ALASKA ENERGY AUTHORITY

PROCUREMENT DEPARTMENT
813 W Northern Lights Blvd
Anchorage, AK 99503

RETURN BY EMAIL
AEAProcurement@akenergyauthority.org

REQUEST FOR QUOTATION

RFQ NO: **26092**
Quotations due on/before
2:00 PM Local Time
06/17/2026

Levelock & Hughes M&I Engine Generator & Accessories Purchase

RFQ Date: 06/03/2026

VENDOR NOTICE (This is NOT a Purchase Order)

This is an **informal quotation** that will not be read at public opening. The information may be publicly reviewed after award. The terms and conditions should be reviewed and understood before preparing a quotation. The quotation shall be the best net price, FOB destination, to include all delivery charges, but exclude applicable taxes. Delivery schedule shall be indicated in the spaces provided below. Please return the quotation by the above time and date to the address:AEAProcurement@akenergyauthority.org. Please reference the RFQ number on the SUBJECT of the email. Please include the completed and signed Debarment Certificate, page 4 of Appendix B and the completed and signed Build America Buy America Act Certificate, page 5 of Appendix B.

DELIVERY LOCATION:
Alaska Energy Authority
2601 Commercial Drive
Anchorage AK 99501

PROCUREMENT OFFICER:
Justin Tuomi (907) 771-3903
jjtuomi@akenergyauthority.org

VENDOR QUOTATION

Item	Description of Supply or Service	Qty	Unit	Unit Price	Extended Price	Firm Delivery In Weeks, See Note
1	223 HP John Deere 6068AFM Engine & Accessories	1	EA			
2	70,000 BTU/Hour Nominal Capacity Fuel Oil Cooler	2	EA			
3	225ekW John Deere 6090HFM Engine-Generator & Accessories	1	EA			
4	65ekW John Deere 4045AFM Engine-Generator & Accessories	1	EA			
5	Generator Accessories (1 ea. of: Wiring J- Box, Exhaust RTD, & Air Restriction. Indicator)	1	Lot			
6	6,000 BTU/Minute Nominal Capacity Charge Air Cooler	1	EA			

Delivery: It is understood that Item #6 Charge Air Cooler may have a delivery of 18 weeks or more. All other items are desired within 12 weeks from award of order. In the column above input a firm delivery in calendar weeks for each item. Note that the schedule for the project is critical so extremely long delivery times for critical equipment may cause a quote to be declared not responsive unless no quotes can meet the desired delivery time.

If some items have significantly longer lead times than others, partial payment will be allowed for major equipment deliveries.

See the following three pages for Standard Terms and Conditions. See Appendix A Specifications for detailed description of equipment. See Appendix B for Federal Assurances. See Appendix B2 for Denali Commission BABA Requirements.

THIS SECTION MUST BE COMPLETED BY VENDOR

Company Name	Address	City	State	ZIP Code	Phone Number

Alaska Business License No.	Vendor Tax I.D.	

Signature _____ Date _____

Typed Name and Title _____

INSTRUCTIONS TO BIDDERS
TERMS AND CONDITIONS

1. REQUEST FOR QUOTATION (RFQ) REVIEW: Offerors shall carefully review this RFQ for defects and questionable or objectionable material. Offerors' comments concerning defects and questionable or objectionable material in the RFQ must be made in writing and received by the purchasing authority before the date and time set for receipt of quotes. This will allow time for an amendment to be issued if one is required. It will also help prevent the opening of a defective quote, upon which award cannot be made, and the resultant exposure of offerors' prices. Offerors' original comments should be sent to the purchasing authority listed on the front of this RFQ.

2. QUOTATION FORMS: Offerors shall use this and attached forms in submitting quotes. A photocopied quote may be submitted.

3. SUBMISSION: Quotations shall be signed where applicable and received at the designated Purchasing Office no later than as indicated.

4. QUOTE REJECTION: The State reserves the right to reject any or all quotes, combinations of items, or lot(s), and to waive defects or minor informalities.

5. EXTENSION OF PRICES: In case of error in the extension of prices in the quote, the unit prices will govern; in a lot bid, the lot prices will govern. Negligence by the vendor in preparing the quotation confers no right for the withdrawal of the quotation after it has been opened.

6. ALASKA PROCUREMENT CODE: 3 AAC 109 and 2 AAC Ch. 12 are made a part of this document as if fully set forth herein. Note that 3 AAC 109 and 2 AAC Ch. 12 are available at most public libraries and legislative information offices; and both are available for review at Alaska State Purchasing Offices.

7. PRICES: The offeror shall state prices in the units of issue on this RFQ. Prices quoted for commodities must be in U.S. funds and include applicable federal duty, brokerage fees, packaging, and transportation cost to the FOB point so that upon transfer of title the commodity can be utilized without further cost. Prices quoted for services must be quoted in U.S. funds and include applicable federal duty, brokerage fee, packaging, and transportation cost so that the services can be provided without further cost. Prices quoted must be exclusive of federal, state, and local taxes. If the offeror believes that certain taxes are payable by the State, the offeror may list such taxes separately, directly below the bid price for the affected item. The State is exempt from Federal Excise Tax except the following:

- Coal - Internal Revenue Code of 1986 (IRC), Section 4121 - on the purchase of coal;
- "Gas Guzzler" - IRC, Section 4064 - on the purchase of low m.p.g. automobiles, except that police and other emergency type vehicles are not subject to the tax;
- Air Cargo - IRC, Section 4271 - on the purchase of property transportation services by air;
- Air Passenger - IRC, Section 4261 - on the purchase of passenger transportation services by air carriers;
- Leaking Underground Storage Tank Trust Fund Tax (LUST) - IRC, Section 4081 - on the purchase of Aviation gasoline, Diesel Fuel, Gasoline, and Kerosene.

8. PAYMENT FOR STATE PURCHASES: Payment for agreements under $500,000 for the undisputed purchase of goods or services provided to a State agency, will be made within 30 days of the receipt of a proper billing or the delivery of the goods or services to the location(s) specified in the agreement, whichever is later. A late payment is subject to 1.5% interest per month on the unpaid balance. Interest will not be paid if there is a dispute or if there is an agreement which establishes a lower interest rate or precludes the charging of interest.

9. PAYMENT DISCOUNT: Discounts for prompt payment will not be considered in evaluating the price you quote. However, the State shall be entitled to take advantage of any payment discount(s) offered by the vendor provided payment is made within the discount period. Payment discount periods will be computed from the date of receipt of the commodities or services and/or a correct invoice, whichever is later. Unless freight and other charges are itemized, any discount provided will be taken on full amount of invoice.

10. VENDOR TAX ID NUMBER: If goods or services procured through this RFQ are of a type that is required to be included on a Miscellaneous Tax Statement, as described in the Internal Revenue Code, a valid tax identification number must be provided to the State of Alaska before payment will be made.

11. 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.

12. SEVERABILITY: If any provision of this contract is declared by a court to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected; and the rights and obligations of the parties shall be construed and enforced as if the contract did not contain the particular provision held to be invalid.

13. TITLE: Title passes to the State for each item at FOB destination.

14. FILING A PROTEST: An offeror shall attempt to informally resolve a dispute with the procurement officer regarding a small procurement. If the attempt is unsuccessful, the vendor may protest the solicitation or the award of a small procurement contract under 3 AAC 109 and 2 AAC

Ch. 12. The protest must be filed in writing with the commissioner of the purchasing agency or the commissioner's designee and include the following information: (1) the name, address, and telephone number of the protester; (2) the signature of the protester or the protester's representative; (3) identification of the contracting agency and the solicitation or contract at issue; (4) a detailed statement of the legal and factual grounds of the protest, including copies of relevant documents; and (5) the form of relief requested. The protester must file a copy of the protest with the procurement officer for the purchasing agency. Protests will be treated in accordance with 3 AAC 109 and 2 AAC Ch. 12.

15. COMPLIANCE: In the performance of a contract that results from this RFQ, the contractor must comply with all applicable federal, state, and borough regulations, codes, and laws; and be liable for all required insurance, licenses, permits and bonds; and pay all applicable federal, state, and borough taxes.

16. SUITABLE MATERIALS, ETC.: Unless otherwise specified, all materials, supplies or equipment offered by an offeror shall be new, unused, and of the latest edition, version, model or crop and of recent manufacture.

17. SPECIFICATIONS: Unless otherwise specified in the RFQ, product brand names or model numbers are examples of the type and quality of product required, and are not statements of preference. If the specifications describing an item conflict with a brand name or model number describing the item, the specifications govern. Reference to brand name or number does not preclude an offer of a comparable or better product, if full specifications and descriptive literature are provided for the product. Failure to provide such specifications and descriptive literature may be cause for rejection of the offer.

18. FIRM OFFER: For the purpose of award, offers made in accordance with this RFQ must be good and firm for a period of ninety (90) days from the date of quote opening.

19. QUOTE PREPARATION COSTS: The State is not liable for any costs incurred by the offeror in quote preparation.

20. CONSOLIDATION OF AWARDS: Due to high administrative costs associated with processing of purchase orders, a single low quote of $50 or less may, at the discretion of the State, be awarded to the next low offeror receiving other awards for consolidation purposes. This paragraph is not subject to the protest terms enumerated in "FILING A PROTEST" above.

21. CONTRACT FUNDING: Offerors are advised that funds are available for the initial purchase and/or the first term of the contract. Payment and performance obligations for succeeding purchases and/or additional terms of the contract are subject to the availability and appropriation of funds.

22. CONFLICT OF INTEREST: An officer or employee of the State of Alaska may not seek to acquire, be a party to, or possess a financial interest in, this contract if (1) the officer or employee is an employee of the administrative unit that supervises the award of this contract; or (2) the officer or employee has the power to take or withhold official action so as to affect the award or execution of the contract.

23. ASSIGNMENT(S): Assignment of rights, duties, or payments under a contract resulting from this RFQ is not permitted unless authorized in writing by the procurement officer of the contracting agency. Quotes that are conditioned upon the State's approval of an assignment will be rejected as nonresponsive.

24. SUBCONTRACTOR(S): Within five (5) working days of notice from the state, the apparent low bidder must submit a list of the subcontractors that will be used in the performance of the contract. The list must include the name of each subcontractor and the location of the place of business for each subcontractor and evidence of each subcontractor's valid Alaska business license.

25. FORCE MAJEURE (Impossibility to perform): The parties to a contract resulting from this RFQ are not liable for the consequences of any failure to perform, or default in performing, any of its obligations under the contract, if that failure or default is caused by any unforeseeable Force Majeure, beyond the control of, and without the fault or negligence of, the respective party. For the purposes of this Agreement, Force Majeure will mean war (whether declared or not); revolution; invasion; insurrection; riot; civil commotion; sabotage; military or usurped power; lightning; explosion; fire; storm; drought; flood; earthquake; epidemic; quarantine; strikes; acts or restraints of governmental authorities affecting the project or directly or indirectly prohibiting or restricting the furnishing or use of materials or labor required; inability to secure materials, machinery, equipment or labor because of priority, allocation or other regulations of any governmental authorities.

26. LATE QUOTES: Late quotes are quotes received after the time and date set for receipt of the quotes. Late quotes will not be accepted.

27. CONTRACT EXTENSION: Unless otherwise provided in this RFQ, the State and the successful offeror/contractor agree: (1) that any holding over of the contract excluding any exercised renewal options, will be considered as a month-to-month extension, and all other terms and conditions shall remain in full force and effect and (2) to provide written notice to the other party of the intent to cancel such month-to-month extension at least thirty (30) days before the desired date of cancellation.

28. DEFAULT: In case of default by the contractor, for any reason whatsoever, the State of Alaska may procure the goods or services from another source and hold the contractor responsible for any resulting excess cost and may seek other remedies under law or equity.

29. DISPUTES: If a contractor has a claim arising in connection with a contract resulting from this RFQ that it cannot resolve with the State by mutual agreement, it shall pursue a claim, if at all, in accordance with the provisions of 3 AAC 109 and 2 AAC Ch. 12.

30. GOVERNING LAW; FORUM SELECTION: A contract resulting from this RFQ is governed by the laws of the State of Alaska. To the extent not otherwise governed by section 29 of these Standard Terms and Conditions, any claim concerning the contract shall be brought only in the Superior Court of the State of Alaska and not elsewhere.

31. CONSUMER ELECTRICAL PRODUCT: AS 45.45.910 requires that "...a person may not sell, offer to sell, or otherwise transfer in the course of the person's business a consumer electrical product that is manufactured after August 14, 1990, unless the product is clearly marked as being listed by an approved third party certification program." Electrical consumer products manufactured before August 14, 1990, must either be clearly marked as being third party certified or be marked with a warning label that complies with AS 45.45.910(e). Even exempted electrical products must be marked with the warning label. By signature on this quote the offeror certifies that the product offered is in compliance with the law. A list of approved third party certifiers, warning labels and additional information is available from: Department of Labor, Labor Standards & Safety Division, Mechanical Inspection Section, P.O. Box 107020, Anchorage, Alaska 99510-7020, (907)269-4925.

32. CONTINUING OBLIGATION OF CONTRACTOR: Notwithstanding the expiration date of a contract resulting from this RFQ, the contractor is obligated to fulfill its responsibilities until warranty, guarantee, maintenance and parts availability requirements have completely expired.

33. ORDER DOCUMENTS: Except as specifically allowed under this RFQ, an ordering agency will not sign any vendor contract. The State is not bound by a vendor contract signed by a person who is not specifically authorized to sign for the State under this RFQ. The State of Alaska Purchase Order, Contract Award and Delivery Order are the only order documents that may be used to place orders against the contract(s) resulting from this RFQ.

34. BILLING INSTRUCTIONS: Invoices must be billed to the ordering agency's address shown on the individual Purchase Order, Contract Award or Delivery Order. The ordering agency will make payment after it receives the merchandise or service and the invoice. Questions concerning payment must be addressed to the ordering agency.

35. OFFERORS WITH DISABILITIES: The State of Alaska complies with Title II of the Americans with Disabilities Act of 1990. Individuals with disabilities who may need auxiliary aids, services, and/or special modifications to participate in this procurement should contact the procurement officer named on the cover page of this RFQ as soon as possible, but no later than the date and time quotations are due to make any necessary arrangements.

36. COMPLIANCE WITH ADA: By signature of their quote the bidder certifies that they comply with the Americans with Disabilities Act of 1990 and the regulations issued thereunder by the federal government. Services or activities furnished to the general public on behalf of the State must be fully accessible. This is intended to ensure that agencies are in accordance with 28 CFR Part 35 Section 35.130 and that services, programs or activities furnished to the public through a contract do not subject qualified individuals with a disability to discrimination based on the disability.

37. FEDERAL ASSURANCES: Because this contract is funded with federal funds, the provisions of Appendix B, Federal Assurances, shall apply. When submitting the quote, the vendor shall include the Debarment Certificate, page 4 of Appendix B.

38. COMPLIANCE WITH BABA: The federal funding for this project is subject to the Build America, Buy America Act and therefore this purchase must comply with Buy America Preferences for Infrastructure Projects, 2 CFR 184. See Appendix B2 for the Denali Commission Buy America Compliance requirements, including applicable waivers. When submitting the quote, the vendor shall include the Build America, Buy America Certificate, page 5 of Appendix B.

APPENDIX B – FEDERAL ASSURANCES

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

B.1 BREACHES AND DISPUTE RESOLUTION.

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

B.2 TERMINATION.

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

B.3 EQUAL EMPLOYMENT OPPORTUNITY.

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

B.4 DAVIS-BACON ACT, AS AMENDED (40 U.S.C. 3141-3148).

Construction contracts in excess of $2,000 are required to comply with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must pay wages not less than once a week. **A copy of the current prevailing wage determination issued by the Department of Labor is included in this solicitation.** Contract and subcontract awards must be conditioned upon the acceptance of the wage determination. All suspected or reported violations must be reported to the Federal awarding agency.

B.5 COPELAND "ANTI-KICKBACK" ACT (40 U.S.C. 3145)

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

B.6 CONTRACT WORK HOURS/SAFETY STANDARDS ACT (40 U.S.C. 3701-3708).

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

B.7 RIGHTS TO INVENTIONS MADE UNDER A CONTRACT OR AGREEMENT.

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

B.8 CLEAN AIR ACT (42 U.S.C. 7401-7671Q.) AND THE FEDERAL WATER POLLUTION CONTROL ACT (33 U.S.C. 1251-1387), AS AMENDED

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

B.9 DEBARMENT AND SUSPENSION (EXECUTIVE ORDERS 12549 & 12689)

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

B.10 BYRD ANTI-LOBBYING AMENDMENT (31 U.S.C. 1352)

Each contractor and subcontractor must certify that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or

employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Disclosures shall be forwarded from tier to tier up to the Authority. **Contractors that apply or bid for an award exceeding $100,000 must sign and submit the attached "Lobbying" certification with their bid**.

B.11 PROCUREMENT OF RECOVERED MATERIALS.

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

B.12 PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT.

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

B.13 DOMESTIC PREFERENCES FOR PROCUREMENTS.

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

The federal funding for this project is subject to the Build America, Buy America Act and therefore this purchase must comply with Buy America Preferences for Infrastructure Projects, 2 CFR 184. See Appendix B2 for the Denali Commission Buy America Compliance requirements, including applicable waivers. The quote must include the Build America, Buy America Certificate at the end of this section.

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

Instructions for Certification:

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

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

3. The terms "covered transaction," “debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "persons," "lower tier covered transaction," "principal," "proposal," and voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Orders 12549 and 12689. You may contact the Authority for assistance in obtaining a copy of those regulations.

4. The prospective contractor and lower tier participants agrees by submitting this bid or proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized in writing by the Authority.

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

6. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Non-procurement List issued by U.S. General Service Administration.

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

8. Except for transactions authorized under Paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to all remedies available to the Federal Government, the Authority may pursue available remedies including suspension and/or debarment.

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

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

(2) When the prospective contractor and lower tier participants is unable to certify to the statements in this certification, such prospective participant shall attach an explanation to this proposal.

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

Signature of Contractor’s Authorized Official: _____

Name and Title of Contractor’s Authorized Official: _____

Date:

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

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

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

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

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

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

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

The Contractor, _____certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 2 CFR §184 apply to this certification and disclosure, if any.

Signature of Contractor's Authorized Official: _____

Name and Title of Contractor's Authorized Official: _____

Date:_____

End of Federal Assurances

APPENDIX B2 - DENALI COMMISSION BUY AMERICA COMPLIANCE

PART 1 - PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes requirements for compliance with **Denali Commission Buy America** provisions for federally funded infrastructure projects.

B. The Denali Commission funding for this Project is subject to the following compliance documentation requirements and procedures for:

1. Partial Public Interest Waiver
2. De Minimis Cost and Minor Components Allowance Waiver

C. This Section establishes documentation procedures for contractor demonstration of compliance with Buy America requirements applicable to iron, steel, manufactured products, construction materials, and Section 70917(c).

1.2 RELATED REQUIREMENTS

A. Division 01 – General Requirements.

B. Section 01 29 73 - Schedule of Values

C. Section 01 29 76 – Application for Payment.

D. Section 01 33 00 – Submittal Procedures.

E. Section 00 90 10 - Buy America Preferences.

1.3 REFERENCES

A. Federal Infrastructure Investment and Jobs Act (IIJA) Buy America provisions as applied to Denali Commission projects

B. Office of Management and Budget (OMB) Memorandum M-22-11.

C. 2 CFR Part 184 – Buy America Preferences for Infrastructure Projects.

1.4 DEFINITIONS

A. Construction Materials: Articles, materials, or supplies consumed in, incorporated into, or affixed to an infrastructure project.

B. Minor Components: Components of an iron or steel product that collectively represent a small portion of total product cost.

C. De Minimis Allowance: Cost-based exception permitting limited use of non-domestic materials below specified percentage thresholds.

D. Partial Public Interest Waiver: A Denali Commission waiver allowing use of manufactured products and construction materials manufactured in the United States but that do not meet the 55% domestic content requirement of BABA.

E. Domestic Content: Materials manufactured in the United States with required domestic component percentages.

1.5 BUY AMERICA COMPLIANCE REQUIREMENTS

A. The Contractor shall ensure that all iron, steel, manufactured products, and construction materials incorporated into the Project comply with Denali Commission Buy America requirements unless permitted under the following allowances:
   1. Partial Public Interest Waiver
   2. De Minimis and Minor Components Allowance

B. The Contractor is responsible for tracking material origin and maintaining documentation demonstrating compliance.

C. The Contractor shall not incorporate non-domestic materials without prior written approval from the Authority.

1.6 DE MINIMIS ALLOWANCE (IRON, STEEL, MANUFACTURED PRODUCTS, CONSTRUCTION MATERIALS)

A. Non-domestic materials may be used under the De Minimis allowance provided that:
   1. Total cost of such materials does not exceed **5 percent of total project material costs subject to Buy America preference**, and
   2. The cumulative value does not exceed **$1,000,000**.

B. Calculation shall include cost of materials only and exclude labor, overhead and installation costs.

1.7 MINOR COMPONENTS ALLOWANCE (IRON AND STEEL)

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

1.8 PARTIAL PUBLIC INTEREST WAIVER (MANUFACTURED PRODS & CONSTRUCTION MATERIALS)

A. The Denali Commission Partial Public Interest Waiver allows the use of specific non-domestic materials where:
   1. The item or material is manufactured in the United States
   2. But whose component content does not meet the 55% domestic content requirement under BABA.

B. The waiver does NOT allow foreign products

C. The wavier does NOT apply to iron and steel products, which shall comply fully with Buy America domestic manufacturing requirements unless otherwise authorized.

1.9 CONTRACTOR DOCUMENTATION REQUIREMENTS

The Contractor shall track and document the origin of all materials incorporated into the Project and submit and maintain documentation sufficient to demonstrate compliance with Buy America requirements and applicable waivers.

A. Material Origin Certification

For each applicable product submit:

1. Product description
2. Manufacturer name and location.
3. Manufacturing facility address.
4. Country of origin.
5. Statement indicating whether material qualifies under:
    a. Domestic production requirements
    b. De Minimis allowance
    c. Minor components allowance
    d. Public Interest Waiver

B. Domestic Manufacturing Certification

Submit signed certification from manufacturer or supplier confirming:

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

C. De Minimis Tracking Log

The Contractor shall maintain and submit a cumulative log including:

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

D. Minor Components Documentation

Submit:

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

E. Public Interest Waiver Compliance Documentation

1. The Contractor shall submit a Manufacturer's or Supplier's Compliance Certificate for each manufactured product or construction material that qualifies under this waiver.

F. **Buy America Compliance Documentation**

1. The Contractor shall submit a BABA Compliance Tracking Log that tracks and documents all iron, steel, manufactured products, construction materials, and Section 70917(c) materials provided under this waiver, including:
    a. BABA Material Category
    b. Description of material or product
    c. Manufacturer and Supplier
    d. Country of origin
    e. BABA Status
    f. Waiver type (as applicable)

1.10 SUBMITTALS

A. Prior to incorporation of materials into the Work submit the following:
1. Buy America Compliance Certification.
2. Material Origin Certifications.
3. De Minimis Log.
4. Minor Component Certification.
5. Public Interest Waiver Certification.
6. Buy America Compliance Tracking Log.

B. Prior to Substantial Completion submit the following:
1. Final Denali BABA Compliance Project Material Tracking Log
2. Final Denali BABA De Minimis Tracking Log
3. Final Denali BABA Contractor Certification

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 COMPLIANCE VERIFICATION

A. A. Authority or Authority's Representative may audit contractor records at any time.

B. B. The Contractor shall maintain documentation for **minimum five years after project completion**.

C. C. Materials lacking documentation may be rejected.

3.2 NON-COMPLIANT MATERIALS

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

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

Attachment A Denali BABA Compliance Project Material Tracking Log

Attachment B Denali BABA De Minimis Tracking Log

Attachment C Denali BABA Contractor Certification

Attachment D Denali BABA Manufacturer Certification

Attachment E Denali BABA Supplier Certification

BABA Compliance Tracking Log

Project Name: **Levelock & Hughes M&I Engine Generator & Accessories Purchase**
Project Location: **Levelock & Hughes, Alaska**
Denali Commission Award Number: **FAA 1949**
AEA Contract Award Number: **AEA RFQ 26092**

Item #	Product/Item	Material Category	Supplier	Manufacturer	Country of Manufacture	BABA Status	Waiver Type	Documentation Provided
1	Steel Beam	Iron & Steel Product	Anchorage Steel	Steel Co.	USA	Compliant	None	Compliance Cert
2	Switchgear	Manufactured Product	Stusser	Square D	Various	Waiver	Partial Public Interest	Manufacturer Certificate
3	Conductors	Construction Material	Northcoast	Southwire	USA	Compliant	None	Compliance Cert
4	Cement	Section 70917(c)	Anchorage Concrete	Cemex USA	USA	Exempt	None	Exempt

Tracking Log Notes:

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

Authorized Representative

Name:

Title:

Company:

Signature:

Date:

Denali BABA De Minimis Tracking Log

Project Name: **Levelock & Hughes M&I Engine Generator & Accessories Purchase**

Project Location: **Levelock & Hughes, Alaska**

Denali Commission Award Number: **FAA 1949**

AEA Contract Award Number: **AEA RFQ 26092**

$100,000 **Total project material costs subject to Buy America preference**

Item #	Material / Product	Supplier	Country of Manufacture	Quantity	Unit Cost	Total Cost
1	Bolts	AIH	China	20	$0.50	$10.00
2	Nails	SBS	Taiwan	50	$5.00	$250.00
3						$0.00
4						$0.00
5						$0.00
6						$0.00
7						$0.00
8						$0.00
					Total De Minimis Cost	**$260.00**
					Percent	**0.3%**

Tracking Log Notes:

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

Confirm Percent <= 5% in Cell G19

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

The total cost of materials does not exceed **5 percent of total project material costs subject to Buy America preference**, and

The cumulative value does not exceed **$1,000,000**.

Authorized Representative

Name:

Title:

Company:

Signature:

Date:

BUILD AMERICA, BUY AMERICA (BABA) - CONTRACTOR CERTIFICATION

Project Name: Levelock & Hughes M&I Engine Generator & Accessories Purchase

Project Location: Levelock & Hughes, Alaska

Denali Commission Award Number: FAA 1949

Contract Number: AEA ITB 26092

Certification Statement

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

The contractor further certifies that:

1. All required BABA documentation has been collected from manufacturers, suppliers, and subcontractors.
2. Documentation is maintained in the project file and available for review by the Denali Commission or authorized federal auditors.
3. Any materials not meeting domestic sourcing requirements are documented under an approved waiver, including the Denali Commission Partial Public Interest Waiver when applicable.

Contractor Name: _____

Authorized Representative

Name: _____

Title: _____

Signature: _____

Date: _____

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

Project Name: Levelock & Hughes M&I Engine Generator & Accessories Purchase
Project Location: Levelock & Hughes, Alaska
Denali Commission Award Number: FAA 1949
Contract Number: AEA ITB 26092

Product Information

Product Name:_____
Model / Type:_____

Material Category:

☐ Iron or Steel
☐ Manufactured Product
☐ Construction Material

Country of Final Manufacture:_____
Manufacturing Facility Location:_____

Certification

The undersigned certifies that the product listed above:

☐ Meets Build America, Buy America domestic content requirements.
or
☐ Does not meet BABA domestic content requirements but is provided under one of the following Denali Commission Waivers (Circle.one):

Partial Public Interest Waiver,
De Minimis,
Minor Components.

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

Manufacturer Name: _____

Authorized Representative

Name: _____

Title: _____

Signature: _____

Date: _____

BUILD AMERICA, BUY AMERICA (BABA) - SUPPLIER CERTIFICATION

Project Name: Levelock & Hughes M&I Engine Generator & Accessories Purchase
Project Location: Levelock & Hughes, Alaska
Denali Commission Award Number: FAA 1949
Contract Number: AEA ITB 26092

The supplier/distributor certifies that all products supplied for the referenced Denali Commission project:

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

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

Supplier Name: _____

Authorized Representative

Name: _____

Title: _____

Signature: _____

Date: _____

PART 1 - GENERAL

1.1 SCOPE

A. The Work included herein shall consist of providing the following:

1. One (1) shop modified John Deere 6068AFM engine configured for repowering an existing generator complete with all accessories as specified.
2. Two (2) fuel oil cooler assemblies.
3. Two (2) shop fabricated and tested skid mounted engine generators complete with all accessories as specified.
4. One (1) lot loose ship generator accessories for field installation on an existing engine-generator.
5. One (1) charge air cooler assembly.

B. In order to meet the Denali Commission requirements the final assembly work specified herein shall be performed in the United States.

1.2 RELATED REQUIREMENTS – not used

1.3 SUBMITTALS

A. Provide the submittal in a single electronic file in Adobe Acrobat PDF format.

B. Provide complete and accurate drawings of the equipment, including outline drawings and dimensional data which fully describe the height, width, and depth of the equipment; skid construction; schematics; wiring diagrams; and other relevant details.

C. Provide mechanical and electrical performance data for the engine and generator.

D. Provide manufacturer's catalog literature for all accessories and equipment.

E. A torsional vibration analysis (TVA) has been prepared and accepted for the following engine generator combinations:

1. John Deere 4045AFM85 with Newage/Stamford UCI274E.
2. John Deere 6090HFM85 with Newage/Stamford S4L1D-D41.
3. John Deere 6090HFM85 with Marathon 432PSL6262.

For any engine generator combinations not specifically listed above, a TVA shall be provided for the proposed engine generator combination within 14-days of contract award.

1.4 REGULATORY COMPLIANCE

The Environmental Protection Agency (EPA) has issued New Source Performance Standards (NSPS) regulations governing use of stationary diesel engines in remote areas of Alaska. These regulations were revised effective June 29, 2021. The following provision of 40 CFR applies to this solicitation:

A. 40 CFR 60.4216(c) stipulates: Manufacturers, owners, and operators of stationary CI ICE that are located in remote areas of Alaska may choose to

meet the applicable emission standards for emergency engines in §§ 60.4202 and 60.4205, and not those for non-emergency engines in §§ 60.4201 and 60.4204, except that for 2014 model year and later nonemergency CI ICE, the owner or operator of any such engine must have that engine certified as meeting at least the Tier 3 PM standards identified in appendix I of 40 CFR part 1039 or 40 CFR 1042.101.

In order to comply with EPA emissions requirements and also be compatible with the intended service applications, the diesel engine furnished under this solicitation shall be a new Tier 3 Marine certified engine.

1.5 QUALITY ASSURANCE

A. Equipment shall not have been in service at any time prior to delivery, except as required by tests.

B. All equipment shall be designed, fabricated, and assembled in accordance with recognized and acceptable engineering and shop practices. Individual parts shall be manufactured to standard sizes and gauges so that repair parts, furnished at any time, can be installed in the field. Like parts of duplicate units shall be interchangeable.

C. Equipment and components furnished under these specifications shall be in accordance with the requirements of applicable UL, NEC, IEEE, NEMA, and ANSI standards.

1.6 FABRICATOR QUALIFICATIONS

The engines shall be shop modified and the engine-generators shall be assembled and tested by a qualified fabricator (Fabricator) who is regularly engaged in the business of providing diesel engine driven generator equipment.

A. The Fabricator must have staff with extensive experience in packaging diesel engine driven electrical generators. A list of five successful installations that key staff have worked on may be requested by the Authority after the bid opening and prior to award in order to verify Fabricator qualifications. The list must include installation date, description of installation, and a reference contact for each installation.

B. The Fabricator must maintain a competent service organization that is available for field service calls. A description of the organization including resumes of key personnel may be requested by the Authority after the bid opening and prior to award in order to verify Fabricator qualifications.

C. The Fabricator must have a fabrication facility with adequate space and appropriate equipment as required to perform the work. The Authority may inspect the Fabricator's shop after the bid opening and prior to award in order to verify Fabricator qualifications.

1.7 FABRICATOR WARRANTIES

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

B. In the event of equipment or component failure during the warranty period, the Fabricator shall repair or replace such defective equipment or components and bear all associated costs. Costs shall include material, parts, and labor. The Fabricator will be allowed to charge for travel and per diem expenses within Alaska related to warranty service at actual cost plus 10%. The Fabricator shall assist the Authority as directed to determine the cause of failure and pursue manufacturer's warranties to the extent necessary to obtain replacement equipment and provide proof of action taken upon request.

C. Provide a nametag on each piece of equipment that clearly identifies the party responsible for the warranty. Nametag shall include the name, address, and phone number, and shop order or Fabricator's serial number.

1.8 OPERATION AND MAINTENANCE MANUALS.

A. Provide one (1) complete bound set of operation and maintenance (O&M) manuals for each unique engine generator unit. Identification symbols for all replaceable parts and assemblies shall be included. Provide manuals for the following equipment:

1. Engine.
2. Generator.
3. Voltage Regulator.
4. All accessories.

B. For each engine provide all available factory service publications including parts manuals, service manuals, component technical manuals, etc.

C. For all other components of each engine generator unit provide:

1. Equipment function, normal operating characteristics, and limiting conditions.
2. Assembly, installation, alignment, adjustment, and checking instructions.
3. Operating instructions for start-up, routine and normal operation, regulation and control, shutdown, and emergency conditions.
4. Lubrication and maintenance instructions.
5. Guide to "troubleshooting."
6. Parts list.
7. Outline, cross section, elevation, and assembly drawings
8. Engineering data including all mechanical and electrical performance characteristics.
9. Complete AC connection and three-line diagrams.
10. Complete DC schematics including voltage regulator, fuel injector pump, sensors, switches, fuses, and all other devices.

D. The operation and maintenance manuals shall be in addition to any instructions or parts list packed with or attached to the equipment when delivered, or any information submitted for review.

E. Bind materials in locking three ring "D" style binders. Binder capacities shall not exceed 3 inches, nor shall material included exceed the designed binder capacity. If material to be bound exceeds capacity rating, multiple volumes shall be furnished. Binder capacity shall not be less than approximately 1/2 inch greater

than the thickness of the material within the binder. Permanently label with project information on the front cover and edge.

F. Where reduction is not practical, larger drawings shall be folded separately and placed in envelopes, which are bound into the manuals. Each envelope shall bear suitable identification on the outside.

G. All information in the O&M manuals shall be new and original publications.

PART 2 - PRODUCTS

2.1 GENERAL CONFIGURATION AND MANUFACTURERS

A. All units shall utilize all new components.

B. All units shall be configured as specified herein and shall include all accessories as indicated.

C. Engines shall be rated for prime power duty at the horsepower (shaft) and electrical kilowatt (generator) ratings indicated for each unit. All engines shall be 1800 RPM unless specifically indicated otherwise. All starting and control systems shall be 24 VDC unless specifically indicated 12 VDC in Paragraph 2.2 - Specific Configuration.

D. Prime Power Rating Nameplate: The Fabricator shall provide a permanently affixed nameplate listing the prime power rating as specified herein for each engine generator.

E. Provide engines of the manufacturer and model as indicated in Paragraph 2.2 - Specific Configuration, no other substitutes except as specifically noted below.

F. Approved equal substitutions of engines will be allowed only by Engineer's approval. To obtain approval, submittals must clearly demonstrate the following:

1. The substitute engine must meet all of the requirements of Paragraph 2.3
2. The substitute engine manufacturer must have at least one factory authorized service representative with a permanent shop in Southcentral Alaska.
3. The size and weight of the substitute engine must not exceed that of the specified engine by more than 10%.
4. The physical layout, piping connections, and service access areas of the substitute engine must be sufficiently similar to that of the specified engine so that no major changes will be required to the power plant design.
5. The substitute engine must meet or exceed the fuel efficiency rate of the specified engine. Provide fuel curve showing fuel consumption (kWh/gallon) at 25%, 50%, 75% and 100% of prime rated capacity.
6. The substitute engine must be provided with a single jacket water cooling circuit without a separate aftercooler circuit except where specifically indicated to have an air-to-air aftercooler. Low temperature liquid aftercoolers will not be accepted.

7. The substitute engine must meet or exceed the heat rejection to the jacket water circuit of the specified engine.
8. The engine must not be equipped, or require to be equipped, with any exhaust emissions equipment including Exhaust Gas Recirculation, Diesel Oxidation Catalyst, Diesel Particulate Filter, or Selective Catalytic Reduction.

G. Provide Newage/Stamford generators as indicated in the Specific Configuration requirements that follow or Kato equal, no other substitutes except as specifically noted below. The generator shall be rated for continuous output at the value and temperature rise indicated at 0.8 power factor. The generator shall be 2/3 pitch winding, 3 phase, 277/480 volt, 12 lead reconnectable, with PMG excitation.

H. If a Marathon or other generator of equivalent or greater capacity is provided it shall be modified and upgraded prior to installation. Prior to assembling to the engine the following tasks shall be performed:

1. Inspect generator internally for defects. If any defects are encountered immediately file a warranty claim with the manufacturer.
2. Electrically test all windings.
3. Check fasteners for proper torque.
4. Replace diode plate mounting bolts with grade 8 bolts with nylok nuts.
5. Insulate main rotor leads with phase paper or fabric wire loom. Secure leads with heat shrinkable polyester tape using epoxy on all knots.

2.2 SPECIFIC CONFIGURATION

Furnish Engine and Engine-Generators of the capacity and configuration listed below:

Item #1: **Engine Only** - 223 hp, 150 ekW prime, John Deere 6068AFM85, Tier 3 Marine. Configured for generator drive application with 11.5" diameter flywheel and SAE 3 adapter. Starting and Control Voltage = **12 VDC**.

Item#3: **Engine** - 319 hp, 225 ekW prime, John Deere 6090HFM85, Tier 3 Marine with separate air to air charge air cooling. Configured for generator drive application with 14" diameter flywheel and SAE 1 adapter. Starting and Control Voltage = 24 VDC (convert as required).
Generator - Minimum 270kW continuous at 105°C rise, Newage/Stamford S4L1D-D41 or Kato equal.

Item #4: **Engine** - 99 hp, 65 ekW prime, John Deere 4045TFM85, Tier 3 Marine. Configured for generator drive application with 11.5" diameter flywheel and SAE 3 adapter. Starting and Control Voltage = 24 VDC (convert as required).
Generator - Minimum 90kW continuous at 105°C rise, Newage/Stamford UCI274C or Kato equal.

2.3 ENGINE STANDARD FEATURES

A. Provide an 1800 RPM, diesel engine of newest design and of recent manufacture.

B. The engine shall be a four-cycle, water-cooled, direct injection diesel engine of 4 or 6 cylinder in-line configuration as indicated by model number and shall be provided with a gear driven coolant pump where offered by manufacturer.

C. Cylinder Liners: The engines shall be provided with removable cylinder liners to facilitate field rebuilding.

D. Horsepower: Certified engine power curves and fuel consumption at 25%, 50%, 75%, and 100% loading, shall be submitted showing the manufacturer's approval of the engine rating for engine generator prime power application. Special ratings or "continuous standby" ratings will not be acceptable.

E. Fuel: The engine shall be capable of satisfactory performance on No. 1 or No. 2 Ultra Low Sulphur Diesel (ULSD) Fuel.

F. Fuel System: The engine shall have manufacturer’s engine mounted fuel filters with replaceable elements.

G. Lubrication: The engine shall have a gear type lubricating oil pump for supplying oil under pressure to the main bearings, crankshaft bearings, pistons, piston pins, timing gears, camshaft bearings and valve rocker mechanism. Threaded spin-on type, full flow lubricating oil filters shall be provided.

H. Starting: The engine shall be equipped with a 24 VDC electric starting system except for Item #1 engine only which shall be equipped with a 12 VDC electric starting system as indicated in Paragraph 2.2 - Specific Configuration.

2.4 ENGINE CONTROL AND MONITORING

A. Engine Control: All engine control functions will be performed by remote switchgear which will perform all start/stop, speed, paralleling, and load sharing control functions in addition to all engine function monitoring and safety shut downs. Engine manufacturer’s electronic control panels shall not be provided.

B. Engine Monitoring: For the complete engine-generator sets and for the loose ship engine wiring junction boxes provide a J1939 multi-function diagnostic gauge programmed to receive unique John Deere fault codes, John Deere DG14 or approved equal. Note that the diagnostic gauge must be programmed for operation with a Marine Tier 3 engine, no exceptions. Provide with wiring harness as required for connection to ECU and battery power.

C. ECU and Isochronous Governor: Provide an Engine Control Unit (ECU) for interface with the switchgear. Program the ECU as shown in the typical payload file in Attachment A.

D. On all AFM engines with Generation II Marine Electronics provide the following accessories:

1. ECU mounting panel with 10’ long engine to ECU interconnect harness, DZ110508.

2. Generator drive legacy adapter harness ECU to 21 pin connection, DZ107498.

3. Min 3’ long extension harness with 21 pin connections, John Deere or Murcal.

4. Fuel pump relay, **12VDC RE52665**. Install on ECU mounting panel.

5. Transient voltage protection diode (TVP), **12VDC AT157679**. Install on ECU mounting panel.

E. On all HFM and TFM engines provide a transient voltage protection diode (TVP), **24VDC AT163022**.

2.5 ENGINE MOUNTED ACCESSORIES, WIRING, AND PIPING

A. Fuel and Oil Hoses: All hoses for fuel, lube oil, vents, mechanical gauges, etc., shall be Aeroquip type FC300, Eaton Weatherhead H569 or approved equal. Minimum hose size shall be 5/16” (#6). Provide with re-useable JIC swivel type fittings. Push-on or barb type hose connections will not be allowed. Route hoses to avoid wear points and to ensure access to normal service points on the engine. Securely support hoses from engine and skid.

B. Glycol Hoses: All hoses for glycol shall be Teflon hose with stainless steel outer braid, Eaton Weatherhead H243 or approved equal. Provide with re-useable plated steel straight JIC swivel ends with NPT adapters. Route hoses to avoid wear points and to ensure access to normal service points on the engine. Securely support hoses from engine and skid.

C. Wire Loom: All wiring for control and instrumentation shall be routed in plastic loom. Provide tee fittings for all branch connections. Route loom to avoid wear points and to ensure access to normal service points on the engine. Securely support loom from engine and skid.

D. Protective Guards: All moving parts and hot surfaces shall be provided with protective guards in accordance with U.L Standard 2200.

E. Air Cleaners: The engine shall be provided with a metal canister air cleaner with a reusable oiled cotton stock element. John Deere, K&N, Parker, or approved equal. Open disposable type air filters or plastic canisters will not be accepted.

F. Fuel Piping Termination: Fuel supply and return lines shall be routed to the front of generator skid for field connection to the plant piping. See Drawings for detailed configuration. On Item #1 engine only provide equivalent length fuel hoses and fittings connected to the engine and coiled for shipment.

G. Lube Oil Piping Termination: The oil drain line shall be routed to the front of generator skid for field connection to the plant piping. See Drawings for detailed configuration. On Item #1 engine only provide equivalent length oil hose and fittings connected to the engine and coiled for shipment.

H. Oil Level: All engines, including Item #1 engine only, shall have a combination visual oil level site gauge with adjustable high and low level switches, Murphy L129CK1 or approved equal. Mount on rubber isolators and connect to engine with minimum #8 hoses. Carefully route upper vent hose to create a high point and connect directly into crankcase. Route lower hose to a connection directly on the

oil pan. Do not tee lower hose into oil drain line. See Drawings for installation detail.

I. Starting: In each control wiring junction box provide a starter auxiliary relay:

1. 24 VDC Relay: John Deere AT145341, Caterpillar 9X-8124, or Denso equal.

2. 12 VDC Relay: John Deere AT141011, Caterpillar 9X-8112, or Denso equal.

J. Control Power: To provide 24VDC or 12 VDC power to the control wiring junction box, a 30A circuit breaker with switch shall be mounted on the engine in the vicinity of the starter, Cooper 187-030-F-00 or approved equal.

K. Sensors and Safety Controls: The engine shall be equipped with the following:

1. Air Restriction Indicator/Switch, Combination visual indication and alarm switch. 1/8" MPT, 22.46" water column limit, manual reset, normally open switch with adjustable setpoint. Donaldson 135578-08420 or approved equal. Wire into engine harness and program ECU to recognize input. Shop adjust switch to close at 20" water column and verify function.

2. Exhaust Gas Temperature. High temperature, 2 wire, 100 ohm RTD with 36" high temperature lead wire, Deutsch DT06-2S-E008 male connector, Deutsch DT04-2P-E008 female connector, and compression fitting with 1/4" MPT adapter. Watlow 4031-7248 RTD, no substitutes, with Eustis NS34 adapter or equal. See note 2 below for installation.

3. Intake Air Temperature Sensor. 4-20mA, 20-240°F, 1/2" MPT. Noshok 800-20/240-1-1-8-8-025-6 or approved equal. Note that this is only installed Item #3 HFM engine. See note 3 below for installation.

Note 1. The above listed sensors shall be independent from engine gauges and all other devices and sensors. Where standard factory furnished sensors for the above listed functions are required for operation of the ECU, provide additional duplicate sensors as specified. All sensors shall be installed on the engine and wired to terminal blocks as indicated in the Drawings.

Note 2. Upon completion of shop testing, if exhaust gas temperature sensor is installed in flex, remove sensor and tywrap to engine in a secure location for shipping.

Note 3. Intake air temperature sensor will be field installed in charge air tubing off the engine. Provide min 6' service loop of wire in loom for field routing and termination. Tywrap sensor to engine in a secure location for shipping.

L. Additional Components: In addition to the above specified items provided with each engine provide the following additional items for field installation on existing engines:

1. Under Item #5 Generator Accessories provide 1 each exhaust gas temperature sensors as specified above for field installation on an existing engine-generator.

2. Under Item #5 Generator Accessories provide 1 each air restriction indicator/switches as specified above for field installation on an existing engine-generator.

2.6 ENGINE MODIFICATIONS

A. The crankcase ventilation filter and accessories shall be removed and a single point hose connection shall be left for field connection by others to a crankcase ventilation system.

B. All engines shall be furnished without a charging alternator. Factory installed components shall be removed as required. Idler pulleys shall be added and belt guards shall be modified as required.

1. Remove charging alternator.

2. Install transient voltage protection diode, see paragraph 2.4.

3. On 4045 and 6068 model engines install an alternator delete kit. Alternately, install an industrial engine fan drive bearing and hub assembly, replace belt as required, and install custom fabricated belt guard.

4. On 6090 model engines install custom fabricated damper guard.

C. All engines shall be configured without a heat exchanger, coolant expansion tank, or accessory reduction gear drive. Factory installed components shall be removed as required. See Paragraph 2.7, Cooling System.

2.7 COOLING SYSTEM

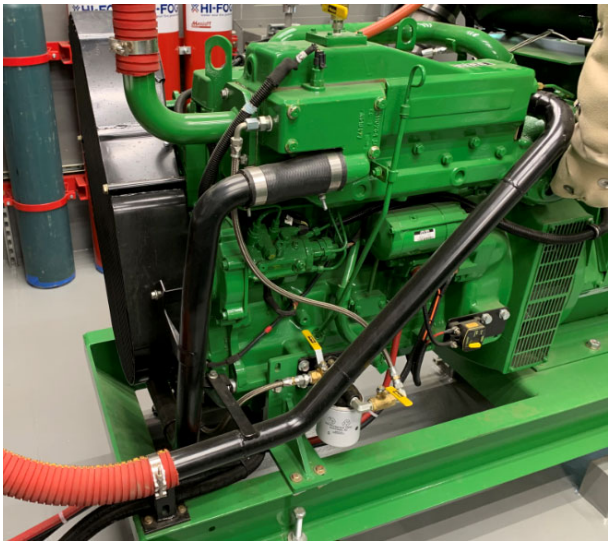
A. Engine cooling will be by remote radiators with coolant circulation driven by the engine coolant pump.

B. Glycol Filter: Provide screw-on canister style filter element with 3/8" NPT connections on head, Wix #24019 head with #24069 element or approved equal. Mount head on steel bracket fixed to front or side of engine. Connect to engine with glycol hoses with 3/8” NPT quarter turn gauge cock isolation valves. Connect inlet to thermostat housing and connect outlet to water pump inlet. On thermostat housing connection provide 3/8” NPT tee fitting with plug for field connection of pre-heat line by others. When filters are provided as part of engine manufacturer’s assembly the standard factory filters may be substituted for the above specified parts; however, equivalent mounting, connections, and isolation valves shall be included.

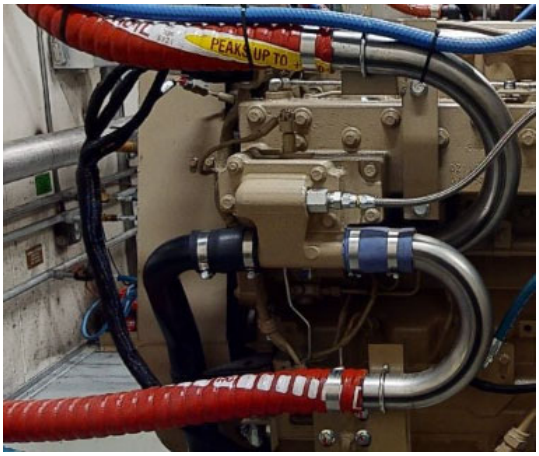
C. Provide an air vent/pre-heat connection at the high point on the engine coolant system. Provide a threaded ball valve with a 1/2" male hose barb fitting.

D. Modify engines as follows:

1. John Deere 4045TFM - Remove coolant tank and other accessories that are not required. Install a bent or welded section of 2 inch steel tube routed to the front of the left skid and supported from the skid or engine block. See photograph for representative installation.



2. John Deere 6068AFM - Remove coolant tank and other accessories that are not required. Modify coolant discharge and suction connections to face horizontally at the front of the engine using bent steel tubing and short sections of silicone hose. Support steel tube from engine block. See photograph for representative installation.



3. John Deere 6090HFM - Manifold vent lines into a single air vent/pre-heat connection near the front. See photograph for representative installation.

2.8 EXHAUST FLEX

A. The turbocharger discharge shall be equipped with a 4-hole square "Cat" flange when available.

B. A flexible, continuous, 18 inch long stainless steel exhaust flex connector with welded connections shall be furnished for each engine, Alaska Rubber, DME, Harco, or approved equal. Provide a mating connection to match the turbocharger at one end and an ANSI 125/150# pattern flange at the opposite end sized as indicated below. Slotted cuff connections are not acceptable. Provide gasket, bolts, v-clamp, or any other components required for connection to the turbocharger. Provide a 90° elbow where required for the flex to be installed vertically. Note that if the exhaust temperature sensor cannot be installed directly in the turbocharger outlet connection, a 1/4" FPT stainless steel thread-o-let shall be welded into the flex between the engine connection and the corrugated hose.

1. Provide 4" ANSI flanged end for 4045 engine (Item #4).
2. Provide 4" ANSI flanged end for 6068 engine (Item #1).
3. Provide 5" ANSI flanged end for 6090 engine (Item #3).

2.9 LOOSE SHIP ACCESSORIES

Provide the following accessories for each engine generator (Item #3 and Item #4):

A. Spring vibration isolators complete with mounting hardware, four (4) per each unit, sized for the complete engine generator unit weight. Caldyn Type RJ or approved equal.

B. Drip pan, 16-gauge galvanized sheet metal, liquid tight joints, 20" wide by 50" long by 1" high.

C. Minimum 800 cold crank amp 12-volt starting batteries, two for each engine. Batteries shall be sealed maintenance free, Optima Red Top NAPA Part Number BAT N993478RED or approved equal. Furnish and install battery racks sized to hold the batteries with hardware to secure the battery for shipping.

D. Two each #2/0 AWG arctic flex battery cables, 15 ft. long, plus one each #2/0 AWG by 12-inch long jumper. All cables shall include compression type terminal ends shipped loose. One battery cable shall be red for the positive lead and the other shall be black for the negative lead. The jumper shall be black with red heat shrink one end. Provide plastic terminal covers. The battery cables shall be routed and supported as indicated on the Drawings.

2.10 GENERATOR/ALTERNATOR

A. Generator shall be a single bearing, four pole, synchronous type. Generator shall be directly connected to the engine flywheel housing and driven through a flexible coupling to ensure permanent alignment. Windings shall 2/3 pitch, random wound, and lashed at the end turns to provide superior mechanical strength. The generator shall be brushless, 12 lead reconnectable, three phase, 60 Hz, 1800 RPM, and connected for 277/480V service.

B. The rotating assembly shall be dynamically balanced to less than 2 mils peak to peak displacement and shall be designed to have an over speed withstand of 125% of rated speed for 2 minutes in accordance with NEMA MG1-32.

C. Cast iron end brackets with bearing bores machined for an O-Ring to retard bearing outer race rotation and fabricated steel frames shall be used. Bearings shall be pre-lubricated, double shielded, ball type, single row Conrad, C3 fit. Minimum B-10 bearing life shall be 30,000 hours for single bearing units.

D. Generator wiring diagram shall be permanently installed on the inside of the terminal enclosure cover.

E. The insulation system of both the rotor and stator shall be of NEMA Class H materials or better and shall be synthetic and non-hygroscopic. The stator winding and rotor shall be coated with resin plus an epoxy sealant for extra moisture and abrasion resistance.

F. The generator shall be equipped with a permanent magnet generator (PMG) excitation system. The system shall supply a minimum short circuit support current of 300% of the rating for 10 seconds. The rotating exciter shall use a three-phase full wave rectifier assembly with hermetically sealed silicon diodes protected against abnormal transient conditions by a multi-plate selenium surge protector. The diodes shall be designed for safety factors of 5 times voltage and 1.5 times current.

G. Voltage Regulator: The voltage regulator shall be compatible with the PMG excitation and shall control the output of the brushless AC generator by regulating the current into the exciter field. The voltage regulation shall be minimum 0.25% accuracy. Basler DECS-100-A05 or approved equal.

1. The voltage regulator shall be configured for rear mounting and shall be mounted inside of the control wiring junction box as indicated in the Drawings.
2. The voltage regulator shall be connected to the 3 phase voltage sensing, field, and PMG on terminal blocks in the control wiring junction box as indicated in the Drawings.

H. Factory Nameplate: The generator manufacturer shall provide a permanently affixed nameplate that provides the following information:

1. Rated voltage, phase, and power factor.
2. Insulation class, winding type, and connection.
3. Rated kW and amperage at specific temperature rise.
4. Exciter voltage and current.

I. Each generator shall be provided with a standard sized terminal compartment. The terminal compartment shall be provided with a load connection block to allow easy field termination of the load, neutral, and ground conductors. The generator neutral connection shall not be connected to the mounting skid or the generator frame. The neutral shall be isolated for field grounding by others at the switchgear or transformer.

J. The generator shall be self-ventilated with a direct drive one-piece, cast aluminum alloy, unidirectional internal fan for high volume, low noise air delivery. Airflow

shall be from opposite drive end through generator to drive end. The exciter shall be in the airflow.

2.11 MOUNTING SKID

A. Each engine-generator shall be equipped with a suitable full length base frame (skid) for mounting the engine and generator. The skid shall be constructed from structural steel channel with ends beveled and plated for short term skidding and rolling of unit. **No formed or stamped steel base frame designs will be accepted.** Provisions shall be made so that the generator can slide back a minimum of 12" to access the rear main seal on the engine without removing the generator end off of the skid or requiring the use of blocking to support it. See the Drawings for skid design and layout.

B. Provisions shall be made in the skid for the mounting of vibration isolators at locations as indicated on the Drawings. Wedge washers shall be welded in place on the skid to provide a flat surface for the vibration isolator lock nuts.

C. Each engine generator shall be placed on the skid at the location indicated on the Drawings.

2.12 WIRING JUNCTION BOX FOR INTERFACE WITH REMOTE SWITCHGEAR

A. A control wiring junction box shall be furnished with each engine-generator (Item #3 and Item #4). It will be field installed on a strut rack above the right hand side of the generator enclosure. The engine ECU mounting panel will be installed directly behind the junction box.

B. Furnish the junction box with the following features:

1. NEMA 12 steel enclosure with hinged door and screw down latches. B-Line, Hoffman or approved equal. See Drawings for size.

2. The junction box orientation, device layout, terminal block layout, and labeling shall be as indicated on the Drawings.

3. All wiring for control, monitoring, and safety shall be terminated on terminal blocks within the control wiring junction. The terminals shall be IDEC or approved equal, BNH15LW except where indicated 50A provide BNH50W. Terminals shall be mounted on DIN rail with heavy duty end anchors. Each terminal block and all wire terminations shall be individually numbered as indicated.

4. Install the voltage regulator and the diagnostic gauge as previously specified in the junction box as shown on the Drawings.

5. Install an engine manufacturer's standard 21 pin customer connection for field connection to the engine ECU in the junction box as shown on the Drawings.

C. The DC power supply for the switchgear shall be provided from the engine starting batteries through the engine-mounted circuit breaker. Terminals shall be provided as indicated on the Drawings for supplying 12 or 24 VDC to the switchgear. All remote indication will be 24VDC, 4-20mA, or as otherwise indicated. All switches used for remote indication shall be rated for operation at 24 VDC.

D. Label each control wiring junction box with the serial number of the associated engine. Connect to the engine and generator prior to performing the load test.

E. Under Item #5 Generator Accessories provide 1 each complete control wiring junction box as specified above for field installation on an existing engine-generator.

2.13 PAINTING

Each unit shall be painted John Deere industrial tan including engine, skid, and generator.

2.14 SPARE FILTERS

In addition to the filters installed on the engines, provide the following quantities of replacement filters for each engine plus break in oil. Package spare filters and oil in boxes and label each box with the engine model.

A. Twelve (12) oil filters.

B. Four (4) primary fuel filters.

C. Four (4) secondary fuel filters.

D. Two (2) air filters plus one air filter service kit.

E. Four (4) glycol filters.

F. Break in oil identical to oil installed in engine. One (1) gallon for each engine.

2.15 FUEL OIL COOLER (ITEM #2)

A. Single pass, vertical core cooler for light oil. Nominal 5,000 BTU/HR at 100°F entering temperature differential, 5 GPM light oil, less than 1 PSI pressure drop. Brazed aluminum bar and core with 1” NPT connections, steel frame and shroud, plastic blade fan with aluminum hub, 1/2 HP, 3450 RPM, 115/230 V, 1 PH motor. Thermal Transfer Products Part# BOL-16-1-2 or approved equal.

2.16 CHARGE AIR COOLER (ITEM #6)

A. Single pass, vertical aluminum core, 4" flanged top connections, epoxy coating, expanded metal guard. 1340 SCFM charge air at 395F IN and 110F OUT at 75F ambient, 34" H2O maximum charge air pressure drop. 5 HP, 460 V, 3 PH, motor suitable for VFD operation at 10:1 turndown ratio. Diesel Radiator Part No. DR3376A or approved equal.

PART 3 - EXECUTION

3.1 SHOP ASSEMBLY OF ENGINE-GENERATORS

A. Prior to beginning assembly, thoroughly inspect engine and generator for manufacturing defects or for damage that may have occurred in shipping. Verify that the shipping arms on the front of the generator are intact and that rotor is properly centered. Check inside of generator for dirt or moisture and clean thoroughly.

B. Replace the standard factory hardware used for attachment of the generator coupling disc to the engine flywheel with Grade 8 hex head bolts. Install heavy

gauge washers, tighten and torque bolts in accordance with manufacturer's specifications, and paint pen mark after final torquing.

C. Upon assembly of engine and generator on the skid, ensure proper alignment then adjust and secure supports to ensure alignment is maintained.

D. Modify engines as specified previously. Install all accessories, devices, hoses, etc. as specified. Verify that all hose and wiring is properly routed, well supported, and secured to avoid wear points.

E. Install exhaust temperature sensor and air restriction indicator/switch and connect to wiring junction box. Adjust air restriction switch to close at 20" water column, verify function, and reset.

F. ECU Mounting: On engines models supplied with an ECU mounting panel, configure wiring harness so that ECU panel can be installed approximately 2' above the top of the generator enclosure. Provide wiring pigtails to connect the terminals in the engine control wiring junction box to the ECU mounting panel using manufacturer's standard connectors.

3.2 SHOP TESTING OF ENGINE-GENERATORS

A. Prior to shipment perform shop tests on each engine-generator at the shop where the engine generator is assembled. Supply sufficient notice to the Authority prior to performing tests. The Authority reserves the right to witness all tests. Test procedures shall conform to ASME, IEEE, and ANSI standards, and NEMA standard practices section on testing, as appropriate and applicable.

B. Provide all required mechanical and electrical equipment including but not limited to fuel supply, radiator, charge air cooler, exhaust, load bank, voltage regulator, etc.

C. Provide all required measuring and indicating devices. All devices shall be certified correct or correction data furnished for the device.

D. Set Up For Load Test: Prior to running the engine perform the following tasks:

1. Verify that engine is filled with break in oil. The break in oil shall be approved by the engine manufacturer for 100 to 500 hour run time, John Deere Break-In Plus or approved equal. Pull a sample of the clean lube oil prior to the load test to be used for reference.
2. Perform hydrostatic test on water jackets to ensure that water seals and water jackets are watertight. Test report shall indicate pressure at which test was made and the results.
3. Connect engine coolant piping to radiator or heat exchanger. Note that all engine coolant circulation must be performed by the engine water pump without the benefit of any external pump or pressurized system.
4. Install thermometer to monitor coolant return temperature entering the engine for comparison against the coolant discharge temperature.
5. Connect engine air piping to charge air cooler.
6. Connect engine and generator to the associated control wiring junction box.

E. Engine Pre-Tests: Prior to the 8 hour load test perform the following tests:

1. Power up the ECU and program as shown in the typical payload file in Attachment A. Connect the ECU to an analog throttle input and verify that it is correctly responding including idle operation at input less than or equal to 0.5 VDC, 1800 RPM at 2.5 VDC, and variable RPM above and below 2.5 VDC. On the load test report note confirmation of throttle function and attach screen shots documenting ECU programming. *Note that ECU programming and documentation also applies to Item #1 engine only.*
2. Run the engine with adequate load to get up to normal operating temperature. Check Service Advisor and verify that the engine is functioning properly and that all parameters are within normal ranges.
3. Perform a Cylinder Cutout Test in accordance with the manufacturer's procedures. If any cylinders test abnormally, perform a Cylinder Misfire Test and a Cylinder Electronic Compression Test. If any injectors appear to be defective replace and then repeat tests.
4. Record the results of the tests, including any corrections made, in the load test report.

F. Load Test: Perform a standard commercial shop 8 hour load test on each engine generator including, but not limited to, the following:

1. Place engine in continuous operation without stoppage for a period of not less than eight hours. Operate not less than one hour at each load point (1/2, 3/4, and full load) and 1 hour at 110 percent of rated load. If stoppage becomes necessary during this period, repeat the 8-hour run.
2. Record the following data at the start, at 15-minute intervals, and at the end of each load run: Hz, kW load, fuel consumption, exhaust temperature, intake air temperature, jacket water temperature, coolant return temperature, lube oil temperature, lube oil pressure, manifold (boost) pressure, and crankcase vacuum.
3. Tests shall indicate satisfactory operation and attainment of guarantees and specified performance.

G. Provide completed test reports to the Authority. Reports shall include but not limited to the following:

1. Complete 8-hour load test data.
2. Results of Cylinder Cutout Test and any subsequent tests performed.
3. Screen shots of throttle programming and confirmation of response.
4. Photos of split oil filters as described below.
5. Laboratory analysis of the clean lube oil sample and the sample pulled after the test as described below.

3.3 ENGINE AND GENERATOR PREPARATION FOR SHIPPING

A. Upon completion of testing perform the following steps to prepare for shipping:

1. Flush the cooling system with extended life 50/50 ethylene glycol mix, Shell Rotella ELC or approved equal. Install covers over the connections.

Note that if testing was performed with extended life ethylene glycol solution the engine does not need to be flushed.

2. Pull a sample of the lube oil. Send to a laboratory for analysis. Include the sample of clean lube oil pulled prior to the load test for reference comparison.

3. Remove oil filter, split case, inspect contents and take photo to document. Note that if excessive or unusual metal fragments are found, contact the Authority immediately. Install new oil filter.

4. Turn the engine at cranking speed with throttle control in full off position and use a sprayer to add a mixture of 50% VCI (volatile corrosion inhibitor) oil and 50% 30-weight engine oil into the engine long enough to ensure the cylinders and exhaust ports are coated.

   a. For marine engines with a jacket water aftercooler, spray the VCI-oil mixture directly into the air intake manifold and then separately spray a small amount into the turbocharger inlet.

   b. For engines without a jacket water aftercooler, spray the VCI-oil mixture into the turbocharger inlet.

Note that the following steps also apply to Item #1 engine only.

5. Clean the outside of the engine and inspect and ensure that the engine and generator are covered by good quality paint. Correct any deficiencies.

6. Spray a thin amount of VCI-oil mixture on the flywheel, ring gear teeth, and starter pinion. Install the covers to keep the vapors in.

7. Install a positive mechanical seal consisting of a fitting plate and gasket on exhaust opening. Then install all covers and/or tape on any other openings. Ensure all covers are air tight and weatherproof. Use waterproof, weather resistant type tape. Do not install tape in such a manner as will damage paint when the tape is removed. Install a mechanical protective device over any protruding items, which may be vulnerable to damage during transportation.

3.4 PACKAGING FOR SHIPPING

A. Securely fasten Item #1 engine only on a shipping skid or pallet suitable for lifting with a forklift. Securely fasten dunnage to the skids of Item #3 and Item #4 engine-generators to allow lifting with a forklift. Package each item as follows:

1. On Item #1 engine only coil hoses, control wiring, wiring harnesses, etc. and secure to engine.

2. Item #3 and Item #4 engine-generators coil wiring harnesses and secure control wiring junction box panel to generator.

3. Put a waterproof cover over the entire engine (engine-generator). Make the cover tight, but loose enough to let air circulate around the unit to prevent damage to exposed metal parts from condensation.

B. Package oil coolers and charge air coolers in individual wooden crates with pallet bases suitable for lifting with a forklift.

C. Package spare filters and loose ship items (except for drip pans) in waterproof wrapping inside wooden crates. Provide a separate crate for each engine and clearly identify on the outside with the engine model number. Provide two copies of a packing slip identifying all items within each crate.

END OF WRITTEN SPECIFICATION

See The Following Attachments:

Attachment A - Typical ECU Payload

Drawing M1 – Generator Fabrication Details

Drawing E1 - 24VDC Engine Wiring Junction Box

JOHN DEERE Custom Performance™

PowerTech™ 4.5L AFM - Marine Genset

Glossary

Sensor Configuration | CAN Configuration | Output Configuration | Speed Control | Governors | Engine Protection | Report

Pinout Report

PIN J2-A1 : CAN 1-High (Yellow)	PIN J2-D1 :	PIN J2-G1 :	PIN J2-K1 :
PIN J2-A2 :	PIN J2-D2 : Stop Lamp (-)	PIN J2-G2 : Excitation 4+	PIN J2-K2 : CAN Shield
PIN J2-A3 : Excitation #3+	PIN J2-D3 :	PIN J2-G3 : Excitation 4-	PIN J2-K3 :
PIN J2-A4 : Primary Analog Throttle	PIN J2-D4 :	PIN J2-G4 :	PIN J2-K4 :
PIN J2-B1 : CAN 1-Low (Green)	PIN J2-E1 :	PIN J2-H1 :	PIN J2-L1 : ECU Power
PIN J2-B2 : Keyswitch	PIN J2-E2 :	PIN J2-H2 :	PIN J2-L2 : ECU Ground
PIN J2-B3 :	PIN J2-E3 : Engine Protection Shutdown Override	PIN J2-H3 : CAN 2-Low	PIN J2-L3 : ECU Ground
PIN J2-B4 :	PIN J2-E4 :	PIN J2-H4 :	PIN J2-L4 : ECU Power
PIN J2-C1 :	PIN J2-F1 :	PIN J2-J1 :	PIN J2-M1 : ECU Power
PIN J2-C2 :	PIN J2-F2 :	PIN J2-J2 :	PIN J2-M2 : ECU Ground
PIN J2-C3 : Excitation #3-	PIN J2-F3 :	PIN J2-J3 : CAN 2-High	PIN J2-M3 :
PIN J2-C4 :	PIN J2-F4 :	PIN J2-J4 :	PIN J2-M4 : ECU Power

Fault Code Report

Note: the following list of Fault Codes are those that are configured in the Trim Page, this list does not include all of the fault codes configured.

Fault 91.03: Primary Analog Throttle Out-of-Range High	Fault 91.04: Primary Analog Throttle Out-of-Range Low

Standard Sensor Configuration

Help

☐ Coolant Loss Switch Enable

Coolant Loss Switch Type: Open if Coolant Loss

☐ Air Filter Restriction Switch Enable - shared with Auxiliary Temperature Sensor

Air Filter Restriction Switch Type: Normally Open

☐ Fuel Leak Switch Enable - shared with Configurable Switch 1

Fuel Leak Switch Type: Normally Closed

☐ Water-in-Fuel Sensor Disable

Auxiliary Sensor Configuration

Help

☐ Enable Auxiliary Temperature Sensor (Pin J2-D3) - shared with Air Filter Restriction Switch

Default (deg. C): 100

☐ Configurable Switch 1 Enable (Pin J2-F2 Switch to Power)
Shared with Fuel Leak Switch

Switch Name Config Switch 1

Switch Type Normally Open

☐ Configurable Switch 2 Enable (Pin J2-E1 Switch to Power)

Switch Name Config Switch 2

Switch Type Normally Open

☐ Configurable Switch 3 Enable (Pin J2-J1 Switch to Ground)
Shared with Auxiliary Derate Switch

Switch Name Config Switch 3

Switch Type Normally Open

☐ Configurable Switch 4 Enable (Pin J2-F1 Switch to Power)
Shared with Bump Down Switch

Switch Name Config Switch 4

Switch Type Normally Open

☐ Configurable Switch 5 Enable (Pin J2-D4 Switch to Power)
Shared with Bump Up Switch

Switch Name Config Switch 5

Switch Type Normally Open

☐ Configurable Switch 6 Enable (Pin J2-J2 Switch to Power)

Switch Name Config Switch 6

Switch Type Normally Open

☐ Configurable Switch 7 Enable (Pin J2-K1 Switch to Ground)
Shared with Auxiliary Shutdown Switch

Switch Name Config Switch 7

Switch Type Normally Open

☐ Configurable Switch 8 Enable (Pin J2-B3 Switch to Power)

Switch Name Config Switch 8

Switch Type Normally Open

☐ Configurable Switch 9 Enable (Pin J2-E4 Switch to Power)
Shared with Bump Enable Switch

Switch Name Config Switch 9

Switch Type Normally Open

☐ Configurable Switch 10 Enable (Pin J2-H4 Switch to Excitation+)
Shared with Isochronous Droop Switch

Switch Name Config Switch 10

Switch Type Normally Open

Configurable Logic

Help

☐ Enable Configurable Logic 1

Logic Name CONFIG LOGIC 1

Active when the following conditions have been met for 0 seconds

Unused is Greater than 0

NONE

Unused is Active

Inactive when the following conditions have been met for 0 seconds

Unused is Greater than 0

NONE

Unused is Active

☐ Enable Configurable Logic 2

Logic Name CONFIG LOGIC 2

Active when the following conditions have been met for 0 seconds

Unused is Greater than 0

NONE

Unused is Active

Inactive when the following conditions have been met for 0 seconds

Unused is Greater than 0

NONE

Unused is Active

☐ Enable Configurable Logic 3

Logic Name CONFIG LOGIC 3

Active when the following conditions have been met for 0 seconds

Unused is Greater than 0

NONE

Unused is Active

Inactive when the following conditions have been met for 0 seconds

Unused is Greater than 0

NONE

Unused is Active

Shared CAN Bus Settings

Help

ECU Source Address Engine 1 - Source Address 0

John Deere OEM Panel Function Instance

Tachometer Output

Help

☐ Enable Tachometer Output 30 Pulses per Revolution

Fuel Transfer Pump

Help

Select Fuel Transfer Pump Stanadyne Transfer Pump

Start Aid Control

Help

☐ Enable Glow Plugs

Hardware Fault Lamps

Help

☐ Enable Warning Fault Lamp (J2-C1) - Shared with Starter Overspeed Relay / Configurable Output 3

☐ Enable Stop Fault Lamp (J2-D2)

Engine Mode Indication

Help

☐ Enable Engine Run Lamp / Alarm (J2-J4) - Shared with Configurable Output 1

☐ Enable Engine Stop Lamp / Alarm (J2-E2)

Configurable Outputs

Help

☐ Enable Configurable Output 1 (J2-J4) - Shared with Run Mode Lamp/Alarm

Output Name CONFIG OUTPUT 1

Output Type On/Off

Enable Output when Unused is Active

Default Output to Disabled when Unused is Active

Lamp Test Disabled

☐ Enable Configurable Output 2 (J2-K4)

Output Name CONFIG OUTPUT 2

Output Type On/Off

Enable Output when Unused is Active

Default Output to Disabled when Unused is Active

Lamp Test Disabled

☐ Enable Configurable Output 3 (J2-C1) - Shared with Warning Fault Lamp

Output Name CONFIG OUTPUT 3

Output Type On/Off

Enable Output when Unused is Active

Default Output to Disabled when Unused is Active

Lamp Test Disabled

Throttle

Help

☐ Disable All Throttles

Digital Throttle	Primary Analog Throttle	Secondary Analog Throttle	PWM Throttle
☐ Enable Digital Throttle ○ 2-State Throttle ◉ 3-State Throttle	☑ Enable Primary Analog Throttle ☐ Self-Calibration Enable	☐ Enable Secondary Analog Throttle ☐ Self-Calibration Enable	☐ Enable PWM Throttle PWM Frequency (Hz): 200 Minimum PWM Duty Cycle %: 10 Maximum PWM Duty Cycle %: 90

Throttle Adjustments

Multiple Throttle Failure Condition Default:
Default to Rated Speed

Throttle Out-of-Range Recovery:
Rated Recovery

Minimum Throttle Offset:

Offset: 0 rpm increase

Maximum Throttle
Offset: 0 rpm Decrease

Envelope Calculation

Torque Speed Control

Help

☐ Enable TSC Source 1 Enable	☐ TSC1 Timeout Fault	3 Source Address 1
☐ Enable TSC Source 2 Enable	☐ TSC2 Timeout Fault	4 Source Address 2

Governor Droop

Help

RPM of Droop 0 Hz (Isochronous)

Envelope Calculation

Startup Acceleration Rate

Help

Acceleration
Rate: Standard (Maximum)

Governor Gains

Help

Information: The factory settings for the engine speed control (governor) parameters have been optimized for the majority of applications to provide the best combination of stability and response characteristics.

DO NOT change these settings from the defaults unless there is a significant problem with engine speed stability or response to load changes. Changing the governor gains from the defaults can aggravate instabilities in the system or lead to unacceptable response. Any changes must be evaluated to determine if the final performance is acceptable.

Low Speed Governor Gain: Use Selected Alternate Gain

All Speed Governor Gain: Use Selected Alternate Gain

Maximum Speed Governor Gain: Use Selected Alternate Gain

Selected Alternate Gain: Alternate Gainset #1

Gain Adjustment Percentage: 100 % (Valid range is 25% to 200%)

Derates & Shutdowns

Help

Standard (Level 1) Derates

☐ Enable Standard (Level 1) Derates

Standard Shutdowns

Refer to the Sensor Configuration section to enable optional sensors

Coolant Temperature Shutdown: Enabled

Engine Overspeed Shutdown: Enabled

J1939 Enable/Disable Shutdowns

☐ Allow Enable/Disable of Shutdowns by J1939 CAN Message

5 Controller Source Address

Engine will shutdown immediately after Engine Overspeed condition

Fuel Temperature Shutdown
Enabled

Intake Manifold Air Temperature Shutdown Enabled

Oil Pressure Shutdown
Enabled

Water-in-Fuel Shutdown
Enabled

Coolant Loss Shutdown
Disabled

Shutdown Timer
Immediate

Fault Indication

Help

☐ Enable Auxiliary Temperature Indication - Auxiliary Temperature Sensor is Disabled

Lamp Type Disabled Aux Temperature Threshold 1 135 (deg. C)

Lamp Type Disabled Aux Temperature Threshold 2 140 (deg. C)

Temperature Shutdown Disabled

Auxiliary Derate

Help

☐ Auxiliary Derate Enable - shared with Configurable Switch 3

Auxiliary Derate Switch Input Type Normally Open

Auxiliary Derate Amount: 20% over 4 minutes

☐ Override Auxiliary Derate at Engine Start

Override Auxiliary Derate Time: 5 seconds

Auxiliary Shutdown

Help

Warning: This is intended as a system protection shutdown. This is not intended to be used as an emergency stop.

☐ Auxiliary Shutdown Enable - shared with Configurable Switch 7

Auxiliary Shutdown Switch Input Type: Normally Open

NOTE: Care should be taken to choose a switch type that matches desired behavior with common failure modes

Auxiliary Shutdown Timer: Immediate

☐ Override Auxiliary Shutdown at Engine Start

Override Auxiliary Shutdown Time: 5 seconds

Shutdown Verify for Certification Testing

Help

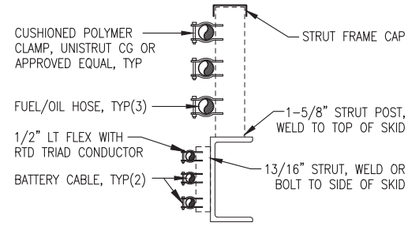
☐ Enable Engine Overspeed Verify - Engine Overspeed Shutdown has been enabled above in Standard Shutdowns

Engine Overspeed Threshold (rpm): 1700

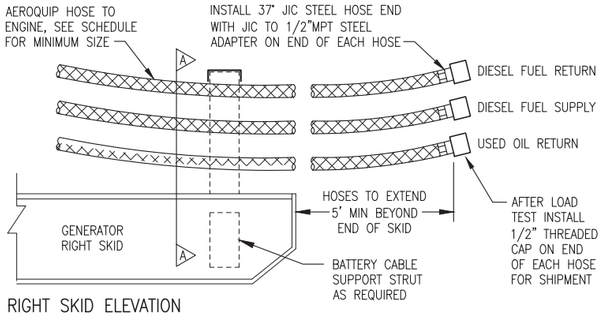
☐ Enable Adjustable Coolant Temperature Shutdown

Coolant Temperature Shutdown Threshold (deg. C): 75

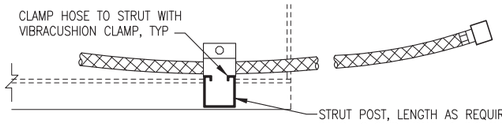
☐ Enable Oil Pressure Shutdown for Certification Testing



RIGHT SKID SECTION A–A



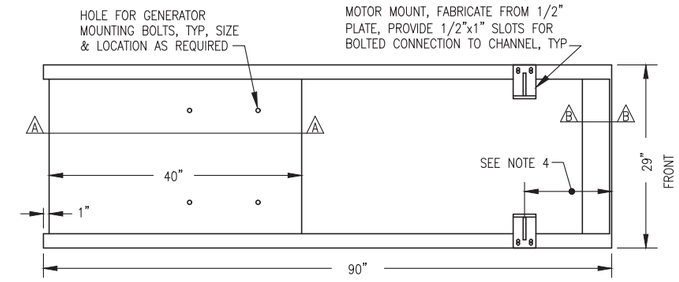
RIGHT SKID ELEVATION



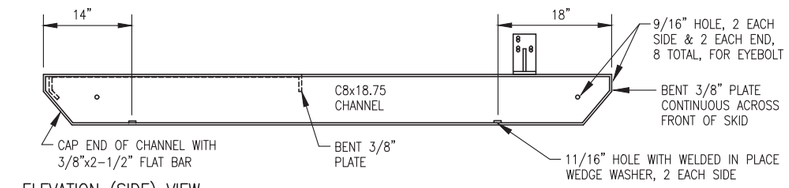
RIGHT SKID PLAN

1 M1 FUEL & OIL HOSE TERMINATIONS

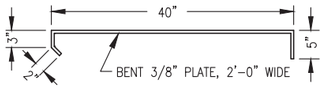
NO SCALE



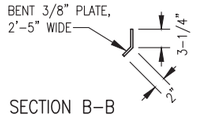
PLAN (TOP) VIEW



ELEVATION (SIDE) VIEW



SECTION A–A



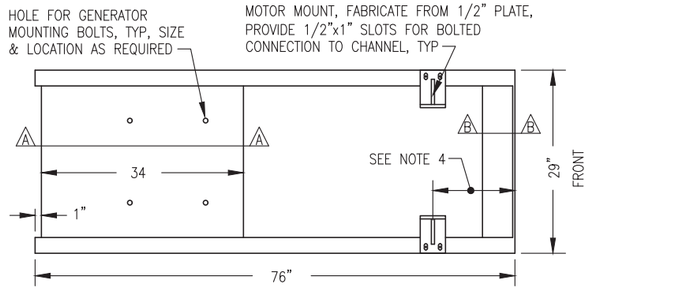
SECTION B–B

NOTES:

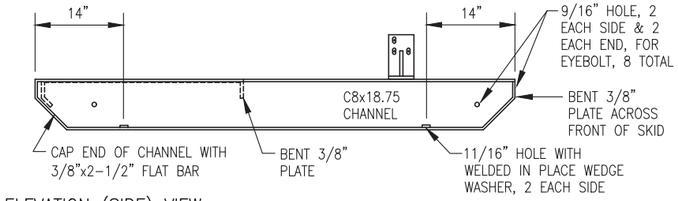
1) FABRICATE FROM ASTM A–36 STEEL. BEND PLATES & CUT ENDS OF CHANNELS AT 90° & 45° AS SHOWN.
2) EXCEPT WHERE INDICATED AS BOLTED MAKE ALL CONNECTIONS WITH CONTINUOUS WELDS (FILLET OR FULL–PENETRATION GROOVE AS REQUIRED) IN ACCORDANCE WITH CURRENT AWS STANDARD CODE.
3) ROUND ALL CORNERS & GRIND WELDS SMOOTH AFTER FABRICATION. PAINT TO MATCH ENGINE–GENERATOR.
4) PLACE UNITS ON SKIDS SO THAT THE CENTERLINES OF THE EXHAUST RISERS ARE 50" FROM THE FRONT OF THE SKIDS.

2 M1 225kW (JOHN DEERE 6090) SKID DESIGN

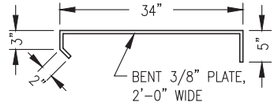
NO SCALE



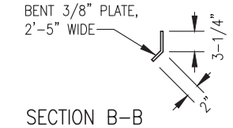
PLAN (TOP) VIEW



ELEVATION (SIDE) VIEW



SECTION A–A



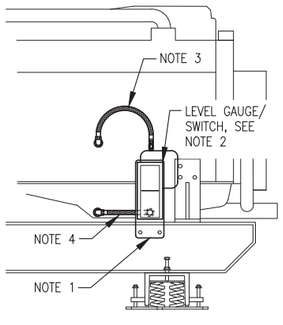
SECTION B–B

NOTES:

1) FABRICATE FROM ASTM A–36 STEEL. BEND PLATES & CUT ENDS OF CHANNELS AT 90° & 45° AS SHOWN.
2) EXCEPT WHERE INDICATED AS BOLTED MAKE ALL CONNECTIONS WITH CONTINUOUS WELDS (FILLET OR FULL–PENETRATION GROOVE AS REQUIRED) IN ACCORDANCE WITH CURRENT AWS STANDARD CODE.
3) ROUND ALL CORNERS & GRIND WELDS SMOOTH AFTER FABRICATION. PAINT TO MATCH ENGINE–GENERATOR.
4) PLACE UNIT ON SKID SO THAT THE EXHAUST RISER CENTERLINE IS 39" FROM THE FRONT OF THE SKID.

3 M1 65kW (JOHN DEERE 4045) SKID DESIGN

NO SCALE



NOTES:

1) 1/4" STEEL SUPPORT PLATE PRE–DRILLED TO MATCH GAUGE/SWITCH MOUNTS AND BOTTOM HOSE ENTRANCE. BOLT TO INSIDE (BACK) OF CHANNEL SKID AT HEIGHT AS REQUIRED TO CENTER GAUGE AT NORMAL FULL OIL LEVEL.
2) MOUNT OIL LEVEL GAUGE/SWITCH TO STEEL SUPPORT PLATE WITH RUBBER SHOCK MOUNTS. ADJUST SWITCH CONTACTS TO 1/2" ABOVE AND BELOW NORMAL FULL LEVEL. PAINT MARK A RED LINE AT BOTH SWITCH LEVELS.
3) CONNECT TOP (VENT) PORT TO ENGINE CRANK CASE WITH #8 HOSE WITH 1/2" OR 3/8" NPT JIC SWIVEL ENDS. ROUTE UPPER HOSE WITH HIGH POINT 4" MIN ABOVE TOP OF GAUGE.
4) CONNECT BOTTOM PORT TO ENGINE OIL PAN WITH #8 HOSE WITH 1/2" OR 3/8" NPT JIC SWIVEL ENDS. DO NOT TEE INTO OIL DRAIN LINE. ROUTE LOWER HOSE BACK THROUGH PRE–DRILLED HOLE IN STEEL PLATE.

4 M1 OIL LEVEL GAUGE/SWITCH INSTALLATION

NO SCALE

ISSUED FOR ENGINE GENERATOR PURCHASE JUNE 2026

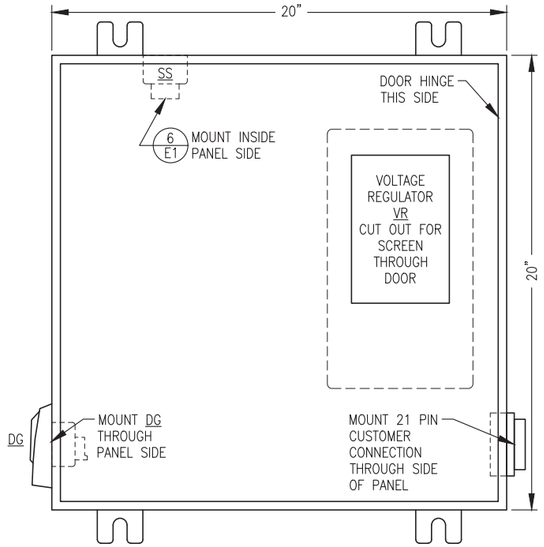
ALASKA ENERGY AUTHORITY

PROJECT: LEVELOCK & HUGHES M&I ENGINE–GENERATOR & ACCESSORIES PURCHASE

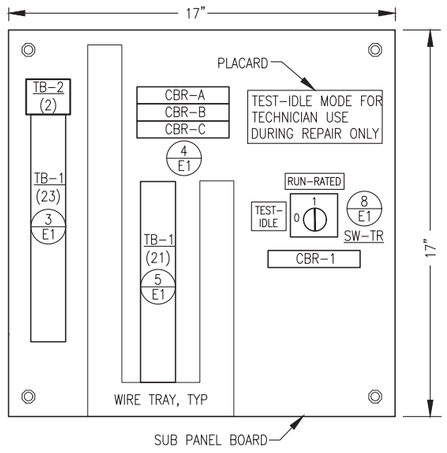
TITLE: GENERATOR FABRICATION DETAILS

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

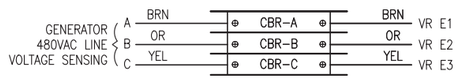
DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: BCG	DATE: 6/1/26
FILE NAME: LVL M&I GEN M	SHEET: M1
PROJECT NUMBER:	



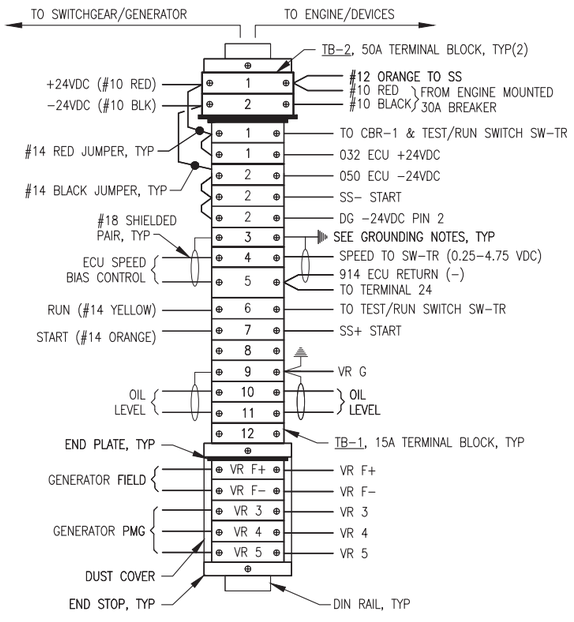
1 E1 JUNCTION BOX FRONT PANEL LAYOUT
NO SCALE



2 E1 JUNCTION BOX SUB PANEL LAYOUT
NO SCALE

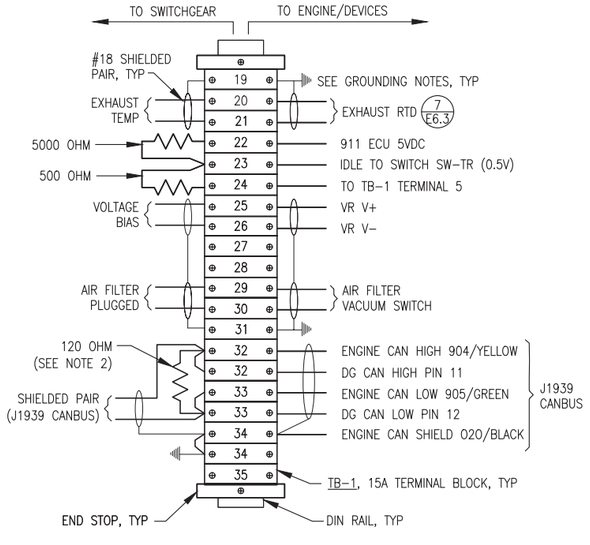


4 E1 CIRCUIT BREAKER CONNECTIONS
NO SCALE



NOTE: TYPICAL JOHN DEERE ECU CONNECTION NUMBERS SHOWN. SEE WIRING HARNESS FOR EACH ENGINE FOR ACTUAL ECU CONNECTIONS.

3 E1 TERMINAL STRIP CONNECTIONS
NO SCALE



NOTES: 1) ALL RESISTORS 0.25W.
2) REMOVE RESISTOR IF ENGINE WIRING HARNESS HAS 120 OHM END OF LINE RESISTOR.

5 E1 TERMINAL STRIP CONNECTIONS
NO SCALE

BILL OF MATERIALS

TAG	MANUFACTURER	MODEL	DESCRIPTION
21 PIN	JOHN DEERE OR DEUTZ		21 PIN CUSTOMER CONNECTION ASSY
CBR-A/B/C	ALLEN-BRADLEY	1489-M1-C010	RAIL MOUNT CIRCUIT BREAKER, 1P, 1A
CBR-1	ALLEN-BRADLEY	1489-M1-C050	RAIL MOUNT CIRCUIT BREAKER, 1P, 5A
DG	JOHN DEERE	DG-14	DIAGNOSTIC GAUGE WITH HARNESS PROGRAMMED FOR MARINE TIER 3 WITH UNIQUE JOHN DEERE FAULT CODE
ENCL.	HOFFMAN	A20H20ALP	20x20x8" NEMA 12
	HOFFMAN	A20P20	BACK PANEL
SS	JOHN DEERE	AT145341	STARTER AUXILIARY SOLENOID, 24V
SW-TR	ALLEN-BRADLEY	194L-A12-225-2	CHANGEOVER SWITCH, 12A, 2P
	ALLEN-BRADLEY	194L-HE-4A-175	90 DEGREE I-O HANDLE
TB-1	IDEC	BNH15LW	15A DIN RAIL-MOUNT TERMINAL BLOCK
TB-2	IDEC	BNH50W	50A DIN RAIL-MOUNT TERMINAL BLOCK
VR	BASLER	DECS-150 5NS1V1N1S	DIGITAL VOLTAGE REGULATOR

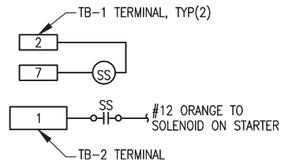
BRAND SPECIFIC NOTE: SPECIFIC PARTS MANUFACTURER AND MODEL SELECTED NOT ONLY TO MEET PERFORMANCE FUNCTION BUT ALSO TO COORDINATE AND INTERFACE WITH OTHER DEVICES AND SYSTEMS. APPROVED EQUAL SUBSTITUTIONS WILL BE ALLOWED ONLY BY ENGINEER'S APPROVAL. TO OBTAIN APPROVAL, SUBMITTALS MUST CLEARLY DEMONSTRATE HOW SUBSTITUTE ITEM MEETS OR EXCEEDS SPECIFIED ITEM QUALITY AND PERFORMANCE CHARACTERISTICS AND ALSO COMPLIES WITH MECHANICAL AND/OR ELECTRICAL CONNECTIONS AND PHYSICAL LAYOUT REQUIREMENTS.

SHOP FABRICATION NOTES:

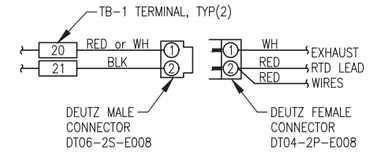
1) PROVIDE ASSEMBLY WITH ALL DEVICES AND WIRING INDICATED.
2) INSTALL IN A NEMA 12 ENCLOSURE WITH MOUNTING FLANGES AT BACK, A MIN 14 GAUGE INTERIOR BACK PANEL AND HINGED LOCKABLE DOOR. SIZE AS INDICATED.
3) PROVIDE DIN RAIL, TERMINAL END PLATES, TERMINAL END STOPS, TERMINAL DUST COVERS AND OTHER MISCELLANEOUS HARDWARE AS REQUIRED TO MATCH TERMINALS. LABEL ALL TERMINALS EXACTLY AS INDICATED ON THE DETAILS.
4) ALL WIRE #14AWG EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE. LABEL BOTH ENDS OF ALL JUMPERS WITH THE ENGINE PANEL TERMINAL NUMBER.
5) PROVIDE MECHANICAL GROUND LUGS FASTENED TO BACK PANEL AND GROUNDED TO ENGINE-GENERATOR. GROUND ALL SHIELD DRAIN WIRES TO LUGS AT BACK PANEL ONLY.
6) PROVIDE WIRING HARNESSES FOR CONNECTION TO GENERATOR AND TO ENGINE. INSTALL WIRES IN LIQUID TIGHT FLEX OR FLEXIBLE PLASTIC WIRE LOOM AND PROVIDE SERVICE LOOPS IN ACCORDANCE WITH SPECIFICATIONS.
7) SHOP TEST EACH NEW ENGINE-GENERATOR WITH ASSOCIATED JUNCTION BOX PERMANENTLY CONNECTED. UPON COMPLETION OF TESTING, COIL WIRING HARNESSES AND SECURE JUNCTION BOX TO GENERATOR FOR SHIPPING.

FIELD INSTALLATION NOTES:

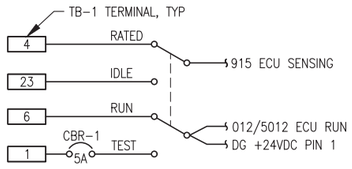
1) PERFORM ALL FIELD WIRING IN ACCORDANCE WITH SPECIFICATIONS. LABEL BOTH ENDS OF ALL FIELD WIRING WITH THE ENGINE PANEL TERMINAL NUMBER.
2) ON SHIELDED CONDUCTORS GROUND ALL SHIELD DRAIN WIRES AT ENGINE J-BOX ONLY. CLIP DRAIN WIRES AT OPPOSITE ENDS.



6 E1 STARTER AUX SOLENOID SS WIRING
NO SCALE



7 E1 EXHAUST RTD CONNECTOR
NO SCALE



8 E1 TEST-IDLE/RUN-RATED SWITCH SW-TR WIRING
NO SCALE

ISSUED FOR ENGINE GENERATOR PURCHASE JUNE 2026

ALASKA ENERGY AUTHORITY

PROJECT: LEVELOCK & HUGHES M&I
ENGINE-GENERATOR & ACCESSORIES PURCHASE

TITLE: 24VDC ENGINE WIRING JUNCTION BOX

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

DRAWN BY: JTD | SCALE: AS NOTED
DESIGNED BY: BCG | DATE: 6/1/26
FILE NAME: LVL M&I GEN E | SHEET: E1
PROJECT NUMBER: