING 3". ALL MAIN & BRANCH PIPING NOT INSULATED.
2) ALL PIPING SCHEDULE 40 STEEL. ALL LINE SIZE VALVES THREADED END.

GENERATOR	SUCTION BUSHING	SUCTION KING NIPPLE
GEN #1	3"x2-1/2" REDUCER, 2-1/2" CLOSE NIPPLE	3" BARB x 3" MPT, BRASS
GEN #2	2-1/2"x2"	2" BARB x 2" MPT, BRASS
GEN #3	NONE	2-1/2" BARB x 2-1/2" MPT, BRASS
GEN #4	2-1/2"x2"	2" BARB x 2" MPT, BRASS

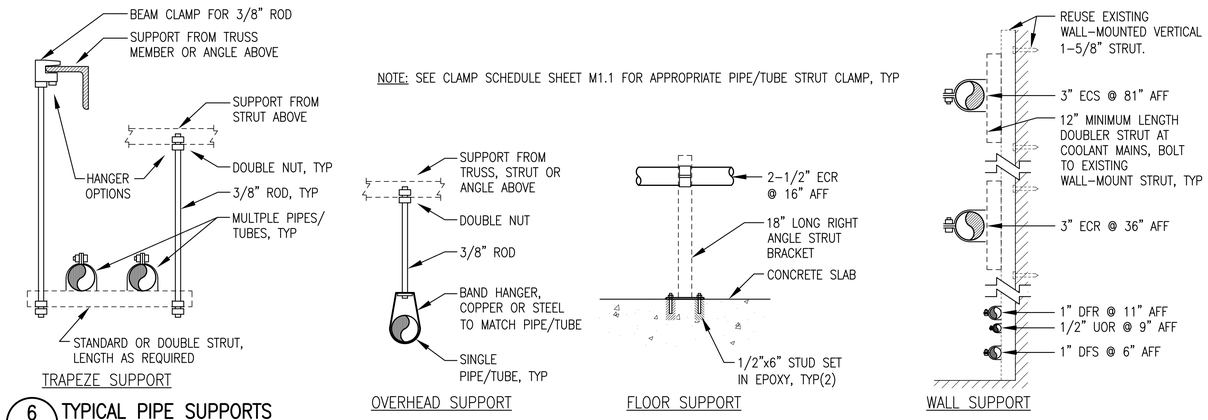


3 M3.2 PARTIAL SECTION THROUGH GENERATOR #4 & CAC-4
3/4"=1'-0"

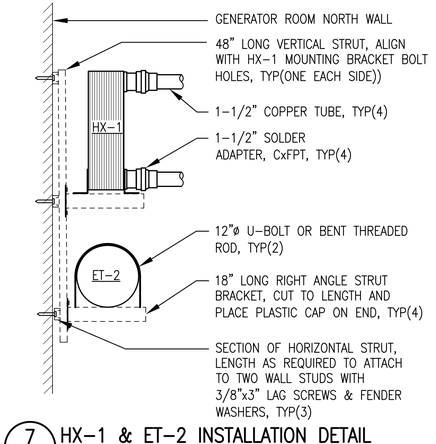


4 M3.2 GENERATOR DISCHARGE CONNECTIONS
NO SCALE

5 M3.2 GENERATOR SUCTION CONNECTIONS
NO SCALE



6 M3.2 TYPICAL PIPE SUPPORTS
NO SCALE



7 M3.2 HX-1 & ET-2 INSTALLATION DETAIL
NO SCALE

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH
BRIAN C. GRAY ME 8210
REGISTERED PROFESSIONAL ENGINEER

Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE: EQUIPMENT LAYOUT SECTIONS & ELEVATIONS

Gray Stassel Engineering, Inc.
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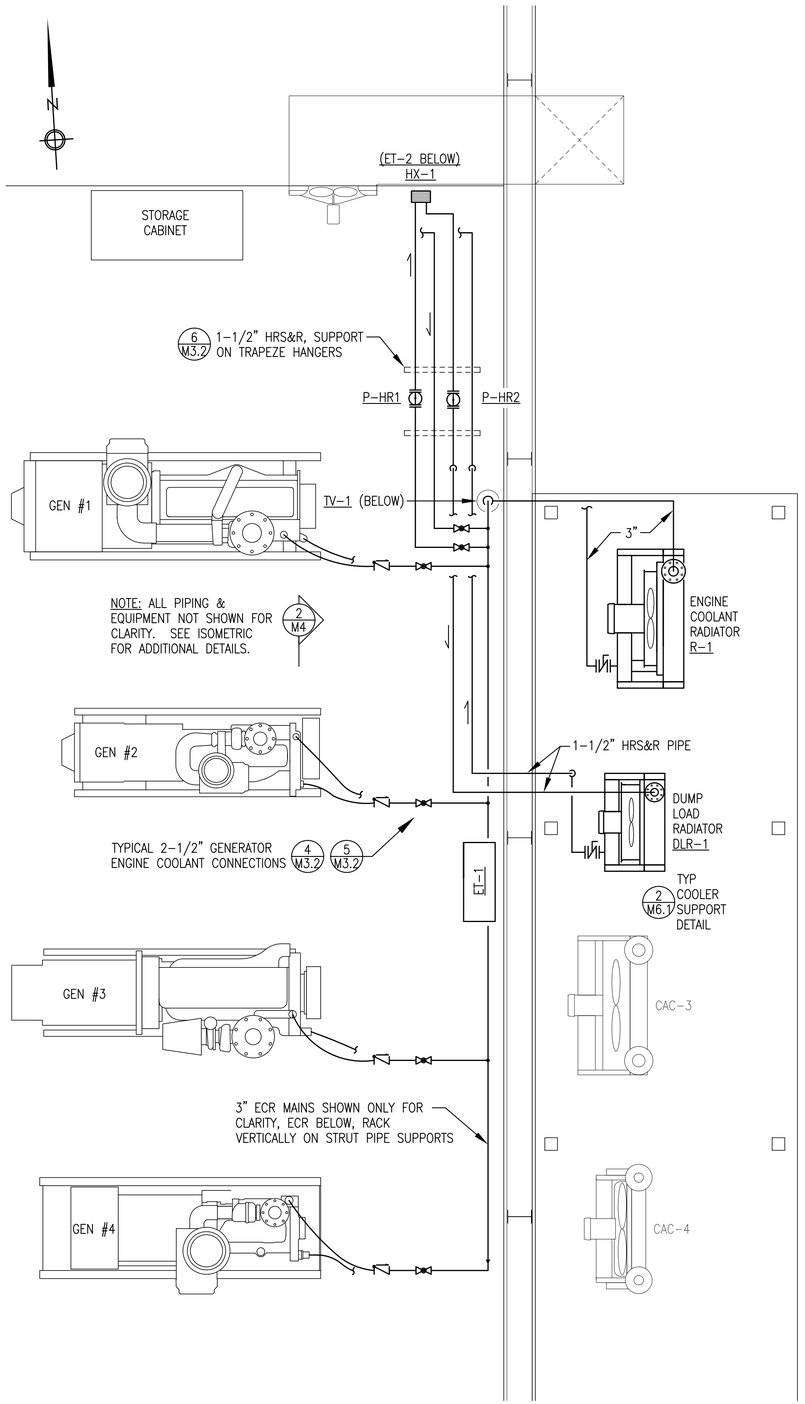
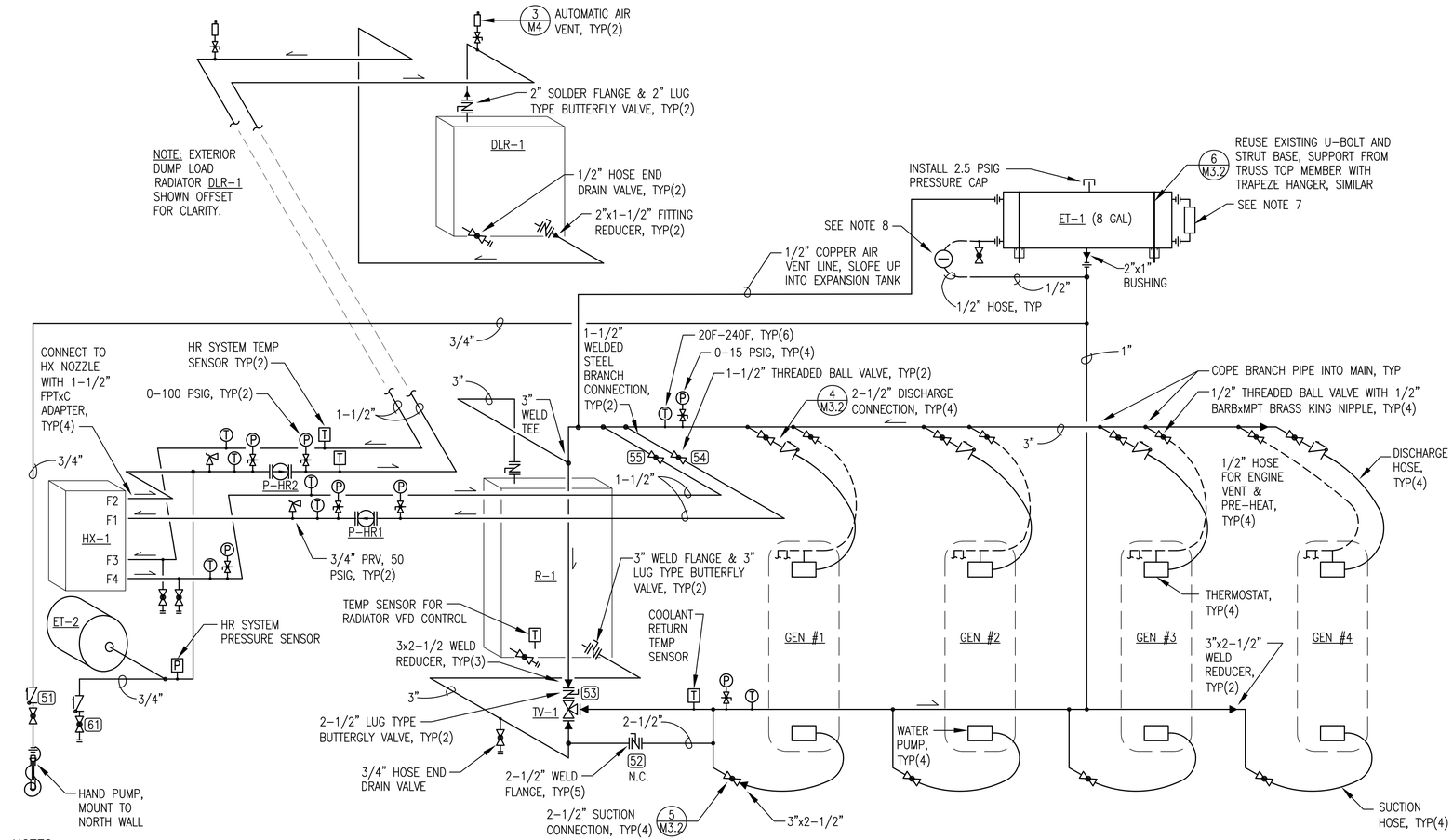
DESIGNED BY: BCG	DATE: 6/23/15
FILE NAME: AVTEC M1-M6	SHEET: M3.2 OF 6
PROJECT NUMBER:	



1 M4 COOLANT & HEAT RECOVERY PIPING PLAN

1/2"=1'-0"



NOTES:

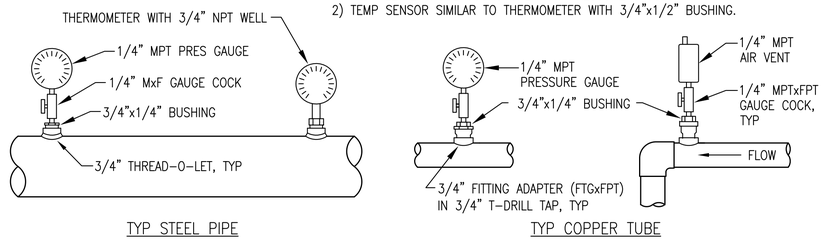
1) ALL 2-1/2" AND LARGER PIPING SHOWN THIS ISOMETRIC SCH 40 STEEL WITH WELDED JOINTS UNLESS SPECIFICALLY INDICATED OTHERWISE. ALL 2" AND SMALLER PIPE SHOWN THIS ISOMETRIC TYPE "L" HARD DRAWN COPPER WITH SOLDER JOINTS UNLESS SPECIFICALLY INDICATED OTHERWISE.
2) UNLESS INDICATED OTHERWISE MAKE ALL CONNECTIONS TO STEEL MAINS FOR INSTRUMENTATION, VENTS, AND BLEED LINES WITH 3/4" THREAD-O-LET. SEE DETAIL 3/M4.
3) UNLESS INDICATED OTHERWISE MAKE ALL CONNECTIONS TO COPPER MAINS FOR INSTRUMENTATION, VENTS, AND BLEED LINES WITH 3/4" T-DRILL TAP AND 3/4" FTGxFPT ADAPTER. SEE DETAIL 3/M4. INSTALL THREADED BRASS BUSHINGS AS REQUIRED. MAKE ALL OTHER REDUCING BRANCH CONNECTIONS IN COPPER MAINS WITH T-DRILL TAP AS REQUIRED UNLESS INDICATED OTHERWISE.
4) ALL PRESSURE GAUGES IN ENGINE COOLING MAINS AND HEAT EXCHANGER PRIMARY SUPPLY 0-15 PSIG. ALL PRESSURE GAUGES IN HEAT RECOVERY SECONDARY 0-100PSIG. ALL THERMOMETERS 20-240F. ALL TEMPERATURE SENSORS 20-240F RANGE 4-20mA TRANSMITTERS.
5) UPON COMPLETION OF FABRICATION FLUSH INTERIOR OF PIPING TO REMOVE ALL DEBRIS AND RESIDUE.
6) ALL PIPING NOT INSULATED.
7) REUSE EXISTING 7" LONG COOLANT SITE GAUGE.
8) REUSE EXISTING LOW COOLANT ALARM SWITCH, MOUNT WITH SWITCH POINT ELEVATION LEVEL WITH BOTTOM OF TANK.

2 M4 ENGINE COOLING & HEAT RECOVERY SYSTEM PIPING ISOMETRIC

NO SCALE

NOTES:

1) CLOSE GAUGE COCKS ON AIR VENTS AFTER BLEEDING SYSTEM OF AIR. LEAVE GAUGE COCKS OPEN ON PRESSURE GAUGES.
2) TEMP SENSOR SIMILAR TO THERMOMETER WITH 3/4"x1/2" BUSHING.



3 M4 TYPICAL AIR VENT/INSTRUMENT INSTALLATION

NO SCALE

ISSUED FOR CONSTRUCTION JUNE 2015

STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

Alaska Industrial Development and Export Authority AIDEA/AEA Alaska Energy Authority

PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE: COOLANT & HEAT RECOVERY PIPING PLAN & ISOMETRICS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

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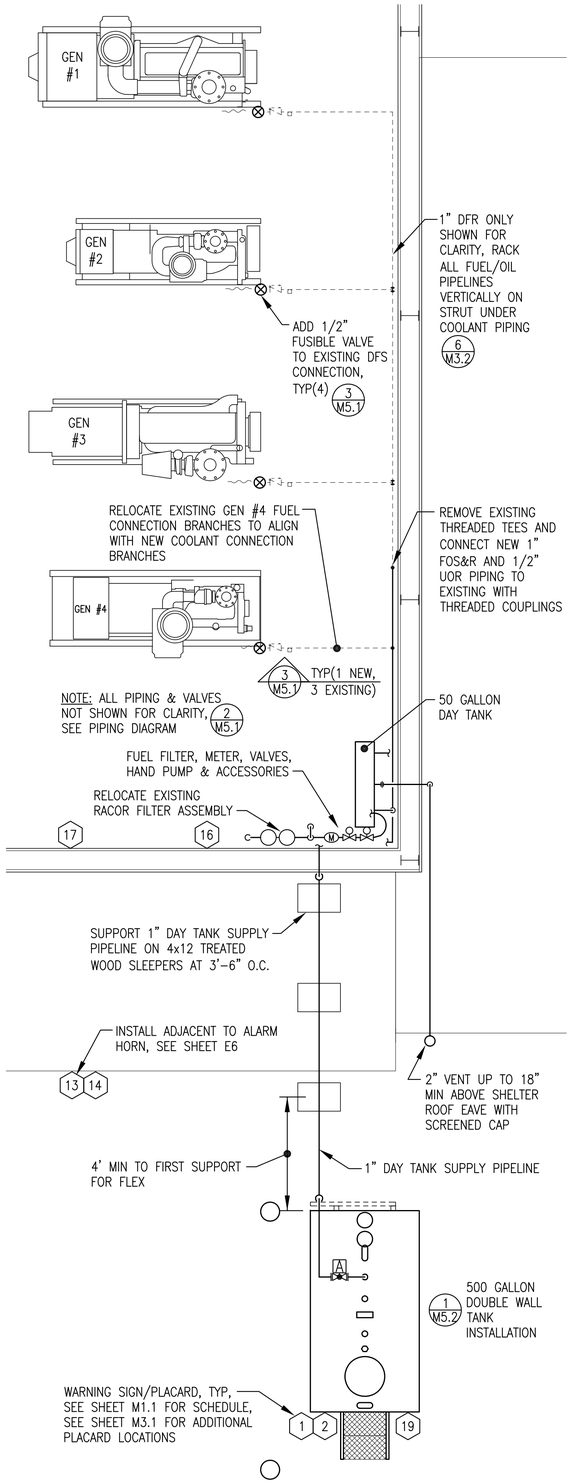
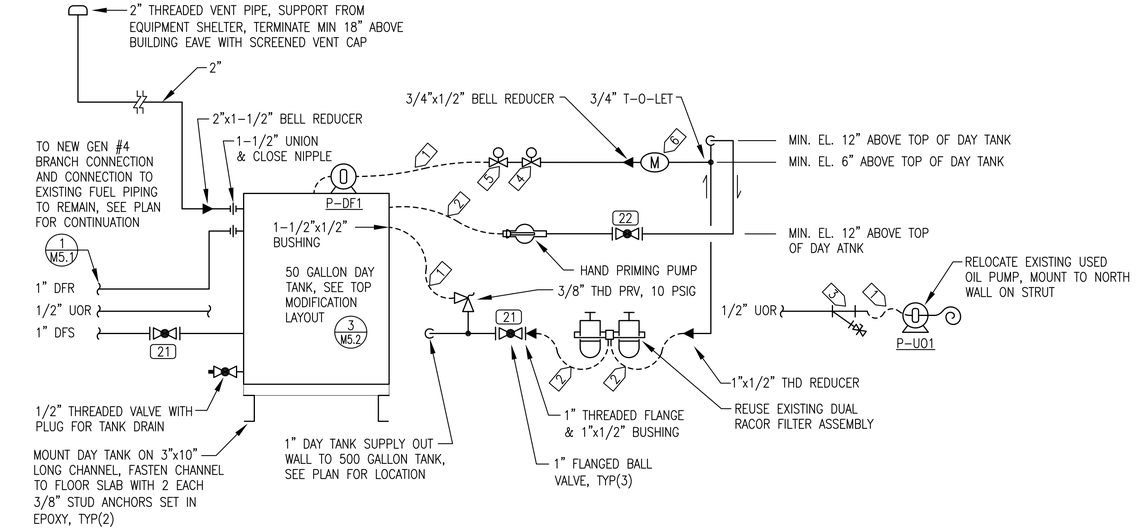
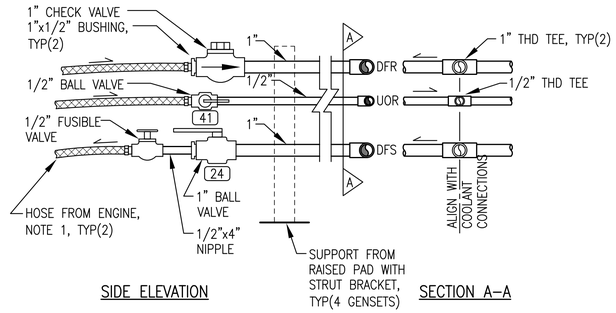
DESIGNED BY: BCG	DATE: 6/23/15
FILE NAME: AVTEC M1-M6	SHEET: M4 OF 6
PROJECT NUMBER:	



1 M5.1 FUEL SYSTEM & USED OIL PLAN
3/8"=1'-0"



2 M5.1 FUEL SYSTEM & USED OIL PIPING DIAGRAM
NO SCALE



NOTES:

1. ALL GENERATOR FUEL BRANCH PIPING CONNECTIONS TO REMAIN EXCEPT RELOCATE GEN #4 BRANCH PIPING AND ADD 1/2" FUSIBLE VALVE ON ALL DFS ENGINE CONNECTIONS.
2. SALVAGE ALL VALVES AND PIPING ON EXISTING GEN #4 AND REUSE FOR RELOCATED FUEL CONNECTION ON NEW GEN #4.
3. AEROQUIP HOSES PROVIDED WITH ENGINE, SIZE VARIES PER ENGINE & PRODUCT. ALL EQUIPPED WITH JIC SWIVELS & 1/2" MPT ADAPTERS. CUT TO LENGTH & RE-INSTALL ENDS.
4. ALL PIPING & NIPPLES SCH 80.

3 M5.1 ENGINE FUEL PIPING CONNECTIONS
NO SCALE

PIPING DIAGRAM GENERAL NOTES:

1) MODIFY AND REUSE EXISTING 50 GALLON DAY TANK. SEE SHEET M5.# FOR MODIFICATIONS. PLUG/CAP ALL SPARE OPENINGS.
2) ALL DAY TANK SUPPLY, DFS & DFR PIPING 1" WITH SOCKET WELD FITTINGS EXCEPT WHERE INDICATED OTHERWISE. VENT PIPING 2" THREADED.

PIPING DIAGRAM SPECIFIC NOTES:

1. #10 HOSE WITH 3/8" OR 1/2" NPT SWIVEL ENDS AS REQUIRED.
2. #12 HOSE WITH NPT SWIVEL ENDS, 1/2", 3/4", OR 1" AS REQUIRED.
3. 1/2" THREADED STRAINER IN 1/2" UOR WITH GAUGE COCK BLOW DOWN.
4. 1/2" NO SOLENOID VALVE.
5. 1/2" NC SOLENOID VALVE.
6. 3/4" THREADED DAY TANK METER WITH PULSER, SEE SPECIFICATIONS.

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE: FUEL SYSTEM & USED OIL PLAN, PIPING DIAGRAM & DETAILS

Gray Stassel Engineering, Inc.
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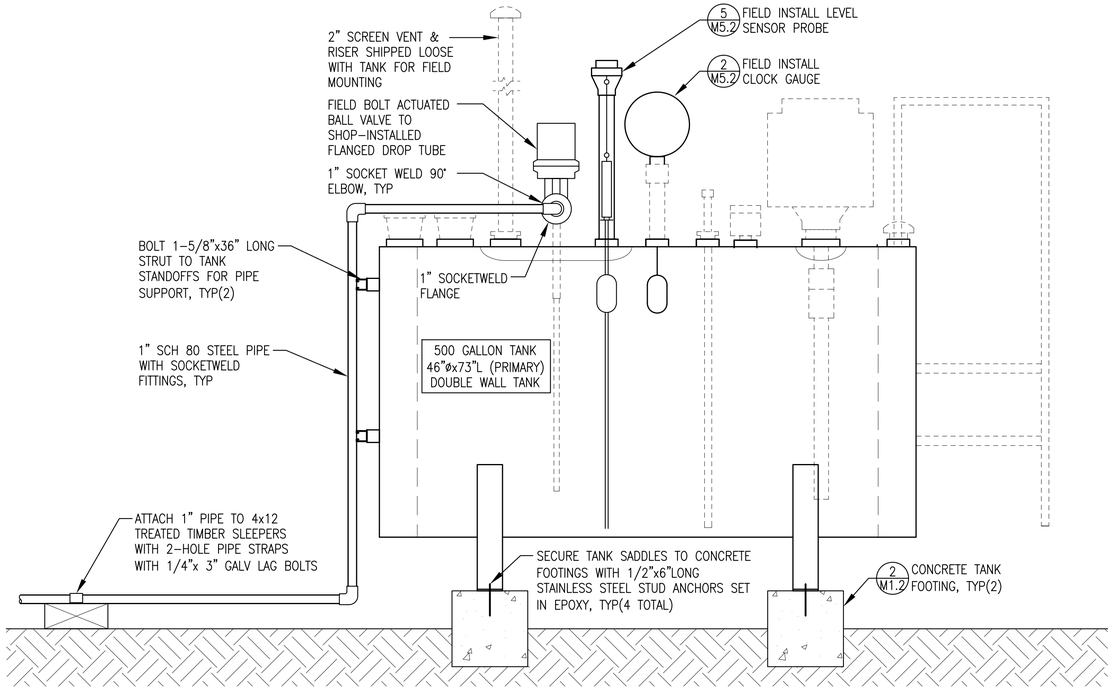
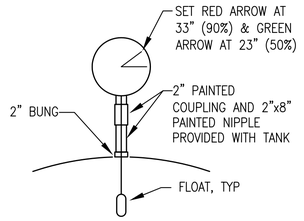
DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: BCG	DATE: 6/23/15
FILE NAME: AVTEC M1-M6	SHEET: M5.1 OF 6
PROJECT NUMBER:	

GENERAL NOTES:

1. ALL PIPING VALVES, AND APPURTENANCES SHOP INSTALLED EXCEPT WHERE SPECIFICALLY INDICATED AS FIELD INSTALLED.
2. ALL SHOP INSTALLED APPURTANANCES SHOWN WITH LIGHT-DASHED LINES.



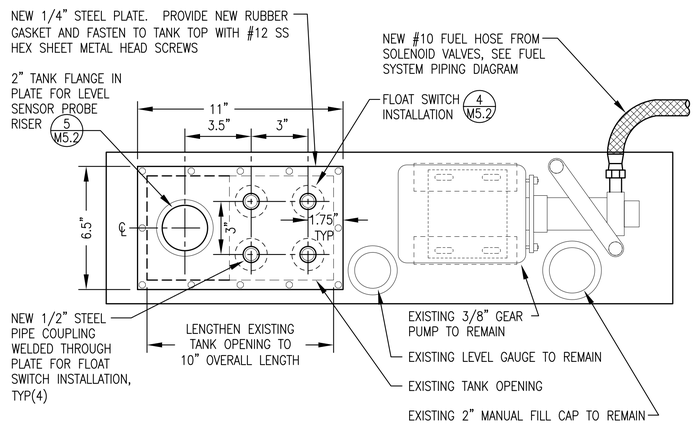
1 M5.2 500 GALLON DOUBLE WALL TANK INSTALLATION
1"=1'-0"



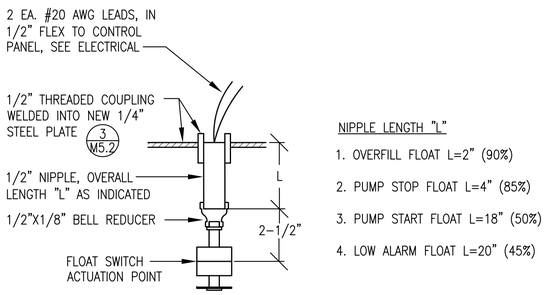
NOTES:
1) FEED FLOAT CABLE THROUGH NIPPLE PRIOR TO CONNECTING TO TANK.
2) GREASE FLOAT PRIOR TO INSTALLING IN TANK TO PREVENT FREEZING TO BOTTOM.
3) CALIBRATE GAUGE AFTER FILLING TANK AND VERIFY WITH MANUAL GAUGING ROD OR TAPE.
4) ENSURE THAT BACK COVER PLATE IS PROPERLY SEALED AFTER REASSEMBLY (ANY LOOSENESS OR RATTLING WHEN TAPPED INDICATES A POOR SEAL).

2 M5.2 CLOCK GAUGE INSTALLATION
NO SCALE

NOTE: REMOVE ALL EXISTING DAY TANK POWER & CONTROL CONDUCTORS, SOLID STATE CONTROL PANEL, FLOAT SWITCHES/SENSORS AND COVER PLATE



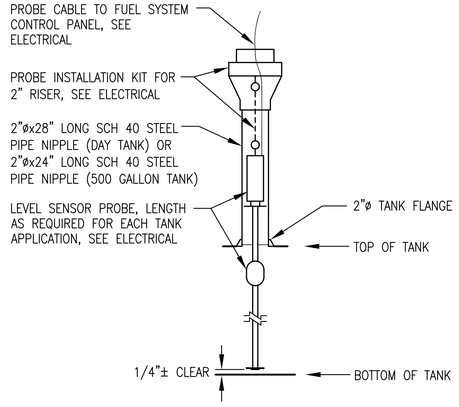
3 M5.2 TOP OF DAY TANK LAYOUT
NO SCALE



NIPPLE LENGTH "L"
1. OVERFILL FLOAT L=2" (90%)
2. PUMP STOP FLOAT L=4" (85%)
3. PUMP START FLOAT L=18" (50%)
4. LOW ALARM FLOAT L=20" (45%)

NOTE: PRIOR TO INSTALLATION CHASE THREADS ON FLOAT SWITCH WITH 1/8" PIPE DIE TO CLEAN OFF ANY EXCESS EPOXY, USE CARE TO AVOID DAMAGING WIRES.

4 M5.2 DAY TANK FLOAT SWITCH INSTALLATION
NO SCALE



NOTES:
1. PROBE & ACCESSORIES SPECIFIED ON ELECTRICAL EQUIPMENT SCHEDULE, SEE SHEET E2.
2. FURNISH 53" PROBE FOR 48"ø DAY TANK AND 46"ø 500 GALLON TANK.

5 M5.2 TYPICAL LEVEL SENSOR PROBE INSTALLATION
NO SCALE

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH BRIAN C. GRAY ME 8210 REGISTERED PROFESSIONAL ENGINEER

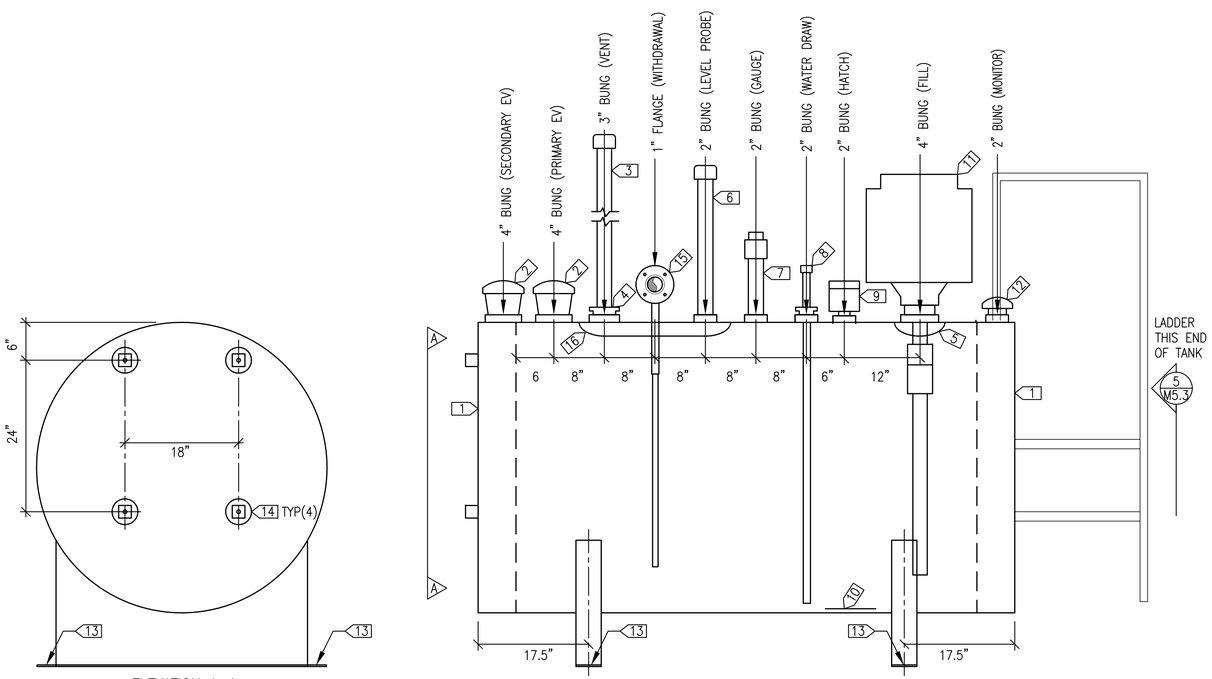
Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE: FUEL SYSTEM DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: BCG	DATE: 6/23/15
FILE NAME: AVTEC M1-M6	SHEET: M5.2 OF 6
PROJECT NUMBER:	



ELEVATION A–A

1 M5.3 500 GALLON DOUBLE WALL TANK ELEVATIONS

1"=1'-0"

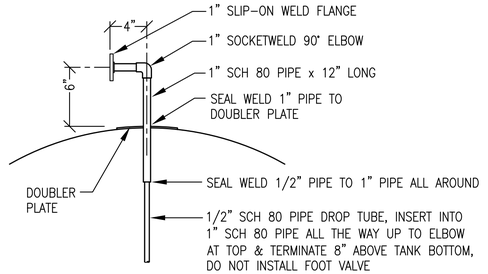
GENERAL NOTES

1. 46"ø x 73"L NOMINAL 500 GALLON CAPACITY DOUBLE WALL WELDED STEEL TANK MANUFACTURED & LABELED IN ACCORDANCE WITH U.L. 142.

SPECIFIC NOTES

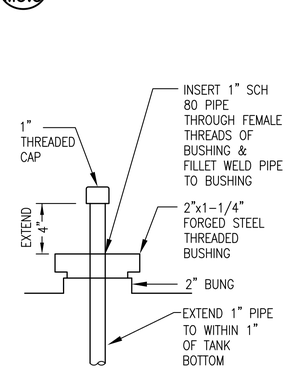
1. 4" HIGH BLACK LETTERING x1/2" STROKE: "DIESEL 500 GALLONS"
2. 4" MPT EMERGENCY VENT INSTALLED ON 4" BUNG.
3. 2"x7'–0" LONG THREADED VENT PIPE, REMOVE AND STRAP TO TANK FOR SHIPPING.
4. 3"x2" BUSHING ON 3" BUNG, INSTALL 2" SCREEN VENT ON BUSHING AFTER REMOVING PIPE FOR SHIPPING.
5. PROVIDE 1/4"x8" DIAMETER DOUBLER PLATE.
6. 2"x24" LONG THREADED NIPPLE ON 2" BUNG, INSTALL PIPE CAP.
7. 8" LONG NIPPLE, 2" COUPLING AND 2" PLUG.
8. 1" WATER DRAW INSTALLED ON 2" BUNG, TERMINATE 1" ABOVE TANK BOTTOM. SEE INSTALLATION DETAIL 3/M5.3.
9. GAUGE HATCH INSTALLED ON 2"x4" NIPPLE.
10. SEAL WELD 1/4"x10"ø STRIKER PLATE TO TANK BOTTOM DIRECTLY BELOW GUAGE HATCH TOP CONNECTION. PLATE TO BE ROLLED TO MATCH DIAMETER OF TANK.
11. FILL LIMITER AND ABOVE GROUND TANK SPILL CONTAINMENT MANHOLE INSTALLED ON 4" BUNG, SEE DETAIL 4/M5.3.
12. 2" SCREEN VENT INSTALLED ON SECONDARY TANK MONITOR BUNG.
13. EXTEND SADDLE BOTTOM PLATE 3" BEYOND EDGE OF SADDLE BOTH SIDES AND DRILL 1" HOLE CENTERED IN EACH TAB, TYP(4 TOTAL).
14. WELD STAND OFF TO FACE OF TANK FOR PIPE SUPPORT, SEE DETAIL 6/M5.3, TYP(4 TOTAL).
15. DAY TANK SUPPLY DROP TUBE, SEE DETAIL 2/M5.3.
16. PROVIDE 1/4"x8"WIDEx24" OVERALL LENGTH DOUBLER PLATE TO REINFORCE THREE BUNGS AS INDICATED. CUT BOTH ENDS TO 4" RADIUS.

NOTE: PRESSURE TEST ENTIRE DROP TUBE ASSEMBLY PRIOR TO INSTALLING IN TANK.



2 M5.3 DAY TANK SUPPLY DROP TUBE

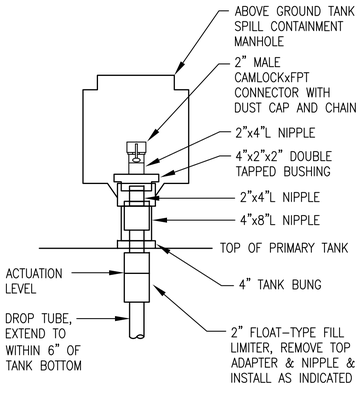
NO SCALE



NOTE: TO USE WATER DRAW REMOVE CAP & THREAD BARREL PUMP ONTO PIPE.

3 M5.3 TANK WATER DRAW

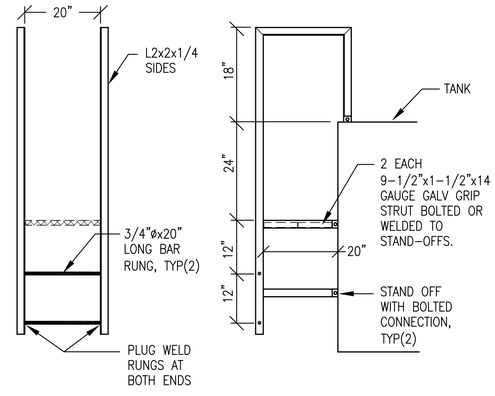
NO SCALE



NOTE: PIPING SIZED TO PROVIDE SHUT OFF AT 41" ABOVE TANK BOTTOM (95% CAPACITY). FIELD VERIFY SHUT OFF HEIGHT & ADJUST LINKAGE AS REQUIRED.

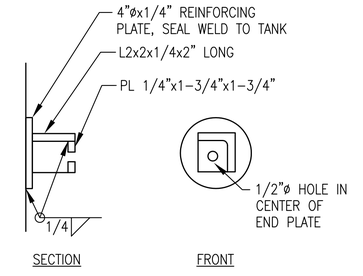
4 M5.3 FILL LIMITER INSTALLATION

NO SCALE



5 M5.3 TANK LADDER DETAILS

NO SCALE



6 M5.3 TYP PIPE SUPPORT STAND OFF

NO SCALE

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH
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Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE: FUEL TANK FABRICATION DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: BCG	DATE: 6/23/15
FILE NAME: AVTEC M1–M6	SHEET: M5.3 OF 6
PROJECT NUMBER:	

** GENERAL **

PROVIDE ONE SHOP FABRICATED CARBON STEEL TANK OF TYPE, CONFIGURATION, DIMENSION, AND CAPACITY AS INDICATED.

TANK SHALL BE RATED FOR STORAGE OF DIESEL FUEL AT ATMOSPHERIC PRESSURE OVER A TEMPERATURE RANGE FROM –20F TO +80F. MANUFACTURE IN ACCORDANCE WITH U.L. STANDARD 142 OR EQUIVALENT THIRD PARTY STANDARD AND PROVIDE WITH LABEL IN ACCORDANCE WITH IFC REQUIREMENTS.

PROVIDE COMPLETE TANK ASSEMBLY WITH ALL ACCESSORIES, ATTACHMENTS, LADDERS, SUPPORTS, AND FASTENERS AS INDICATED. ALL BOLTS, NUTS, WASHERS, AND HARDWARE TO BE TYPE 304 OR TYPE 301 STAINLESS STEEL.

LABEL FACES AND ENDS OF TANKS AS INDICATED ON INDIVIDUAL TANK DRAWINGS. LABEL ALL OPENINGS ON TOP OF TANKS WITH MINIMUM 1" HIGH LETTERS INDICATING FUNCTION AS LISTED IN PARENTHESES ON TANK DRAWINGS. PROVIDE PERMANENT BLACK VINYL LETTERS OR STENCIL WITH BLACK POLYURETHANE PAINT.

** SUBMITTALS **

PROVIDE SHOP DRAWINGS TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO STARTING FABRICATION. SHOP DRAWINGS TO INDICATE COMPLIANCE WITH ALL REQUIREMENTS OF DRAWINGS AND SPECIFICATIONS INCLUDING JOINT TYPE, CONSTRUCTION DETAILS, ATTACHMENTS, SURFACE PREPARATION, PAINTING, LABELING, ETC.

** TANK CONSTRUCTION **

TANK SHELL JOINTS TO BE FULL PENETRATION BUTT WELDS OR DOUBLE WELDED FULL FILLET LAP JOINTS, U.L. 142 FIGURE 6.1 #2 OR #3. HEAD TO SHELL JOINTS TO BE FULL PENETRATION BUTT WELDS OR DOUBLE WELDED FULL FILLET LAP JOINTS, U.L. 142 FIGURE 6.2 #2 OR #6.

PROVIDE WITH INTEGRAL STEEL SADDLES. SADDLES TO BE SEAL WELDED TO TANK – BOLT ON OR STRAP ON SADDLES WILL NOT BE ACCEPTED.

** OPENINGS AND ATTACHMENTS **

PROVIDE WITH ALL OPENINGS AND ATTACHMENTS INDICATED. OPENINGS INDICATED AS FLANGES SHALL BE ANSI 150# PATTERN FLANGES WITH RAISED FACE. OPENINGS INDICATED AS BUNGS SHALL BE FEMALE PIPE THREAD. PROVIDE 1/4" DOUBLER PLATES WHERE INDICATED.

INSTALL ALL FLANGES AND BUNGS PLUM, LEVEL AND SQUARE TO THE MAIN AXIS OF THE TANK IN ALL THREE PLANES. VERIFY BUNG ORIENTATION WITH PIPE NIPPLE. INSTALL FLANGES WITH BOLT PATTERN SQUARE TO TANK AXIS. PIPING CONNECTIONS MORE THAN ONE DEGREE OUT OF ALIGNMENT SHALL BE CUT OUT AND RE–INSTALLED. VERIFY ALIGNMENT PRIOR TO PAINTING.

ATTACH ALL COMPONENTS PERMANENTLY WELDED TO THE TANKS INCLUDING STAND–OFFS. PROVIDE REINFORCING PLATES ON ALL STAND–OFFS. SEAL WELD ALL NON–STRUCTURAL SEAMS, AND ROUND CORNERS AND SHARP EDGES PRIOR TO SANDBLASTING AND PAINTING. REMOVE ALL DETACHABLE COMPONENTS PRIOR TO SANDBLASTING TANKS.

PROVIDE WITH LADDER ATTACHED TO TANK AS INDICATED. SHOP FABRICATE LADDER; VERIFY FIT; REMOVE; SANDBLAST AND PAINT EQUIVALENT TO TANK PRIOR TO FASTENING TO TANK.

** COATINGS **

SURFACE PREPARATION AND COATING SPECIFICATIONS APPLY TO ALL UN–COATED BLACK STEEL EXTERIOR TANK ASSEMBLY COMPONENTS INCLUDING TANK, PIPE, NIPPLES AND FITTINGS.

SANDBLAST IN ACCORDANCE WITH SSPC–SP–10. PRIME WITHIN 4 HOURS OF SANDBLASTING. PRIME WITH REINFORCED INORGANIC ZINC PRIMER, DEVOE CATHA–COAT 302, COLOR GREEN, TO 3 MILS DRY FILM THICKNESS. COVER WITH TWO COATS OF EPOXY, DEVOE BAR–RUST 236, TO 10 MILS TOTAL DRY FILM THICKNESS, FIRST COAT GRAY, SECOND COAT WHITE. FINISH WITH ONE COAT OF ALIPHATIC URETHANE ENAMEL, DEVOE DEVTHANE 389, COLOR WHITE, TO 3 MILS DRY FILM THICKNESS. SUBSTITUTIONS OF PAINT WILL NOT BE ACCEPTED. PERFORM ALL PAINTING IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

** PREPARATION FOR SHIPPING **

UPON COMPLETION OF FABRICATION, CLEAN OUT TANK INTERIOR TO REMOVE ALL DEBRIS AND DIRT. SEAL ALL OPENINGS TO PREVENT ENTRANCE OF WATER AND DIRT. BLIND FLANGE ALL FLANGED OPENINGS. PLUG ANY OPEN BUNGS WITH THREADED PIPE PLUGS AND CAP ANY THREADED PIPE ENDS WITH THREADED PIPE CAPS EXCEPT AS NOTED. COAT ALL FLANGE GASKETS, PIPE PLUGS, AND BOLTS WITH ANTI–SIZE COMPOUND PRIOR TO INSTALLATION.

PROVIDE TEMPORARY VENTING TO ALLOW FOR NORMAL INTERNAL EXPANSION AND CONTRACTION DUE TO CHANGES IN TEMPERATURE DURING SHIPPING BY INSTALLING A 2–INCH VENT CAP IN A TOP BUNG IN EACH TANK COMPARTMENT, INCLUDING INTERSTITIAL SPACES.

** PIPE AND FITTINGS **

PIPE – ASTM A106B SCH 80 SEAMLESS CARBON STEEL PIPE.

WELD FITTINGS – BUTT WELD FITTINGS FOR ALL PIPING 2" DIAMETER AND LARGER AND SOCKET WELD FITTINGS FOR ALL PIPING SMALLER THAN 2". ASTM A234 SEAMLESS DOMESTIC BUTT WELD CARBON STEEL FITTINGS. ASTM A105 DOMESTIC FORGED STEEL FLANGES, ANSI 150# RAISED FACE, EXTRA HEAVY/HEAVY BORE ON SCH 80 PIPE. ASTM A105 SOCKET WELD FITTINGS, CLASS 3000 MINIMUM.

NIPPLES – SCH 80, ASTM A53 CARBON STEEL NIPPLES.

FLANGE GASKETS – SPIRAL WOUND METALLIC, LAMONS SPIRASEAL STYLE WR OR EQUAL.

THREADED FITTINGS – ASTM A105 FORGED STEEL FITTINGS, CLASS 3000 MINIMUM, UNLESS SPECIFICALLY NOTED OTHERWISE.

WELDED JOINTS – PERFORM ALL WELDING IN ACCORDANCE WITH ASME SECTION IX AND API 1104 FOR WELDING PROCEDURE AND PERFORMANCE QUALIFICATION. VISUALLY INSPECT WELD JOINTS IN ACCORDANCE WITH API 1104.

THREADED JOINTS – PRIOR TO ASSEMBLY, THOROUGHLY COAT MALE END WITH ANTI–SEIZE COMPOUND.

FLANGED JOINTS – COAT METALLIC GASKETS WITH ANTI SEIZE COMPOUND PRIOR TO ASSEMBLY.

TESTING – PRIOR TO PAINTING TEST ALL PIPING JOINTS WITH MINIMUM 125 PSIG AIR WITH EACH JOINT SOAKED WITH A FOAMING SOAPY WATER SOLUTION, AND VISUALLY INSPECT EACH JOINT FOR LEAKS. ALL WELDS THAT FAIL INSPECTION SHALL BE CUT OUT, REWELDED AND RETESTED.

** SUPPORTS AND FASTENERS **

FASTENERS – ALL BOLTS, NUTS AND WASHERS, INCLUDING FLANGE BOLT SETS, TO BE TYPE 304 OR TYPE 301 STAINLESS STEEL.

** VALVES **

1" FLANGED BALL VALVES – REDUCED PORT UNI–BODY STYLE, CARBON STEEL, ANSI 150# RF FLANGED ENDS, STAINLESS STEEL BALL AND TRIM, GLASS FILLED TEFLON SEAT, GRAPHITE SEALS, LOCKABLE HANDLE, 150 PSIG MINIMUM WORKING PRESSURE, NACE MR0175 CONFORMANCE, FIRE SAFE PER API 607. PBV C–5410–31–2236–FTNL OR APOLLO EQUAL, NO OTHER SUBSTITUTES.

** TANK AND PIPING SPECIALTIES **

SCREEN VENT CAPS – ALUMINUM BODY, STAINLESS STEEL SCREEN, 2" FPT CONNECTION. MORRISON FIGURE 155 OR EQUAL.

FILL LIMITERS – 2" FPT FLOAT–TYPE MECHANICAL SHUT–OFF VALVE. ALUMINUM BODY, CLOSED CELL BUNA–N FLOAT, BRASS PLUNGER, STAINLESS STEEL TRIM, 100 PSIG SHUT–OFF PRESSURE. MORRISON FIGURE 9095–A OR EQUAL. PROVIDE WITH 2" ALUMINUM DROP TUBE CUT TO LENGTH AT 45 DEGREES AS REQUIRED TO TERMINATE WITHIN 6" ABOVE TANK BOTTOM.

QUICK–CONNECT COUPLINGS – ALUMINUM BODY CAM AND GROOVE FITTING WITH DUST CAP. MALE FITTING WITH FPT CONNECTION, AS SPECIFIED, 150 PSIG MINIMUM WORKING PRESSURE. PT COUPLING, CAM–V–LOK OR EQUAL.

EMERGENCY VENTS – ALUMINUM BODY, CAST IRON COVER, 16 OZ/SQUARE INCH PRESSURE SETTING, 4" SIZE, 119,750 CFH RELIEF CAPACITY AT 2.5 PSIG, MALE THREAD CONNECTION, MORRISON FIGURE 244M OR EQUAL.

GAUGE HATCH – BRASS CAP AND CHAIN, BUNA–N GASKET, 2" FPT CONNECTION. MORRISON FIGURE 307 OR EQUAL.

SPILL CONTAINMENT MANHOLE – 7 GALLON CAPACITY, 12 GAUGE STEEL CONTAINER AND HINGED LOCKING COVER, 1/4" STEEL BASE WITH 4" DOUBLE–TAPPED FPT CONNECTION AND BRASS QUICK–DRAIN VALVE, POWDER COATED FINISH. POMECO 211–AST, OR EQUAL.

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA
49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT:
AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE:
FUEL TANK & ACCESSORIES SPECIFICATIONS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

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PROJECT NUMBER:
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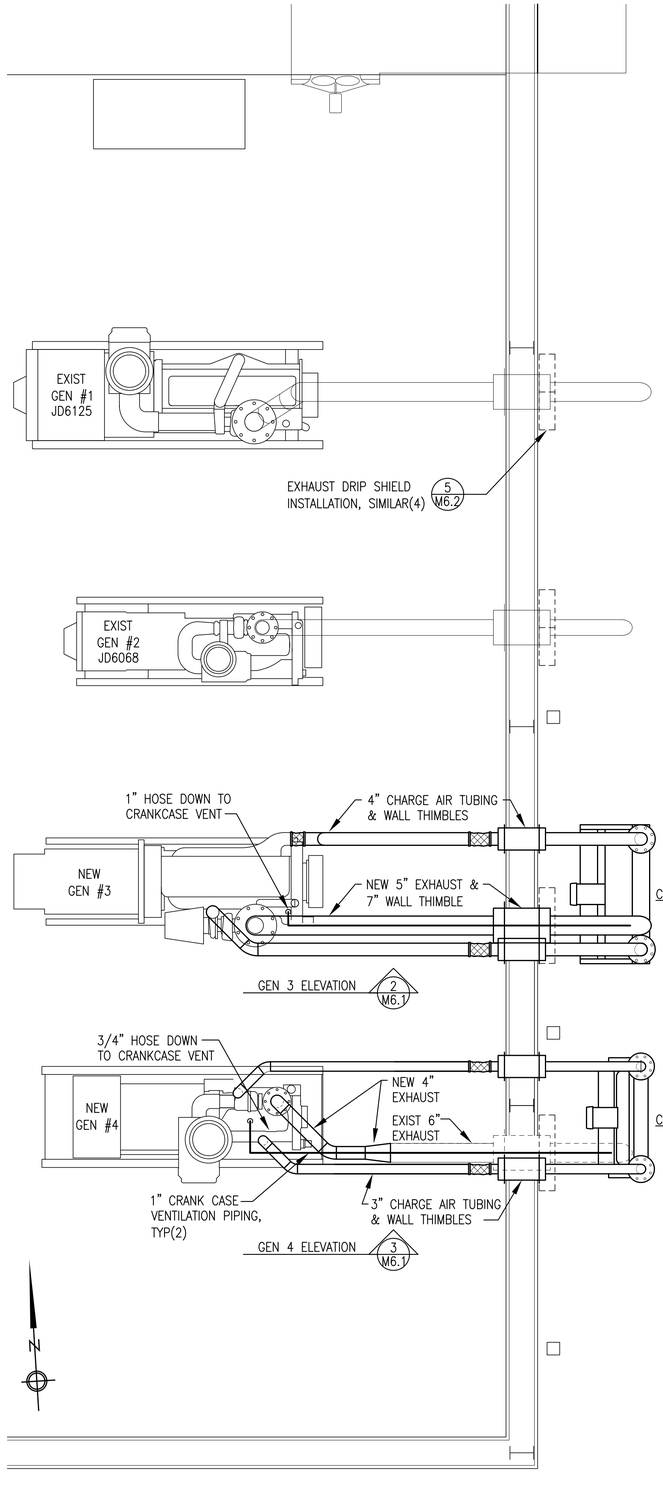
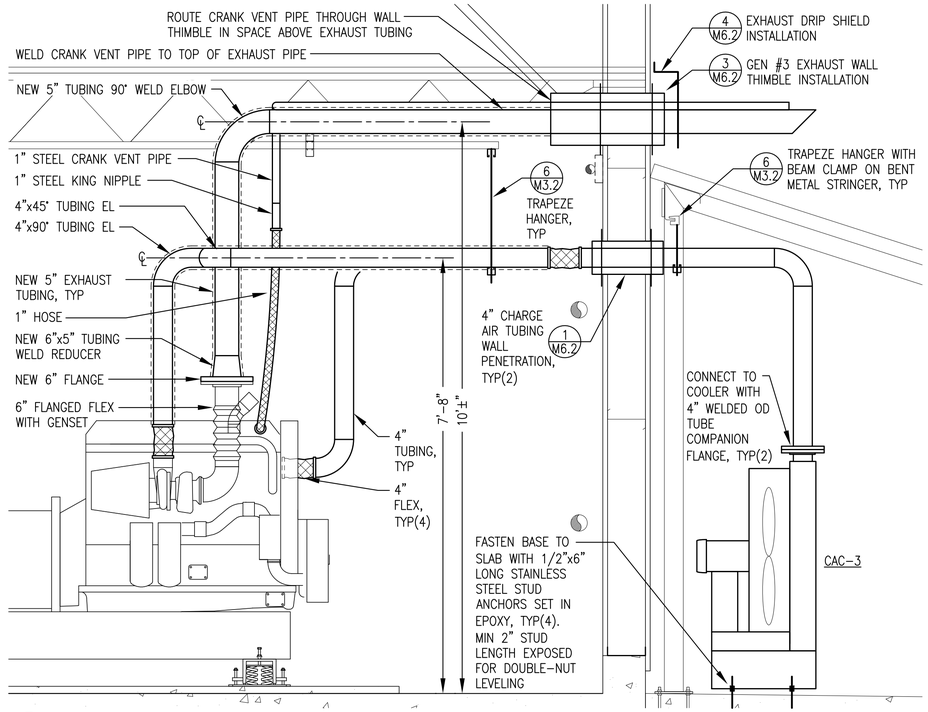
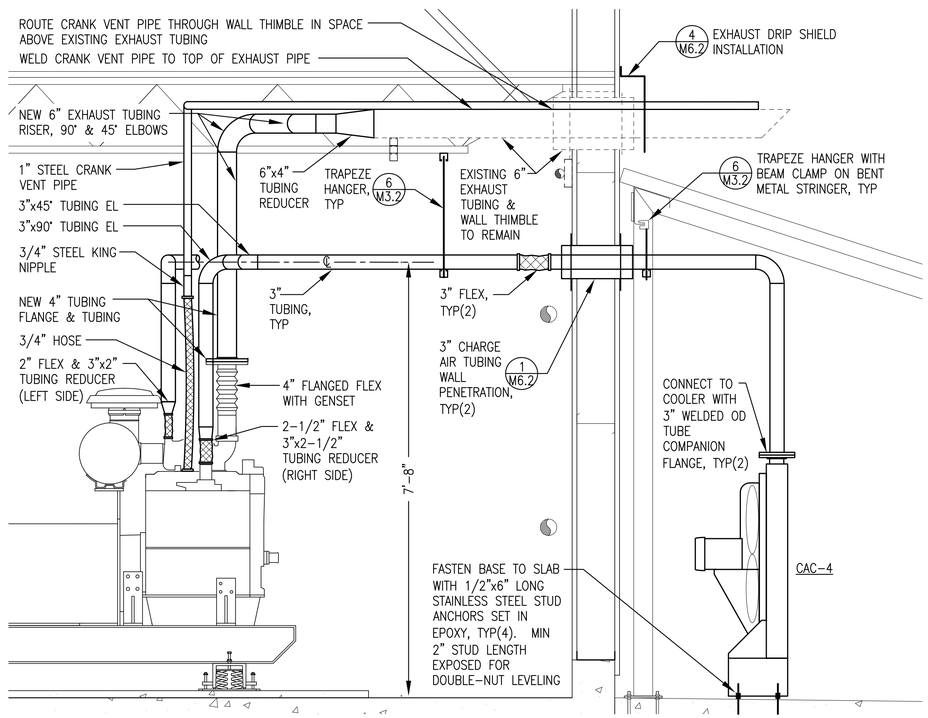
SHEET: M5.4 OF 6



1 M6.1 EXHAUST, CHARGE AIR TUBING & CRANK VENT PLAN
1/2"=1'0"



2 M6.1 GEN #3 EXHAUST, CHARGE AIR TUBING & CRANK VENT PIPE INSTALLATION
3/4"=1'0"



3 M6.1 GEN #4 EXHAUST, CHARGE AIR TUBING & CRANK VENT PIPE INSTALLATION
3/4"=1'0"

EXHAUST, CHARGE AIR & CRANK VENT SYSTEMS GENERAL NOTES:

1. ALL EXHAUST PIPE AND CHARGE AIR TUBING TUBING TO BE LIGHT WALL CARBON STEEL O.D. EXHAUST TUBING, SIZE AS INDICATED. ALL ELBOWS TO BE SHORT RADIUS FITTINGS TO MATCH TUBING. ALL JOINTS TO BE WELDED EXCEPT AS INDICATED.
2. ALL CRANK VENT PIPING TO SCHEDULE 40 STEEL PIPE WITH BUTT-WELD ELBOWS.
3. ENGINE EXHAUST FLEXES FURNISHED WITH GENERATORS.
4. ALL CHARGE AIR TUBING FLEX CONNECTIONS HIGH TEMPERATURE DOUBLE HUMP SILICONE TURBO SLEEVES WITH RINGS, 6" LONG BY DIAMETER INDICATED, TCFA-N##-R6 OR EQUAL. FASTEN WITH STAINLESS STEEL T-BOLT CLAMPS.
5. INSULATE INTERIOR ENGINE EXHAUST PIPING WITH 1-1/2" MEDIUM TEMPERATURE INSULATION FROM FLEX TO TO WALL PENETRATION.
6. INSULATE INTERIOR CHARGE AIR TUBING FROM FLEX AT ENGINE TO FLEX AT WALL PENETRATION WITH YARN TAPE, SEE SPECIFICATIONS.
7. MAKE COOLER CONNECTIONS WITH O.D. TUBE BY ANSI 125# STEEL PLATE FLANGES, G.T. EXHAUST PART #41 OR EQUAL. INSTALL HIGH TEMPERATURE FULL FACE STAINLESS STEEL AND GRAPHITE GASKETS, DURABLA BLACK OR EQUAL.

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH
BRIAN C. GRAY
ME 8210
REGISTERED PROFESSIONAL ENGINEER

Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE: EXHAUST, CHARGE AIR TUBING & CRANK VENT PLAN & DETAILS

Gray Stassel Engineering, Inc.
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FILE NAME: AVTEC M1-M6	SHEET: M6.1 OF 6
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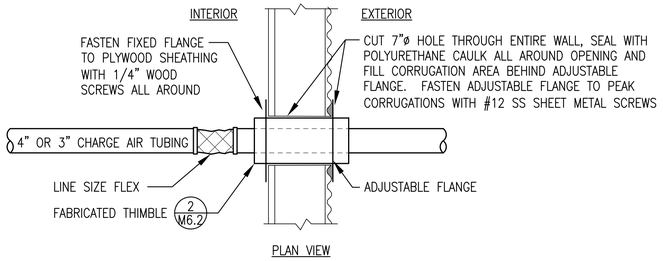
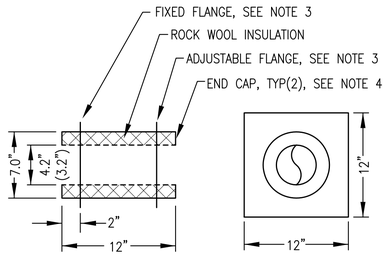


1 M6.2 TUBING WALL PENETRATION
NO SCALE

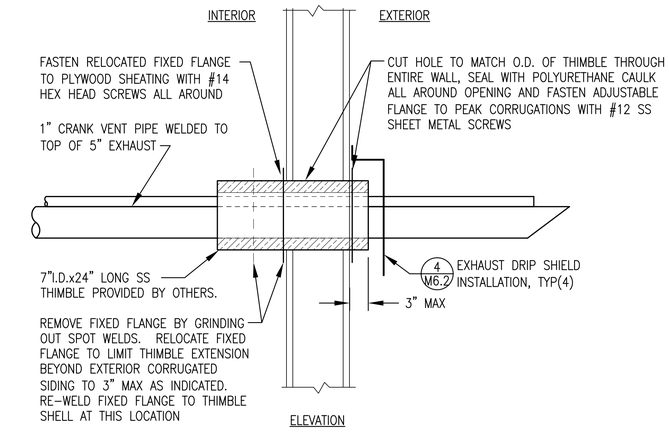


NOTES:

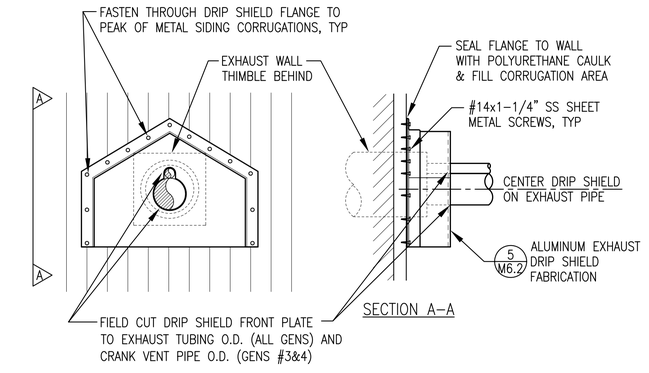
1) FABRICATE 2 EACH 4" (4.2"ID) AND 2 EACH 3" (3.2"ID) THIMBLES.
2) FABRICATE ENTIRE ASSEMBLY FROM MINIMUM 16 GAUGE TYPE 304 STAINLESS STEEL WITH ALL JOINTS SEAL WELDED.
3) FABRICATE TWO IDENTICAL SQUARE FLANGES. SEAL WELD FIXED FLANGE TO OUTER SHELL. ADJUSTABLE FLANGE TO SHIP LOOSE FOR FIELD INSTALLATION.
4) SEAL WELD END CAPS TO INNER AND OUTER SHELLS.

2 M6.2 4" AND 3" CHARGE AIR TUBING THIMBLE FABRICATION
NO SCALE

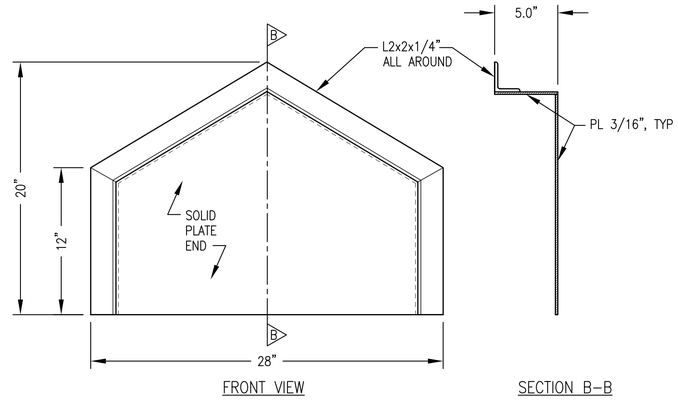
NOTE: FABRICATE 4 EACH IDENTICAL DRIP SHIELDS FROM TYPE 5052 ALUMINUM PLATE AND TYPE 6061-T6 ALUMINUM ANGLE USING CONTINUOUS SEAL WELDS FOR ALL JOINTS.



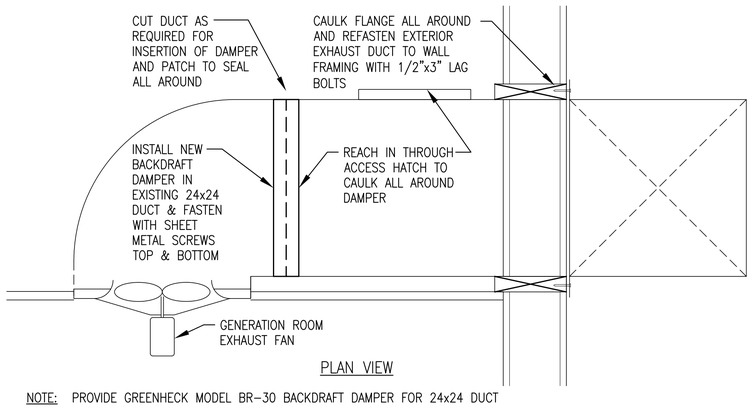
3 M6.2 GEN #3 EXHAUST THIMBLE INSTALLATION
NO SCALE



4 M6.2 TYPICAL EXHAUST DRIP SHIELD INSTALLATION
NO SCALE

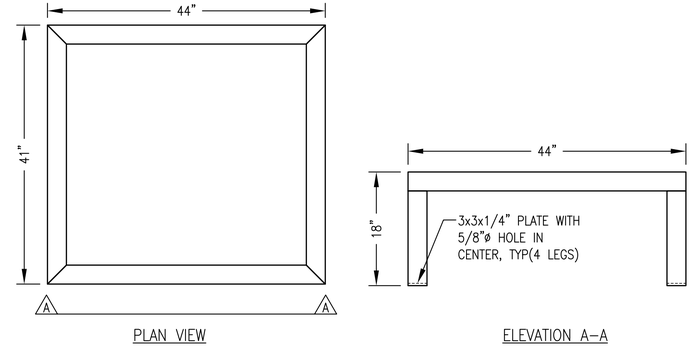


5 M6.2 ALUMINUM EXHAUST DRIP SHIELD FABRICATION
2"=1'-0"



NOTE: PROVIDE GREENHECK MODEL BR-30 BACKDRAFT DAMPER FOR 24x24 DUCT

6 M6.2 BACKDRAFT DAMPER INSTALLATION
NO SCALE



NOTE: FABRICATE ONE SUPPORT BASE FROM 3x3x1/4" TYPE 6061-T6 ALUMINUM ANGLE USING CONTINUOUS SEAL WELDS FOR ALL JOINTS.

7 M6.2 LOAD BANK LB-1 SUPPORT BASE FABRICATION
NO SCALE

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH
BRIAN C. GRAY
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PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE: EXHAUST & CHARGE AIR TUBING DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: NO SCALE
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FILE NAME: AVTEC M1-M6	SHEET: M6.2 OF 6
PROJECT NUMBER:	

SCHEDULE OF DRAWINGS

E1	SPECIFICATIONS, SCHEDULES & DETAILS
E2	SWITCHGEAR & POWER GENERATION SYSTEM MODIFICATIONS ONE-LINE DIAGRAM
E3	DEMOLTION PLAN & NOTES
E4	POWER, FEEDER, & CONTROL PLAN & DETAILS
E5.1	POWER, FEEDER, & CONTROL SECTIONS & DETAILS
E5.2	POWER, FEEDER, & CONTROL SECTIONS & DETAILS
E6	STATION SERVICE PLAN & DETAILS
E7.1	DAY TANK CONTROL PANEL LOGIC DIAGRAM & BILL OF MATERIALS
E7.2	DAY TANK CONTROL PANEL LAYOUT, INSTALLATION & TERMINAL STRIP
E7.3	DAY TANK CONTROL PANEL NOTES, SEQUENCE OF OPERATIONS & INTERCONNECT DETAILS

ELECTRICAL SPECIFICATIONS

** GENERAL CONDITIONS **

PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE INCLUDING STATE OF ALASKA AMENDMENTS.

THE DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY SHOW ALL FEATURES OF THE REQUIRED WORK. PROVIDE ALL EQUIPMENT AND MATERIALS REQUIRED FOR A COMPLETE SYSTEM. VERIFY EXISTING FIELD CONDITIONS PRIOR TO STARTING CONSTRUCTION. IMMEDIATELY CONTACT THE ENGINEER FOR CLARIFICATION OF QUESTIONABLE ITEMS OR APPARENT CONFLICTS.

ALL EQUIPMENT AND MATERIALS SHOWN ARE NEW UNLESS SPECIFICALLY INDICATED AS EXISTING. INSTALL ALL MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS, UNLESS INDICATED OTHERWISE.

PERFORM WORK WITH SKILLED CRAFTSMEN SPECIALIZING IN SAID WORK. INSTALL ALL MATERIALS IN A NEAT, ORDERLY, AND SECURE FASHION, AS REQUIRED BY THESE SPECIFICATIONS AND COMMONLY RECOGNIZED STANDARDS OF GOOD WORKMANSHIP.

DO NOT CUT, DRILL, OR NOTCH STRUCTURAL MEMBERS UNLESS SPECIFICALLY APPROVED BY THE ENGINEER. MINIMIZE PENETRATIONS AND DISRUPTION OF BUILDING FEATURES.

** SPECIAL CONDITIONS **

ENSURE THAT APPROPRIATE SAFETY MEASURES ARE IMPLEMENTED AND THAT ALL WORKERS ARE AWARE OF THE POTENTIAL HAZARDS FROM ELECTRICAL SHOCK, BURN, ROTATING FANS, PULLEYS, BELTS, HOT MANIFOLDS, NOISE, ETC. ASSOCIATED WITH WORKING NEAR POWER GENERATION AND CONTROL EQUIPMENT.

** DEVICES AND EQUIPMENT **

DEVICES – LISTED FOR INTENDED SERVICE. INSTALL ALL DEVICES SUCH THAT MINIMUM REQUIRED ACCESS CLEARANCE IS MAINTAINED.

SUPPORT – INDEPENDENTLY SUPPORT EACH DEVICE FROM BUILDING STRUCTURAL MEMBERS WITH CHANNEL STRUT OR FABRICATED BRACKETS UTILIZING APPROPRIATE FASTENERS. ALL FASTENERS SHALL BE GALVANIZED OR ZINC PLATED .

** RACEWAYS **

INTERIOR – ALL INTERIOR LOCATIONS SHALL BE ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR NEMA 1 SCREW COVER WIREWAY AS INDICATED. NOTE THAT EXISTING GENERATOR OVERHEAD CABLE TRAYS WILL BE RE-USED AS INDICATED.

EXTERIOR – ALL EXTERIOR LOCATIONS SHALL BE GALVANIZED RIGID CONDUIT (GRC) EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE. PROVIDE LIQUID TIGHT OIL RESISTANT FLEXIBLE CONDUIT WHERE INDICATED AND AS REQUIRED TO ACCOMMODATE MOVEMENT.

TERMINATION – FINAL CONNECTIONS TO DEVICES MAY BE WITH LIQUID TIGHT OIL RESISTANT FLEXIBLE CONDUIT EXCEPT WHERE INDICATED SPECIFICALLY AS LISTED FLEXIBLE CONNECTORS. CONDUITS TERMINATING IN EXTERIOR ENCLOSURES SHALL UTILIZE A WEATHERPROOF CONDUIT HUB. CONDUITS TERMINATING IN INDOOR ENCLOSURES SHALL UTILIZE LOCKNUTS INSIDE AND OUT WITH A METALLIC CONDUIT BUSHING, HUB, OR BOX CONNECTOR INSIDE THE ENCLOSURE.

SUPPORT – SUPPORT CONDUIT FROM BUILDING STRUCTURAL MEMBERS WITH CHANNEL STRUT AND PIPE CLAMPS OR PIPE HANGERS. DO NOT SUPPORT FROM CONNECTIONS TO EQUIPMENT. DO NOT USE PERFORATED STRAPS FOR SUPPORT.

** CONDUCTORS **

GROUNDING – PROVIDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN EACH RACEWAY AND DO NOT USE THE CONDUIT AS AN EQUIPMENT GROUNDING CONDUCTOR UNLESS SPECIFICALLY INDICATED OTHERWISE. EQUIPMENT GROUNDING CONDUCTORS SHALL BE OF CLASS AND SIZE AS INDICATED ON THE DRAWINGS. CONDUCTORS NOT INDICATED SHALL BE SIZED IN ACCORDANCE WITH THE NEC.

GENERAL USE CONDUCTORS – CLASS B CONCENTRIC STRANDED, SOFT DRAWN COPPER. TYPE XHHW INSULATION, 600V AND 75C RATED.

GENERATOR FEEDERS – RE-USE/REINSTALL EXISTING 105°C COBRA AND 90°C CONDUMEX CABLE AS INDICATED. TERMINATE AND SPLICE WITH LUGS AND CONNECTORS RATED FOR THE FULL AMPACITY OF THE CABLE AT 90°C MINIMUM.

COLOR CODING – UNLESS SPECIFICALLY INDICATED OTHERWISE CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS:

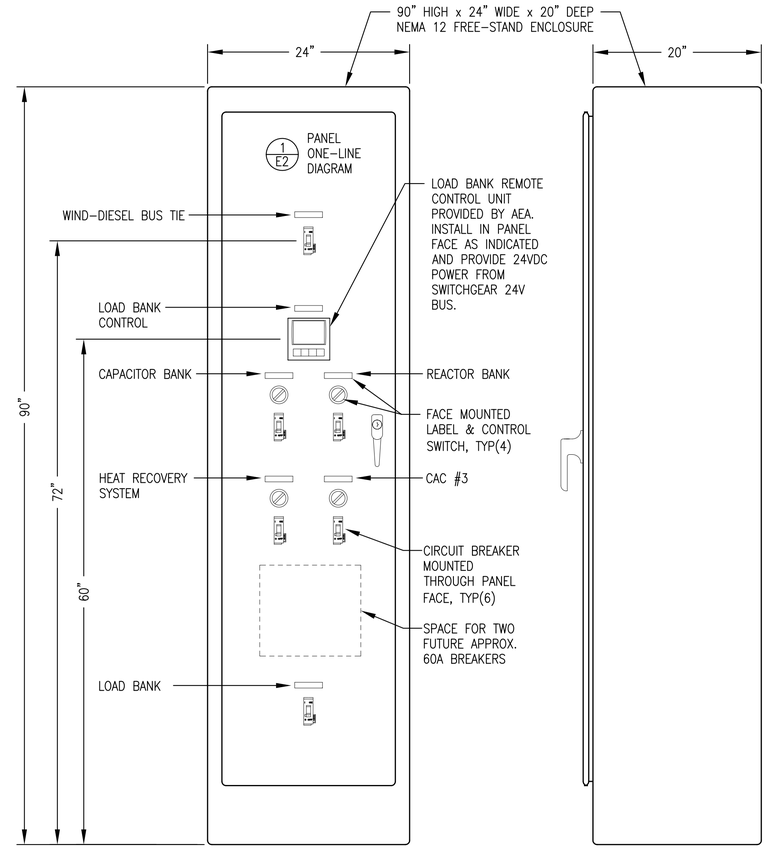
120/208-VOLT POWER CONDUCTORS
PHASE A – BLACK
PHASE B – RED
PHASE C – BLUE
NEUTRAL – WHITE

FOR NO. 6 AWG AND SMALLER CONDUCTORS COLOR CODING SHALL BE PROVIDED BY USING CONDUCTORS WITH CONTINUOUS COLOR EMBEDDED IN THE INSULATION. FOR ALL CONDUCTORS LARGER THAN NO. 6 SCOTCH 35 MARKING TAPE OR EQUIVALENT MAY BE USED TO COLOR CODE THE CABLE. WHERE MARKING TAPE IS USED THE CABLE SHALL BE IDENTIFIED AT EVERY ACCESSIBLE LOCATION. PROVIDE A MINIMUM OF 2 INCHES OF TAPE AT EACH LOCATION.

SHIELDED CONDUCTORS – STRANDED TINNED COPPER CONDUCTORS, 600V POLYETHYLENE INSULATION, 100% COVERAGE ALUMINUM FOIL-POLYESTER TAPE SHIELD WITH A STRANDED TINNED COPPER DRAIN WIRE, AND PVC OUTER JACKET. SINGLE PAIR TWISTED #18 AWG, BELDEN #1120A OR EQUAL.

ELECTRICAL EQUIPMENT SCHEDULE

ITEM NO.	DESCRIPTION	MANUFACTURER
1	MULTI-TONE ALARM WITH STROBE, 115V, NEMA 3R, WEATHER RESISTANT SURFACE MOUNT BELL BOX	WHEELOCK MT4-115-WH-VNS
2	DAY TANK VERTICAL ACTION FLOAT SWITCH, REVERSIBLE 70VASPST NC/NO SWITCH, 1/8" NPT, 1"MAX ø BUNA-N FLOAT FOR S.G=.47, MINIMUM 60" LONG PVC COATED #20 AWG LEAD WIRES	INNOVATIVE COMPONENTS LS-12-111/2
9	0-5 MINUTE TIMER SWITCH, 120V, 20A, 1HP RATED, INSTALL IN 4"x4" CAST BELL BOX WITH METAL COVER.	INTERMATIC FF5M
11	SINGLE POLE SNAP SWITCH WITH RED PILOT LIGHT, 120V, 20A, 1-1/2HP RATED, INSTALL IN 4"x4" PRESSED STEEL BOX WITH METAL COVER	HUBBELL 1221-PL
17	12/24-VOLT SOLID STATE 20-AMP AUTO-EQUALIZING BATTERY CHARGER FOR 120 VOLT AC INPUT, WITH OPTIONAL HIGH/LOW VOLTAGE, AC POWER FAILURE, & REMOTE SUMMARY ALARM RELAYS	SENS NRG22-20-RCLS
18	TEMPERATURE TRANSMITTER, RTD, 20-240°F RANGE, 4-20mA OUTPUT, 1/2" NPT PIPING CONNECTION, 6mm DIAMETER BY 2.5" LONG STEM, HIRSCHMANN ELECTRICAL CONNECTION	NOSHOK 800-20/240-1-1-8-8-025-6
19	PRESSURE TRANSMITTER, 0-60 PSIG RANGE, 4-20mA OUTPUT, 1/4" NPT PIPING CONNECTION, HIRSCHMANN ELECTRICAL CONNECTION	NOSHOK 100-60-1-1-2-7
20	NON-FUSED LOCKABLE SAFETY SWITCH, NEMA 3R ENCLOSURE, 3PST, 120/240V, 30A, MIN 3HP RATED	SIEMENS GNF321NR
21	NON-FUSED LOCKABLE SAFETY SWITCH, NEMA 3R ENCLOSURE, 3PST, 600V, 400A	SIEMENS HNF365R
22	TOP-MOUNT TANK PROBE WITH INSTALLATION KIT FOR 2" NPT RISER, WATER TIGHT COMPRESSION GLAND FITTING FOR CABLE ENTRANCE. FRANKLIN FUEL SYSTEMS, NO SUBSTITUTES. PROBE AND RISER LENGTH AS INDICATED IN TANK INSTALLATION DETAILS.	4' TANK PROBE: TSP-LL2-53-I FLOAT: INTSP-IDF2 2" FOR DIESEL INSTALLATION KIT: TSP-K2A
23	LOAD BANK LB-1, UL LISTED, FREESTANDING HORIZONTAL AIRFLOW, FORCED AIR COOLED TYPE 3R RESISTIVE LOAD BANK. 100KW, 208V, 3-PHASE, 60HZ. 10-20-20-50KW LOAD STEPS. EXTERNALLY POWERED, 120V-1-60 THERMOSTATICALLY CONTROLLED ANTI CONDENSATION HEATERS IN CONTACTOR SECTION OF LOAD BANK ENCLOSURE. REMOTE INDOOR WALL MOUNT ENCLOSURE WITH MANUALLY OPERATED DIGITAL TOUCH PANEL CONTROLLER (HMI)	SIMPLEX POLARIS PS-100-2083-60-R-M-010
24	POWER FACTOR CORRECTION FIXED CAPACITOR, RATED 20 kVAR @ 240V (OPERATING 15 kVAR @ 208V), 3 PH, NEMA 1 UNIPAK, STANDARD DUTY ROUND CELL	EATON 20-2-3-PM-U-R-N
25	POWER FACTOR CORRECTION FIXED REACTOR, IRON CORE, 15KVAR, 208VAC, 3 PHASE, 50AMPS, 15.8 MILLI H INSULATION CLASS, 220C TEMPERATURE RISE.	REX POWER MAGNETICS 50C15800E6-3



1 / E1 NEW FEEDER CABINET ENCLOSURE LAYOUT
NO SCALE

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

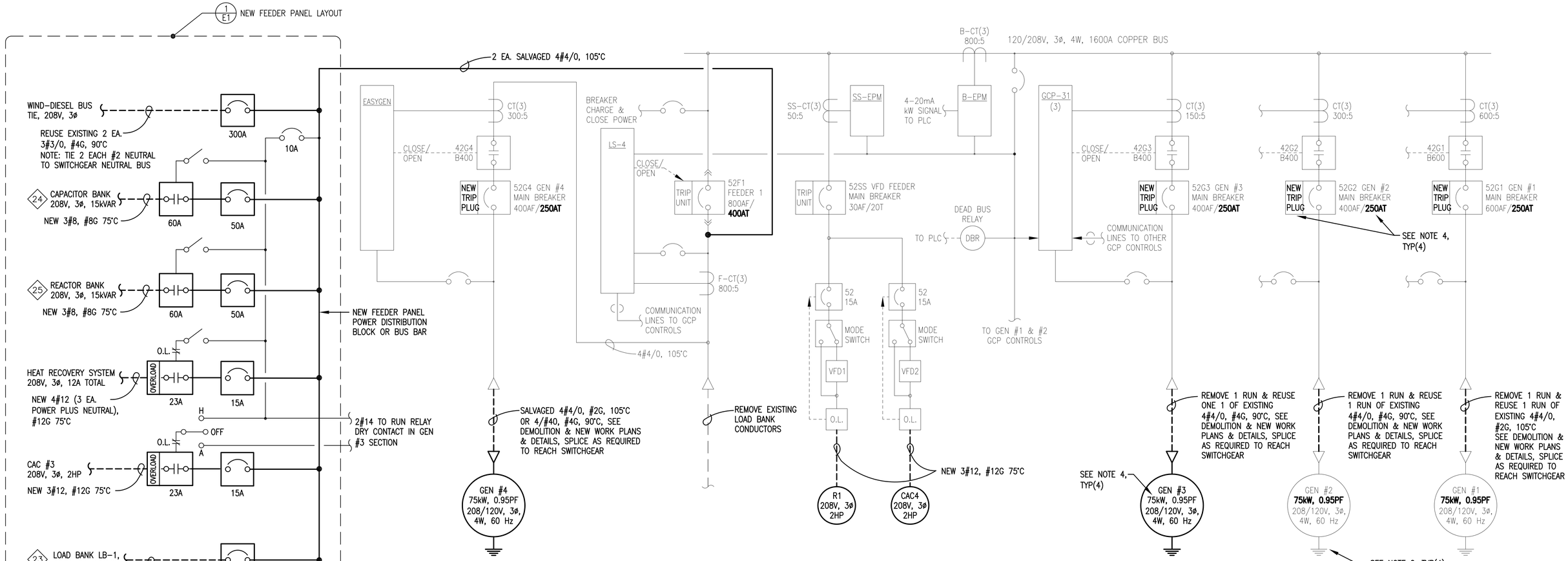
Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE: SPECIFICATIONS, SCHEDULES & DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: CWV/BCG	DATE: 6/22/15
FILE NAME: AVTEC E1-E6	SHEET: E1 OF 7
PROJECT NUMBER:	



NOTES:

1. ALL EXISTING/UNMODIFIED DEVICES/WIRING/EQUIPMENT SHOWN LIGHT. ALL NEW/MODIFIED DEVICES/WIRING/EQUIPMENT SHOWN DARK
2. ISOLATE EACH GENERATOR NEUTRAL FROM MOUNTING SKID & GENERATOR FRAME. CONNECT NEUTRAL TO THE NEUTRAL BUS AT THE PARALLELING SWITCHGEAR. INDEPENDENTLY GROUND EACH GENERATOR FRAME TO SWITCHGEAR GROUND BUS & PROVIDE SECOND GROUND DIRECTLY TO PLANT GROUND GRID.
3. GENERATOR AND LARGE EQUIPMENT POWER CONDUCTORS ARE A COMBINATION OF NEW AND EXISTING. TERMINATE WITH COPPER COMPRESSION LUGS RATED FOR THE FULL AMPACITY OF THE CABLE AT RATED TEMPERATURE.
4. REVISE DEMAND CONTROL SETTINGS TO LIMIT ALL GENERATORS TO 75kW REGARDLESS OF ENGINE OR GENERATOR CAPACITY. REPLACE BREAKER TRIP PLUGS AS INDICATED TO MATCH 75kW RATING AND TO OPERATE WITHIN AMPACITY OF EXISTING POWER CONDUCTORS.
5. PROVIDE AN AIR INTAKE DAMPER RELAY IN MASTER SECTION TO PROVIDE 120V, 10A POWER FOR OPENING DAMPER WHEN ANY ENGINE STARTS

1/E2 SWITCHGEAR & POWER GENERATION SYSTEM MODIFICATIONS ONE-LINE DIAGRAM

NO SCALE

SWITCHGEAR SYMBOL LEGEND

- CURRENT TRANSFORMER M.R. – INDICATES MULTIRATIO CT'S RATING FACTOR RF=2.0
- CONTACTOR WITH AMPERE RATING
- CIRCUIT BREAKER AT=AMP TRIP RATING AF=AMP FRAME RATING
- BUS/SWITCHGEAR POWER WIRING
- FIELD POWER WIRING
- CONTROL WIRING

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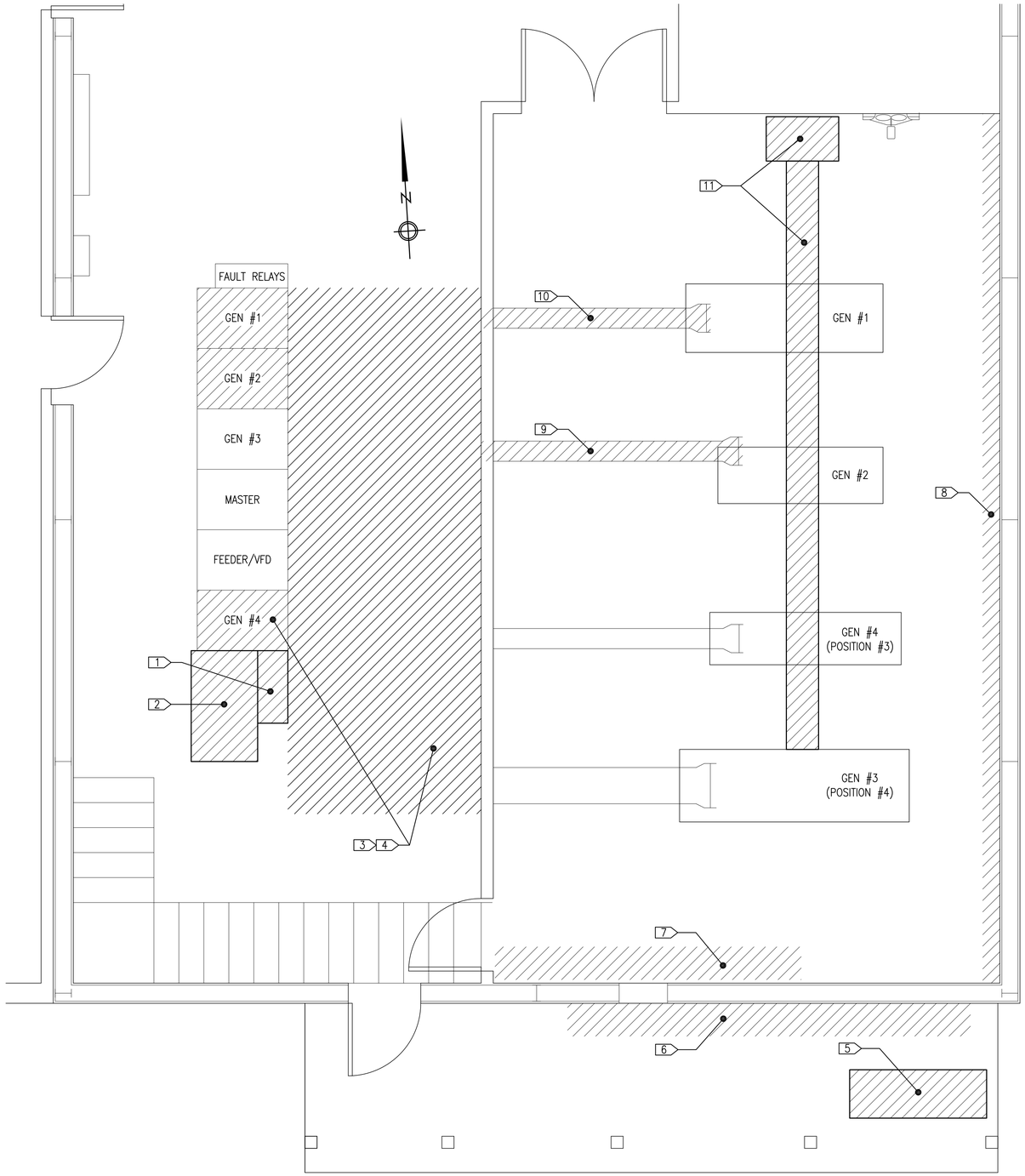
PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE: SWITCHGEAR & POWER GENERATION SYSTEM MODIFICATIONS ONE-LINE DIAGRAM

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: CWV/BCG	DATE: 6/22/15
FILE NAME: AVTEC E1-E6	SHEET: E2 OF 7
PROJECT NUMBER:	



1 E3 DEMOLITION PLAN
3/8"=1'-0"

DEMOLITION GENERAL NOTES:

1) ALL ITEMS TO REMAIN UNLESS SPECIFICALLY INDICATED FOR DEMOLITION.

2) ENSURE ALL EQUIPMENT AND CIRCUITS ARE DE-ENERGIZED PRIOR TO BEGINNING DEMOLITION. LOCK AND TAG OUT ALL CIRCUIT BREAKERS AND DISCONNECTS.

3) TAKE ALL PRECAUTIONS TO MINIMIZE DAMAGE TO ELECTRICAL EQUIPMENT BEING REMOVED DURING DEMOLITION. TARP ALL EQUIPMENT AND SEAL ALL EXPOSED OPENINGS PRIOR TO REMOVING FROM PLANT. STORE ALL REMOVED CONDUCTOR, CONDUIT & FITTINGS FOR POSSIBLE REUSE. TURN ALL REMOVED EQUIPMENT OVER TO AVTEC FOR FINAL DISPOSITION IF NOT REUSED.

DEMOLITION SPECIFIC NOTES:

1. REMOVE EXISTING POWER SWITCH BOARD ALONG WITH ALL CONDUCTORS EXCEPT MECHANIC SHOP SOUTH FEEDER CONDUIT & CONDUCTORS TO REMAIN FOR RECONNECTION TO NEW PANEL.

2. REMOVE EXISTING MAIN LOAD BANK ALONG WITH ALL POWER/CONTROL CONDUCTORS AND FAN DUCTING.

3. DISCONNECT GENERATOR POWER & CONTROL CONDUCTORS FROM SWITCHGEAR. CAREFULLY PULL FROM SWITCHGEAR CABINETS, REMOVE FROM EXISTING CONTROL ROOM OVERHEAD CONDUIT/WIRE TRAY AND COIL IN SECURE LOCATION FOR REINSTALLATION AND/OR SALVAGING FOR REUSE ELSEWHERE.

4. DEMOLISH ALL OVERHEAD CABLE TRAY AND STRUT THIS AREA UNLESS INDICATED OTHERWISE ON NEW WORK PLAN. CAREFULLY REMOVE LIGHT FIXTURES AND SAVE FOR REUSE. PROVIDE TEMPORARY SUPPORT FOR STATION SERVICE CONDUIT & DEVICES TO REMAIN.

5. REMOVE EXISTING EXTERIOR LOAD BANK ALONG WITH ALL POWER/CONTROL CONDUCTORS.

6. REMOVE ALL CONDUIT/CONDUCTOR/DEVICES FOR DEMOLISHED EQUIPMENT THIS AREA. SEE MECHANICAL FOR EQUIPMENT DEMOLITION.

7. REMOVE ALL ABANDONED PUMP AND DAY TANK CIRCUIT CONDUIT/CONDUCTOR/DEVICES THIS AREA.

8. REMOVE CONDUCTOR & CONDUIT FOR EXISTING USED OIL PUMP AND RECEPTACLE CIRCUIT ON EAST WALL AND SAVE FOR FUTURE REUSE.

9. REMOVE ONE RUN OF EXISTING CIC (1 EA. CONDUMEX 4-#4/0 TYPE TC WITH #4 TYPE THHN GROUND IN 2" HDPE DUCT). TAKE CARE TO AVOID DAMAGING AND STORE FOR POSSIBLE REUSE. CABLE TRAY AND ONE RUN OF EXISTING CONDUMEX TO REMAIN.

10. REMOVE ONE RUN OF EXISTING POWER CONDUCTORS (4 EA. #4/0 COBRA TYPE AWM-I 105° C CABLE AND 1 EA. #2 BARE COPPER GROUND). TAKE CARE TO AVOID DAMAGING AND STORE FOR POSSIBLE REUSE. CABLE TRAY AND ONE EXITING RUN OF POWER CONDUCTORS TO REMAIN.

11. DEMOLISH EXISTING BATTERY CHARGING AREA AND OVERHEAD CABLE TRAY. SAVE BATTERIES, CHARGER AND CABLE FOR POSSIBLE FUTURE REUSE.

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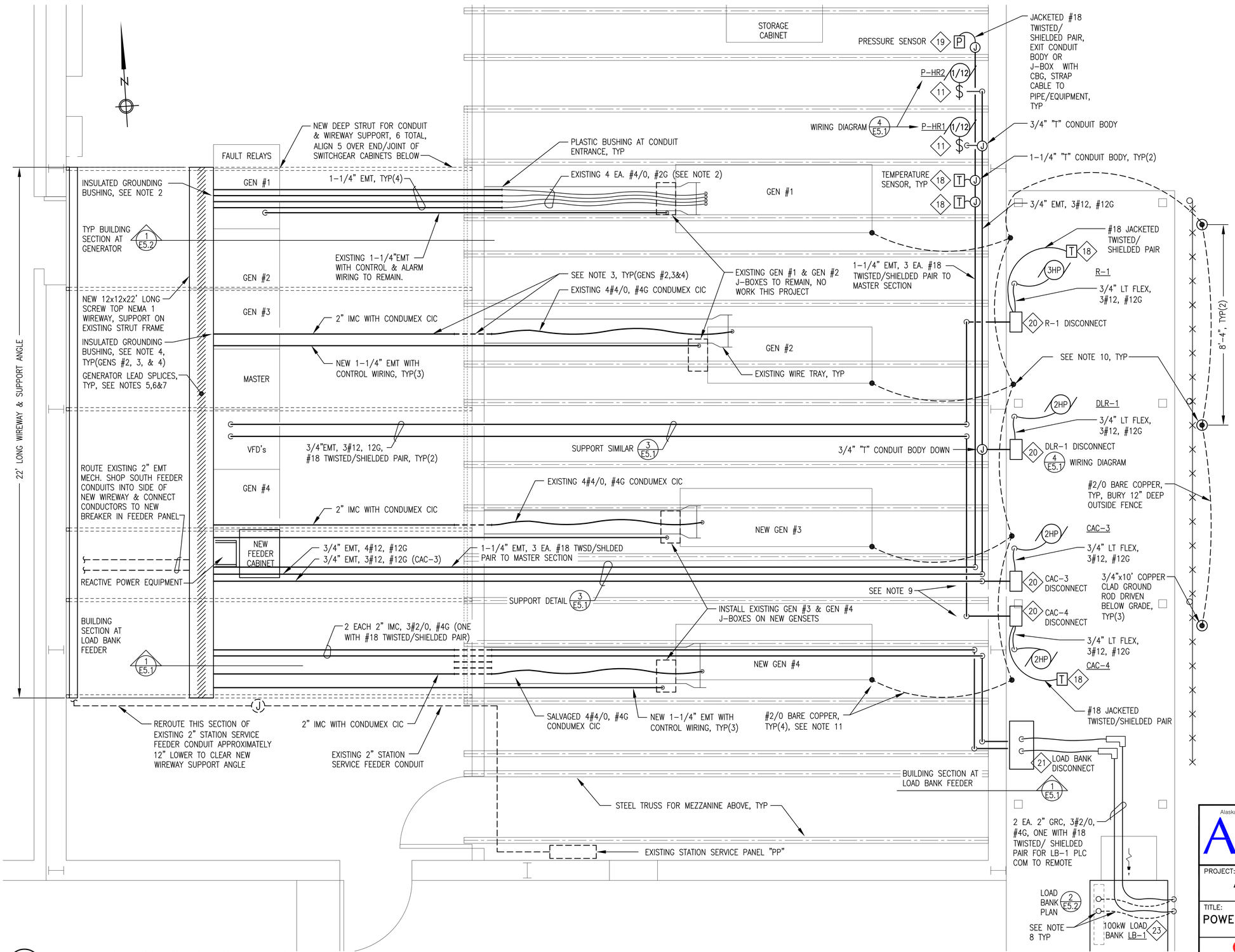
Alaska Energy Authority

PROJECT:
AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE:
DEMOLITION PLAN & NOTES

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: NO SCALE
DESIGNED BY: CWV/BCG	DATE: 6/22/15
FILE NAME: AVTEC E1-E6	SHEET: E3 OF 7
PROJECT NUMBER:	



1/E4 POWER, FEEDER, CONTROL & GROUNDING PLAN
1/2"=1'-0"

NOTES:

1. ALL EXISTING GENERATOR CONDUCTORS ARE TOO SHORT FOR PROPER DROPS INTO BACK OF SWITCHGEAR CABINETS. FOLLOWING NOTES 2-7 PROVIDE INSTRUCTIONS FOR SPLICING SALVAGED CONDUCTOR TO EXISTING GENERATOR LEADS FOR RE-ROUTING CONDUCTORS TO SWITCHGEAR CABINETS. SEE DEMOLITION INSTRUCTIONS FOR REMOVAL/SALVAGING OF EXTRA CONDUCTORS IN PREPARATION FOR THIS WORK.
2. RUN EXISTING #2 BARE COPPER MAIN GROUNDING CABLE WITH ONE POWER CONDUCTOR IN ONE CONDUIT. TIE ALL CONDUIT GROUNDING BUSHINGS TO EACH OTHER AND TO MAIN GROUNDING CABLE IN NEW CONTROL ROOM WIREWAY.
3. ROUTE REMAINING EXISTING GENERATOR CONDUCTORS INTO NEW CONDUIT AND ACROSS CONTROL ROOM TO NEW WIREWAY OVER SWITCHGEAR CABINETS AS INDICATED IN PLAN. USE EXISTING 2" GRC NIPPLE (SHOWN DASHED) FOR WALL PENETRATION WHERE AVAILABLE. OTHERWISE, INSTALL NEW 2"x24" LONG IMC NIPPLE THROUGH WALL.
4. REMOVE CABLE JACKET FROM ALL CONDUMEX CIC CABLES AFTER ENTERING WIREWAY FOR ACCESS TO INDIVIDUAL CONDUCTORS AND GROUND CABLE. TIE CONDUIT GROUNDING BUSHING TO MAIN GROUNDING CABLE IN NEW CONTROL ROOM WIREWAY.
5. LAYOUT EXISTING/SALVAGED GENERATOR CONDUCTORS IN WIREWAY AND CUT IN STAGGERED LENGTHS FOR SPLICE CONNECTIONS, TYP(4 GENERATORS).
6. CONNECT SALVAGED CONDUCTORS TO BREAKERS IN GENERATOR SECTION AND ROUTE UP TO WIREWAY AS INDICATED. CUT SALVAGED CONDUCTORS FROM BREAKERS TO MATCH EXISTING STAGGERED GENERATOR CONDUCTORS IN WIREWAY, TYP(4 GENERATORS).
7. CONNECT EXISTING/SALVAGED GENERATOR CONDUCTORS TO NEW/SALVAGED CONDUCTORS IN WIREWAY WITH INSULATED POWER DISTRIBUTION SPLICE KITS RATED FOR 90° C MINIMUM, SIZED TO MATCH CONDUCTOR DIAMETERS.
8. CONNECT OVERHEAD GRC TO DISCONNECT AND TO LOAD BANK WITH 2" LIQUID TIGHT FLEX, SEE SHEET E5.2
9. ROUTE CONDUIT CLEAR OF CHARGE AIR TUBING AREAS FOR GEN #4 AND FUTURE GEN #3. SEE MECHANICAL FOR TUBING LOCATIONS.
10. CAD-WELD ALL GROUNDING GRID CABLE AND GROUND ROD CONNECTIONS.
11. ROUTE #2 GROUND WITH FUEL PIPING AND BOND TO GENSET SKID WITH MECHANICAL LUG. VERIFY THAT INTERNAL GENERATOR GROUND IS SECURELY BONDED TO FRAME/SKID.

STATE OF ALASKA 49TH
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ISSUED FOR CONSTRUCTION
JUNE 2015

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PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE: POWER, FEEDER, CONTROL & GROUNDING PLAN & DETAILS

Gray Stassel Engineering, Inc.
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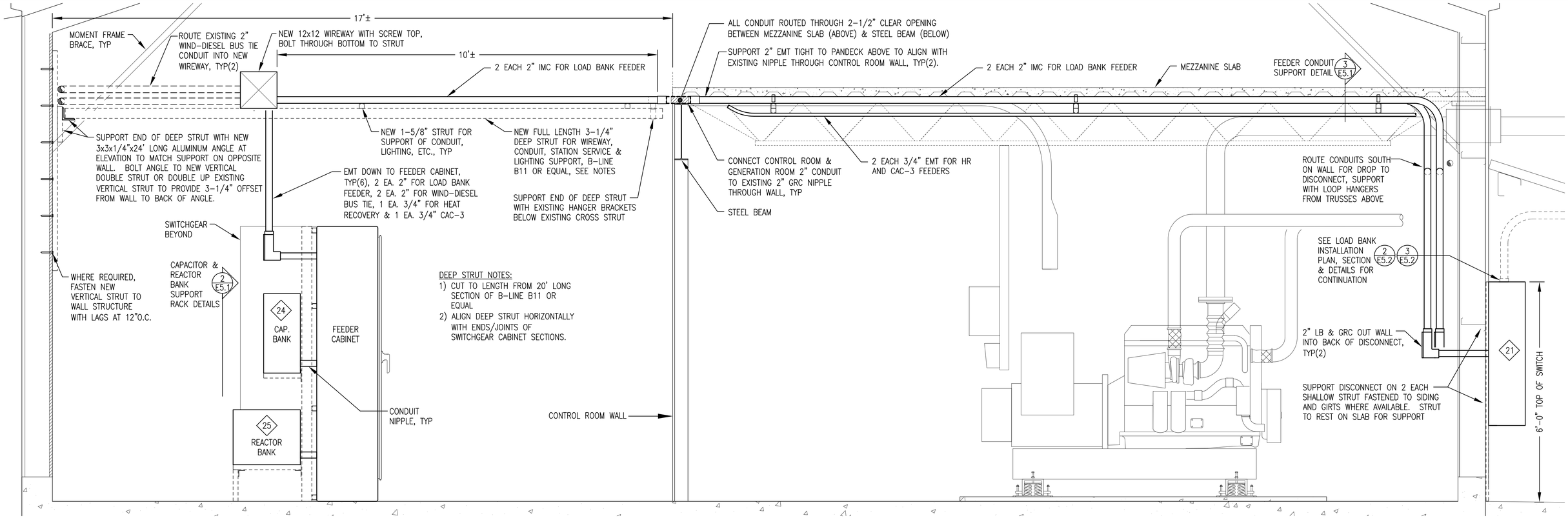
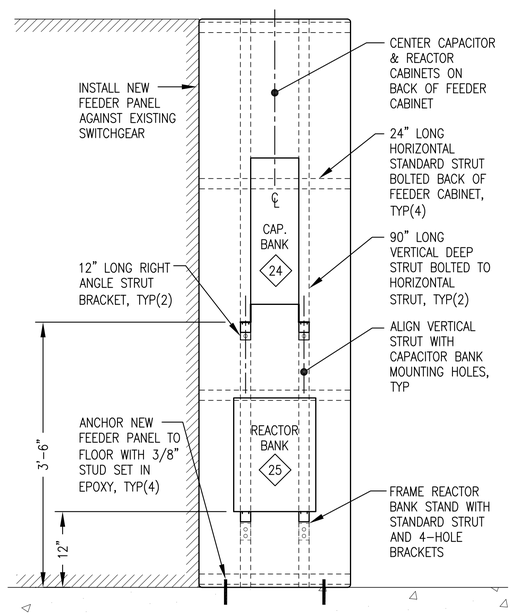
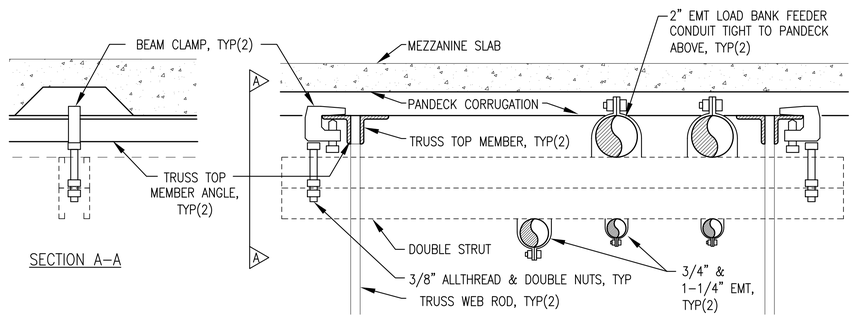
DESIGNED BY: CWV/BCG	DATE: 6/22/15
FILE NAME: AVTEC E1-E6	SHEET: E4 OF 7
PROJECT NUMBER:	



1 E5.1 BUILDING SECTION AT LOAD BANK FEEDER
3/4"=1'-0"



2 E5.1 CAPACITOR & REACTOR BANK SUPPORT RACK
NO SCALE



3 E5.1 CONDUIT SUPPORT DETAIL
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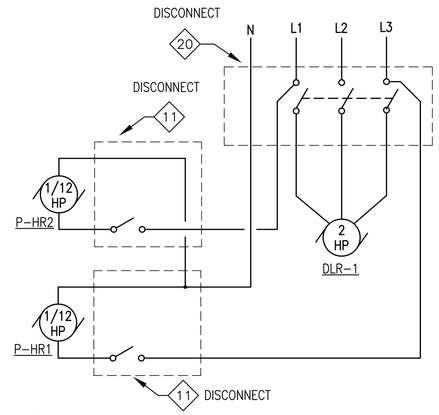

4 E5.1 HEAT RECOVERY SYSTEM WIRING DIAGRAM
NO SCALE

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STATE OF ALASKA 49TH
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PROJECT: AVTEC POWER PLANT TRAINING FACILITY UPGRADE

TITLE: POWER, FEEDER & CONTROL SECTIONS & DETAILS

Gray Stassel Engineering, Inc.
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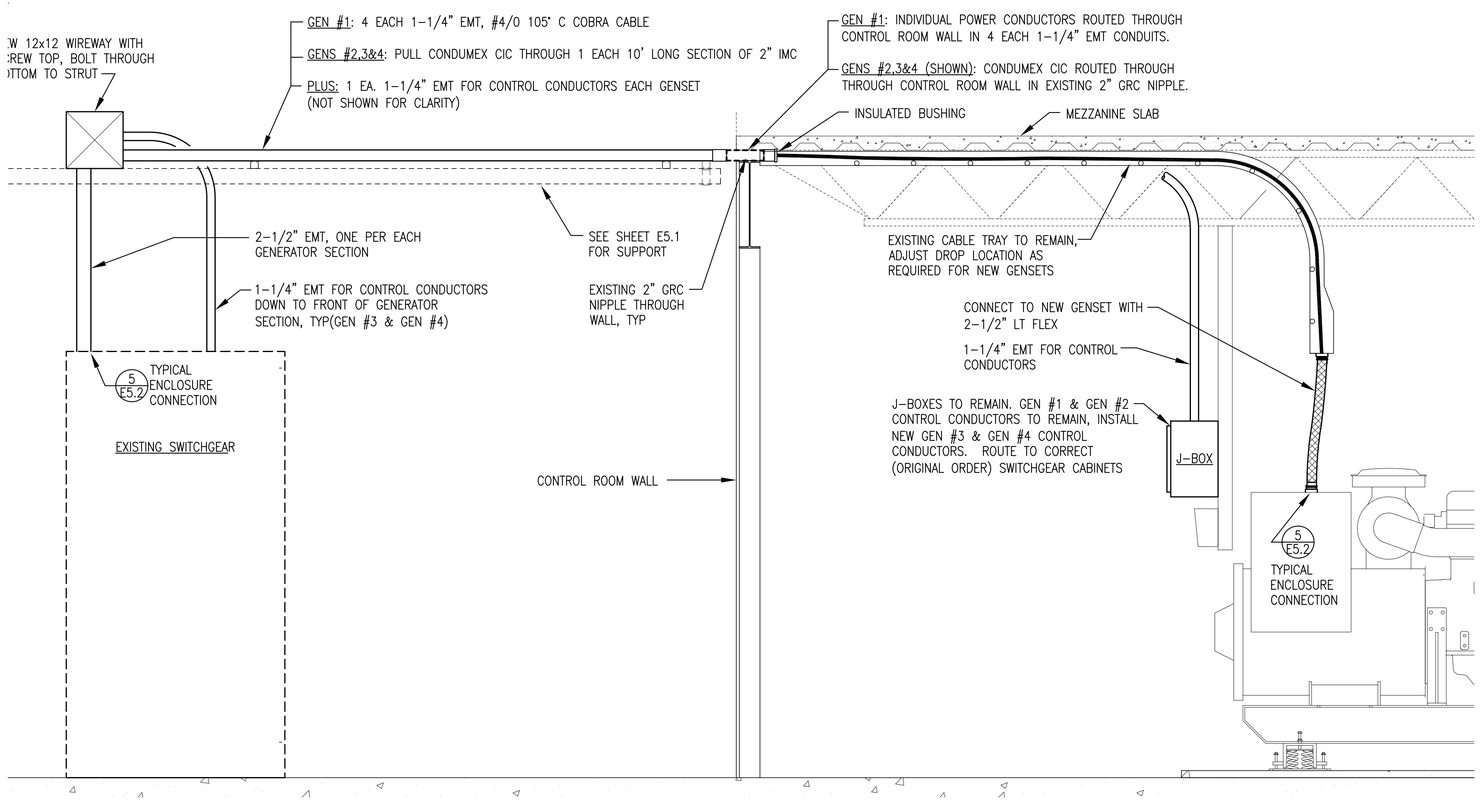
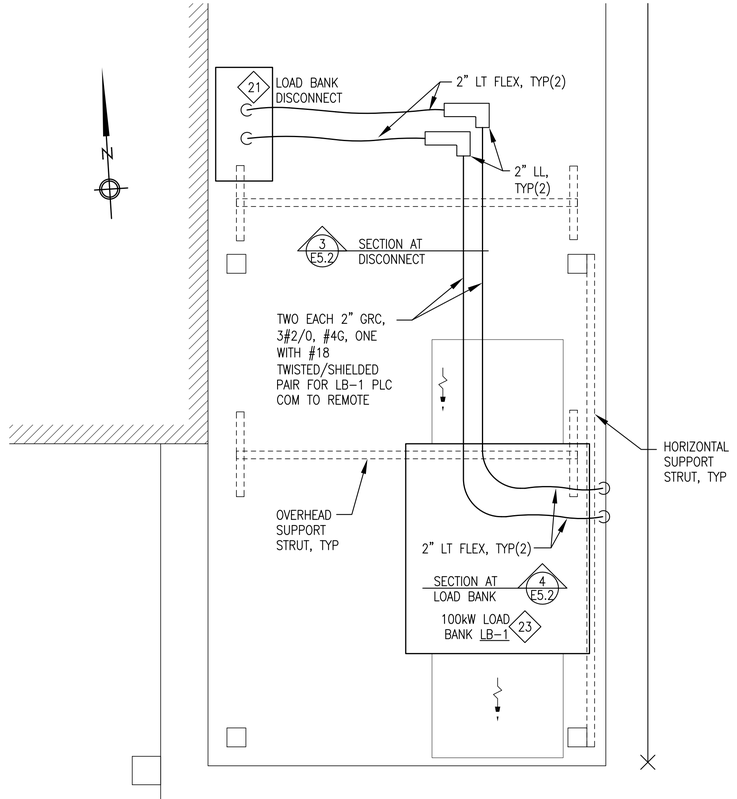
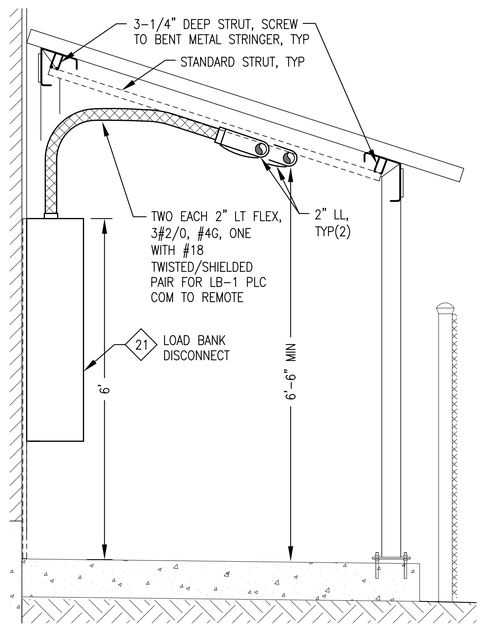
FILE NAME: AVTEC E1-E6	SHEET: E5.1 OF 7
PROJECT NUMBER:	



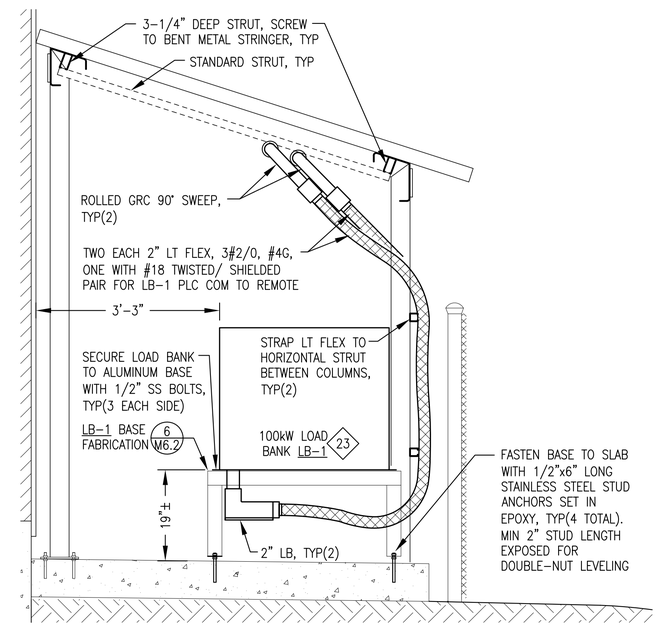
1 E5.2 TYPICAL BUILDING SECTION AT GENERATOR
3/4"=1'-0"



2 E5.2 LOAD BANK PLAN
3/4"=1'-0"

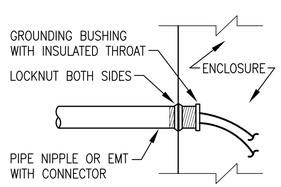


3 E5.2 SECTION AT LOAD BANK DISCONNECT
3/4"=1'-0"



4 E5.2 SECTION AT LOAD BANK
3/4"=1'-0"

NOTE: THIS DETAIL APPLIES TO ALL CONNECTIONS TO WIREWAY, GENERATOR ENCLOSURES, SWITCHGEAR, AND PANELS. ON GENERATOR ENCLOSURES MAKE ALL CONNECTIONS AS TIGHT AS POSSIBLE.



5 E5.2 TYP ENCLOSURE CONNECTION
NO SCALE

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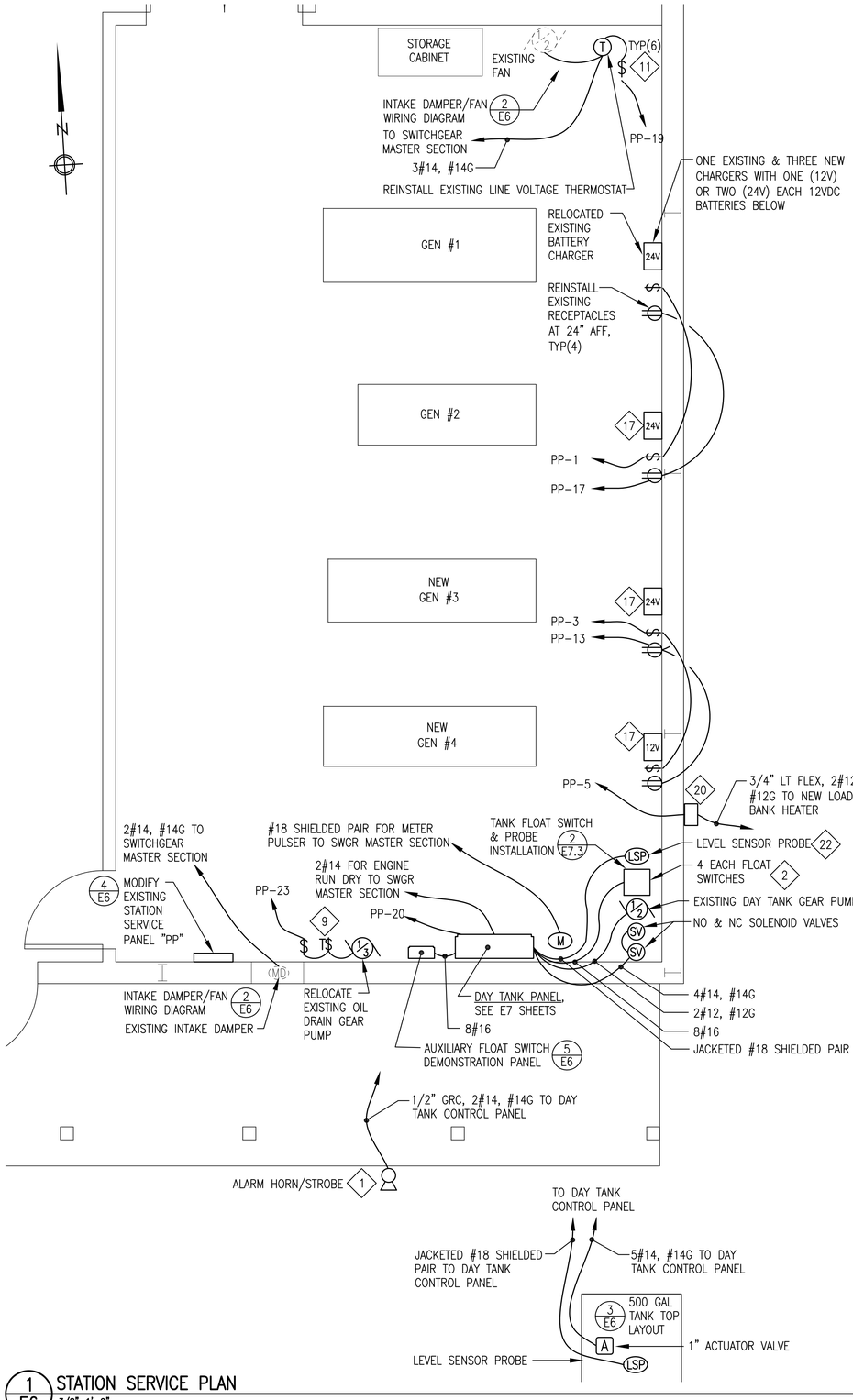
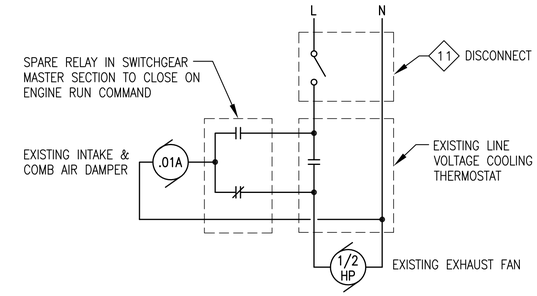
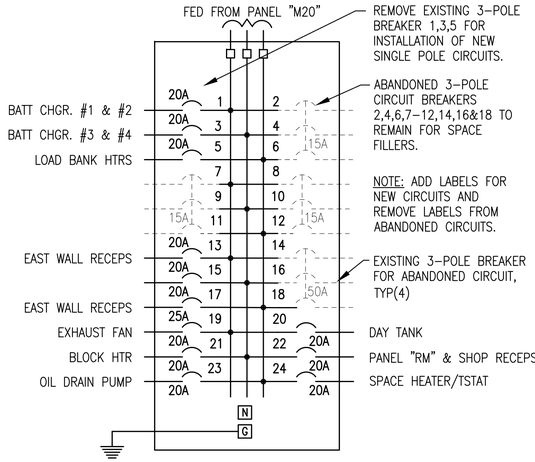
PROJECT NUMBER:	



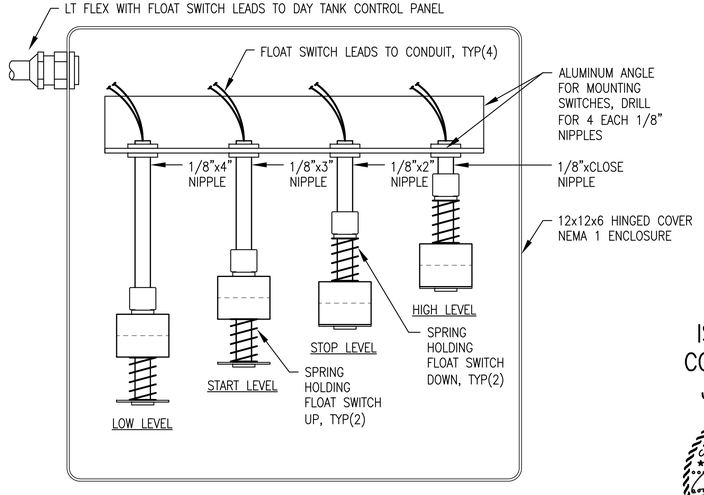
1 E6 STATION SERVICE PLAN
3/8"=1'-0"



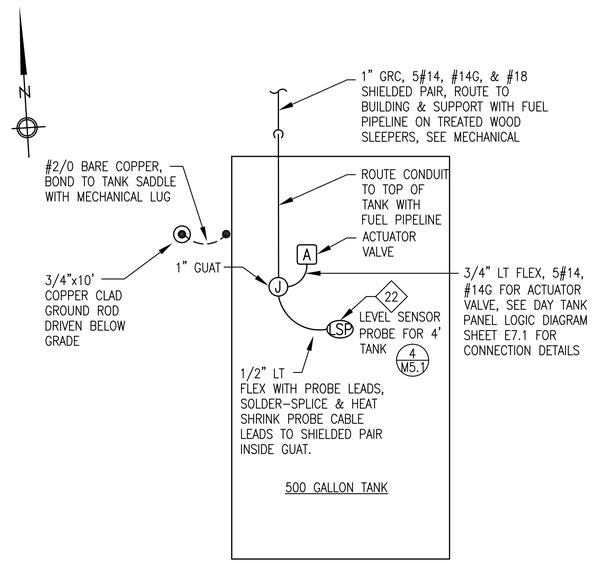
2 E6 EXHAUST FAN/COMBUSTION AIR DAMPER WIRING DIAGRAM
NO SCALE



4 E6 STATION SERVICE PANEL "PP" MODIFICATIONS
NO SCALE



5 E6 AUXILIARY FLOAT SWITCH DEMONSTRATION PANEL
NO SCALE



3 E6 500 GALLON TANK TOP LAYOUT
NO SCALE

BUILDING PLANS SYMBOL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
SS-##	HOME RUN TO PANEL & BREAKER(S) INDICATED. SHORT DASH INDICATES HOT CONDUCTOR, LONG DASH INDICATES NEUTRAL CONDUCTOR, CURVED DASH INDICATES GROUND CONDUCTOR. IF NOT SPECIFICALLY INDICATED, PROVIDE 2#12 AWG & 1#12 AWG GROUND.	MD	MOTORIZED DAMPER – SEE MECHANICAL
			125V, 20A, DUPLEX RECEPTACLE
		T	LINE VOLTAGE THERMOSTAT
#	ELECTRICAL ITEM – SEE EQUIPMENT SCHEDULE ON SHEET E6	$	SNAP SWITCH / SMALL MOTOR DISCONNECT
		T$	TIMER SWITCH
1/4	MOTOR (HORESPOWER INDICATED)		GROUND

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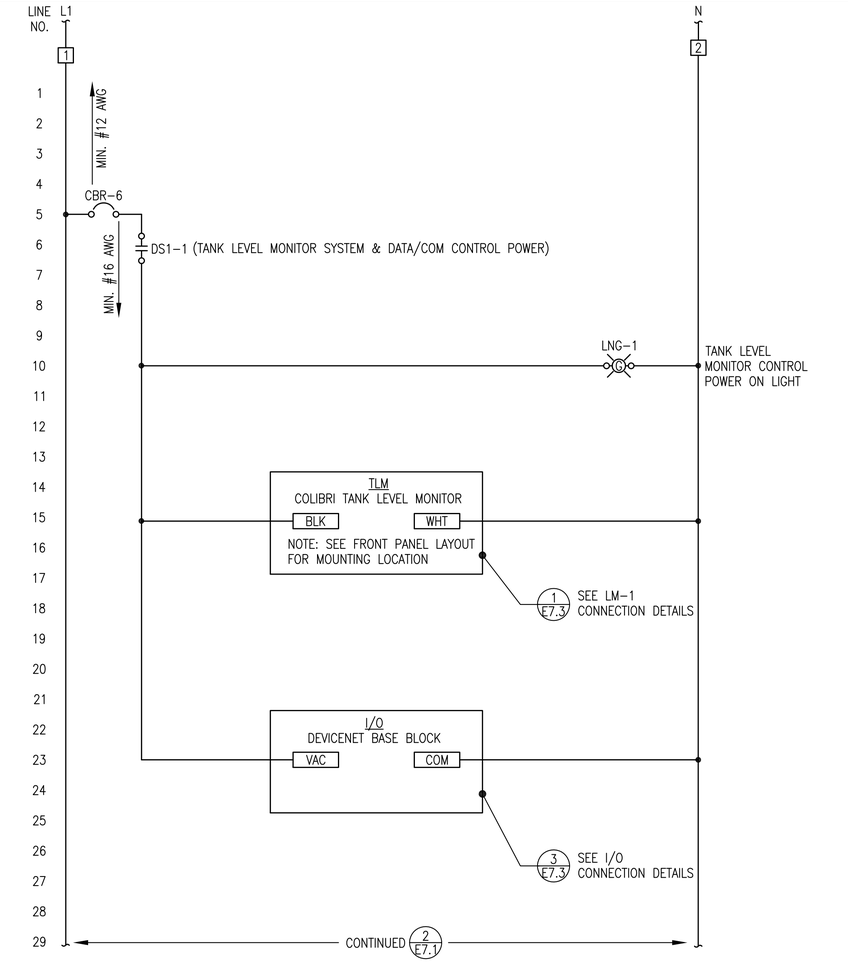
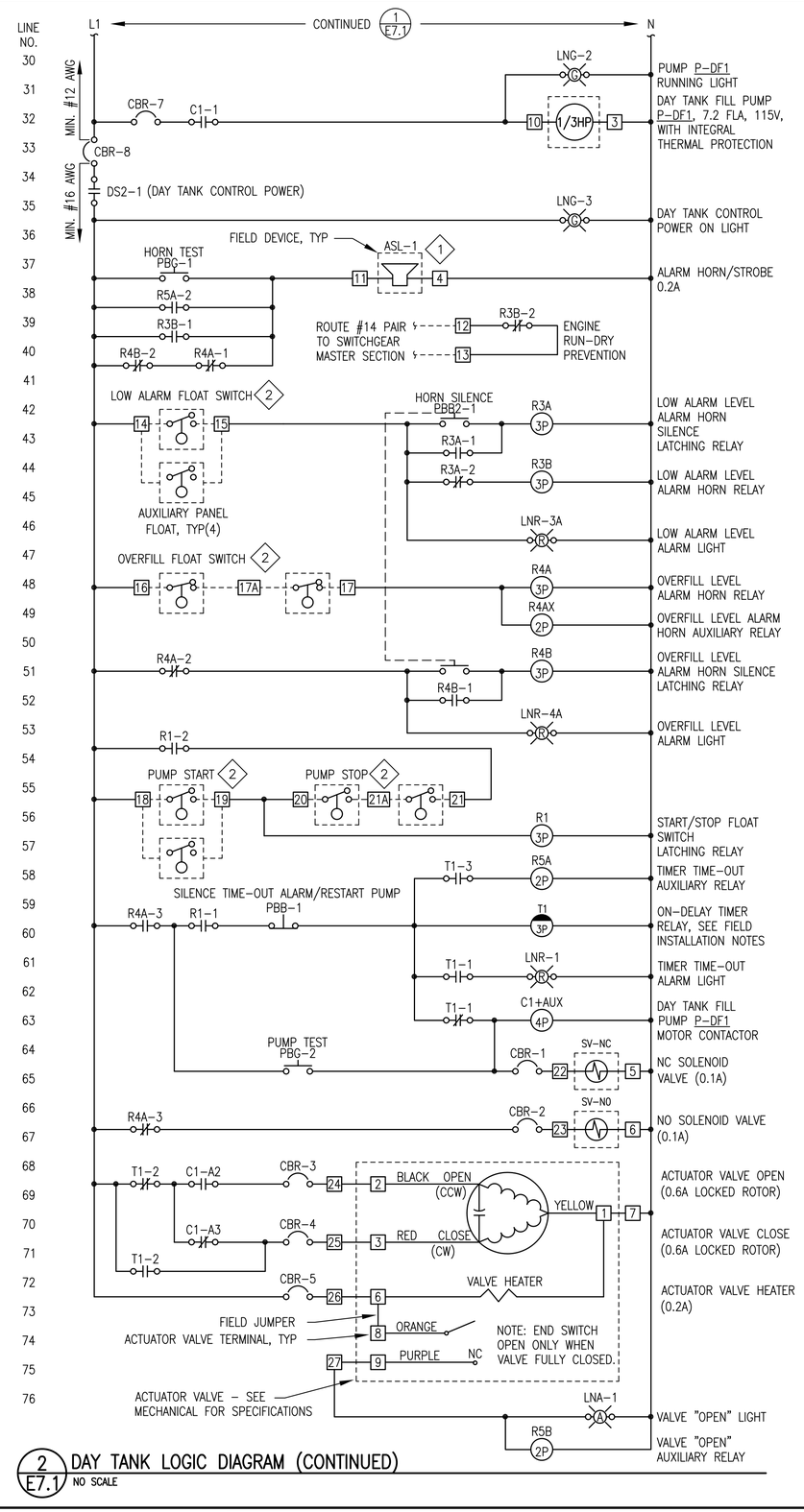


1 E7.1 DAY TANK LOGIC LOGIC DIAGRAM
NO SCALE



2 E7.1 DAY TANK LOGIC DIAGRAM (CONTINUED)
NO SCALE

BILL OF MATERIALS (NOTE: PROVIDE MATERIALS AS SPECIFIED – NO SUBSTITUTIONS ALLOWED)

TAG	QTY	MANUFACTURER	MODEL	DESCRIPTION
AUX	1	ALLEN–BRADLEY	100SA11	AUXILIARY CONTACT FOR CONTACTOR, 2 POLE, NO, NC
C	1	ALLEN–BRADLEY	100C23D10	CONTACTOR, 120V COIL, 23A, 3 POLE WITH 1 NO AUX
CBR–1,2,3,4,5	5	ALLEN–BRADLEY	1489–A1–C010	RAIL–MOUNT CIRCUIT BREAKER, 1 POLE, 1A
CBR–6,8	2	ALLEN–BRADLEY	1489–A1–C050	RAIL–MOUNT CIRCUIT BREAKER, 1 POLE, 5A
CBR–7	1	ALLEN–BRADLEY	1489–A1–C150	RAIL–MOUNT CIRCUIT BREAKER, 1 POLE, 15A
DS	2	ALLEN–BRADLEY	194LE201753	DISCONNECT, 2 POSITION, 3 N.O., 20A, FACE MOUNT
	2	ALLEN–BRADLEY	194LHC4E1751	KNOB ACTUATOR FOR LOAD SWITCH, ON/OFF, LOCKABLE
LNG	3	ALLEN–BRADLEY	800HQRH2G	GREEN LED PILOT LIGHT, 12–130V, NEMA 4X
LNR	3	ALLEN–BRADLEY	800HQRH2R	RED LED PILOT LIGHT, 12–130V, NEMA 4X
LNA	1	ALLEN–BRADLEY	800HQRH2A	AMBER LED PILOT LIGHT, 12–130V, NEMA 4X
I/O	1	ALLEN–BRADLEY	1790D–T8A0	120VAC DEVICENET 8 INPUT BASE TERM. BLOCK
PBB	1	ALLEN–BRADLEY	800HAR2D2	MOMENTARY PUSH BUTTON, 1 NC, NEMA 4X, BLACK
PBB2	1	ALLEN–BRADLEY	800HAR2A2	MOMENTARY PUSH BUTTON, 2 NO, NEMA 4X, BLACK
PBG	2	ALLEN–BRADLEY	800HAR1D1	MOMENTARY PUSH BUTTON, 1 NO, NEMA 4X, GREEN
PP	1	PHOENIX CONTACTS	FLPPRJ45/RJ45	ETHERNET PATCH PANEL, RJ45xRJ45, DIN RAIL MOUNT
R (3P)	5	ALLEN–BRADLEY	700HA33A1	3PDT RELAY
	5	ALLEN–BRADLEY	700HN101	11 PIN SOCKET BASE
R (2P)	3	ALLEN–BRADLEY	700HA32A1	DPDT RELAY
	3	ALLEN–BRADLEY	700HN100	8 PIN SOCKET BASE
T	1	ALLEN–BRADLEY	700HA33A1	3PDT RELAY
	1	ALLEN–BRADLEY	700HN205	11 PIN RELAY SOCKET BASE FOR TIMER
	1	ALLEN–BRADLEY	700HT3	SERIES B TIMING MODULE
TB–1/2	37	ALLEN–BRADLEY	1492CAM1L	35A, 600V, LARGE–HEAD SCREW TERMINALS
*TLM	*1	* OWNER FURNISHED COMPONENT TO BE INSTALLED BY PANEL FABRICATOR IN PANEL FACE AND CONNECTED AS INDICATED		* FRANKLIN/INCON COLIBRI CL6D TANK LEVEL MONITOR CONSOLE, COLOR LCD SCREEN, ETHERNET CONNECTION WITH WEB INTERFACE, PROGRAMMABLE VOLUME CALCULATIONS FOR UP TO SIX TANKS WITH TEMPERATURE COMPENSATION

LEGEND

- R# — CONTROL RELAY
- T# — TIME DELAY RELAY
- C# — CONTACTOR
- [#] — TERMINAL BLOCK
- CB–# — CIRCUIT BREAKER
- PANEL WIRING
- R#–# — NORMALLY OPEN CONTACT
- SS–# — 2–POSITION SELECTOR SWITCH
- R#–# — NORMALLY CLOSED CONTACT
- O.L. — OVERLOADS
- PB–# — NORMALLY OPEN MOMENTARY PUSH BUTTON
- PB–# — NORMALLY CLOSED MOMENTARY PUSH BUTTON
- FIELD WIRING
- SW–# — NORMALLY OPEN FLOAT SWITCH
- SW–# — NORMALLY CLOSED FLOAT SWITCH
- SV# — SOLENOID VALVE
- ASL–# — ALARM & STROBE LIGHT

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH — CLOIS W. VERSYP EE 7802 — REGISTERED PROFESSIONAL ENGINEER

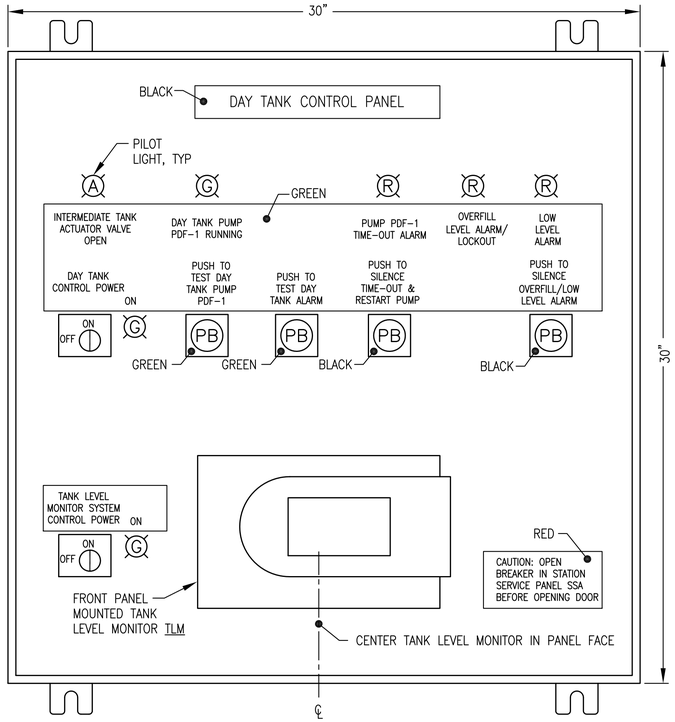
Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT: AVTEC TRAINING FACILITY UPGRADE

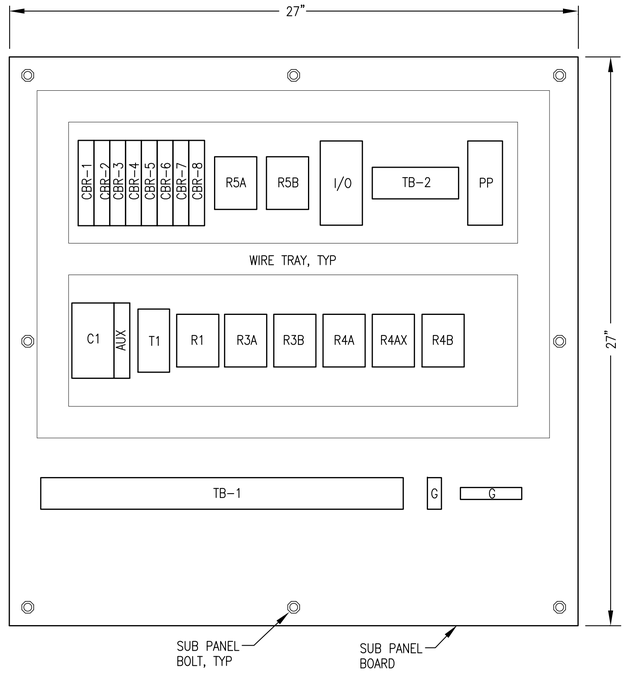
TITLE: DAY TANK CONTROL PANEL LOGIC DIAGRAM & BILL OF MATERIALS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

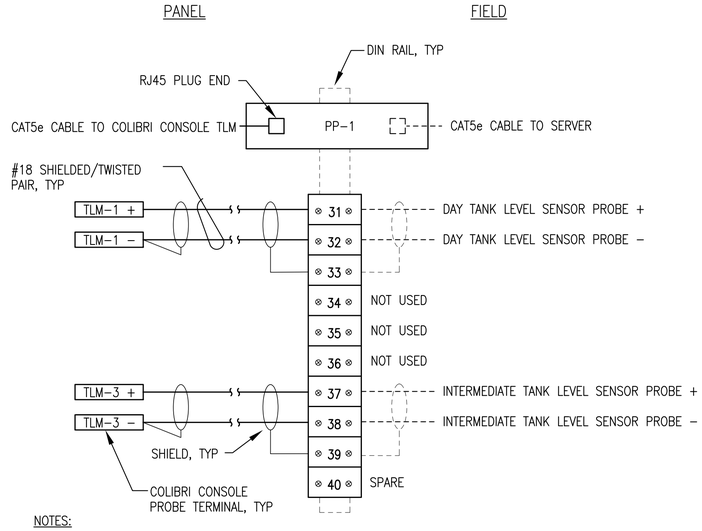
DRAWN BY: BCG/JTD
DESIGNED BY: CWV/BCG
FILE NAME: AVTEC E7
PROJECT NUMBER:
SCALE: AS NOTED
DATE: 6/22/15
SHEET: E7.1 OF 7



1 E7.2 FRONT PANEL LAYOUT
NO SCALE



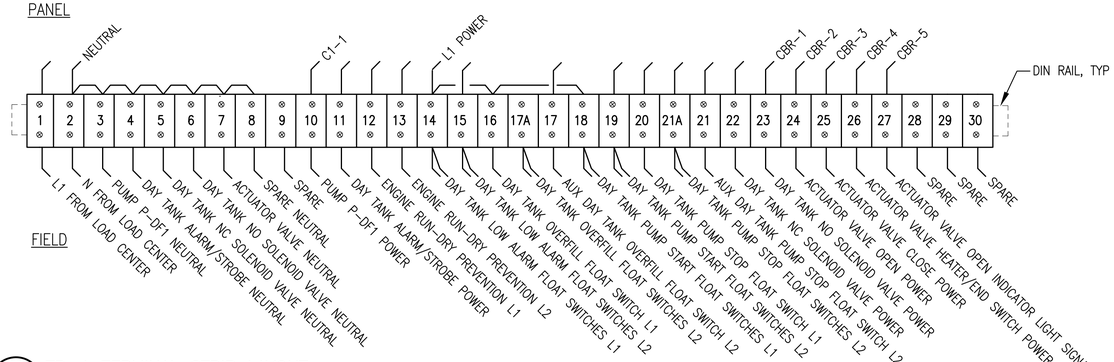
2 E7.2 SUB PANEL LAYOUT
NO SCALE



NOTES:

1. INSTALL TERMINAL STRIP TB–2 AND ETHERNET PATCH PANEL PP–1 ON VERTICAL DIN RAIL AS SHOWN. LOCATE TERMINAL STRIP IN THE UPPER RIGHT CORNER OF PANEL TO ACCOMMODATE CONDUCTOR ENTRY THROUGH RIGHT SIDE OF PANEL, SEE SUB–PANEL LAYOUT.

3 E7.2 TB–2 TERMINAL STRIP AND PP–1 ENTERNET PATCH PANEL LAYOUT
NO SCALE



NOTES:

1) INSTALL TERMINAL STRIP TB–1 ON HORIZONTAL DIN RAIL AS SHOWN. LOCATE TERMINAL STRIP BELOW PANEL DEVICES TO ACCOMMODATE CONDUCTOR ROUTING FROM CONDUITS CONNECTING TO BOTTOM OF PANEL, SEE SUB–PANEL LAYOUT.

2) IN ADDITION TO THE TERMINAL STRIPS SHOWN, PROVIDE 6 EACH 35A SCREW TERMINAL GROUNDING BUS.

4 E7.2 TB–1 TERMINAL STRIP LAYOUT
NO SCALE

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH CLOIS W. VERSYP EE 7802 REGISTERED PROFESSIONAL ENGINEER

Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT: AVTEC TRAINING FACILITY UPGRADE

TITLE: DAY TANK CONTROL PANEL LAYOUT, INSTALLATION & TERMINAL STRIP

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: BCG/JTD	SCALE: AS NOTED
DESIGNED BY: CWV/BCG	DATE: 6/22/15
FILE NAME: AVTEC E7	SHEET: E7.2 OF 7
PROJECT NUMBER:	

PANEL NOTES:

1) PROVIDE COMPLETE UL LISTED PANEL ASSEMBLY WITH ALL DEVICES INDICATED IN LOGIC DIAGRAM EXCEPT FOR FIELD DEVICES. FIELD DEVICES ARE INDICATED WITH DASHED OUTLINE. INSTALL IN A 30"TALLx30"WIDEx8"DEEP NEMA 12 ENCLOSURE WITH 4 EACH INTEGRAL MOUNTING LUGS AT BACK. SEE SHEET E7 FOR PANEL LAYOUT DETAILS.

2) USE MIN #12 WIRE FOR ALL CIRCUITS UP TO FIRST IN-LINE PANEL BREAKERS (FOR 20A FEED). USE MIN #16 AWG ON ALL 5 AMP CIRCUITS AND MIN #14 AWG WIRE ON ALL 15A CIRCUITS. FOR ALL JUMPERS THAT RUN CONTINUOUSLY (ONE-PIECE WIRE) BETWEEN THE DESIGNATED BEGINNING AND ENDING POINTS, TAG EACH END WITH DEVICE OR TERMINATION DESIGNATOR OF LANDING OF OPPOSITE END OF JUMPER (REVERSE ADDRESS). FOR ALL JUMPERS THAT RUN DISCONTINUOUSLY (MULTIPLE WIRES) BETWEEN THE DESIGNATED BEGINNING AND ENDING POINTS, TAG WITH A COMMON JUMPER NUMBER. TAG ALL NEUTRALS WITH A COMMON JUMPER NUMBER. PROVIDE AN AS-BUILT LOGIC WIRING DIAGRAM THAT INCLUDES ALL ASSIGNED JUMPER TAGS.

3) LABEL ALL PANEL DEVICES ON BASE OR BACK PANEL ADJACENT TO ITEM. LABEL REMOTE EQUIPMENT CONNECTIONS AT EACH TERMINAL BLOCK BY THE ITEM TITLE AS SHOWN ON THE FIELD SIDE OF THE TERMINAL STRIP DRAWING. PROVIDE BEVELED EDGE WHITE CORE NAMEPLATES AS SHOWN ON THE PANEL FACE LAYOUT AND SECURE TO PANEL FACE WITH A MINIMUM OF TWO STAINLESS STEEL MOUNTING SCREWS, COLOR AS INDICATED.

4) BENCH TEST COMPLETED UNIT. PROVIDE MIN 48 HOURS NOTICE TO ENGINEER TO SCHEDULE OBSERVATION OF BENCH TEST. PROVIDE SWITCHES AND LAMPS TO SIMULATE OPERATION OF ALL FIELD DEVICES.

5) FIELD WIRING AND FIELD INSTALLED DEVICES PROVIDED BY OTHERS ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY AND ARE NOT PART OF THE PANEL BID.

6) POWER TO PANEL PROVIDED FROM DEDICATED 20A 2-POLE CIRCUIT BREAKER IN LISTED LOAD CENTER. SEE FIELD INSTALLATION NOTE #3.

FIELD INSTALLATION NOTES:

1) SEE MECHANICAL FOR DAY TANK INSTALLATION & PIPING. INSTALL CONTROL PANEL & FIELD DEVICES AS INDICATED TO PROVIDE REDUNDANT HIGH & LOW LIMIT CONTROLS & OVERFILL PROTECTION.

2) FIELD WIRING TO FLOAT SWITCHES, SOLENOID VALVES, ACTUATOR VALVE, & ALARM HORN #14 AWG. ALL OTHER FIELD WIRING #12 AWG. LABEL BOTH ENDS OF ALL CONDUCTORS WITH CONTROL PANEL TERMINAL BLOCK TERMINATION NUMBERS. WHEN NOT IN CONDUIT, MAKE JACKETED COM CABLE ENCLOSURE ENTRIES WITH CABLE GLAND CONNECTORS.

3) PERFORM ALL FIELD WIRING IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS ON SHEET E2. PROVIDE POWER TO DAY TANK PANEL FROM DEDICATED 20A 2-POLE CIRCUIT BREAKER IN LISTED LOAD CENTER.

4) VERIFY THAT ALL FLOAT SWITCHES ARE ORIENTED FOR N.C. (OPEN ON RISE) OPERATION PRIOR TO INSTALLATION. ALL FLOATS SHOWN ON LOGIC DIAGRAM WITH TANK AT FULL (PUMP STOP) LEVEL.

5) FILL PUMP CAVITY WITH LUBE OIL PRIOR TO INITIAL OPERATION. VERIFY PROPER ROTATION OF PUMP. PRIME SYSTEM WITH HAND PRIMING PUMP PRIOR TO OPERATING DAY TANK PUMP.

6) FIELD TEST COMPLETED UNIT TO VERIFY ALL CONTROL AND ALARM FUNCTIONS. MANIPULATE FLOAT SWITCHES BY REACHING IN THROUGH ADJACENT 4" BUNG. TEMPORARILY SET TIMING RELAY TO 30 SECONDS TO VERIFY TIME-OUT AND RESET FUNCTIONS.

7) FIELD VERIFY NORMAL FILL CYCLE RUN TIME WITH AVTEC PERSONNEL THEN SET TIMER FOR 125% OF THE NORMAL RUN TIME.

DAY TANK FILL SEQUENCE OF OPERATIONS:

1) WHEN THE DAY TANK CIRCUIT BREAKER AND CONTROL POWER SWITCH ARE CLOSED, THE POWER LIGHT IS ON AND POWER IS PROVIDED TO THE REMOTE ACTUATOR VALVE HEATER/"OPEN" LIGHT CIRCUIT.

2) WHEN THE DAY TANK IS NOT CALLING FOR FUEL, POWER IS PROVIDED TO THE REMOTE ACTUATOR VALVE CLOSE CIRCUIT. WHEN THE ACTUATOR IS IN THE FULLY CLOSED POSITION, THE CLOSING CIRCUIT IS BROKEN BY INTERNAL ACTUATOR LIMIT SWITCH #2 AND THE REMOTE ACTUATOR VALVE "OPEN" LIGHT IS OFF.

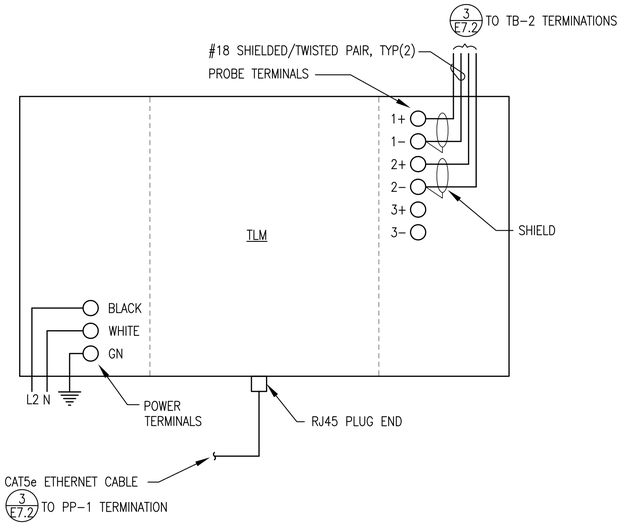
3) NORMAL FILL OPERATION – WHEN THE FUEL LEVEL DROPS TO THE "PUMP START" SWITCH, THE TIMER IS STARTED, THE N.C. DAY TANK SOLENOID VALVE OPENS, THE REMOTE ACTUATOR VALVE OPENS & THE VALVE "OPEN" LIGHT TURNS ON, THE DAY TANK PUMP IS ENERGIZED, AND THE PUMP "ON" LIGHT TURNS ON. WHEN THE ACTUATOR IS IN THE FULLY OPEN POSITION, THE OPENING CIRCUIT IS BROKEN BY INTERNAL ACTUATOR LIMIT SWITCH #7 AND THE REMOTE ACTUATOR VALVE "OPEN" LIGHT REMAINS ON. WHEN FUEL REACHES THE "PUMP STOP" FLOAT SWITCH BEFORE THE TIMER TIMES-OUT, THE TIMER IS RESET, THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE REMOTE ACTUATOR VALVE "OPEN" LIGHT TURNS OFF, THE PUMP DE-ENERGIZES, AND THE PUMP "ON" LIGHT TURNS OFF.

4) TIMER OPERATION – IF THE TIMER TIMES-OUT THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE REMOTE ACTUATOR VALVE "OPEN" LIGHT TURNS OFF, THE PUMP DE-ENERGIZES, THE PUMP "ON" LIGHT TURNS OFF, THE "TIME-OUT" ALARM LIGHT TURNS ON, AND THE TIME-OUT ALARM HORN SOUNDS. PRESSING THE "TIME-OUT ALARM SILENCE / PUMP RESTART" BUTTON RESETS THE TIMER, SILENCES THE ALARM HORN, AND STARTS THE NORMAL FILL OPERATION. SEE FIELD INSTALLATION NOTES FOR TIMER SETTING.

5) OVERFILL FUEL LEVEL – IF THE TANK OVERFILLS AND THE FUEL LEVEL REACHES THE "OVERFILL" FLOAT SWITCH, THE N.O. DAY TANK SOLENOID VALVE CLOSES, THE "OVERFILL LEVEL" ALARM LIGHT TURNS ON, THE N.C. DAY TANK SOLENOID VALVE AND REMOTE ACTUATOR VALVE CLOSE, THE VALVE "OPEN" LIGHT TURNS OFF, THE PUMP DE-ENERGIZES, THE PUMP "ON" LIGHT TURNS OFF, THE "OVERFILL LEVEL" ALARM LIGHT TURNS ON, AND THE ALARM HORN SOUNDS. PRESSING THE LEVEL ALARM HORN "SILENCE" BUTTON SILENCES THE ALARM HORN WHILE LEAVING THE "OVERFILL LEVEL" ALARM LIGHT ON. WHEN THE FUEL LEVEL FALLS BELOW THE "OVERFILL" FLOAT SWITCH, THE "OVERFILL LEVEL" ALARM LIGHT TURNS OFF, THE N.O. DAY TANK SOLENOID VALVE OPENS AND THE ALARM HORN TURNS OFF (IF NOT PREVIOUSLY SILENCED). WHEN THE FUEL LEVEL REACHES THE "PUMP START" FLOAT SWITCH, THE NORMAL FILL OPERATION IS REPEATED.

6) LOW FUEL LEVEL – IF THE FUEL LEVEL FALLS BELOW THE "LOW ALARM" FLOAT SWITCH, THE "LOW FUEL LEVEL" ALARM LIGHT TURNS ON, THE ENGINE RUN-DRY PREVENTION DRY CONTACT OPENS, AND THE ALARM HORN SOUNDS. THE LEVEL ALARM HORN "SILENCE" BUTTON SILENCES THE ALARM HORN WHILE LEAVING THE "LOW FUEL LEVEL" ALARM LIGHT ON. WHEN THE FUEL LEVEL RISES ABOVE THE "LOW ALARM" FLOAT SWITCH THE "LOW FUEL LEVEL" ALARM LIGHT TURNS OFF, THE ENGINE RUN-DRY PREVENTION DRY CONTACT CLOSES, AND THE ALARM HORN TURNS OFF (IF NOT PREVIOUSLY SILENCED).

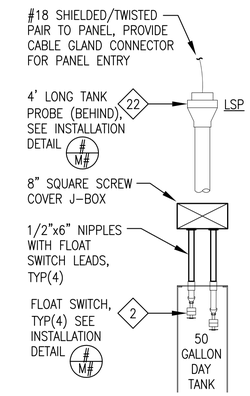
7) PUMP & HORN TEST – MOMENTARY CONTACT BUTTONS ARE PROVIDED TO TEST FUNCTION OF THE DAY TANK PUMP AND ALARM HORN. PRESSING THE "PUSH TO TEST DAY TANK PUMP" BUTTON STARTS THE TIMER, MOMENTARILY OPENS THE N.C. DAY TANK SOLENOID VALVE & ACTUATED BALL VALVE, ENERGIZES THE DAY TANK PUMP, AND TURNS ON THE DAY TANK PUMP "RUNNING" LIGHT. THE "PUSH TO TEST DAY TANK PUMP" BUTTON IS LOCKED OUT IF THE DAY TANK IS AT THE OVERFILL LEVEL. PRESSING THE "PUSH TO TEST DAY TANK ALARM" BUTTON MOMENTARILY ENERGIZES THE ALARM HORN/STROBE.



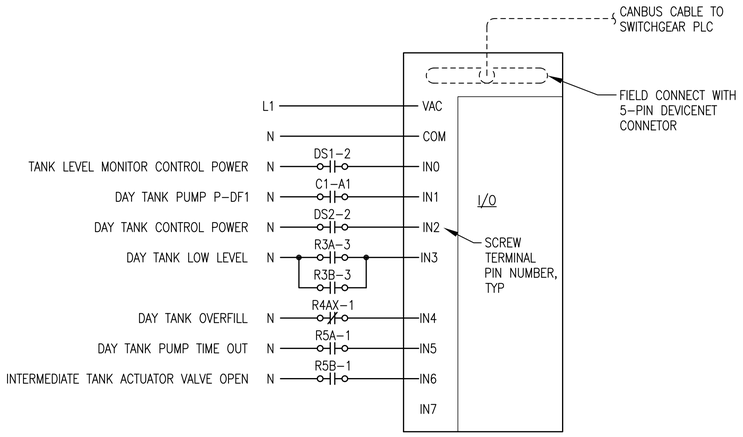
1 E7.3 TANK LEVEL MONITOR (TLM) CONSOLE CONNECTION DETAILS
NO SCALE

NOTES:

1. DAY TANK GEAR PUMP AND SOLENOID VALVE CONNECTIONS NOT SHOWN THIS DETAIL FOR CLARITY. SEE STATION SERVICE PLAN FOR CONDUCTORS AND CONDUIT ROUTING FOR ALL ASSOCIATED DAY TANK DEVICES FROM REMOTE WALL-MOUNTED DAY TANK CONTROL PANEL.
2. SEE MECHANICAL FOR PLAN VIEW OF TOP OF TANK.
3. THIS DETAIL IS FOR FIELD INSTALLATION ONLY AND IS NOT PART OF THE PANEL BID.



2 E7.3 FLOAT SWITCH & PROBE INSTALLATION
NO SCALE



3 E7.3 DEVICENET TERMINAL BLOCKS (I/O) LOGIC & CONNECTION DETAILS
NO SCALE

ISSUED FOR CONSTRUCTION
JUNE 2015

STATE OF ALASKA 49TH
CLOIS W. VERSYP
EE 7802
REGISTERED PROFESSIONAL ENGINEER

Alaska Industrial Development and Export Authority
AIDEA/AEA
Alaska Energy Authority

PROJECT: AVTEC TRAINING FACILITY UPGRADE

TITLE: DAY TANK CONTROL PANEL NOTES, SEQUENCE OF OPERATIONS & INTERCONNECT DETAILS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: BCG/JTD	SCALE: AS NOTED
DESIGNED BY: CW/BCG	DATE: 6/22/15
FILE NAME: AVTEC E7	SHEET: E7.3 OF 7
PROJECT NUMBER:	

Laborers' & Mechanics' Minimum Rates of Pay

Effective April 1, 2015
Issue 30

Title 36. Public Contracts
AS 36.05 & AS 36.10
Wage & Hour Administration
Pamphlet No. 600

ALASKA DEPARTMENT OF LABOR
& WORKFORCE DEVELOPMENT

THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Labor and Workforce Development

Office of the Commissioner

Post Office Box 111149
Juneau, Alaska 99811
Main: 907.465.2700
fax: 907.465-2784

April 1, 2015

TO ALL CONTRACTING AGENCIES:

At the Alaska Department of Labor and Workforce Development, our goal is putting Alaskans to work. This pamphlet is designed to help contractors awarded public construction contracts understand the most significant laws of the State of Alaska pertaining to prevailing wage and resident hire requirements.

This pamphlet identifies current prevailing wage rates and resident hire classifications for public construction contracts (any construction projects awarded by the State of Alaska or its political subdivisions, such as local governments and certain non-profit organizations). Because these rates may change, this publication is printed in the spring and fall of every year, so please be sure you are using the appropriate rates. The rates published in this edition become effective April 1, 2015.

All projects with a final bid date of April 11, 2015, or later, must pay the prevailing wage rates contained in this pamphlet. As the law now provides, these rates will remain stable during the life of a public construction contract or for 24 calendar months, whichever is shorter. **The 24 months period begins on the date the prime contract is awarded.** Upon expiration of the initial 24-month period, the latest wage rates issued by the department shall become effective for a subsequent 24-month period or until the original contract is completed, whichever occurs first. This process shall be repeated until the original contract is completed.

The term "original contract" means the signed contract that resulted from the original bid and any amendments, including changes of work scope, additions, extensions, change orders, and other instruments agreed to by the parties that have not been subject to subsequent open bid procedures.

If a higher federal rate is required due to partial federal funding or other federal participation, the higher rate must be paid.

For additional copies of this pamphlet, contact the nearest office of the Division of Labor Standards and Safety, Wage and Hour office or the Web address at: http://labor.state.ak.us/lss/pamp600.htm

For questions regarding prevailing wage or resident hire requirements, please contact the nearest Wage and Hour office. These offices are listed on Page xi.

Sincerely,

Heidi Drygas
Commissioner

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Wage Rates ..... Pages 1-25

Note to Readers: The statutes and administrative regulations listed in this publication were taken from the official codes, as of the effective date of the publication. However, there may be errors or omissions that have not been identified and changes that occurred after the publication was printed. This publication is intended as an informational guide only and is not intended to serve as a precise statement of the statutes and regulations of the State of Alaska. To be certain of the current laws and regulations, please refer to the official codes.

On the cover: Wrenched DOF
Photo by Flickr user LadyDragonflyCC

EXCERPTS FROM ALASKA LAW

(The following statute (36.05.005) applies to projects bid on or after October 20, 2011)

Sec. 36.05.005. Applicability.

This chapter applies only to a public construction contract that exceeds $25,000.

Sec. 36.05.010. Wage rates on public construction.

A contractor or subcontractor who performs work on a public construction contract in the state shall pay not less than the current prevailing rate of wages for work of a similar nature in the region in which the work is done. The current prevailing rate of wages is that contained in the latest determination of prevailing rate of wages issued by the Department of Labor and Workforce Development at least 10 days before the final date for submission of bids for the contract. The rate shall remain in effect for the life of the contract or for 24 calendar months, whichever is shorter. At the end of the initial 24-month period, if new wage determinations have been issued by the department, the latest wage determination shall become effective for the next 24-month period or until the contract is completed, whichever occurs first. This process shall be repeated until the contract is completed.

Sec. 36.05.040. Filing schedule of employees, wages paid, and other information.

All contractors or subcontractors who perform work on a public construction contract for the state or for a political subdivision of the state shall, before the Friday of every second week, file with the Department of Labor and Workforce Development a sworn affidavit for the previous reporting period, setting out in detail the number of persons employed, wages paid, job classification of each employee, hours worked each day and week, and other information on a form provided by the Department of Labor and Workforce Development.

Sec. 36.05.045. Notice of work and completion; withholding of payment.

(a) Before commencing work on a public construction contract, the person entering into the contract with a contracting agency shall designate a primary contractor for purposes of this section. Before work commences, the primary contractor shall file a notice of work with the Department of Labor and Workforce Development. The notice of work must list work to be performed under the public construction contract by each contractor who will perform any portion of work on the contract and the contract price being paid to each contractor. The primary contractor shall pay all filing fees for each contractor performing work on the contract, including a filing fee based on the contract price being paid for work performed by the primary contractor's employees. The filing fee payable shall be the sum of all fees calculated for each contractor. The filing fee shall be one percent of each contractor's contract price. The total filing fee payable by the primary contractor under this subsection may not exceed $5,000. In this subsection, "contractor" means an employer who is using employees to perform work on the public construction contract under the contract or a subcontract.

(b) Upon completion of all work on the public construction contract, the primary contractor shall file with the Department of Labor and Workforce Development a notice of completion together with payment of any additional filing fees owed due to increased contract amounts. Within 30 days after the department's receipt of the primary contractor's notice of completion, the department shall inform the contracting agency of the amount, if any, to be withheld from the final payment.

(c) A contracting agency

(1) may release final payment of a public construction contract to the extent that the agency has received verification from the Department of Labor and Workforce Development that

(A) the primary contractor has complied with (a) and (b) of this section;

(B) the Department of Labor and Workforce Development is not conducting an investigation under this title; and

(C) the Department of Labor and Workforce Development has not issued a notice of a violation of this chapter to the primary contractor or any other contractors working on the public construction contract; and

(2) shall withhold from the final payment an amount sufficient to pay the department's estimate of what may be needed to compensate the employees of any contractors under investigation on this construction contract, and any unpaid filing fees.

(d) The notice and filing fee required under (a) of this section may be filed after work has begun if
   (1) The public construction contract is for work undertaken in immediate response to an emergency; and
   (2) The notice and fees are filed not later than 14 days after the work has begun.

(e) A false statement made on a notice required by this section is punishable under AS 11.56.210.

Sec. 36.05.060. Penalty for violation of this chapter.

A contractor who violates this chapter is guilty of a misdemeanor and upon conviction is punishable by a fine of not less than $100 nor more than $1,000, or by imprisonment for not less than 10 days nor more than 90 days, or by both. Each day a violation exists constitutes a separate offense.

Sec. 36.05.070. Wage rates in specifications and contracts for public works.

(a) The advertised specifications for a public construction contract that requires or involves the employment of mechanics, laborers, or field surveyors must contain a provision stating the minimum wages to be paid various classes of laborers, mechanics, or field surveyors and that the rate of wages shall be adjusted to the wage rate under AS 36.05.010.

(b) Repealed by §17 ch 142 SLA 1972.

(c) A public construction contract under (a) of this section must contain provisions that
   (1) the contractor or subcontractors of the contractor shall pay all employees unconditionally and not less than once a week;
   (2) wages may not be less than those stated in the advertised specifications, regardless of the contractual relationship between the contractor or subcontractors and laborers, mechanics, or field surveyors;
   (3) 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;
   (4) the state or a political subdivision 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
      (A) the rates of wages required by the contract to be paid laborers, mechanics, or field surveyors on the work; and
      (B) the rates of wages in fact received by laborers, mechanics, or field surveyors.

Sec. 36.05.080. Failure to pay agreed wages.

Every contract within the scope of AS 36.05.070 shall contain a provision that if it is found that a laborer, mechanic, or field surveyor employed by the contractor or subcontractor has been or is being paid a rate of wages less than the rate of wages required by the contract to be paid, the state or its political subdivision may, by written notice to the contractor, terminate the contractor's right to proceed with the work or the part of the work for which there is a failure to pay the required wages and to prosecute the work to completion by contract or otherwise, and the contractor and the contractor's sureties are liable to the state or its political subdivision for excess costs for completing the work.

Sec. 36.05.090. Payment of wages from withheld payments and listing contractors who violate contracts.

(a) The state disbursing officer in the case of a state public construction contract and the local fiscal officer in the case of a political subdivision public construction contract shall pay directly to laborers, mechanics, or field surveyors from accrued payments withheld under the terms of the contract the wages due laborers, mechanics, or field surveyors under AS 36.05.070.

(b) The state disbursing officer or the local fiscal officer shall distribute to all departments of the state government and to all political subdivisions of the state a list giving the names of persons who have disregarded their obligations to employees. A person appearing on this list and a firm, corporation,

partnership, or association in which the person has an interest may not work as a contractor or subcontractor on a public construction contract for the state or a political subdivision of the state until three years after the date of publication of the list. If the accrued payments withheld under the contract are insufficient to reimburse all the laborers, mechanics, or field surveyors with respect to whom there has been a failure to pay the wages required under AS 36.05.070, the laborers, mechanics, or field surveyors have the right of action or intervention or both against the contractor and the contractor's sureties conferred by law upon persons furnishing labor or materials, and in the proceedings it is not a defense that the laborers, mechanics, or field surveyors accepted or agreed to accept less than the required rate of wages or voluntarily made refunds.

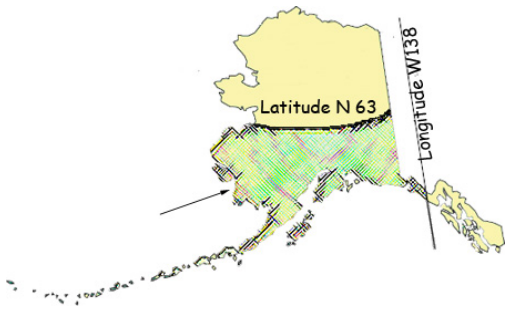
Sec. 36.05.900. Definition.
In this chapter, "contracting agency" means the state or a political subdivision of the state that has entered into a public construction contract with a contractor.

ADDITIONAL INFORMATION

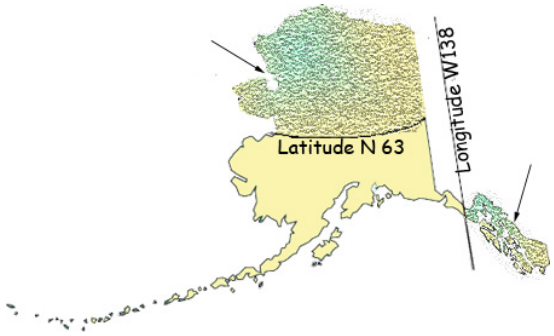
LABORER CLASSIFICATION CLARIFICATION

The laborer rates categorized in class code S1201-S1206 apply in one area of Alaska; the area that is south of N63 latitude and west of W138 Longitude. The laborer rates categorized in class code N1201-N1206 apply in two areas of Alaska; the Alaska areas north of N63 latitude and east of W138 longitude. The following graphic representations should assist with clarifying the applicable wage rate categories:

S1201-S1206



N1201-N1206



ACCOMMODATIONS AND PER DIEM

The Alaska Department of Labor and Workforce Development has adopted a per diem requirement for blocklayers, bricklayers, carpenters, dredgemen, heat & frost insulators/asbestos workers, ironworkers, laborers, operative plasterers & cement masons, painters, piledrivers, power equipment operators, roofers, surveyors, truck

drivers/surveyors, and tunnel workers. This per diem rate creates an allowable alternative to providing board and lodging under the following conditions:

Employer-Provided Camp or Suitable Accommodations

Unless otherwise approved by the Commissioner, the employer shall ensure that a worker who is employed on a project that is 65 road miles or more from the international airport in either Fairbanks, Juneau or Anchorage or is inaccessible by road in a 2-wheel drive vehicle and who is not a domiciled resident of the locality of the project shall receive meals and lodging. Lodging shall be in accordance with all applicable state and federal laws. In cases where the project site is not road accessible, but the employee can reasonably get to the project worksite from their permanent residence within one hour, the Commissioner may waive these requirements for that employee upon a written request from the employer.

The term "domiciled resident" means a person living within 65 road miles of the project, or in the case of a highway project, the mid-point of the project, for at least 12 consecutive months prior to the award of the project. However, if the employer or person provides sufficient evidence to convince the department that a person has established a permanent residence and an intent to remain indefinitely within the distance to be considered a "domiciled resident," the employer shall not be required to provide meals and lodging or pay per diem.

Where the employer provides or furnishes board, lodging or any other facility, the cost or amount thereof shall not be considered or included as part of the required prevailing wage basic hourly rate and cannot be applied to meet other fringe benefit requirements. The taxability of employer provided board and lodging shall be determined by the appropriate taxation enforcement authority.

Per Diem

Employers are encouraged to use commercial facilities and lodges; however, when such facilities are not available, per diem in lieu of meals and lodging must be paid at the basic rate of $75.00 per day, or part thereof, the worker is employed on the project. Per diem shall not be allowed on highway projects west of Livengood on the Elliott Highway, at Mile 0 of the Dalton Highway to the North Slope of Alaska, north of Mile 20 on the Taylor Highway, east of Chicken, Alaska, on the Top of the World Highway and south of Tetlin Junction to the Alaska-Canada border.

The above-listed standards for room and board and per diem only apply to the crafts as identified in Pamphlet 600, *Laborers' and Mechanics' Minimum Rates of Pay*. Other crafts working on public construction projects shall be provided room and board at remote sites based on the department's existing policy guidelines. In the event that a contractor provides lodging facilities, but no meals, the department will accept payment of $36 per day for meals to meet the per diem requirements.

APPRENTICE HIRING REQUIREMENTS

On July 24, 2005, Administrative Order No. 226 established a 15 percent goal for hiring apprentices in certain job categories on highway, airport, harbor, dam, tunnel, utility or dredging projects awarded by the Alaska Department of Transportation and Public Facilities that exceed $2.5 million. This Order will apply to all projects in the referenced categories that are advertised after September 1, 2005. On these projects, the hours worked by apprentices will be compared to the hours worked by journeyman level workers to determine if the 15 percent goal has been met. This on-the-job training goal is critical to ensure that the Alaska work force is prepared for the future. For additional details, contact the nearest Wage and Hour office at the address listed on Page xi of this publication. Administrative Order No. 226 may be viewed in its entirety on the Internet at http://www.gov.state.ak.us/admin-orders/226.html or call any Wage and Hour office to receive a copy.

APPRENTICE RATES

Apprentice rates at less than the minimum prevailing rates may be paid to apprentices according to an apprentice program which has been registered and approved by the Commissioner of the Alaska Department of Labor and Workforce Development in writing or according to a bona fide apprenticeship program registered with the U.S. Department of Labor, Office of Apprenticeship. **Any employee listed on a payroll at an apprentice wage rate who is not registered as above shall be paid the journeyman prevailing minimum wage in that work classification.** Wage rates are based on prevailing crew makeup practices in Alaska and apply to work performed regardless of either the quality of the work performed by the employee or the titles or classifications which may be assigned to individual employees.

FRINGE BENEFIT PLANS

Contractors/subcontractors may compensate fringe benefits to their employees in any one of three methods. The fringe benefits may be paid into a union trust fund, into an approved benefit plan, or paid directly on the paycheck as gross wages.

Where fringe benefits are paid into approved plans, funds, or programs including union trust funds, the payments must be contributed at least monthly. If contractors submit their own payroll forms and are paying fringe benefits into approved plans, funds, or programs, the employer's certification must include, in addition to those requirements of 8 AAC 30.020(c), a statement that fringe benefit payments have been or will be paid at least monthly. Contractors who pay fringe benefits to a plan must ensure the plan is one approved by the Internal Revenue Service and that the plan meets the requirements of 8 AAC 30.025 (eff. 3/2/08) in order for payments to be credited toward the prevailing wage obligation.

SPECIAL PREVAILING WAGE RATE DETERMINATION

Special prevailing wage rate determinations may be requested for special projects or a special worker classification if the work to be performed does not conform to traditional public construction for which a prevailing wage rate has been established under 8 AAC 30.050(a) of this section. Requests for special wage rate determinations must be in writing and filed with the Commissioner at least 30 days before the award of the contract. An applicant for a special wage rate determination shall have the responsibility to support the necessity for the special rate. An application for a special wage rate determination filed under this section must contain:

(1) a specification of the contract or project on which the special rates will apply and a description of the work to be performed;
(2) a brief narrative explaining why special wage rates are necessary;
(3) the job class or classes involved;
(4) the special wage rates the applicant is requesting, including survey or other relevant wage data to support the requested rates;
(5) the approximate number of employees who would be affected; and
(6) any other information which might be helpful in determining if special wage rates are appropriate.

Requests made pursuant to the above should be addressed to:

Director
Alaska Department of Labor and Workforce Development
Labor Standards & Safety Division
Wage and Hour Administration
P.O. Box 111149
Juneau, AK 99811-1149
-or-
Email: anchorage.lss-wh@alaska.gov

LABOR STANDARDS REGULATIONS
NOTICE REQUEST

If you would like to receive ***notices of proposed changes to regulations*** for Wage and Hour or Mechanical Inspection, please indicate below the programs for which you are interested in receiving such notices, print your name and email or mailing address in the space provided, and send this page to:

Alaska Department of Labor and Workforce Development
Labor Standards & Safety Division
Wage and Hour Administration
1251 Muldoon Road, Suite 113
Anchorage, AK 99504-2098
Email: anchorage.lss-wh@alaska.gov

For *REGULATIONS* information relating to any of the following:

❒ Wage and Hour Title 23 Employment Practices
❒ Wage and Hour Title 36 Public Works
❒ Employment Agencies
❒ Child Labor
❒ Employment Preference (Local Hire)
❒ Plumbing Code
❒ Electrical Code
❒ Boiler/Pressure Vessel Construction Code
❒ Elevator Code
❒ Certificates of Fitness
❒ Recreational Devices

Request any of the following *PUBLICATIONS* by checking below:

❒ Wage and Hour Title 23 Employment Practices
❒ Minimum Wage & Overtime Poster
❒ Child Labor Poster
❒ Public Construction Pamphlet
❒ Public Construction Wage Rates
❒ Child Labor Pamphlet

PLEASE NOTE: DUE TO INCREASED MAILING AND PRINTING COSTS, ONLY ONE OF EACH PUBLICATION REQUESTED WILL BE MAILED TO YOU. IF YOU WISH TO RECEIVE ADDITIONAL COPIES OR SUBSEQUENT PUBLICATIONS, PLEASE CONTACT OUR OFFICE AT (907) 269-4900.

Name: _____

Mailing Address: _____

_____

_____

_____

Email Address: _____

EMPLOYMENT PREFERENCE INFORMATION
(EFFECTIVE August 16, 2013)

By authority of AS 36.10.150 and 8 AAC 30.064, the Commissioner of Labor and Workforce Development has determined the 15 boroughs and census areas listed below to be Zones of Underemployment. A Zone of Underemployment requires that Alaska residents who are eligible under AS 36.10.140 be given a minimum of 90 percent employment preference on public works contracts throughout the state in certain job classifications. This hiring preference applies on a project-by-project, craft-by-craft or occupational basis and must be met each workweek by each contractor/subcontractor.

For additional information about the Alaska resident hire requirements, contact the nearest Wage and Hour Office in Anchorage at (907) 269-4900, in Fairbanks at (907) 451-2886 or in Juneau at (907) 465-4248.

The following classifications qualify for a minimum of 90 percent Alaska resident hire preference:

Aleutians East Borough: Plumbers and Pipefitters
Aleutians West Borough: Painters
Bethel Census Area: Culinary Workers, Foremen and Supervisors, Mechanics, Painters, Surveyors, Tug Boat Workers
Denali Borough: Carpenters
Dillingham Census Area: Carpenters, Culinary Workers, Electricians, Equipment Operators, Foremen and Supervisors, Laborers, Mechanics, Truck Drivers, Tug Boat Workers
Hoonah-Angoon Census Area: Carpenters, Culinary Workers, Electricians, Equipment Operators, Foremen and Supervisors, Laborers, Mechanics, Painters, Truck Drivers
Nome Census Area: Carpenters, Culinary Workers, Electricians, Equipment Operators, Foremen and Supervisors, Laborers, Mechanics, Surveyors, Truck Drivers, Tug Boat Workers, Welders
Northwest Arctic Borough: Carpenters, Culinary Workers, Electricians, Equipment Operators, Foremen and Supervisors, Plumbers and Pipefitters, Surveyors, Truck Drivers, Tug Boat Workers, Welders
Petersburg Borough: Culinary Workers, Engineers and Architects, Foremen and Supervisors, Laborers
Prince of Wales-Hyder Census Area: Carpenters, Culinary Workers, Electricians, Equipment Operators, Foremen and Supervisors, Laborers, Mechanics, Surveyors, Truck Drivers, Welders
Skagway: None
Southeast Fairbanks Census Area: Carpenters, Culinary Workers, Equipment Operators, Laborers, Painters, Truck Drivers
Wade Hampton Census Area: Carpenters, Electricians, Engineers and Architects, Mechanics, Roofers
Yakutat: None
Yukon-Koyukuk Census Area: Culinary Workers, Electricians, Foremen and Supervisors, Painters, Plumbers and Pipefitters, Surveyors, Truck Drivers, Tug Boat Workers, Welders

This determination is effective August 16, 2013, and remains in effect until June 30, 2015.

The first person on a certified payroll in any classification is called the "first worker" and is not required to be an Alaskan resident. However, once the contractor adds any more workers in the classification, then all workers in the classification are counted, and the 90 percent is applied to compute the number of required Alaskans to be in compliance. To compute the number of Alaskan residents required in a workweek in a particular classification, multiply the number of workers in the classification by 90 percent. The result is then rounded down to the nearest whole number to determine the number of Alaskans that must be employed.

If a worker works in more than one classification during a week, the classification in which they spent the most time would be counted for employment preference purposes. If the time is split evenly between two classifications, the worker is counted in both classifications.

If you have difficulty meeting the 90 percent requirement, an approved waiver must be obtained before a non-Alaskan resident is hired who would put the contractor/subcontractor out of compliance (8 AAC 30.081 (e) (f)). The waiver process requires proof of an intensive search for qualified Alaskan workers. To apply for a waiver, contact the nearest Wage and Hour Office for instructions.

Here is an example to apply the 90 percent requirement to four carpenter workers. Multiply four workers by 90% and drop the fraction (.90 X 4 = 3.6 - .6 = 3). The remaining number is the number of Alaskan resident carpenters required to be in compliance in that particular classification for that week.

The penalties for being out of compliance are serious. AS 36.10.100 (a) states "A contractor who violates a provision of this chapter shall have deducted from amounts due to the contractor under the contract the prevailing wages which should have been paid to a displaced resident, and these amounts shall be retained by the contracting agency." If a contractor/subcontractor is found to be out of compliance, penalties accumulate until they come into compliance.

If you have difficulty determining whether a worker is an Alaska resident, you should contact the nearest Wage and Hour Office. Contact Wage and Hour in Anchorage at (907) 269-4900, in Fairbanks at (907) 451-2886, or in Juneau at (907) 465-4842.

Alaska Department of Labor and Workforce Development
Labor Standards & Safety Division
Wage and Hour Administration
Web site: http://labor.state.ak.us/lss/pamp600.htm

Anchorage	Juneau	Fairbanks
1251 Muldoon Road, Suite 113 Anchorage, Alaska 99504-2098 Phone: (907) 269-4900 Email: anchorage.lss-wh@alaska.gov	1111 W. 8th Street, Suite 302 Juneau, Alaska 99801 Phone: (907) 465-4842 Email: juneau.lss-wh@alaska.gov	Regional State Office Building 675 7th Ave., Station J-1 Fairbanks, Alaska 99701-4593 Phone: (907) 451-2886 Email: fairbanks.lss@alaska.gov

DEBARMENT LIST

AS 36.05.090(b) states that "the state disbursing officer or the local fiscal officer shall distribute to all departments of the state government and to all political subdivisions of the state a list giving the names of persons who have disregarded their obligations to employees."

A person appearing on the following debarment list and a firm, corporation, partnership, or association in which the person has an interest may not work as a contractor or subcontractor on a public construction contract for the state or a political subdivision of the state for three years from the date of debarment.

Company Name	Debarment Expires
Bengal Groups, LLC	November 3, 2017
Mohammed Ali, Individual	November 3, 2017
Fry's Services, LLC	November 16, 2017
John Paul Freie, Individual	November 16, 2017

Laborers' & Mechanics' Minimum Rates of Pay

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits		THR
Boilermakers								
						VAC	**SAF**	
A0101	Boilermaker (journeyman)	44.01	8.57	15.34	1.60	3.00	0.34	72.86
Bricklayers & Blocklayers								
	**See note on last page if remote site							
						L&M		
A0201	Blocklayer	39.03	9.53	8.50	0.55	0.15	0.37	58.13
	Bricklayer Marble or Stone Mason Refractory Worker (Firebrick, Plastic, Castable, and Gunite Refractory Applications) Terrazzo Worker Tile Setter							
						L&M		
A0202	Tuck Pointer Caulker	39.03	9.53	8.50	0.55	0.15	0.37	58.13
	Cleaner (PCC)							
						L&M		
A0203	Marble & Tile Finisher	33.27	9.53	8.50	0.55	0.15	0.37	52.37
	Terrazzo Finisher							
						L&M		
A0204	Torginal Applicator	37.14	9.53	8.50	0.55	0.15	0.37	56.24
Carpenters, Statewide								
	**See note on last page if remote site							
						L&M	**SAF**	
A0301	Carpenter (journeyman)	37.34	9.78	12.86	0.70	0.10	0.15	60.93
	Lather/Drywall/Acoustical							
Cement Masons, Region I (North of N63 latitude)								
	**See note on last page if remote site							
						L&M		
N0401	Group I, including:	36.69	7.24	11.80	1.18	0.10		57.01
	Application of Sealing Compound Application of Underlayment Building, General Cement Mason (journeyman) Concrete							

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Cement Masons, Region I (North of N63 latitude)							
	**See note on last page if remote site						
						L&M	
N0401	Group I, including:	36.69	7.24	11.80	1.18	0.10	57.01
	Concrete Paving Curb & Gutter, Sidewalk Curing of All Concrete Grouting & Caulking of Tilt-Up Panels Grouting of All Plates Patching Concrete Screed Pin Setter Spackling/Skim Coating						
						L&M	
N0402	Group II, including:	36.69	7.24	11.80	1.18	0.10	57.01
	Form Setter						
						L&M	
N0403	Group III, including:	36.69	7.24	11.80	1.18	0.10	57.01
	Concrete Saw (self-powered) Curb & Gutter Machine Floor Grinder Pneumatic Power Tools Power Chipping & Bushing Sand Blasting Architectural Finish Screed & Rodding Machine Operator Troweling Machine Operator						
						L&M	
N0404	Group IV, including:	36.69	7.24	11.80	1.18	0.10	57.01
	Application of All Composition Mastic Application of All Epoxy Material Application of All Plastic Material Finish Colored Concrete Gunite Nozzleman Hand Powered Grinder Tunnel Worker						
						L&M	
N0405	Group V, including:	36.94	7.24	11.80	1.18	0.10	57.26
	Plasterer						
Cement Masons, Region II (South of N63 latitude)							
	**See note on last page if remote site						
						L&M	
S0401	Group I, including:	36.44	7.24	11.80	1.18	0.10	56.76

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Cement Masons, Region II (South of N63 latitude)							
	**See note on last page if remote site						
						L&M	
S0401	Group I, including:	36.44	7.24	11.80	1.18	0.10	56.76
	Application of Sealing Compound						
	Application of Underlayment						
	Building, General						
	Cement Mason (journeyman)						
	Concrete						
	Concrete Paving						
	Curb & Gutter, Sidewalk						
	Curing of All Concrete						
	Grouting & Caulking of Tilt-Up Panels						
	Grouting of All Plates						
	Patching Concrete						
	Screed Pin Setter						
	Spackling/Skim Coating						
						L&M	
S0402	Group II, including:	36.44	7.24	11.80	1.18	0.10	56.76
	Form Setter						
						L&M	
S0403	Group III, including:	36.44	7.24	11.80	1.18	0.10	56.76
	Concrete Saw (self-powered)						
	Curb & Gutter Machine						
	Floor Grinder						
	Pneumatic Power Tools						
	Power Chipping & Bushing						
	Sand Blasting Architectural Finish						
	Screed & Rodding Machine Operator						
	Troweling Machine Operator						
						L&M	
S0404	Group IV, including:	36.44	7.24	11.80	1.18	0.10	56.76
	Application of All Composition Mastic						
	Application of All Epoxy Material						
	Application of All Plastic Material						
	Finish Colored Concrete						
	Gunite Nozzleman						
	Hand Powered Grinder						
	Tunnel Worker						
						L&M	
S0405	Group V, including:	36.69	7.24	11.80	1.18	0.10	57.01
	Plasterer						

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Culinary Workers * See note on last page							
A0501	Baker/Cook	25.17	5.92	5.73		**LEG** 0.05	36.87
A0503	General Helper	22.12	5.92	5.73		**LEG** 0.05	33.82
	Housekeeper Janitor Kitchen Helper						
A0504	Head Cook	25.72	5.92	5.73		**LEG** 0.05	37.42
A0505	Head Housekeeper	22.54	5.92	5.73		**LEG** 0.05	34.24
	Head Kitchen Help						
Dredgemen **See note on last page if remote site							
A0601	Assistant Engineer, including:	39.26	9.60	10.50	1.00	**L&M** 0.10	60.46
	Craneman Electrical Generator Operator (primary pump/power barge/dredge) Engineer Welder						
A0602	Assistant Mate (deckhand)	38.10	9.60	10.50	1.00	**L&M** 0.10	59.30
A0603	Fireman	38.54	9.60	10.50	1.00	**L&M** 0.10	59.74
A0605	Leverman Clamshell	41.79	9.60	10.50	1.00	**L&M** 0.10	62.99
A0606	Leverman Hydraulic	40.03	9.60	10.50	1.00	**L&M** 0.10	61.23
A0607	Mate & Boatman	39.26	9.60	10.50	1.00	**L&M** 0.10	60.46
A0608	Oiler (dredge)	38.54	9.60	10.50	1.00	**L&M** 0.10	59.74
Electricians							
A0701	Inside Cable Splicer	39.82	11.61	12.59	0.95	**L&M** 0.20 **LEG** 0.15	65.32

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits		THR
Electricians								
						L&M	**LEG**	
A0702	Inside Journeyman Wireman, including:	39.49	11.61	12.83	0.95	0.20	0.15	65.23
	Technicians							
						L&M	**LEG**	
A0703	Power Cable Splicer	52.27	11.61	17.34	0.95	0.20	0.15	82.52
						L&M	**LEG**	
A0704	Tele Com Cable Splicer	47.45	11.61	15.02	0.95	0.20	0.15	75.38
						L&M	**LEG**	
A0705	Power Journeyman Lineman, including:	50.52	11.61	17.29	0.95	0.20	0.15	80.72
	Power Equipment Operator Technician							
						L&M	**LEG**	
A0706	Tele Com Journeyman Lineman, including:	45.70	11.61	14.97	0.95	0.20	0.15	73.58
	Technician Tele Com Equipment Operator							
						L&M	**LEG**	
A0707	Straight Line Installer - Repairman	45.70	11.61	14.97	0.95	0.20	0.15	73.58
						L&M	**LEG**	
A0708	Powderman	48.52	11.61	17.23	0.95	0.20	0.15	78.66
						L&M	**LEG**	
A0710	Material Handler	26.18	11.11	4.54	0.15	0.15	0.15	42.28
						L&M	**LEG**	
A0712	Tree Trimmer Groundman	26.67	11.61	10.55	0.15	0.15	0.15	49.28
						L&M	**LEG**	
A0713	Journeyman Tree Trimmer	35.34	11.61	10.81	0.15	0.15	0.15	58.21
						L&M	**LEG**	
A0714	Vegetation Control Sprayer	38.79	11.61	10.91	0.15	0.15	0.15	61.76
						L&M	**LEG**	
A0715	Inside Journeyman Communications CO/PBX	38.07	11.61	12.54	0.95	0.20	0.15	63.52
Elevator Workers								
						L&M	**VAC**	
A0802	Elevator Constructor	35.94	13.58	14.21	0.60	0.30	3.27	67.90
						L&M	**VAC**	
A0803	Elevator Constructor Mechanic	51.34	13.58	14.21	0.60	0.30	5.70	85.73

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits		THR
Heat & Frost Insulators/Asbestos Workers								
	**See note on last page if remote site							
						SAF		
A0902	Asbestos Abatement-Mechanical Systems	36.18	8.84	9.51	0.60	0.12		55.25
						SAF		
A0903	Asbestos Abatement/General Demolition All Systems	36.18	8.84	9.51	0.60	0.12		55.25
						SAF		
A0904	Insulator, Group II	36.18	8.84	9.51	0.60	0.12		55.25
						SAF		
A0905	Fire Stop	36.18	8.84	9.51	0.60	0.12		55.25
IronWorkers								
	**See note on last page if remote site							
						L&M	**IAF**	
A1101	Ironworkers, including:	36.25	7.58	18.00	0.97	0.46	0.10	63.36
	Bender Operators Bridge & Structural Machinery Mover Ornamental Reinforcing Rigger Sheeter Signalman Stage Rigger Toxic Haz-Mat Work Welder							
						L&M	**IAF**	
A1102	Helicopter	37.25	7.58	18.00	0.97	0.46	0.10	64.36
	Tower (energy producing windmill type towers to include nacelle and blades)							
						L&M	**IAF**	
A1103	Fence/Barrier Installer	32.75	7.58	17.75	0.97	0.46	0.10	59.61
	Guard Rail Installer							
						L&M	**IAF**	
A1104	Guard Rail Layout Man	33.49	7.58	17.75	0.97	0.46	0.10	60.35
Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)								
	**See note on last page if remote site							
						L&M	**LEG**	
N1201	Group I, including:	29.79	7.53	15.95	1.20	0.20	0.15	54.82
	Asphalt Worker (shovelman, plant crew)							

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits		THR
						L&M	LEG	

Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)

**See note on last page if remote site

N1201	Group I, including:	29.79	7.53	15.95	1.20	0.20	0.15	54.82

Brush Cutter
Camp Maintenance Laborer
Carpenter Tender or Helper
Choke Setter, Hook Tender, Rigger, Signalman
Concrete Labor (curb & gutter, chute handler, grouting, curing, screeding)
Crusher Plant Laborer
Demolition Laborer
Ditch Digger
Dumpman
Environmental Laborer (hazard/toxic waste, oil spill)
Fence Installer
Fire Watch Laborer
Flagman
Form Stripper
General Laborer
Guardrail Laborer, Bridge Rail Installer
Hydro-seeder Nozzleman
Laborer, Building
Landscaper or Planter
Laying of Mortarless Decorative Block (retaining walls, flowered decorative block 4 feet or less - highway or landscape work)
Material Handler
Pneumatic or Power Tools
Portable or Chemical Toilet Serviceman
Pump Man or Mixer Man
Railroad Track Laborer
Sandblast, Pot Tender
Saw Tender
Slurry Work
Steam Cleaner Operator
Steam Point or Water Jet Operator
Storm Water Pollution Protection Plan Worker (SWPPP Worker - erosion and sediment control Laborer)
Tank Cleaning
Utiliwalk & Utilidor Laborer
Watchman (construction projects)
Window Cleaner

						L&M	LEG	
N1202	Group II, including:	30.79	7.53	15.95	1.20	0.20	0.15	55.82

Burning & Cutting Torch
Cement or Lime Dumper or Handler (sack or bulk)

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits		THR
						L&M	LEG	

Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)

**See note on last page if remote site

N1202	Group II, including:	30.79	7.53	15.95	1.20	0.20	0.15	55.82

Certified Erosion Sediment Control Lead (CESCL Laborer)
Choker Splicer
Chucktender (wagon, air-track & hydraulic drills)
Concrete Laborer (power buggy, concrete saws, pumpcrete nozzleman, vibratorman)
Culvert Pipe Laborer
Cured Inplace Pipelayer
Environmental Laborer (asbestos, marine work)
Foam Gun or Foam Machine Operator
Green Cutter (dam work)
Gunite Operator
Hod Carrier
Jackhammer or Pavement Breaker (more than 45 pounds)
Laser Instrument Operator
Laying of Mortarless Decorative Block (retaining walls, flowered decorative block over 4 feet - highway or landscape work)
Mason Tender & Mud Mixer (sewer work)
Pilot Car
Pipelayer Helper
Plasterer, Bricklayer & Cement Finisher Tender
Powderman Helper
Power Saw Operator
Railroad Switch Layout Laborer
Sandblaster
Scaffold Building & Erecting
Sewer Caulker
Sewer Plant Maintenance Man
Thermal Plastic Applicator
Timber Faller, Chainsaw Operator, Filer
Timberman

N1203	Group III, including:	31.69	7.53	15.95	1.20	0.20	0.15	56.72

Bit Grinder
Camera/Tool/Video Operator
Guardrail Machine Operator
High Rigger & Tree Topper
High Scaler
Multiplate
Plastic Welding
Slurry Seal Squeegee Man
Traffic Control Supervisor

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits		THR
						L&M	LEG	
Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)								
	**See note on last page if remote site							
N1203	Group III, including:	31.69	7.53	15.95	1.20	0.20	0.15	56.72
	Welding Certified (in connection with laborer's work)							
						L&M	LEG	
N1204	Group IIIA	34.97	7.53	15.95	1.20	0.20	0.15	60.00
	Asphalt Raker, Asphalt Belly Dump Lay Down							
	Drill Doctor (in the field)							
	Driller (including, but not limited to, wagon drills, air-track drills, hydraulic drills)							
	Licensed Powderman							
	Pioneer Drilling & Drilling Off Tugger (all type drills)							
	Pipelayers							
	Storm Water Pollution Protection Plan Specialist (SWPPP Specialist)							
						L&M	LEG	
N1205	Group IV	19.36	7.53	15.95	1.20	0.20	0.15	44.39
	Final Building Cleanup							
	Permanent Yard Worker							
						L&M	LEG	
N1206	Group IIIB	35.80	7.53	15.95	1.20	0.20	0.15	60.83
	Federally Licensed Powderman (Responsible Person in Charge)							
	Grade Checking (setting or transferring of grade marks, line and grade, Stake Hopper)							
Laborers (The area that is south of N63 latitude and west of W138 longitude)								
	**See note on last page if remote site							
						L&M	LEG	
S1201	Group I, including:	29.79	7.53	15.95	1.20	0.20	0.15	54.82
	Asphalt Worker (shovelman, plant crew)							
	Brush Cutter							
	Camp Maintenance Laborer							
	Carpenter Tender or Helper							
	Choke Setter, Hook Tender, Rigger, Signalman							
	Concrete Labor (curb & gutter, chute handler, grouting, curing, screeding)							
	Crusher Plant Laborer							
	Demolition Laborer							
	Ditch Digger							
	Dumpman							
	Environmental Laborer (hazard/toxic waste, oil spill)							
	Fence Installer							
	Fire Watch Laborer							
	Flagman							

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits		THR
						L&M	LEG	

Laborers (The area that is south of N63 latitude and west of W138 longitude)

**See note on last page if remote site

S1201	Group I, including:	29.79	7.53	15.95	1.20	0.20	0.15	54.82

Form Stripper
General Laborer
Guardrail Laborer, Bridge Rail Installer
Hydro-seeder Nozzleman
Laborer, Building
Landscaper or Planter
Laying of Mortarless Decorative Block (retaining walls, flowered decorative block 4 feet or less - highway or landscape work)
Material Handler
Pneumatic or Power Tools
Portable or Chemical Toilet Serviceman
Pump Man or Mixer Man
Railroad Track Laborer
Sandblast, Pot Tender
Saw Tender
Slurry Work
Steam Cleaner Operator
Steam Point or Water Jet Operator
Storm Water Pollution Protection Plan Worker (SWPPP Worker - erosion and sediment control Laborer)
Tank Cleaning
Utiliwalk & Utilidor Laborer
Watchman (construction projects)
Window Cleaner

						L&M	LEG	
S1202	Group II, including:	30.79	7.53	15.95	1.20	0.20	0.15	55.82

Burning & Cutting Torch
Cement or Lime Dumper or Handler (sack or bulk)
Certified Erosion Sediment Control Lead (CESCL Laborer)
Choker Splicer
Chucktender (wagon, air-track & hydraulic drills)
Concrete Laborer (power buggy, concrete saws, pumpcrete nozzleman, vibratorman)
Culvert Pipe Laborer
Cured Inplace Pipelayer
Environmental Laborer (asbestos, marine work)
Foam Gun or Foam Machine Operator
Green Cutter (dam work)
Gunite Operator
Hod Carrier
Jackhammer or Pavement Breaker (more than 45 pounds)

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits		THR
						L&M	LEG	

Laborers (The area that is south of N63 latitude and west of W138 longitude)

**See note on last page if remote site

						L&M	LEG	
S1202	Group II, including:	30.79	7.53	15.95	1.20	0.20	0.15	55.82

Laser Instrument Operator
Laying of Mortarless Decorative Block (retaining walls, flowered decorative block over 4 feet - highway or landscape work)
Mason Tender & Mud Mixer (sewer work)
Pilot Car
Pipelayer Helper
Plasterer, Bricklayer & Cement Finisher Tender
Powderman Helper
Power Saw Operator
Railroad Switch Layout Laborer
Sandblaster
Scaffold Building & Erecting
Sewer Caulker
Sewer Plant Maintenance Man
Thermal Plastic Applicator
Timber Faller, Chainsaw Operator, Filer
Timberman

						L&M	LEG	
S1203	Group III, including:	31.69	7.53	15.95	1.20	0.20	0.15	56.72

Bit Grinder
Camera/Tool/Video Operator
Guardrail Machine Operator
High Rigger & Tree Topper
High Scaler
Multiplate
Plastic Welding
Slurry Seal Squeegee Man
Traffic Control Supervisor
Welding Certified (in connection with laborer's work)

						L&M	LEG	
S1204	Group IIIA	34.97	7.53	15.95	1.20	0.20	0.15	60.00

Asphalt Raker, Asphalt Belly Dump Lay Down
Drill Doctor (in the field)
Driller (including, but not limited to, wagon drills, air-track drills, hydraulic drills)
Licensed Powderman
Pioneer Drilling & Drilling Off Tugger (all type drills)
Pipelayers
Storm Water Pollution Protection Plan Specialist (SWPPP Specialist)

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits		THR
Laborers (The area that is south of N63 latitude and west of W138 longitude)								
	**See note on last page if remote site							
						L&M	**LEG**	
S1205	Group IV	19.36	7.53	15.95	1.20	0.20	0.15	44.39
	Final Building Cleanup Permanent Yard Worker							
						L&M	**LEG**	
S1206	Group IIIB	35.80	7.53	15.95	1.20	0.20	0.15	60.83
	Federally Licensed Powderman (Responsible Person in Charge) Grade Checking (setting or transferring of grade marks, line and grade, Stake Hopper)							
Millwrights								
						L&M		
A1251	Millwright (journeyman)	35.74	9.78	10.51	1.00	0.25	0.15	57.43
						L&M		
A1252	Millwright Welder	36.33	9.78	10.51	1.00	0.25	0.15	58.02
Painters, Region I (North of N63 latitude)								
	**See note on last page if remote site							
						L&M		
N1301	Group I, including:	30.96	7.69	11.10	0.83	0.07		50.65
	Brush General Painter Hand Taping Hazardous Material Handler Lead-Based Paint Abatement Roll							
						L&M		
N1302	Group II, including:	31.48	7.69	11.10	0.83	0.07		51.17
	Bridge Painter Epoxy Applicator General Drywall Finisher Hand/Spray Texturing Industrial Coatings Specialist Machine/Automatic Taping Pot Tender Sandblasting Specialty Painter Spray Structural Steel Painter							

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Painters, Region I (North of N63 latitude)							
	**See note on last page if remote site						
						L&M	
N1302	Group II, including:	31.48	7.69	11.10	0.83	0.07	51.17
	Wallpaper/Vinyl Hanger						
N1304	Group IV, including:	37.52	7.69	11.16	0.85	0.05	57.27
	Glazier						
	Storefront/Automatic Door Mechanic						
N1305	Group V, including:	29.65	7.69	5.02	0.83	0.07	43.26
	Carpet Installer						
	Floor Coverer						
	Heat Weld/Cove Base						
	Linoleum/Soft Tile Installer						
Painters, Region II (South of N63 latitude)							
	**See note on last page if remote site						
						L&M	
S1301	Group I, including :	29.20	7.69	10.85	0.83	0.07	48.64
	Brush						
	General Painter						
	Hand Taping						
	Hazardous Material Handler						
	Lead-Based Paint Abatement						
	Roll						
	Spray						
						L&M	
S1302	Group II, including :	30.45	7.69	10.85	0.83	0.07	49.89
	General Drywall Finisher						
	Hand/Spray Texturing						
	Machine/Automatic Taping						
	Wallpaper/Vinyl Hanger						
						L&M	
S1303	Group III, including :	30.55	7.69	10.85	0.83	0.07	49.99
	Bridge Painter						
	Epoxy Applicator						
	Industrial Coatings Specialist						
	Pot Tender						
	Sandblasting						
	Specialty Painter						
	Structural Steel Painter						

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits		THR
Painters, Region II (South of N63 latitude)								
	**See note on last page if remote site							
S1304	Group IV, including:	37.52	7.69	10.41	0.88	L&M 0.07		56.57
	Glazier Storefront/Automatic Door Mechanic							
S1305	Group V, including:	29.65	7.69	5.02	0.83	L&M 0.07		43.26
	Carpet Installer Floor Coverer Heat Weld/Cove Base Linoleum/Soft Tile Installer							
Piledrivers								
	**See note on last page if remote site							
A1401	Piledriver	37.34	9.78	12.86	0.70	L&M 0.10	IAF 0.15	60.93
	Assistant Dive Tender Carpenter/Piledriver Rigger Sheet Stabber Skiff Operator							
A1402	Piledriver-Welder/Toxic Worker	38.34	9.78	12.86	0.70	L&M 0.10	IAF 0.15	61.93
A1403	Remotely Operated Vehicle Pilot/Technician	41.65	9.78	12.86	0.70	L&M 0.10	IAF 0.15	65.24
	Single Atmosphere Suit, Bell or Submersible Pilot							
A1404	Diver (working) ***See note on last page	81.45	9.78	12.86	0.70	L&M 0.10	IAF 0.15	105.04
A1405	Diver (standby) ***See note on last page	41.65	9.78	12.86	0.70	L&M 0.10	IAF 0.15	65.24
A1406	Dive Tender ***See note on last page	40.65	9.78	12.86	0.70	L&M 0.10	IAF 0.15	64.24
A1407	Welder (American Welding Society, Certified Welding Inspector)	42.90	9.78	12.86	0.70	L&M 0.10	IAF 0.15	66.49
Plumbers, Region I (North of N63 latitude)								
N1501	Journeyman Pipefitter	40.96	7.40	12.70	1.10	L&M 1.10	S&L	63.26
	Plumber							

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Plumbers, Region I (North of N63 latitude)							
						L&M **S&L**	
N1501	Journeyman Pipefitter	40.96	7.40	12.70	1.10	1.10	63.26
	Welder						
Plumbers, Region II (South of N63 latitude)							
						L&M	
S1501	Journeyman Pipefitter	39.21	8.67	10.82	1.50	0.20	60.40
	Plumber						
	Welder						
Plumbers, Region IIA (1st Judicial District)							
						L&M	
X1501	Journeyman Pipefitter	37.27	12.47	11.25	2.50	0.24	63.73
	Plumber						
	Welder						
Power Equipment Operators							
	**See note on last page if remote site						
						L&M	
A1601	Group I, including:	40.03	9.60	10.50	1.00	0.10	61.23
	Asphalt Roller: Breakdown, Intermediate, and Finish						
	Back Filler						
	Barrier Machine (Zipper)						
	Beltcrete with Power Pack & similar conveyors						
	Bending Machine						
	Boat Coxswain						
	Bulldozer						
	Cableways, Highlines & Cablecars						
	Cleaning Machine						
	Coating Machine						
	Concrete Hydro Blaster						
	Cranes (45 tons & under or 150 feet of boom & under (including jib & attachments))						
	(a) Hydralifts or Transporters, (all track or truck type)						
	(b) Derricks						
	Crushers						
	Deck Winches, Double Drum						
	Ditching or Trenching Machine (16 inch or over)						
	Drag Scraper, Yarder, and similar types						

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR

Power Equipment Operators

**See note on last page if remote site

						L&M	
A1601	Group I, including:	40.03	9.60	10.50	1.00	0.10	61.23

Drilling Machines, Core, Cable, Rotary and Exploration
Finishing Machine Operator, Concrete Paving, Laser Screed, Sidewalk, Curb & Gutter Machine
Helicopters
Hover Craft, Flex Craft, Loadmaster, Air Cushion, All-Terrain Vehicle, Rollagon, Bargecable, Nodwell, & Snow Cat
Hydro Ax, Feller Buncher & similar
Licensed Line & Grade
Loaders (2 1/2 yards through 5 yards, including all attachments):
(a) Forklifts (with telescopic boom & swing attachment)
(b) Front End & Overhead, (2-1/2 yards through 5 yards)
(c) Loaders, (with forks or pipe clamp)
(d) Loaders, (elevating belt type, Euclid & similar types)
Mechanic, Welder, Bodyman, Electrical, Camp & Maintenance Engineer
Micro Tunneling Machine
Mixers: Mobile type with hoist combination
Motor Patrol Grader
Mucking Machine: Mole, Tunnel Drill, Horizontal/Directional Drill Operator and/or Shield
Operator on Dredges
Piledriver Engineer, L.B. Foster, Puller or similar paving breaker
Plant Operator (Asphalt & Concrete)
Power Plant, Turbine Operator 200 k.w & over (power plants or combination of power units over 300 k.w.)
Remote Controlled Equipment
Scraper (through 40 yards)
Service Oiler/Service Engineer
Shot Blast Machine
Shovels, Backhoes, Excavators with all attachments, and Gradealls (3 yards & under)
Sideboom (under 45 tons)
Spreaders, Blaw Knox, Cedarapids, Barber Greene, Slurry Machine
Sub Grader (Gurries, Reclaimer & similar types)
Tack Tractor
Truck Mounted Concrete Pump, Conveyor & Creter
Unlicensed Off-Road Hauler
Wate Kote Machine

						L&M	
A1602	Group IA, including:	41.79	9.60	10.50	1.00	0.10	62.99

Camera/Tool/Video Operator (Slipline)

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Power Equipment Operators							
	**See note on last page if remote site						
						L&M	
A1602	Group IA, including:	41.79	9.60	10.50	1.00	0.10	62.99
	Certified Welder, Electrical Mechanic, Camp Maintenance Engineer, Mechanic (over 10,000 hours)						
	Cranes (over 45 tons or 150 feet including jib & attachments)						
	(a) Clamshells & Draglines (over 3 yards)						
	(b) Tower Cranes						
	Licensed Water/Waste Water Treatment Operator						
	Loaders (over 5 yards)						
	Motor Patrol Grader, Dozer, Grade Tractor, Roto-Mill/Profiler (finish: when finishing to final grade and/or to hubs, or for asphalt)						
	Power Plants (1000 k.w. & over)						
	Quad						
	Scrapers (over 40 yards)						
	Screed						
	Shovels, Backhoes, Excavators with all attachments (over 3 yards)						
	Sidebooms (over 45 tons)						
	Slip Form Paver, C.M.I. & similar types						
						L&M	
A1603	Group II, including:	39.26	9.60	10.50	1.00	0.10	60.46
	Boiler - Fireman						
	Cement Hogs & Concrete Pump Operator						
	Conveyors (except those listed in Group I)						
	Hoists on Steel Erection, Towermobiles & Air Tuggers						
	Horizontal/Directional Drill Locator						
	Licensed Grade Technician						
	Loaders (i.e., Elevating Grader & Material Transfer Vehicle)						
	Locomotives, Rod & Geared Engines						
	Mixers						
	Screening, Washing Plant						
	Sideboom (cradling rock drill, regardless of size)						
	Skidder						
	Trenching Machines (under 16 inches)						
	Water/Waste Water Treatment Operator						
						L&M	
A1604	Group III, including:	38.54	9.60	10.50	1.00	0.10	59.74
	"A" Frame Trucks, Deck Winches						
	Bombardier (tack or tow rig)						
	Boring Machine						
	Brooms, Power						
	Bump Cutter						
	Compressor						

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Power Equipment Operators							
	**See note on last page if remote site						
A1604	Group III, including:	38.54	9.60	10.50	1.00	L&M 0.10	59.74
	Farm Tractor Forklift, Industrial Type Gin Truck or Winch Truck (with poles when used for hoisting) Grade Checker & Stake Hopper Hoists, Air Tuggers, Elevators Loaders: (a) Elevating-Athey, Barber Greene & similar types (b) Forklifts or Lumber Carrier (on construction job sites) (c) Forklifts, (with tower) (d) Overhead & Front End, (under 2-l/2 yards) Locomotives: Dinkey (air, steam, gas & electric) Speeders Mechanics, Light Duty Oil, Blower Distribution Posthole Digger, Mechanical Pot Fireman (power agitated) Power Plant, Turbine Operator, (under 200 k.w.) Pumps, Water Roller (other than Asphalt) Saws, Concrete Skid Hustler Skid Steer (with all attachments) Straightening Machine Tow Tractor						
A1605	Group IV, including:	32.33	9.60	10.50	1.00	L&M 0.10	53.53
	Crane Assistant Engineer/Rig Oiler Drill Helper Parts & Equipment Coordinator Spotter Steam Cleaner Swamper (on trenching machines or shovel type equipment)						
Roofers							
	**See note on last page if remote site						
A1701	Roofer & Waterproofer	42.95	7.43	2.91	0.81	L&M 0.10	0.02 54.22
A1702	Roofer Material Handler	30.07	7.43	2.91	0.81	L&M 0.10	0.02 41.34

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Sheet Metal Workers, Region I (North of N63 latitude)							
						L&M	
N1801	Sheet Metal Journeyman	45.68	8.80	10.34	1.32	0.25	66.39

Air Balancing and duct cleaning of HVAC systems
Brazing, soldering or welding of metals
Demolition of sheet metal HVAC systems
Fabrication and installation of exterior wall sheathing, siding, metal roofing, flashing, decking and architectural sheet metal work
Fabrication and installation of heating, ventilation and air conditioning ducts and equipment
Fabrication and installation of louvers and hoods
Fabrication and installation of sheet metal lagging
Fabrication and installation of stainless steel commercial or industrial food service equipment
Manufacture, fabrication assembly, installation and alteration of all ferrous and nonferrous metal work
Metal lavatory partitions
Preparation of drawings taken from architectural and engineering plans required for fabrication and erection of sheet metal work
Sheet Metal shelving
Sheet Metal venting, chimneys and breaching
Skylight installation

Sheet Metal Workers, Region II (South of N63 latitude)							
						L&M	
S1801	Sheet Metal Journeyman	40.49	8.80	11.42	1.18	0.33	62.22

Air Balancing and duct cleaning of HVAC systems
Brazing, soldering or welding of metals
Demolition of sheet metal HVAC systems
Fabrication and installation of exterior wall sheathing, siding, metal roofing, flashing, decking and architectural sheet metal work
Fabrication and installation of heating, ventilation and air conditioning ducts and equipment
Fabrication and installation of louvers and hoods
Fabrication and installation of sheet metal lagging
Fabrication and installation of stainless steel commercial or industrial food service equipment
Manufacture, fabrication assembly, installation and alteration of all ferrous and nonferrous metal work
Metal lavatory partitions
Preparation of drawings taken from architectural and engineering plans required for fabrication and erection of sheet metal work
Sheet Metal shelving
Sheet Metal venting, chimneys and breaching

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Sheet Metal Workers, Region II (South of N63 latitude)							
S1801	Sheet Metal Journeyman	40.49	8.80	11.42	1.18	L&M 0.33	62.22
	Skylight installation						
Sprinkler Fitters							
A1901	Sprinkler Fitter	43.75	8.52	13.20	0.45	L&M 0.25	66.17
Surveyors							
	**See note on last page if remote site						
A2001	Chief of Parties	42.31	8.78	9.99	1.25	L&M 0.10	62.43
A2002	Party Chief	40.72	8.78	9.99	1.25	L&M 0.10	60.84
A2003	Line & Grade Technician/Office Technician	40.12	8.78	9.99	1.25	L&M 0.10	60.24
A2004	Associate Party Chief (including Instrument Person & Head Chain Person)	38.00	8.78	9.99	1.25	L&M 0.10	58.12
A2005	Stake Hop/Grademan	35.07	8.78	9.99	1.25	L&M 0.10	55.19
A2006	Chain Person (for crews with more than 2 people)	33.66	8.78	9.99	1.25	L&M 0.10	53.78
Truck Drivers							
	**See note on last page if remote site						
A2101	Group I, including:	39.09	8.78	9.99	1.25	L&M 0.10	59.21
	Air/Sea Traffic Controllers						
	Ambulance/Fire Truck Driver (EMT certified)						
	Boat Coxswain						
	Captains & Pilots (air & water)						
	Deltas, Commanders, Rollagons, & similar equipment (when pulling sleds, trailers or similar equipment)						
	Dump Trucks (including rockbuggy & trucks with pups) over 40 yards up to & including 60 yards						
	Helicopter Transporter						
	Lowboys, including attached trailers & jeeps, up to & including 12 axles (over 12 axles or 150 tons to be negotiated)						

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Truck Drivers							
	**See note on last page if remote site						
A2101	Group I, including:	39.09	8.78	9.99	1.25	L&M 0.10	59.21
	Material Coordinator and Purchasing Agent Ready-mix (over 12 yards up to & including 15 yards) (over 15 yards to be negotiated) Semi with Double Box Mixer Tireman, Heavy Duty/Fueler Water Wagon (250 Bbls and above)						
A2102	Group 1A including:	40.36	8.78	9.99	1.25	L&M 0.10	60.48
	Dump Trucks (including rockbuggy & trucks with pups) over 60 yards up to & including 100 yards (over 100 yards to be negotiated) Jeeps (driver under load)						
A2103	Group II, including:	37.83	8.78	9.99	1.25	L&M 0.10	57.95
	All Deltas, Commanders, Rollagons, & similar equipment Boom Truck/Knuckle Truck (over 5 tons) Construction and Material Safety Technician Dump Trucks (including rockbuggy & trucks with pups) over 20 yards up to & including 40 yards Gin Pole Truck, Winch Truck, Wrecker (truck mounted "A" frame manufactured rating over 5 tons) Lowboys (including attached trailers & jeeps up to & including 8 axles) Mechanics Partsman Ready-mix (over 7 yards up to & including 12 yards) Stringing Truck Super Vac Truck/Cacasco Truck/Heat Stress Truck Turn-O-Wagon or DW-10 (not self loading)						
A2104	Group III, including:	37.01	8.78	9.99	1.25	L&M 0.10	57.13
	Batch Trucks (8 yards & up) Boom Truck/Knuckle Truck (up to & including 5 tons) Dump Trucks (including rockbuggy & trucks with pups) over 10 yards up to & including 20 yards Expeditor (electrical & pipefitting materials) Gin Pole Truck, Winch Truck, Wrecker (truck mounted "A" frame manufactured rating 5 tons & under) Greaser - Shop Oil Distributor Driver Thermal Plastic Layout Technician Traffic Control Technician						

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Truck Drivers							
	**See note on last page if remote site						
						L&M	
A2104	Group III, including:	37.01	8.78	9.99	1.25	0.10	57.13
	Trucks/Jeeps (push or pull)						
						L&M	
A2105	Group IV, including:	36.43	8.78	9.99	1.25	0.10	56.55
	Air Cushion or similar type vehicle						
	All Terrain Vehicle						
	Buggymobile						
	Bull Lift & Fork Lift, Fork Lift with Power Boom & Swing Attachment (over 5 tons)						
	Bus Operator (over 30 passengers)						
	Combination Truck-Fuel & Grease						
	Compactor (when pulled by rubber tired equipment)						
	Dump Trucks (including Rockbuggy & trucks with pups up to & including 10 yards)						
	Dumpster						
	Expeditor (general)						
	Fire Truck/Ambulance Driver						
	Flat Beds, Dual Rear Axle						
	Foam Distributor Truck Dual Axle						
	Front End Loader with Fork						
	Grease Truck						
	Hydro Seeder, Dual Axle						
	Hyster Operators (handling bulk aggregate)						
	Loadmaster (air & water operations)						
	Lumber Carrier						
	Ready-mix, (up to & including 7 yards)						
	Rigger (air/water/oilfield)						
	Semi or Truck & Trailer						
	Tireman, Light Duty						
	Track Truck Equipment						
	Vacuum Truck, Truck Vacuum Sweeper						
	Warehouseperson						
	Water Truck (Below 250 Bbls)						
	Water Truck, Dual Axle						
	Water Wagon, Semi						
						L&M	
A2106	Group V, including:	35.67	8.78	9.99	1.25	0.10	55.79
	Batch Truck (up to & including 7 yards)						
	Buffer Truck						
	Bull Lifts & Fork Lifts, Fork Lifts with Power Boom & Swing Attachments (up to & including 5 tons)						

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Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Truck Drivers							
	**See note on last page if remote site						
						L&M	
A2106	Group V, including:	35.67	8.78	9.99	1.25	0.10	55.79
	Bus Operator (up to 30 passengers)						
	Farm Type Rubber Tired Tractor (when material handling or pulling wagons on a construction project)						
	Flat Beds, Single Rear Axle						
	Foam Distributor Truck Single Axle						
	Fuel Handler (station/bulk attendant)						
	Gear/Supply Truck						
	Gravel Spreader Box Operator on Truck						
	Hydro Seeders, Single axle						
	Pickups (pilot cars & all light-duty vehicles)						
	Rigger/Swamper						
	Tack Truck						
	Team Drivers (horses, mules, & similar equipment)						
Tunnel Workers, Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)							
	**See note on last page if remote site						
						L&M	**LEG**
N2201	Group I, including:	32.77	7.53	15.95	1.20	0.20	0.15	57.80
	Brakeman						
	Mucker						
	Nipper						
	Storm Water Pollution Protection Plan Worker (SWPPP Worker - erosion and sediment control Laborer)						
	Topman & Bull Gang						
	Tunnel Track Laborer						
						L&M	**LEG**
N2202	Group II, including:	33.87	7.53	15.95	1.20	0.20	0.15	58.90
	Burning & Cutting Torch						
	Certified Erosion Sediment Control Lead (CESCL Laborer)						
	Concrete Laborer						
	Jackhammer						
	Laser Instrument Operator						
	Nozzlemen, Pumpcrete or Shotcrete						
	Pipelayer Helper						
						L&M	**LEG**
N2203	Group III, including:	34.86	7.53	15.95	1.20	0.20	0.15	59.89
	Miner						
	Retimberman						

Wage benefits key: BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits		THR
						L&M	LEG	
Tunnel Workers, Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)								
	**See note on last page if remote site							
N2204	Group IIIA, including:	38.47	7.53	15.95	1.20	0.20	0.15	63.50
	Asphalt Raker, Asphalt Belly Dump Lay Down							
	Drill Doctor (in the field)							
	Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)							
	Licensed Powderman							
	Pioneer Drilling & Drilling Off Tugger (all type drills)							
	Pipelayer							
	Storm Water Pollution Protection Plan Specialist (SWPPP Specialist)							
						L&M	LEG	
N2206	Group IIIB, including:	39.38	7.53	15.95	1.20	0.20	0.15	64.41
	Federally Licensed Powderman (Responsible Person in Charge)							
	Grade Checking (setting or transferring of grade marks, line and grade, Stake Hopper)							
Tunnel Workers, Laborers (The area that is south of N63 latitude and west of W138 longitude)								
	**See note on last page if remote site							
						L&M	LEG	
S2201	Group I, including:	32.77	7.53	15.95	1.20	0.20	0.15	57.80
	Brakeman							
	Mucker							
	Nipper							
	Storm Water Pollution Protection Plan Worker (SWPPP Worker - erosion and sediment control Laborer)							
	Topman & Bull Gang							
	Tunnel Track Laborer							
						L&M	LEG	
S2202	Group II, including:	33.87	7.53	15.95	1.20	0.20	0.15	58.90
	Burning & Cutting Torch							
	Certified Erosion Sediment Control Lead (CESCL Laborer)							
	Concrete Laborer							
	Jackhammer							
	Laser Instrument Operator							
	Nozzlemen, Pumpcrete or Shotcrete							
	Pipelayer Helper							
						L&M	LEG	
S2203	Group III, including:	34.86	7.53	15.95	1.20	0.20	0.15	59.89
	Miner							
	Retimberman							

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits		THR
						L&M	LEG	
Tunnel Workers, Laborers (The area that is south of N63 latitude and west of W138 longitude)								
	**See note on last page if remote site							
S2204	Group IIIA, including:	38.47	7.53	15.95	1.20	0.20	0.15	63.50
	Asphalt Raker, Asphalt Belly Dump Lay Down							
	Drill Doctor (in the field)							
	Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)							
	Licensed Powderman							
	Pioneer Drilling & Drilling Off Tugger (all type drills)							
	Pipelayer							
	Storm Water Pollution Protection Plan Specialist (SWPPP Specialist)							
						L&M	LEG	
S2206	Group IIIB, including:	39.38	7.53	15.95	1.20	0.20	0.15	64.41
	Federally Licensed Powderman (Responsible Person in Charge)							
	Grade Checking (setting or transferring of grade marks, line and grade, Stake Hopper)							
Tunnel Workers, Power Equipment Operators								
	**See note on last page if remote site							
						L&M		
A2207	Group I	44.03	9.60	10.50	1.00	0.10		65.23
						L&M		
A2208	Group IA	45.97	9.60	10.50	1.00	0.10		67.17
						L&M		
A2209	Group II	43.19	9.60	10.50	1.00	0.10		64.39
						L&M		
A2210	Group III	42.39	9.60	10.50	1.00	0.10		63.59
						L&M		
A2211	Group IV	35.56	9.60	10.50	1.00	0.10		56.76

*** A remote site is isolated and relatively distant from the amenities of civilization, and usually far from the employee's home. As a condition of employment, the workers must eat, sleep, and socialize at the worksite and remain there for extended periods.**

**** This classification must receive board and lodging under certain conditions. A per diem option of $75 is an alternative to providing meals and lodging. See Page v for an explanation.**

***** Work in combination of classifications: Employees working in any combination of classifications within the diving crew (working diver, standby diver, and tender) in a shift are paid in the classification with the highest rate for a minimum of 8 hours per shift.**

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