

Pre-Purchase

RHAM Middle and High School
85 Wall Street
Hebron, Connecticut

Building Official: <u>Scott Phelps</u>	 _____ (Signature)	 _____ (Date)
Fire Marshal: Christopher Bray	 _____ (Signature)	 _____ (Date)

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DIVISION 00 – BIDDING AND CONTRACT REQUIREMENTS

001000 LEGAL NOTICE BID

002000 INSTRUCTIONS TO BIDDERS

003000 BID FORM - STIPULATED SUM

005000 AGREEMENT FORMS

005100 BID BOND

008600 NON-COLLUSIVE AFFIDAVIT OF
PROPOSER

008700 HEBRON CODE OF ETHICS

008950 NO BID RESPONSE FORM

P263213 PRE-PURCHASE ENGINE GENERATORS

Legal Notice Bid #2025-09

**FURNISH ONLY AN
EMERGENCY ELECTRIC GENERATOR
RHAM MIDDLE/HIGH SCHOOL
85 WALL STREET
HEBRON, CONNECTICUT**

The Town of Hebron is seeking sealed bids for **Furnish Only an Emergency Electric Generator, RHAM Middle/High School, 85 Wall Street, Hebron, CT.** Bid Documents are available and posted on the Town of Hebron's website and can be accessed at <https://hebronct.com/bids/>

All bids must be sealed and must be received at the Town Manager's Office prior to the due date. Bids will be submitted to Andrew J. Tierney, Town Manager, Town Office Building, 15 Gilead Street, Hebron CT 06248. Proposals shall include one (1) printed original and six (6) printed copies and one (1) digital proposal. All bids are due no later than Monday, July 7, 2025, **before 2:00 p.m.** Bids must be in a sealed envelope and clearly marked: **"Bid# 2025-09, Furnish Only an Emergency Electric Generator, RHAM Middle/High School, 85 Wall Street, Hebron, Connecticut"** on the outside of the envelope. The bids will be opened publicly and read aloud at the Town Office Building.

The Specifications include **(Pre-Purchasing of the Emergency Electrical Generator)**

Any questions can be directed to **Andrew J. Tierney** 860 228-5971, but **preferably by email to atierney@hebronct.com**. The Town of Hebron will award the bid to the lowest responsible bidder and reserves the right to waive any technical defects in the bids and to reject any bids which do not conform to the terms and conditions in the bid specifications.

The Town of Hebron also reserves the right to reject any or all bids and waive the informalities or irregularities in the bid procedure or bids when it is deemed by the Board of Selectmen that it is in the best interest of the Town to reject.

After opening of Bids, all Bids shall stand available for acceptance for a period of ninety (90) days.

Bid security in the form of a certified check or bid surety bond, issued by a bonding company licensed to do business in the State of Connecticut, is required in the amount of 10% of base bid. Bid security shall be made payable to the Town of Hebron.

The Contractor must comply with the CHRO-Affirmative Action requirements (C.G.S. 4a-60, 4a-60a, 4a-60g, and 46a-68b through 46a-68f, inclusive, as amended by June 2015 Special Session Public Act 15-5.

The Town of Hebron reserves the right to reject or accept any or all Bids and to waive any informalities, omissions, excess verbiage or technical defects in the bidding if, in the opinion of the Town of Hebron, it would be in their best interest to do so.

The Town of Hebron is an Affirmative Action, Equal Opportunity Employer. Minority/Women's Business Enterprises are encouraged to apply.

END OF SECTION

**INSTRUCTIONS TO BIDDERS
TOWN OF HEBRON, CONNECTICUT 06248
FURNISH ONLY AN
EMERGENCY ELECTRIC GENERATOR
RHAM MIDDLE/HIGH SCHOOL
85 WALL STREET
HEBRON, CONNECTICUT**

The following instructions and specifications shall be observed by all Bidders:

I. GENERAL CONDITIONS

INTENT: The name of the Project is **Furnish Only an Emergency Electrical Generator, RHAM Middle/High School, 85 Wall Street, Hebron, CT.**

The purpose of these specifications is to obtain Sealed bids for the **Furnish Only an Electrical Generator, RHAM Middle/High School, 85 Wall Street, Hebron, CT.**

1. Bid Opening

Sealed bids will be accepted by the Town Manager's Office, Town of Hebron, 15 Gilead Street, Hebron, Connecticut 06248 no later than 2:00 p.m. Monday, July 7, 2025, at which time they shall be publicly opened and read. **Bids received by the Town after the date and time specified will not be accepted.**

2. Withdrawal of Bid

Bids may be withdrawn 90 days after bid opening if no award has been made.

3. Award of Bid

Award of bid shall be made to the lowest responsible, and qualified bidder, who is qualified to perform the work. The lowest responsible bidder is that person or firm whose bid to perform is lowest, who is qualified and competent to do the work, whose past performance of work is satisfactory to the Town and whose bid documents comply with the procedural requirements stated herein, and is prequalified pursuant to C.G.S. 4a-100.

The Town of Hebron reserves the right to reject any and all bids, or part of such bid, or waive any defect, irregularity or informality of any bid when it is determined to be in the best interest of the Town.

Failure to completely fill out the bid form could result in rejection of bid submission. If an option is not available, it should clearly be stated on the bid form.

4. Bid Return Envelope

Bids are to be submitted in an envelope clearly marked with the bid title, bid number and opening date so as to prevent opening a sealed bid prior to the date specified. Any bids not so marked and opened by the Town prior to the date specified shall be rejected.

5. No Bid

Failure to return a bid could result in the removal of your firm's name from the Bid List. No Bids and responsive bids could result in your firm's retention on the Bid List. It is very helpful for the Town to obtain a better understanding as to why a vendor decides not to bid. We would appreciate the completion of the "No Bid" form and send it back to us so we can put improvements or changes in place that might be warranted.

6. Bid Security

Bid security in the form of a certified check or bid surety bond, issued by a bonding company licensed to do business in the State of Connecticut, is required in the amount of 10% of base bid.

Bid security shall be made payable to the Town of Hebron.

10% Bid Bond required. Bids from vendors that have previously failed to satisfactorily complete performance on a contract with the Town, will not be considered.

7. Acceptance of Subcontractor

Submission of name of Subcontractor in Bid shall be deemed to constitute an acceptance by Contractor, if awarded the Contract, of Bid of such Subcontractor. Any alteration therein, after award of contract, shall be subject to approval of the Town of Hebron.

8. Changes and/or Additions

All changes or additions to these specifications shall only be done by written communication bearing the signature of the Town Manager.

9. Questions Relating to Specifications

Any request from prospective bidders for interpretation of meaning of specifications or other contract documents shall be made in writing, **preferably by email to atierney@hebronct.com**, to the Town Manager, 15 Gilead St, Hebron, Connecticut 06248, and to be given consideration must be received at least seven (7) days prior to date fixed for opening of bids. If necessary, interpretations will be made in the form of a written Addendum to Bid Documents, which Addenda shall become a part of Contract. Not later than four (4) days prior to date fixed for opening of Bids, Addenda will be provided to all persons who obtained Bid Documents. Failure of any Bidder to receive any such Addenda shall not relieve bidder from any obligation under this bid as submitted.

10. Equal Opportunity - Affirmative Action

The successful bidder shall comply in all aspects with the Equal Employment Opportunity Act. All bidders must certify that they agree and warrant that it will not discriminate against any person or group of persons on the grounds of sex, race, color, religion, age, marital status, ancestry, national origin, past history of mental disorder, mental retardation, or physical disability or other basis in any manner prohibited by the laws or ordinances of the United States, the State of Connecticut, or the Town of Hebron. Findings of non-compliance with applicable State and Federal regulations could be sufficient reason for revocation or cancellation of this contract.

The Town of Hebron is an Affirmative Action, Equal Opportunity Employer.

11. Price and Discounts

Prices bid shall not include any taxes, Local, State or Federal, as the Town is not liable. In addition to the prices bid each bidder may quote binding discounts which will be considered in making the award. All labor and materials shall be included in the prices quoted on the bid form. Tax exempt certificates are available upon request from the Town of Hebron Finance Office.

12. Applications for Payment:

All Applications for Payments will be subjected to retainage being held in the amount of five (5%) percent.

13. Insurance and Bond Requirements

The Insurance Requirements shall comply with the insurance requirements listed in the attached purchase order terms and conditions. The bidder shall, as part of the purchase price, provide from a surety authorized to issue bonds in the State of Connecticut, a 100% Performance and Labor and Materials Payment Bond. The form of Bond shall be AIA A312.

14. Non-collusive Affidavit and Town of Hebron Code of Ethics Policy

Any act or acts of misrepresentation or collusion shall be the basis for disqualification of any bid or proposal submitted by such person or company guilty of said misrepresentation or collusion. If the bidder has made any misrepresentations or has been involved in collusion and such conduct is discovered after the execution of an Agreement with the Town, the Town may cancel the Agreement without incurring liability, penalty, or damages. The attached Non-collusive Affidavit of Proposer form and acknowledgement of the Town Code of Ethics Policy must be submitted with the formal bid proposal.

15. Severability

If any terms or provisions of this bid shall be found to be illegal or unenforceable, then such term or provision shall be deemed stricken and the remaining portions of this bid shall remain in full force and effect.

16. CHRO-Affirmative Action Requirements

If applicable, the Contractor must comply with the CHRO-Affirmative Action requirements (C.G.S. 4a-60, 4a-60a, 4a-60g, and 46a-68b through 46a-68f, inclusive, as amended by June 2015 Special Session Public Act 15-5.

II. TECHNICAL SPECIFICATIONS/ADDITIONAL REQUIREMENTS

1. Completion Date

The successful bidder shall have the generator and its associated components completed and shipped to a storage facility within the State of Connecticut by sometime during the month of May 2026.

2. Rejection of Bids

Any bid received that does not contain the information requested in bidder's qualifications shall be rejected. The Town reserves the right to waive certain missing information if it does not have a bearing on the overall decision to award the bid.

3. Specifications

See Table of Contents section of this Project Manual for description of Specification Sections.

4. Pre-Purchase of Electric Generator and Offsite Storage

The Town of Hebron is pre-purchasing the Electric Generator for a variety of reasons. One of them is to be sure that when it is required to be on the campus of the middle and high school that it is available for delivery. There is a significant amount of electrical work that will need to be undertaken to connect the new generator and then disconnect the existing electrical generator. As such, it is prudent that this work be undertaken after both the middle and high school have been dismissed for the summer recess which would begin in the middle of June 2026. As such, the Town is aware that this will require that after the generator is manufactured it will need to be shipped and stored locally until it can be received on the site. **Please note:** The installing trade contractor shall be responsible for accepting the generator at the local rigger/storage facility, including the off-loading and all related storage costs. The trade contractor shall also be responsible for all costs associated with the pick-up, loading, transportation and delivery of the generator from the rigger/storage facility to the project site. The installing trade contractor shall also be responsible for all costs associated the off-loading, crane costs and placement of the generator on the concrete pad.

5. Payment for Offsite Stored Materials

The Town of Hebron will consider payment for locally offsite stored materials. The Supplier would need to provide, at a minimum, the following documents to facilitate this:

- 1) Secured facility, 2) Certificate of Insurance covering the equipment with the Town named as additional insured, 3) Bill of Sale, 4) Partial Lien Waiver, and 5) Inspection of the stored material by a representative of the Town of Hebron.

6. Form of Contract

The form of contract to be utilized shall be a purchase order with terms and conditions. The terms and conditions are attached hereto. By submitting a bid for the project, the Contractor warrants and represents that it accepts the purchase order terms and conditions and shall execute the form of contract without modification, exception, or condition.

END OF SECTION

**BID PROPOSAL FORM
TOWN OF HEBRON, CONNECTICUT 06248
FURNISH ONLY
EMERGENCY ELECTRIC GENERATOR
RHAM MIDDLE/HIGH SCHOOL
85 WALL STREET
HEBRON, CONNECTICUT**

BID # 2025-09

Opening Date: Monday, July 7, 2025, 2:00 p.m.

Town Manager's Office
Town of Hebron
15 Gilead St
Hebron, CT 06248

In accordance with the Drawings, Specifications, Bidding and Contract Document, the undersigned agrees to the following:

Provide ALL Labor, Material and Equipment that is necessary to complete the Furnish Only an Electric Generator.

References:

We have performed work or provided services for the following municipalities and on these dates:

- 1 _____
- 2 _____
- 3 _____

SUBMITTED BY:

(Bidder's full Company Name).....

(Bidder's full address).....

.....

(Bidder's telephone and fax numbers).....

(Bidder's email address).....

1. OFFER

Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Bidding and Contract Documents prepared by Van Zelm Engineers for the above-mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work of the Base Bid for the Sum of:

\$.....dollars (.....)
(amount in words) (amount in figures)

2. ACCEPTANCE

This offer shall be open to acceptance and is irrevocable for ninety (90) days from the bid closing date.

If the Town of Hebron accepts this bid within the time period stated above, we will:

- Execute the Agreement within ten days of receipt of notice of acceptance of this bid.
- Furnish the required bonds and insurance certificates within ten (10) days of receipt of notice of acceptance of this bid in the form described in the Supplementary Conditions.
- Commence work within ten days after award of Contract and written Notice to Proceed.

If this bid is accepted within the time stated, and we fail to enter into an Agreement or we fail to provide the required Bonds, the Bid Security shall be forfeited as damages to the Town of Hebron by reason of our failure.

In the event our bid is not accepted within the time stated above, the required Bid Security shall be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

We understand the Town of Hebron reserves the right to accept any Bid or reject any or all Bids and to waive any informality in the Bidding.

5. CONTRACT TIME

If this Bid is accepted, we will be required to complete the Work in accordance with the following schedule:

All manufacturers related Punch List items of work shall be completed no later than July 10, 2026 as designated by the Town of Hebron.

6. ADDENDA

The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.

Addendum	No.		Dated	
Addendum	No.		Dated	
Addendum	No.		Dated	

7. APPENDICES

In accordance with the Instructions to Bidders, we include the following required Appendices concurrent with Bid submission. The information provided shall be an integral part of our Bid.

Bid Bond - Section 00510

8. The undersigned is familiar with the conditions surrounding this call for bids, is aware that the Town of Hebron reserves the right to reject any and all bids, and is submitting this bid without collusion with any other person, individual or corporation.

Signature

Witness

Printed Name & Title of Signer

Date

Company Name

Phone

Address

Fax

Town/City

State

Zip

END OF SECTION

SECTION 005000
AGREEMENT FORMS

PART 1 GENERAL

- 1.01 See attached purchase order with terms and conditions.

END OF SECTION

Section 005100

BID BOND

June 16, 2025

SECTION 005100

BID BOND

#2024-09

June 16, 2025

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned

_____ as Principal; and _____ as Surety are here by held and

Firmly bound unto the **Town of Hebron, Connecticut**, in the penal sum of

_____ Dollars (\$ _____), for the payment of which, well and truly to be made we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

Signed this _____ day of _____, 20____

The condition of the above obligation is such that whereas the Principal has submitted to the **Town of Hebron, Connecticut**, a certain Bid, attached hereto and hereby made a part hereof, to enter into a Contract in writing, for the

NOW, THEREFORE,

- a) If said Bid shall be rejected, or, on the other hand,
- b) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached thereto (properly completed in accordance with said Bid) and shall furnish a bond for his faithful performance of said Contract, and shall in all other respects perform the agreement created by the acceptance of said Bid.

Then this obligation shall be void; otherwise, the same shall remain in force and effect, it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of the said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Town of Hebron may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Principal

Seal)
Surety

By _____

END OF SECTION

SECTION 008600
TOWN OF HEBRON
Department of Finance
NON COLLUSIVE AFFIDAVIT OF PROPOSER

The undersigned proposer, having fully informed themselves regarding the accuracy of statements made herein certifies that;

- (1) the proposer developed the bid independently and submitted it without collusion with, and without any agreement, understanding, or planned common course of action with any other entity designed to limit independent bidding or competition;
- (2) the proposer, its employees and agents have not communicated the contents of the bid to any person not an employee or agent of the proposer and will not communicate the proposal to any such person prior to the official opening of the proposal, and
- (3) acknowledges that the Town of Hebron's Code of Ethics Policy has been received and understood.

The undersigned proposer further certifies that this statement is executed for the purpose of inducing the Town of Hebron to consider the proposal and make an award in accordance therewith.

Legal Name of Proposer/Firm

Business Address

Signature and Title

Date

Printed Name of Title Person

Subscribed and Sworn to me this _____ day of _____, 20____

Notary Public

My Commission Expires

END OF SECTION

SECTION 008700

HEBRON CODE OF ETHICS

Effective November 5, 2019

I. Persons Governed by this Code

This code shall apply to all Town officials, officers and employees, whether elected and/or appointed, including members of boards, commissions, and committees, full time or part time, paid or unpaid and shall hereinafter be referred to collectively as “persons governed by this code.”

II. Purpose

Public office is a public trust. The trust of the public is essential for government to function effectively. Policy developed by government officials and employees affects every citizen of the town, and it must be based upon honest and fair deliberations and decisions. This process must be free from threats, favoritism, undue influence and all forms of impropriety so that the confidence of the public is not eroded. By enacting this Code, the Town seeks to avoid any loss of trust and to maintain and increase the confidence of our citizens in the integrity, fairness and transparency of their government.

Persons governed by this code shall strive to conduct themselves in a professional, courteous, honest manner and otherwise according to the highest moral and personal standards of integrity, such that their behavior reflects favorably upon themselves and the Town of Hebron, including but not limited to conduct or communication in any public forum or media.

III. Definitions

As used in this Chapter, the following listed words and phrases shall have these specific meanings:

A. ***Conflict of Interest***: A conflict between one’s obligation to the public good and one’s self-interest.

B.

C. ***Financial Interest***: Any monetary benefit accruing to persons governed by this code that is not equally available to the general public.

D. ***Gift***: Anything having value whether in the form of service, loan, tangible property, promise or any other form. However a gift shall not include political

contributions made in accordance with campaign financing regulations; nor tokens of appreciation, recognition or other incidental gratuities not exceeding \$100 per year.

E. ***Immediate Family***: Includes spouse/domestic partner, siblings, child(ren), parents, of persons governed by this code or the spouse/domestic partner and any individual residing in the same household.

F. ***Independent Contractor***: Any general contractor, subcontractor, consultant, person, firm, corporation, vendor or organization currently providing or formerly providing, goods or services to the Town of Hebron in exchange for compensation.

G. ***Personal Interest***: Any non-monetary benefit, special consideration, treatment or advantage accruing to persons governed by this code which is not equally available to the general public.

IV. Conflicts of Interest

No person governed by this code shall use his position or office for the financial or personal interest of himself, a business with which he is associated, an individual with which he is associated or a member of his immediate family.

No person governed by this code shall engage in or participate in any business or transaction, including outside employment with a private business, or have an interest, direct or indirect, that is incompatible with the proper discharge of his official responsibilities in the public interest or that would tend to impair his independent judgment or action in the performance of his official responsibilities.

No person governed by this code or a business with which he is associated or member of his immediate family shall enter into a contract with the Town unless it is awarded through a process of public notice and/or competitive bidding.

No person governed by this code or independent contractor shall knowingly counsel, authorize or otherwise sanction action that violates any provision of this code.

V. Disclosure and Recusal

A person governed by this code shall refrain from participating on behalf of the Town of Hebron in any matter pending before any agency of the town if he, a business with which he is associated, an individual with whom he is associated or a member of his immediate family has a financial or personal interest in that matter and such interest is not shared by a substantial segment of the town's population.

If such participation is within the scope of said person's official responsibility, he shall be required to provide written disclosure, that sets forth the nature and extent of such interest to the Town Clerk, and this disclosure shall be included in the official record of all proceedings on this matter.

Notwithstanding the prohibition outlined above, a person governed by this code may vote or otherwise participate in a matter that involves a determination of general policy if said person's interest in the matter is shared with a substantial segment of the population of the Town.

No person governed by this code shall appear on behalf of private interests before any agency of the Town, nor shall he represent private interests in any action, proceeding or litigation against the town.

Nothing contained in this code shall prohibit or restrict a person governed by this code from appearing before any agency of the Town on his own behalf, or from being a party in any action, proceeding or litigation brought by or against such person to which the Town is also a party.

For a period of one (1) year after termination of service to the Town, no former employee or Town official who participated in the negotiation or award of a town contract valued in excess of \$25,000 shall accept employment with, appear on behalf of, or represent any private interest concerning matters related to this same contract.

VI. Gifts

No person governed by this code or member of such individual's immediate family or business with which he is associated shall solicit or accept any gift that could reasonably be expected to influence or create an appearance of influencing the actions or judgment of such person.

If a prohibited gift is offered to a person governed by this code, he shall refuse it, return it, pay the donor the market value of the gift or donate it to a nonprofit organization provided he does not take the corresponding tax write-off. Alternatively, such prohibited gift may be considered a gift to the Town provided it remains in the Town's possession.

VII. Use of Town Assets

No person governed by this code or independent contractor shall request or permit the use of town funds or services, Town owned or leased vehicles, equipment, facilities, materials or property for personal convenience or profit, except when such assets and services are available to the public generally or are provided as

Town policy for the use of persons governed by this code in the conduct of official business.

VIII. Use of Confidential Information

No person governed by this code, former employee or independent contractor shall disclose confidential information concerning Town affairs, nor shall such persons governed by this code use this information for the personal or financial interests of themselves or others.

END OF SECTION

TOWN OF HEBRON

PURCHASE ORDER TERMS AND CONDITIONS

1. Agreement. No changes, conditions or agreements other than those stipulated herein are to govern this purchase order ("Order") unless expressly made in writing and mutually agreed to. Acceptance of this Order constitutes acceptance of all terms and conditions stated herein.
2. Prices. This Order shall not be filled at prices or fees higher than those shown on the Order without the written authority of the Purchaser. If this Order is not priced, it shall not be filled at prices higher than those last quoted or charged the Purchaser, unless prices shall have been authorized in writing by the Purchaser. The Purchaser shall be protected against declining prices on the undelivered portion of this Order. Seller may elect to meet price reductions, but if Seller should refuse to do so, the Purchaser shall have the right to cancel any or all of the balance due on this Order without cost or penalty.
3. Invoices. No invoice shall be delivered by the Seller to any employee of the Town of Hebron. All invoices, in duplicate, shall be mailed to: Andrew J. Tierney, Town Manager, Town of Hebron, 15 Gilead Street, Hebron, CT 06248, unless instructed to do otherwise in writing. Invoices may also be emailed to: atierney@hebronct.com.
4. Delivery. Time is of the essence in the Seller's fulfillment of the Order. Delays in shipment shall be reported immediately by the Seller to the Purchaser. The Purchaser reserves the right to cancel this Order if delivery is not made within a reasonable period of time from the date of this Order or as expressly set forth in the Order, whichever is sooner. Prices are considered "FOB Jobsite" with transportation charges prepaid on all Orders; charges for freight, express, cartage or packing will not be allowed or paid by the Purchaser unless expressly stated on the Order. The Risk of Loss shall remain with the Seller and delivery shall not be deemed to be complete until the goods, materials, labor, and/or services have been actually received and accepted by the Purchaser.
5. Inspection & Acceptance. All goods, labor, materials, and services are subject to inspection and approval by the Purchaser. If goods are rejected, goods will be returned at Seller's expense. The Purchaser reserves the right to refuse any goods and to cancel all or any part of the goods not conforming to applicable specifications, drawings, samples, or descriptions. Acceptance of any part of the Order shall not bind the Purchaser to accept future shipments, nor deprive it of the right to return goods already accepted.
6. Quantity. The quantity of goods delivered must be that specified in the Order. All changes in quantity must be approved in writing by an authorized agent of the Purchaser. The Purchaser reserves the right to return excess shipments, if any, at the Seller's expense.
7. Defects. By accepting this Order, the Seller acknowledges that the goods covered by this Order are satisfactory for the purposes intended by the Purchaser, if previously disclosed to Seller, and that any defect in such goods may occasion special damages to the Purchaser.
8. Conforming Goods. All goods shall strictly conform to the drawings and/or specifications and/or other description of the goods set forth on the Order. Acceptance of all or any part of the goods shall not be deemed to be a waiver of the Purchaser's right to either cancel or to return all or any portion of the goods because of failure to conform to the Order, or by reason of defects, latent or patent, or other breach of warranty, or to make any claim for damages including special damages occasioned to the Purchaser. Such rights shall be in addition to any other remedies provided by law.
9. Payment Discounts. To the extent Seller offers any discount, it shall be understood that the cash discount period will date from the Purchaser's RECEIPT of the invoice and not from the DATE of the invoice.
10. Insurance and Bonds. If this Order includes any labor or work on any premises other than those of the Seller, the Seller, in accepting the Order agrees:
 - a. Not to transfer this Order nor any part thereof to any person, firm or corporation without the prior consent of the Purchaser, but to give personal attention and superintendence to the work, and that the Purchaser shall be at liberty to place other contractors at work on the premises during the continuance of the work under this Order, for the execution of such other work as may be necessary and that are not included in this Order.
 - b. To maintain such insurance as will protect the Seller and the Purchaser from claims under workmen's compensation or employer's liability acts and commercial general liability insurance for any other claims for personal injury or property damage which may arise by reason of the performance of any work under this Order (including but not limited to

delivery, unloading of the goods, and/or servicing/repairing the goods); automobile liability, and to deliver to the Purchaser; a certificate of insurance and policy endorsements acceptable to Purchaser of insurance coverage limits and obligations to Purchaser as set forth below, and further to the fullest extent allowed by law, to defend, protect, indemnify and save the Purchaser, RHAM Board of Education, the Hebron Public Building Committee and RHAM Emergency Electric Generator Upgrade Project Building Committee for the project for which the goods shall be a part, the State of Connecticut, the Architect/Engineer identified on the Order and their consultants, and their respective directors, trustees, officials, officers, committee members, agents, volunteers, employees, consultants and representatives harmless from any and against all liabilities arising from bodily injuries, damage to property, injuries to mechanics, laborers or any other persons whatsoever employed in the performance of said work or otherwise employed on or coming upon or near said premises from and against damage to property adjacent thereto, and from and against any and all liabilities for damage or injury to any persons or property whatsoever in any manner resulting from or caused by the performance of this Order, or any work relating thereto or any portion of said work.

c. Minimum types and limits of insurance shall be as follows:

(i). Commercial General Liability insurance on an "occurrence" basis for bodily injury and property damage that may arise out of or result from the goods or services identified in this Order.

- \$1,000,000 each occurrence
- \$1,000,000 personal and advertising injury
- \$2,000,000 general aggregate. Aggregate amounts shall apply per project/sale.
- \$2,000,000 products-completed operations aggregate

Coverage for ongoing operations, independent contractors, and any persons or entities performing services on behalf of the Seller.

Products and completed operations coverage, which coverage shall be maintained in effect for a period equivalent to the applicable statute of limitations and/or repose.

An endorsement stating that "limits apply per sale."

Contractual liability coverage.

Contain a severability or separation of insureds clause.

An additional insured endorsement (on ISO form CG 20 10 or CG 20 26 and form CG 20 37, or equivalent acceptable to the Purchaser) naming the Additional Insureds (defined below) as additional insureds.

The insurance maintained by the Seller shall be primary. Any insurance maintained by the Purchaser and any other Additional Insured is in excess and shall not contribute to Seller's insurance in all instances regardless of any like insurance that the Purchaser or the other Additional Insureds may have.

Waiver of Subrogation endorsement in favor of the Purchaser, the other Additional Insureds, and their respective insurers. The Purchaser, the other Additional Insureds, and their respective insurers retain all rights of subrogation.

(ii). Commercial Automobile Liability coverage to include owned, hired, leased, and non-owned automobile liability insurance covering all use of all automobiles, trucks and other motor vehicles utilized by the Seller or its subcontractors and suppliers, including each of the following:

A combined single limit for bodily injury and property damage of \$1,000,000 per accident.

Coverage for upset, overturn and collision coverage related to pollution events (applying to the vehicle, trailer or other attachments to vehicle and extend to cargo/waste carried and to subcontractors or others providing services to the Seller).

Waiver of Subrogation endorsement in favor of the Purchaser, the other Additional Insureds, and their respective insurers. The Owner, the other Additional Insureds, and their respective insurers retain all rights of subrogation.

(iii). Seller's Pollution Liability coverage with policy limits of not less than \$1,000,000 per claim and \$2,000,000 in the aggregate (with coverage for asbestos related claims).

(iv). Follow-form umbrella (excess) liability insurance with a limit of \$5,000,000 each occurrence in excess of the general liability, employer's liability and business automobile liability coverages required of Seller under this Section. Such insurance shall contain a provision that it will not be more restrictive than the primary insurance. Aggregate limits of liability shall apply separately with respect to the Order. Waiver of Subrogation endorsement in favor of the Purchaser, the other Additional Insureds, and their respective insurers. The Purchaser, the other Additional Insureds, and their respective insurers retain all rights of subrogation.

(v) Workers' Compensation insurance, including employer's liability, for all persons whom the Seller employs (or uses as subcontract labor if the subcontractor is uninsured) in carrying out any services related to this Order. Such insurance shall be in strict compliance with the requirements of the most current and applicable workers' compensation insurance laws in effect from time to time in the state(s) where the Order is delivered or services are performed, and shall include the following:

Coverage A (Workers' Compensation) - Statutory

Coverage B (Employer's Liability)

At a minimum, the following limits and coverages:

- \$1,000,000 for each accident, for bodily injury by accident
- \$1,000,000 for each employee, for bodily injury by disease
- \$1,000,000 for each disease policy limit

Waiver of Subrogation endorsement in favor of the Purchaser, the other Additional Insureds, and their respective insurers. The Purchaser, the other Additional Insureds, and their respective insurers retain all rights of subrogation.

Contain endorsements that provide: Voluntary Compensation

(vi). Professional Liability Insurance. If the Seller is required to furnish professional services as part of this Order, the Seller shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than five million (\$5,000,000) per claim and five million (\$5,000,000) in the aggregate.

(vii) Additional Insureds.

To the fullest extent permitted by law, the Seller shall cause the primary and excess or umbrella policies for Commercial General Liability, Automobile Liability and Seller's Pollution Liability to include the Purchaser, RHAM Board of Education, the Hebron Public Building Committee and RHAM Emergency Electric Generator Upgrade Project Building Committee for the project for which the goods shall be a part, the State of Connecticut, the Architect/Engineer identified on the Order, and their consultants and their respective directors, trustees, officials, officers, committee members, agents, volunteers, employees, consultants and representatives and their respective directors, trustees, officials, officers, committee members, agents, volunteers, employees, consultants and representatives (collectively, the "Additional Insureds") as additional insureds for claims caused in whole or in part by the Seller's negligent acts or omissions or defects in the goods provided by Seller. The additional insured coverage shall be primary and non-contributory to any of the Additional Insureds' insurance policies and shall apply to both ongoing and completed operations. The Seller shall provide the Purchaser with an additional insured endorsement evidencing the Seller's compliance with its obligations to name additional insureds pursuant to this Section which endorsement shall be the ISO Endorsements specified herein or otherwise satisfactory to the Purchaser.

(viii) The insurance provisions set forth herein shall survive the delivery and acceptance of the goods and services set forth in this Order, termination of this Order, or full or partial performance of this Order, to the maximum extent allowed by law.

(ix) Claims Made Policies. If any of the insurance maintained by the seller is a "claims" made" policy, the policy shall include tail coverage to the applicable statute of limitations.

d. Performance and Payment Bonds. The Seller shall provide from a surety authorized to issue bonds in the State of Connecticut, a 100% Performance and Labor and Materials Payment Bond. The form of Bond shall be AIA A312.

e. During the course of execution of the work, whenever there is a lapse in the insurance requirements as stated herein, through cancellation, expiration, failure to renew, or any other cause, the Purchaser shall order the cessation of all construction activities until such time as the insurance requirements are complied with. The Seller shall have no claim or claims whatever against the Purchaser. Seller's certificate of insurance and policy endorsement shall specify that the Purchaser will receive thirty (30) days written notice of any cancellation, non-renewal or reduction in coverage and limits originally provided.

11. Patent Infringement. To the fullest extent allowed by law, the Seller agrees to defend, indemnify and hold harmless the Purchaser, the RHAM Board of Education, the Hebron Public and Project Specific Building Committee for the project for which the goods shall be a part, the State of Connecticut, the Architect/Engineer identified on the Order and their consultants, and their respective directors, trustees, officials, officers, committee members, agents, volunteers, employees, consultants and representatives and their respective directors, trustees, officials, officers, committee members, agents, volunteers, employees, consultants and representatives ("Patent Indemnitees") from and against all costs, damage, loss or expense, including reasonable attorneys' fees, which the Patent Indemnitees may incur or undergo in the event of any suit, claim, or proceedings being brought against the Patent Indemnitees for the infringement of any letters patent of the United States of America by reason of the sale and/or use of any device, design or apparatus furnished by the Seller under this Order; including any actual or claimed trademark, patent or copyright infringement.

12. Regulatory Compliance. In filling this Order, Seller represents and covenants that all goods, labor, services, and materials used to fill this Order are produced and/or provided in compliance with all applicable existing local, federal and state laws, including but not limited to those regarding labor, wages, hours and materials.

13. OSHA Requirements. Seller agrees to comply with the provisions of the Occupational Safety and Health Act of 1970 and the standards and regulations issued thereunder and warrants that all goods, materials, labor and services furnished under this Order will conform to and comply with said standards and regulations. Seller further agrees to defend, indemnify and hold harmless the Indemnitees for all damages suffered by the Indemnitees as a result of Seller's failure of the goods, materials, labor and services furnished under this Order to so comply. Seller agrees to furnish Material Safety Data Sheet as applicable for hazardous or potentially hazardous products.

14. Non-Discrimination. The Seller agrees and warrants that in the fulfillment of this Order it will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religion, national origin, sex or physical disability including, but not limited to blindness, mental impairment, mental disability, gender identity, or sexual orientation unless it is shown by Seller that such disability prevents performance of that which must be done to successfully fulfill the terms of this Order or in any manner which is prohibited by the laws of the United States or the State of Connecticut and further agrees to provide the Connecticut Human Rights and Opportunities Commission with such information requested by the Commission concerning the employment practices and procedures of the Seller.

15. Warranty. Seller expressly warrants that the goods covered by this Order are of merchantable quality and satisfactory and safe and fit for the use intended.

a. Warranty of Merchantability. Goods provided by the Seller under this Order shall be merchantable. All goods provided shall be of good quality, within the description given by the Purchaser, shall be fit for their ordinary purpose, shall be adequately contained and packaged within the description given by the Purchaser, shall conform to the drawings, specifications, and other documents that describe the goods set forth in the Order, and shall conform to the affirmations of fact made by the Seller or on the container or label.

b. Warranty of Fitness for a Particular Purpose. When Seller has reason to know or knows any particular purpose, for which the goods are required, and the Purchaser is relying on the Seller's skill or judgment to select or furnish suitable goods, there is a warranty that the goods are fit for such purpose.

c. Extended Warranty. The Seller shall provide at no additional cost to the Purchaser, any extended warranty required by the drawings, specifications, and other documents that describe the goods set forth in the Order.

d. Warranty of Title. Seller shall, in providing goods to the Purchaser, convey good title in those goods, whose transfer is right and lawful. All goods provided by the Seller shall be delivered free from any security interest, lien, or encumbrance. Goods provided by the Seller shall be delivered free of any rightful claim of any person by patent, copyright, infringement or the like.

16. Indemnification. To the maximum extent allowed by law, Seller shall defend, indemnify and hold harmless the Purchaser, RHAM Board of Education, the Hebron Public Building Committee, and the RHAM Emergency Electric Generator Upgrade Building Committee, for the project for which the goods shall be a part, the State of Connecticut, and their respective directors, trustees, officials, officers, committee members, agents, volunteers, employees, consultants and representatives ("Indemnitees") from and against any and all damages, claims, liabilities, demands, suits, judgments, penalties and costs

(including reasonable attorneys' fees and expenses) and all liability imposed by law, for or on account of damage to property or death of or injury to any person or persons (including property and employees of the Purchaser), breach of contract, and breach of warranty but only to the extent arising or resulting from any negligent act or omission of, act, omission, willful misconduct, breach of contract or breach of warranty by, or the fault of the Seller or anyone for whom the Seller is responsible in the performance of the Order or the work, goods, labor, materials, or services provided by the Seller, its employees, agents or subcontractors pursuant to this Order. This indemnification will survive the delivery and acceptance of the goods and services set forth in this Order, termination of this Order, or full or partial performance of this Order, to the maximum extent allowed by law.

17. Taxes. The Town of Hebron is exempt from sales tax. Seller shall not include sales taxes on invoices.

18. Gratuities. By accepting this Order, the Seller represents and warrants that no arrangement has been made with the Purchaser or any person or agency to solicit or secure this Order upon an agreement or understanding for a gratuity, commission, percentage, brokerage or contingent fee, in any form, to any person excepting bona fide employees of the Seller.

19. Governing Law. This Agreement shall be construed in accordance with and governed by the laws of the State of Connecticut, without regard to its conflicts of law principles, and if applicable, the laws and regulations of the United States.

20. Termination for Convenience. Purchaser may, by written notice to Seller, terminate the Order, or any part thereof, for any or no reason, for Purchaser's convenience. Upon notice of termination, Seller shall immediately stop all work and cause its suppliers and/or subcontractors to stop all work in connection with the Order. If Purchaser terminates for convenience, Purchaser shall pay Seller for goods and services accepted as of the date of termination, and subject to Purchaser's approval, which approval shall not be unreasonably withheld, for Seller's actual and reasonable out of pocket costs incurred directly as a result of such termination. Incidental costs or other damages or costs of any kind or nature, including but not limited to consequential damages, lost profits, lost opportunity, and the like shall not be compensable by Purchaser and are irrevocably abandoned and waived by Seller. Purchaser shall have no responsibility for Seller's work performed after Purchaser transmits to seller a notice of termination.

21. Termination for Cause. Purchaser may, by written notice to Seller, terminate the Order, or any part thereof, if Seller breaches any of the terms and conditions of the Order, becomes insolvent or files for bankruptcy protection. By way of example; (a) failure by Seller to make timely, complete and conforming delivery of goods and services, or (b) breach of the representations or warranties set forth in this Order, shall entitle Purchaser to terminate the Order for cause. If Purchaser terminates for cause, Purchaser shall have no payment obligations to Seller. Should a court of competent jurisdiction subsequently determine that Purchaser's termination for cause was wrongful or unjustified, then such termination shall be automatically considered a termination for convenience under Section 20, and Seller shall have rights under that provision, but no other rights or claims for damages of any kind or nature, including but not limited to consequential damages, lost profits, lost opportunity, and the like which claims are irrevocably abandoned and waived by Seller.

22. Damages. Without limiting Purchaser's rights and remedies at law or in equity, Purchaser reserves the right to charge Seller for any loss, expense (including reasonable attorneys' fees) or damage sustained as a result of Seller's failure to deliver conforming goods, labor, materials, or services or other breach of the Order, including without limitation, expenses incurred in connection with Purchaser's purchase of substitute goods, incidental damages and consequential damages resulting from Seller's failure or breach.

23. Entire Agreement. This Order contains the entire agreement of the parties. It may not be modified or terminated orally and no claimed modification, termination or waiver shall be binding on the Purchaser unless in writing signed by an authorized representative of the Purchaser. No modification or waiver shall be deemed effected by Seller's acknowledgement or confirmation containing other or different terms. All titles to clauses contained in this Order are for identification only and shall not be construed as being a substantive part of the Order.

24. Certification as to No Use of Natural Gas Waste or Oil Waste. For all Orders related to either (a) the purchase or acquisition of materials to be used to construct, repair or maintain any publicly owned and/or maintained road or real property within the Town of Hebron or (b) the performance of services to construct, repair or maintain any publicly owned and/or maintained road or real property within the Town of Hebron:

By accepting this Order, the Seller certifies that in connection with this Order: (a) no materials containing natural gas waste or oil waste shall be provided to the Purchaser or shall be used in providing any services to the Purchaser by the Seller or any contractor, sub-contractor or agent of the Seller, (b) nor will the Seller or any contractor, sub-contractor or agent of the Seller apply any natural gas waste or oil waste to any publicly owned and/or maintained road or real property within the Town of Hebron in performing its obligations under this Order.

25. If this Order entails any exposure to a regulated material, including, but not limited to, asbestos or lead, the Seller certifies that it and each of its subcontractors and their employees shall be certified and trained under all OSHA and other relevant regulations for such Work.

26. State, federal, or other grant programs may fund some or all of the goods or services which are the subject of this Order. The Seller is advised that such funding programs may include contractual provisions binding on sellers and or providers of goods and/or services, and which may, for example, require audits or certifications under oath that the Seller has not been debarred, suspended, or excluded from any publicly funded project or programs.

27. The Seller is required to comply with all provisions of the Civil Rights Act of 1964, the Equal Employment Opportunity Act of 1972, Executive Orders 11246, 11375, 11478 and, if applicable, the Connecticut Fair Employment Practice Law.

28. Pursuant to Conn. Gen. Stat. Sect. 4a-60, (1) The Seller agrees and warrants that in the performance of this Order such Seller will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, status as a veteran, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such Seller that such disability prevents performance of the work or services or goods involved, in any manner prohibited by the laws of the United States or of the state of Connecticut; and the Seller further agrees to take affirmative action to ensure that applicants with job-related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, status as a veteran, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such Seller that such disability prevents performance of the work or services or goods involved;

(2) The Seller agrees, in all solicitations or advertisements for employees placed by or on behalf of the Seller, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Commission on Human Rights and Opportunities;

(3) The Seller agrees to provide each labor union or representative of workers with which such Seller has a collective bargaining agreement or other contract or understanding and each vendor with which such Seller has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the Seller's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment;

(4) The Seller agrees to comply with each provision of this section and sections 46a-68e and 46a-68f and with each regulation or relevant order issued by said commission pursuant to sections 46a-56, 46a-68e, 46a-68f and 46a-86; and

(5) The Seller agrees to provide the Commission on Human Rights and Opportunities with such information requested by the commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Seller as relate to the provisions of this section and section 46a-56.

(b) The Seller agrees and warrants that he or she will make good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials on such public works or quasi-public agency project.

(c) Except as provided in section 10a-151i:

(1) Any Seller who has one or more contracts with an awarding agency or who is a party to a municipal public works contract or a contract for a quasi-public agency project shall include a nondiscrimination affirmation provision certifying that the Seller understands the obligations of this section and will maintain a policy for the duration of the Order to assure that the Order will be performed in compliance with the nondiscrimination requirements of subsection (a) of this section. The authorized signatory of the Order shall demonstrate his or her understanding of this obligation by (A) initialing the nondiscrimination affirmation provision in the body of the Order, (B) providing an affirmative response in the required online bid or response to a proposal question which asks if the Seller understands its obligations, or (C) signing the Order.

(2) No awarding agency, or in the case of a municipal public works contract, no municipality, or in the case of a quasi-public agency project contract, no entity, shall award a contract to a Seller that has not included the nondiscrimination affirmation provision in the contract and demonstrated its understanding of such provision as required under subdivision (1) of this subsection.

(d) For the purposes of this section, “contract” is synonymous with “Order” and includes any extension or modification of the contract, “Seller” includes any successors or assigns of the Seller, “marital status” means being single, married as recognized by the state of Connecticut, widowed, separated or divorced, and “mental disability” means one or more mental disorders, as defined in the most recent edition of the American Psychiatric Association’s “Diagnostic and Statistical Manual of Mental Disorders”, or a record of or regarding a person as having one or more such disorders. For the purposes of this section, “contract” does not include a contract where each Seller is (1) a political subdivision of the state, including, but not limited to, a municipality, unless the contract is a municipal public works contract or quasi-public agency project contract, (2) any other state, as defined in section 1-267, (3) the federal government, (4) a foreign government, or (5) an agency of a subdivision, state or government described in subdivision (1), (2), (3) or (4) of this subsection.

(e) For the purposes of this section, “minority business enterprise” means any small contractor or supplier of materials fifty-one per cent or more of the capital stock, if any, or assets of which is owned by a person or persons: (1) Who are active in the daily affairs of the enterprise, (2) who have the power to direct the management and policies of the enterprise, and (3) who are members of a minority, as such term is defined in subsection (a) of section 32-9n; and “good faith” means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations. “Good faith efforts” shall include, but not be limited to, those reasonable initial efforts necessary to comply with statutory or regulatory requirements and additional or substituted efforts when it is determined that such initial efforts will not be sufficient to comply with such requirements.

(f) Determination of the Seller’s good faith efforts shall include, but shall not be limited to, the following factors: The Seller’s employment and subcontracting policies, patterns and practices; affirmative advertising, recruitment and training; technical assistance activities and such other reasonable activities or efforts as the Commission on Human Rights and Opportunities may prescribe that are designed to ensure the participation of minority business enterprises in public works projects.

(g) The Seller shall develop and maintain adequate documentation, in a manner prescribed by the Commission on Human Rights and Opportunities, of its good faith efforts.

(h) The Seller shall include the provisions of subsections (a) and (b) of this section in every subcontract or purchase order entered into in order to fulfill any obligation of an Order with the state or municipality, and in every subcontract entered into in order to fulfill any obligation of a municipal public works contract or contract for a quasi-public agency project, and such provisions shall be binding on a subcontractor, vendor or manufacturer, unless exempted by regulations or orders of the Commission on Human Rights and Opportunities. The Seller shall take such action with respect to any such subcontract or purchase order as the commission may direct as a means of enforcing such provisions, including sanctions for noncompliance in accordance with section 46a-56; provided, if such Seller becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the commission regarding a state contract, the Seller may request the state of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the state and the state may so enter.

Pursuant to Conn. Gen. Stat. Sect 4a-60a, (1) The Seller agrees and warrants that in the performance of the Contract such Seller will not discriminate or permit discrimination against any person or group of persons on the grounds of sexual orientation, in any manner prohibited by the laws of the United States or of the state of Connecticut, and that employees are treated when employed without regard to their sexual orientation;

(2) The Seller agrees to provide each labor union or representative of workers with which such Seller has a collective bargaining agreement or other contract or understanding and each vendor with which such Seller has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers’ representative of the Seller’s commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment;

(3) The Seller agrees to comply with each provision of this section and with each regulation or relevant order issued by said commission pursuant to section 46a-56; and

(4) The Seller agrees to provide the Commission on Human Rights and Opportunities with such information requested by the commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Seller which relate to the provisions of this section and section 46a-56.

(b) Except as provided in section 10a-151i:

(1) Any Seller who has one or more contracts with an awarding agency or who is a party to a municipal public works contract or a contract for a quasi-public agency project shall include a nondiscrimination affirmation provision in the Order certifying that the Seller understands the obligations of this section and will maintain a policy for the duration of the Order to assure that the Order will be performed in conformance with the nondiscrimination requirements of this section. The authorized signatory of the

Order shall demonstrate his or her understanding of this obligation by either (A) initialing the nondiscrimination affirmation provision in the body of the Contract, or (B) providing an affirmative response in the required online bid or response to a proposal question which asks if the Seller understands its obligations.

(2) No awarding agency, or in the case of a municipal public works contract, no municipality, or in the case of a quasi-public agency project contract, no entity, shall award a contract to a Seller who has not included the nondiscrimination affirmation provision in the Order and demonstrated its understanding of such provision as required under subdivision (1) of this subsection.

(c) For the purposes of this section, "contract" is synonymous with "Order" and includes any extension or modification of the contract, and "Seller" includes any successors or assigns of the Seller. For the purposes of this section, "contract" does not include a contract where each Seller is (1) a political subdivision of the state, including, but not limited to, a municipality, unless the contract is a municipal public works contract or quasi-public agency project contract, (2) any other state, as defined in section 1-267, (3) the federal government, (4) a foreign government, or (5) an agency of a subdivision, state or government described in subdivision (1), (2), (3) or (4) of this subsection.

(d) The Seller shall include the provisions of subsection (a) of this section in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the state or municipality, and in every subcontract entered into in order to fulfill any obligation of a municipal public works Seller contract for a quasi-public agency project, and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission on Human Rights and Opportunities. The Seller shall take such action with respect to any such subcontract or purchase order as the commission may direct as a means of enforcing such provisions, including sanctions for noncompliance in accordance with section 46a-56; provided, if such Seller becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the commission regarding a state contract, the Seller may request the state of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the state and the state may so enter.

29. Prevailing Wages (State of Connecticut)

If the Order includes labor and if the Purchase Price is above the State of Connecticut Prevailing Wage threshold pursuant to Conn. Gen. Stat. Sec. 31-53, et seq. then State of Connecticut Prevailing Wages shall apply as set forth in 29(a) below:

State of Connecticut Prevailing Wages apply to this Project: Yes ☐ No: ☒ X

(a) This Contract is above the prevailing wage threshold as defined by Connecticut law, section 31-53, as amended, the Seller shall include the costs of such wages including all yearly adjustments in the Contract Price. The wages paid on an hourly basis to any mechanic, laborer or workman employed upon the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such employee to any employee welfare fund, as defined in subsection (h) of this section, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any Seller who is not obligated by agreement to make payment or contribution on behalf of such employees to any such employee welfare fund shall pay to each employee as part of his wages the amount of payment or contribution for his classification on each pay day.

30. Non-Resident Contractor 5% Tax For Contracts. Conn. Gen. Stat. Sec. 12-430(7) requires non-resident Sellers who perform services or furnish materials, or both, for the construction, alteration or improvement of any project in which the contract price is at least \$250,000, to furnish the Department of Revenue Services (DRS) a Guarantee Bond for 5% of the total cost of the work, issued under a contract using Form AU-766, Guarantee Bond. This form is available on the State DRS website. Form AU-766 must be submitted for each additional change order or supplement issued against the contract. Non-resident Sellers must have completed and submitted to the DRS Form REG-1, Business Tax Registration Application, to register with the DRS and have been issued a Connecticut Tax Registration Number. This form is available on the DRS website. Non-resident contractors have 120 days from the commencement of the contract to file the Guarantee Bond with the State. Commencement of the contract, as defined by law, "means the time when the non-resident contractor signs the contract, but, in any event, occurs no later than when the work under the contract actually starts." As soon as the guarantee bond is filed with the DRS, the non-resident contractor shall submit the copy of such Guarantee Bond together with the non-resident Seller's Connecticut Tax Registration Number to the Town department for whom the project is required. After the non-resident contractor receives its Certificate of Compliance from the DRS confirming that the Guarantee Bond requirement has been met, the non-resident contractor shall submit a copy of the same to the department, for whom the work is being performed, with a copy to the Buyer's purchasing department.

31. The following are incorporated by reference into this Agreement as though fully set forth and stated herein: The 13th, 14th and 15th Amendments of the United States Constitution, Civil Rights Act of 1964, Equal Pay Act of 1963, Title VI and VII of the 1964 United States Civil Rights Act, Presidential Executive Orders 11246, 11375, 11478 (nondiscrimination under federal contracts), Act 1, Section 1 and 20 of the Connecticut Constitution, Governor Grasso's Executive Order Number 11, Governor

O'Neill's Executive Order Number 9, the Connecticut Fair Employment Practices Law (Sec. 46a-60-69) of the Connecticut General Statutes, Connecticut Code of Fair Practices (46a-70-81), Deprivation of Civil Rights (46a-58 (a)(d)), Public Accommodations Law (46a-63-64), Discrimination against Criminal Offenders (46a-80), definition of blind (46a-51(1)), definition of Physically Disabled (46a-51 (15)), definition of Mentally Retarded (46a-51-13), cooperation with the Commission on Human Rights and Opportunities (46a-77), Sexual Harassment (46a-60 (a)-8), Connecticut Credit Discrimination Law (360436 through 439), Title 1 of the State and the Local Fiscal Assistance Act 1 1972, and the affirmative action provisions provided in the Connecticut General Statutes Section 4a-60a.

32. Executive Orders. This Agreement is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill promulgated February 15, 1973, concerning the listing of employment opening and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of the contract as if they had been fully set forth in it. The contract may also be subject to Executive Order No. 7C of Governor M. Jodi Rell, promulgated July 13, 2006, concerning contracting reforms and Executive Order No. 14 of Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services, in accordance with their respective terms and conditions.

33. Compliance with Immigration Laws. The Seller, during the term of this Agreement will comply, with the Immigration Reform and Control Act ("IRCA") and that each person it provides under the Agreement will at all times be authorized for employment in the United States of America. The Seller confirms that it has a properly completed Employment Eligibility Verification, Form I-9, for each person who will be assigned under the Agreement and that it will require each subcontractor, supplier, or consultant, if any, to confirm that it has a properly completed Form I-9 for each person who will be assigned under the Order. The Seller shall defend, indemnify, and hold harmless the Buyer and its employees, officers, officials, agents, volunteers and independent contractors, including any of the foregoing sued as individuals (collectively, the "Town Indemnified Parties"), against any and all proceedings, suits, actions, claims, damages, injuries, awards, judgments, losses or expenses, including fines, penalties, punitive damages, attorney's fees and costs, brought or assessed against, or incurred by, the Town Indemnified Parties related to or arising from the obligations under IRCA imposed upon the Seller or its subcontractors/consultants, or suppliers. The Seller shall also be required to pay any and all attorney's fees and costs incurred by the Town Indemnified Parties in enforcing any of the Seller's obligations under this provision, whether or not a lawsuit or other proceeding is commenced, which obligations shall survive the termination or expiration of the Order.

34. State of Connecticut Set Aside Provisions

If the Order includes State of Connecticut SBE/WBE/MBE set aside provisions, the provision set forth in 34(a) below, shall apply:

This Order includes the State of Connecticut Set Aside Provision set forth below: Yes__ No: X

(a)The Seller shall be required to comply with the provisions of this section and the requirements concerning nondiscrimination and affirmative action under sections 4a-60 and 4a-60a. As a result of the foregoing, the Seller shall (A) set aside at least twenty-five per cent of the total value of the state's financial assistance for such contract for award to subcontractors who are small contractors, and (B) of that portion to be set aside in accordance with subparagraph (A) of this subdivision, reserve a portion equivalent to twenty-five per cent of the total value of the Contract or portion thereof to be set aside for awards to subcontractors who are minority business enterprises.

35. Submittals/Product Data. Seller shall timely submit shop drawings, specifications, and other documents necessary as required by the Order to the Purchaser for review and approval. Purchaser's approval of any submittal, shop drawing, or other document shall not relieve the Seller from its obligation to deliver conforming goods.

35. Liquidated Damages. Seller shall deliver conforming goods to the location specified on the Order by the date specified on the Order. Seller has accounted for supply chain disruptions, material shortages, tariffs, pandemics, and all other cause's that may delay production of the goods and affirms that the goods shall be delivered on or before the date specified on the Order. In the event Seller fails to deliver the goods on or before the date specified on the Order, Seller shall pay purchaser liquidated damages in the amount of One Thousand Dollars (\$1,000.000) per calendar day after the delivery date set forth on the Order.

TABLE OF CONTENTS
SECTION 263213 – ENGINE GENERATORS

PART 1 - GENERAL	1
1.1 REFERENCES	1
1.2 SCOPE	1
1.3 DEFINITIONS.....	2
1.4 SUBMITTALS	2
1.5 QUALITY ASSURANCE	4
1.6 COORDINATION.....	5
1.7 DELIVERY, STORAGE AND HANDLING.....	5
1.8 WARRANTY	5
1.9 MAINTENANCE SERVICE.....	6
1.10 EXTRA MATERIALS	6
PART 2 - PRODUCTS	6
2.1 MANUFACTURERS	6
2.2 ASSEMBLY DESCRIPTION	6
2.3 ENGINE-GENERATOR SET	7
2.4 GENERATOR-SET PERFORMANCE	8
2.5 SERVICE CONDITIONS.....	9
2.6 ENGINE.....	9
2.7 ENGINE COOLING SYSTEM.....	10
2.8 FUEL SUPPLY SYSTEM.....	11
2.9 ENGINE EXHAUST SYSTEM	11
2.10 COMBUSTION-AIR INTAKE.....	11
2.11 STARTING SYSTEM	11
2.12 CONTROL AND MONITORING	12
2.13 GENERATOR OVERCURRENT AND FAULT PROTECTION.....	15
2.14 GENERATOR, EXCITER, AND VOLTAGE REGULATOR.....	17
2.15 OUTDOOR GENERATOR-SET ENCLOSURE – SKIN TIGHT TYPE.....	18
2.16 FINISHES.....	19
2.17 SOURCE QUALITY CONTROL	19
PART 3 - EXECUTION	20
3.1 EXAMINATION	20
3.2 CONCRETE BASES	20
3.3 INSTALLATION	20
3.4 CONNECTIONS	21
3.5 IDENTIFICATION.....	22
3.6 FIELD QUALITY CONTROL.....	22
3.7 STARTUP SERVICE	24
3.8 DEMONSTRATION	24

SECTION P263213 – PRE PURCHASE ENGINE GENERATORS

PART 1 - GENERAL

1.1 REFERENCES

- A. This Section covers the specification of Packaged Engine Generators. Section – COMMON WORK RESULTS FOR ELECTRICAL WORK, GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, applicable Sections of DIVISION 1, and all other project instructions for other requirements.

1.2 SCOPE

- A. Provide labor, materials, services, equipment and transportation necessary for complete and operational electrical generation systems as indicated on Contract Drawings and specified herein, including, but not limited to the following:
1. Engine generator set
 2. Unit mounted cooling system
 3. Unit-mounted and remote-mounted control and monitoring
 4. Performance requirements for sensitive loads
 5. Fuel system, including sub-base fuel tank.
 6. Load Management System
 7. Starting battery
 8. Battery charger
 9. Silencer/exhaust system
 10. Remote annunciators
 11. Remote stop switch
 12. Outdoor Enclosure
- B. The engine generator will be pre-purchased by the Owner and assigned to the contractor.
- C. The contractor will provide all work required for the complete installation of the pre-purchased generator, including, but not limited to the following.
1. Processing of submittals.
 2. Acceptance of delivery and rigging into final location.
 3. Preparation of site to accept new equipment.
 4. Concrete base for generator.
 5. Power, control and monitoring field wiring.
 6. Piping and wiring connections.
 7. Identification.
 8. Schedule and coordinate all required work.

9. Assist in field start-up and testing.

D. Related Sections include the following:

1. Division 26 Section "Transfer Switches" for transfer switches including sensors and relays to initiate automatic-starting and -stopping signals for engine-generator sets.

1.3 DEFINITIONS

- A. Operational Bandwidth: The total variation from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.
- B. Steady-State Voltage Modulation: The uniform cyclical variation of voltage within the operational bandwidth, expressed in Hertz or cycles per second.

1.4 SUBMITTALS

- A. Product Data: Include the following:
- B. Specifications Compliance: A complete copy of this generator specification with each subparagraph noted with the comment, "compliance", "deviation", or "alternate". In the case of non-primary, vendor-supplied items, the name of the sub-vendor supplying said item, including model number, shall be indicated.
 1. By noting the term "compliance", it shall be understood that the manufacturer is in full compliance with the item specified and will provide exactly the same with no deviations.
 2. By noting the term "deviation", it shall be understood that the manufacturer prefers to provide a different component in lieu of that specified. Manufacturer shall indicate all deviations.
 3. By noting the term "alternate", it shall be understood that the manufacturer proposes to provide the same operating function but prefers to do it in a different manner. An alternate shall be fully described as to what the manufacturer proposes to provide.
 4. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
 5. Include thermal damage curve for generator.
 6. Include time-current characteristic curves for generator protective device.
 7. Include fuel consumption in gallons per hour at 0.8 power factor at 0.5, 0.75 and 1.0 times generator capacity.
 8. Include generator efficiency at 0.8 power factor at 0.5, 0.75 and 1.0 times generator capacity.
 9. Include air flow requirements for cooling and combustion air in cfm at 0.8 power factor, with air supply temperature of 95, 80, 70, and 50 deg F. Provide drawings showing requirements and limitations for location of air intake and exhausts.
 10. Include generator characteristics, including, but not limited to kw rating, efficiency, reactances, and short-circuit current capability.

- C. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components and location and size of each field connection.
1. Dimensioned outline plan and elevation drawings of engine-generator set and other components specified.
 2. Detailed, dimensioned plan, elevations and sections for outdoor enclosure. Include sound attenuation data.
 3. Design Calculations: Signed and sealed by a qualified professional engineer. Calculate requirements for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
 4. Vibration Isolation Base Details: Signed and sealed by a qualified professional engineer. Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include base weights.
 5. Wiring Diagrams: Power, signal, and control wiring.
- D. Welding certificates.
- E. Manufacturer Seismic Qualification Certification: Submit certification that sub-base tank engine-generator set, batteries, battery racks, accessories, and components will withstand seismic forces defined as Seismic Design Category D. Include the following:
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- F. Submit Qualification Data for testing agency; including a sample of a representative Field Quality Control Test Report.
- G. Certified summary of prototype-unit test report.
- H. Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.
- I. Certified Summary of Performance Tests: Demonstrate compliance with specified requirement to meet performance criteria for sensitive loads.

J. Test Reports:

1. Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements.
2. Report of sound generation.
3. Report of exhaust emissions showing compliance with applicable regulations.
4. Field quality-control test reports.

K. Certification of Torsional Vibration Compatibility: Comply with NFPA 110.

L. Operation and Maintenance Data: For packaged engine generators to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 and Division 26, include the following:

1. List of tools and replacement items recommended to be stored at the Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.

M. Warranty: Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

1. Maintenance Proximity: Not more than four hours' normal travel time from Installer's place of business to Project site.
2. Engineering Responsibility: Preparation of data for vibration isolators and seismic restraints of engine skid mounts, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Manufacturer Qualifications: A qualified manufacturer. Maintain, within 50 miles of Project site, a service center capable of providing training, parts, and emergency maintenance repairs.

C. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

D. Source Limitations: Obtain packaged generator sets and auxiliary components through one source from a single manufacturer.

- E. Product Options: Drawings indicate size, profiles, and dimensional requirements of packaged generator sets and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
- F. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX for welding exhaust system piping.
- G. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- H. Comply with NFPA 37.
- I. Comply with NFPA 70.
- J. Comply with NFPA 99.
- K. Comply with NFPA 110 requirements for Level 1 emergency power supply system.
- L. Engine Exhaust Emissions: Comply with applicable state and local government requirements.
- M. Noise Emission: Comply with applicable state and local government requirements for maximum noise level at adjacent property boundaries due to sound emitted by generator set including engine, engine exhaust, engine cooling-air intake and discharge, and other components of installation.

1.6 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver engine generator set and system components to their final locations in protective wrappings, containers and other protection that will exclude dirt and moisture and prevent damage from construction operations. Remove protection only after equipment is safe from such hazards.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.

- 1. Warranty Period: Five years from date of Substantial Completion.

2. All warranty work shall include all parts and labor for the duration of warranty period and shall include provision of temporary generator for the duration of the repair at no additional cost to the Owner.

1.9 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance by skilled employees of manufacturer's designated service organization. Include quarterly exercising to check for proper starting, load transfer, and running under load. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Maintenance agreements shall include parts and supplies as used in manufacture and installation of original equipment.

1.10 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Fuses: One for every 10 of each type and rating, but not less than one of each.
 2. Indicator Lamps: Two for every six of each type used, but not less than two of each.
 3. Filters: One set each of lubricating oil, fuel, and combustion-air filters.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Generators:
 - a. Caterpillar; Engine Div.
 - b. Generac Power Systems, Inc.
 - c. Kohler Co; Generator Division.
 - d. Cummins Power Generation; Industrial Business Group.
 - e. MTU.
 2. The Basis of Design is Caterpillar C32-1250.

2.2 ASSEMBLY DESCRIPTION

- A. Factory-assembled and -tested, water-cooled engine, with brushless generator and accessories.

- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
- C. EPSS Class: Engine-generator set shall be classified as a Class 48 in accordance with NFPA 110.
- D. Induction Method: Turbocharged.
- E. Governor: Adjustable isochronous, with speed sensing.
- F. Emissions: Comply with EPA Tier requirements.
- G. Mounting Frame: Structural steel framework to maintain alignment of mounted components without depending on concrete foundation. Provide lifting attachments sized and spaced to prevent deflection of base during lifting and moving.
- H. Capacities and Characteristics:
 - 1. Power Output Ratings: Nominal ratings as indicated at 0.8 power factor excluding power required for the continued and repeated operation of the unit and auxiliaries, with capacity as required to operate as a unit as evidenced by records of prototype testing.
 - 2. Output Connections: Three-phase, four wire.
 - 3. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component.

2.3 ENGINE-GENERATOR SET

- A. Packaged engine-generator set shall be a coordinated assembly of compatible components.
- B. Power Output Ratings: Nominal ratings of 1,250 kW with capacity as required to operate as a unit as evidenced by records of prototype testing.
- C. Output Connections: Three-phase, four wire.
- D. Safety Standard: Comply with ASME B15.1.
- E. NFPA Compliance:
 - 1. Comply with NFPA 37.
 - 2. Comply with NFPA 70.
 - 3. Comply with NFPA 99.
 - 4. Comply with NFPA 110 requirements for Level 1 emergency power supply system.
- F. UL Compliance: Comply with UL 2200.

- G. Nameplates: Each major system component shall be equipped with a nameplate to identify manufacturer's name and address, and model and serial number of component.
- H. Fabricate engine-generator-set mounting frame and attachment of components to resist generator-set movement during a seismic event when generator-set mounting frame is anchored to building structure.
- I. Mounting Frame: Adequate strength and rigidity to maintain alignment of mounted components without depending on concrete foundation. Mounting frame shall be free from sharp edges and corners and shall have lifting attachments arranged for lifting with slings without damaging components.
 - 1. Rigging Diagram: Inscribed on metal plate permanently attached to mounting frame to indicate location and lifting capacity of each lifting attachment and generator-set center of gravity.

2.4 GENERATOR-SET PERFORMANCE

- A. Oversizing generator compared with the rated power output of the engine is permissible to meet specified performance.
 - 1. Nameplate Data for Oversized Generator: Show ratings required by the Contract Documents rather than ratings that would normally be applied to generator size installed.
- B. Steady-State Voltage Operational Bandwidth: 2 percent of rated output voltage from no load to full load.
- C. Steady-State Voltage Modulation Frequency: Less than 1 Hz.
- D. Transient Voltage Performance: Not more than 10 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within 0.5 second.
- E. Steady-State Frequency Operational Bandwidth: Plus or minus 0.25 percent of rated frequency from no load to full load.
- F. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
- G. Transient Frequency Performance: Less than 2-Hz variation for a 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within three seconds.
- H. Output Waveform: At no load, harmonic content measured line to neutral shall not exceed 2 percent total with no slot ripple. The telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.

- I. Sustained Short-Circuit Current: For a 3-phase, bolted short circuit at system output terminals, the system shall supply a minimum of 300 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to winding insulation or other generator system components.
- J. Excitation System: Performance shall be unaffected by voltage distortion caused by nonlinear load.
- K. Start Time: Comply with NFPA 110, Type 10, system requirements.

2.5 SERVICE CONDITIONS

- A. Environmental Conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:
 - 1. Ambient Temperature: Minus 15 to plus 40 deg C.
 - 2. Relative Humidity: 0 to 95 percent.
 - 3. Altitude: Sea level to 1000 feet.

2.6 ENGINE

- A. Fuel: Fuel oil, Grade DF-2.
- B. Rated Engine Speed: 1800 rpm.
- C. Maximum Piston Speed for Four-Cycle Engines: 2250 fpm.
- D. Lubrication System: The following items are mounted on engine or skid:
 - 1. Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
 - 2. Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.
 - 3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.
- E. Engine Fuel System:
 - 1. Main Fuel Pump: Mounted on engine. Pump ensures adequate primary fuel flow under starting and load conditions.
 - 2. Relief-Bypass Valve: Automatically regulates pressure in fuel line and returns excess fuel to source.
 - 3. Provide fuel cooler to maintain fuel temperature and viscosity during a long period (up to one week) of continuous operation at high load.

- 4. Provide fuel consumption meter to provide data on fuel consumed during any testing or actual power outage generator operation. The fuel data will be transmitted to the Facility Wide BMS system to aid in generator running data required by the State of Connecticut DEEP.
- F. Coolant Jacket Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity: minimum 1500 Watt.
- G. Pipe crankcase ventilation fumes directly into engine intake to burn them and reduce unwanted emissions.
- H. Emissions: Engine must be certified to meet the EPA Emissions Limits Alternate Standard for Stationary Emergency Generator Sets.

2.7 ENGINE COOLING SYSTEM

- A. Description: Closed loop, liquid cooled, with radiator factory mounted on engine-generator-set mounting frame and integral engine-driven coolant pump.
- B. Radiator: Rated for specified coolant.
- C. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
- D. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gage glass and petcock.
- E. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
- F. Coolant Hose: Flexible assembly with inside surface of nonporous rubber and outer covering of aging-, ultraviolet-, and abrasion-resistant fabric.
 - 1. Rating: 50-psig maximum working pressure with coolant at 180 deg F, and non-collapsible under vacuum.
 - 2. End Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.
- G. Coolant piping external to engine-generator set. Use ASTM B 88, Type L (ASTM B 88M, Type B) copper tubing with brazed joints, sized as recommended by engine manufacturer. Refer to Division 23 Section "Basic Mechanical Materials and Methods" for basic piping installation and joint construction.

2.8 FUEL SUPPLY SYSTEM

- A. Comply with NFPA 30.
- B. Base-Mounted Fuel Oil Tank: Factory installed and piped, complying with UL 142 fuel oil tank. Features include the following:
 - 1. Tank level indicator.
 - 2. Capacity: Fuel for 48 hours' continuous operation at 100 percent rated power output of engine generator system without being refilled.
 - 3. Vandal-resistant fill cap.
 - 4. Containment Provisions: Double wall, EPA rupture basin.
 - 5. Fuel tank can be up to 48" high and up to 376" long to provide required fuel amount.

2.9 ENGINE EXHAUST SYSTEM

- A. Muffler/Silencer: Critical type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.
 - 1. Minimum sound attenuation of 25 dB at 500 Hz.
 - 2. Sound level measured at a distance of 7 meters from exhaust discharge after installation is complete shall be 78.8 dBA or less.
- B. Connection from Engine to Exhaust System: Flexible section of corrugated stainless-steel pipe, minimum 18" length from exhaust outlet to muffler with flanged pipe connections.
- C. Connection from Exhaust Pipe to Muffler: Stainless-steel expansion joint with liner.
- D. Exhaust Piping External to Engine: ASTM A 53/A 53M, Schedule 40, welded, black steel, with welded joints and fittings.

2.10 COMBUSTION-AIR INTAKE

- A. Description: Heavy-duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.

2.11 STARTING SYSTEM

- A. Description: 24-V electric, with negative ground and including the following items:
 - 1. Components: Sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum specified in "Environmental Conditions" Paragraph in "Service Conditions" Article.

2. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
3. Cranking Cycle: 60 seconds.
4. Battery: Adequate capacity within ambient temperature range specified in "Environmental Conditions" Paragraph in "Service Conditions" Article to provide specified cranking cycle at least three times without recharging.
5. Battery Cable: Size as recommended by engine manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.
6. Battery Compartment: Factory fabricated of metal with acid-resistant finish and thermal insulation. Thermostatically controlled heater shall be arranged to maintain battery above 10 deg C regardless of external ambient temperature within range specified in "Environmental Conditions" Paragraph in "Service Conditions" Article. Include accessories required to support and fasten batteries in place.
7. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 35-A minimum continuous rating.
8. Battery Charger: Current-limiting, automatic-equalizing and float-charging type. Unit shall comply with UL 1236 and include the following features:
 - a. Operation: Equalizing-charging rate of 10 A shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.
 - b. Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 40 deg C to plus 60 deg C to prevent overcharging at high temperatures and undercharging at low temperatures.
 - c. Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.
 - d. Ammeter and Voltmeter: Flush mounted in door. Meters shall indicate charging rates.
 - e. Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.
 - f. Enclosure and Mounting: NEMA 250, Type 1, wall-mounted cabinet.

2.12 CONTROL AND MONITORING

- A. Provide a fully solid-state, microprocessor based, generator set mounted control. The control panel shall be designed and built by the engine manufacturer. The control shall provide all operating, monitoring and control functions for the generator set. The control panel shall provide real time digital communications to all engine and regulator controls via SAE J1939.

- B. The controller shall also include logic to automatically provide load management. If the load exceed a maximum preset level, the controller shall initiate load shed by closing a contact to signal the existing BMS to immediately shut down one of the existing chillers and its auxiliary equipment. The maximum preset level shall be 1250kW. Provide a total of two (2) load shed output contacts.
1. The controller shall provide Monitoring Software with the following functionality
- a. Provide access to all data and events on generator set communications network and transmit all, including sub-base fuel levels and fuel consumption to the High School BMS.
 - b. Provide interface adapters to convert the generator's data protocol to be compatible with the High School BMS. The generator supplier shall also include software package(s) that will allow all available status points of the generator to be programmed, read, and recorded. The generator data interface shall be a read only interface.
 - c. Ability to communicate via Modbus TCP, Modbus RTU or remote modem.
 - d. The integrity of the generator remote start circuit(s) shall be continuously monitored for broken, disconnected, or shorted wires.
 - 1) Loss of integrity of the remote start circuit(s) shall initiate visual and audible annunciation of generator malfunction at the generator local and remote annunciator(s) and start the generator(s).
- C. Functional Description: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of the generator set. When mode-selector switch is switched to the on position, the generator set starts. The off position of the same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down the generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down the generator set.
- D. Manual Starting System Sequence of Operation: Switching on-off switch on the generator control panel to the on position starts generator set. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms.
- E. Provide minimum run time control set for 15 minutes with override only by operation of a remote emergency-stop switch.
- F. Comply with UL 508A.
- G. Configuration: Operating and safety indications, protective devices, basic system controls, and engine gauges shall be grouped in a common control and monitoring panel mounted on the generator set. Mounting method shall isolate the control panel from generator-set vibration.
- H. Indicating and protective devices and controls shall include those required by NFPA 110 for a Level 1 system, and the following:

I. Indicating and Protective Devices and Controls:

1. AC voltmeter: dual scale, 0-600V, 2% accuracy, 2-1/2" diameter.
2. AC ammeter: dual scale, 2% accuracy, 2-1/2" diameter.
3. AC frequency meter: dial type.
4. DC voltmeter (alternator battery charging).
5. Engine-coolant temperature gage.
6. Engine lubricating-oil pressure gage.
7. Engine lube oil temperature.
8. Running-time meter.
 - a. Transmit running-time meter data to the system wide BMS system to aid in providing generator operating data required by the State DEEP.
9. Ammeter-voltmeter, phase-selector switch(es).
10. Generator-voltage adjusting rheostat.
11. Upper and lower meter scale indicator lights.
12. Auto/Off/Test switch. Test mode shall automatically start unit without interrupting normal electrical supply.
13. Overspeed shutdown device with LED status indicator which lights when overspeed condition has occurred as cause of shutdown.
14. Coolant high-temperature shutdown device with LED status indicator which lights when pre-alarm operating temperature has been reached and stays lit when shutdown occurs.
15. Coolant low-level shutdown device with LED status indicator which lights when low coolant level causes shutdown.
16. Oil low-pressure shutdown device with LED status indicator which lights when pre-alarm oil pressure condition has been reached and stays lit when shutdown occurs.
17. Overcrank shutdown device with LED status indicator which indicates engine has failed to start after 60 second cranking period.
18. Lamp test switch and audible alarm with silencer switch.
19. Low coolant temperature alarm with LED status indicator which indicates failure of block heater.
20. LED status indicator for "switch off", which indicates when control switch has been placed in "off" position.
21. LED status indicator for "system ready", indicating no malfunctions detected.
22. Fuel tank derangement alarm.
23. Fuel tank high-level shutdown of fuel supply alarm.
24. Generator overload.
25. Start-stop switch.
26. Overspeed shutdown device.
27. Coolant high-temperature shutdown device.
28. Coolant low-level shutdown device.
29. Oil low-pressure shutdown device.

J. Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator, unless otherwise indicated.

- K. Connection to Data Link: A separate terminal block, factory wired to Form C dry contacts, for each alarm and status indication is reserved for connections for data-link transmission of indications to remote data terminals. Data system connections to terminals are covered elsewhere in Division 26.
- L. 12 Volt remote annunciator panel: Provide two remote annunciator panels. Install one in the High School Main Electrical Room and one in the Middle Schol Main Electrical Room. Panels shall include lights, audible alarm, alarm switch and lamp test switch, in accordance with NFPA 110, Level 1, to monitor the following conditions:
 - 1. Line power.
 - 2. Generator power.
 - 3. System ready (in auto position).
 - 4. Alarm switch off.
 - 5. Generator switch off.
 - 6. Emergency stop.
 - 7. Engine high-temperature shutdown.
 - 8. Lube-oil low-pressure shutdown.
 - 9. Overspeed shutdown.
 - 10. Remote emergency-stop shutdown.
 - 11. Engine high-temperature prealarm.
 - 12. Lube-oil low-pressure prealarm.
 - 13. Fuel tank, low-fuel level.
 - 14. Low coolant level.
 - 15. Overcrank shutdown.
 - 16. Coolant low-temperature alarm.
 - 17. Control switch not in auto position.
 - 18. Battery-charger malfunction alarm.
 - 19. Battery low-voltage alarm.
 - 20. Battery high voltage alarm.
- M. Remote Alarm Annunciator: Comply with NFPA 99. Labeled LED shall identify each alarm event. Common audible signal shall sound for alarm conditions. Silencing switch in face of panel shall silence signal without altering visual indication. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset. Cabinet and faceplate are surface- or flush-mounting type to suit mounting conditions indicated.
- N. Enclosure Exterior Remote Emergency Stop Switch: Mounted on exterior of generator enclosure. Glass break type switch within weatherproof enclosure.

2.13 GENERATOR OVERCURRENT AND FAULT PROTECTION

A. General

- 1. Acceptance of generator overcurrent protective devices will be contingent upon achievement of selective coordination of system including but not limited to elevators per

- NEC Article 620; Emergency Systems per NEC Article 700 and legally required Standby Systems and components per NEC Article 701.
2. Provide an energy-reducing maintenance switch with local status indicator for all breakers rated 1200 Amp or higher or that can be adjusted to 1200 Amp or higher.
 - a. The maintenance switch shall override the coordinated trip settings that may cause a delay in breaker opening during a fault condition while service is being performed on the breaker or distribution sections of the switchboard. The resulting faster breaker opening time will lower the potential arc flash energy available.
 - b. Provide alternate means to reduce clearing time and provide arc energy reduction.
 - 1) Zone selective interlocking.
 - 2) Differential delaying.
 - 3) Energy reducing active arc flash mitigation system.
- B. The 800 Ampere and 125 Ampere Generator Circuit Breakers: Molded-case, electronic-trip type; 100 percent rated; complying with UL 489; Sq. D. PowerPact family or equal by ABB or Cutler Hammer as a minimum. These breakers must be capable of providing WCR/closing rating of the existing ATS's of a minimum of 50,000 RMS symmetrical amperes; SQD Type MH or PJ.
1. Tripping Characteristics: Adjustable long-time pickup and delay, short-time pickup and delay, instantaneous and ground fault pickup INDICATION ONLY if 1,000 amperes or above at 480/277 volts. Instantaneous must have high setting (15 times LTPU) or the capability to be turned off.
 2. Trip Settings: Matched to generator thermal damage curve.
 3. Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices.
 4. Mounting: Adjacent to or integrated with control and monitoring panel.
- C. 2000 Ampere and 1200 Ampere Generator Circuit Breakers: Insulated-case, electronic-trip type; 100 percent rated; complying with UL 489.
1. Tripping Characteristics: Adjustable long-time pickup and delay, short-time pickup and delay, instantaneous and ground fault pickup INDICATION ONLY if 1,000 amperes or above at 480/277 volts. Instantaneous must have high setting (15 times LTPU) or the capability to be turned off. Breakers shall include energy reduction.
 2. Trip Settings: Matched to generator thermal damage curve as closely as possible.
 3. Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices.
 4. Mounting: Adjacent to or integrated with control and monitoring panel.
- D. The 125A and 1200A circuit breakers shall be provided in Nema 3R enclosures for exterior mounting in the field.

- E. Generator Protector: Microprocessor-based unit that continuously monitors current level in each phase of generator output, integrates generator heating effect over time, and predicts when thermal damage of the alternator will occur. When signaled by the protector or other generator-set protective devices, a shunt-trip device in the generator disconnect switch shall open the switch to disconnect the generator from the load circuits. Protector shall perform the following functions:
 - 1. Initiates a generator overload alarm when the generator has operated at an overload equivalent to 110 percent of full-rated load for 60 seconds. Indication for this alarm is integrated with other generator-set malfunction alarms.
 - 2. Under single or three-phase fault conditions, regulates the generator to 300 percent of rated full-load current for up to 10 seconds.
 - 3. As the overcurrent heating effect on the generator approaches the thermal damage point of the unit, the protector switches the excitation system off, opens the generator disconnect device, and shuts down the generator set.
 - 4. Senses clearing of a fault by other overcurrent devices and controls recovery of rated voltage to avoid overshoot.
- F. Ground-Fault Indication: Comply with NFPA 70, Article 700.7(D). Integrate ground-fault alarm indication with other generator-set alarm indications.
- G. Provide generator OPD with one N.C. and one N.O. contact indicating breaker status. This status indication shall signal an alarm to the remote annunciator panel to indicate a “Generator Output Breaker Open” alarm. The remote annunciator panel shall be equipped with a single summary alarm wired to the building BMS system indicating a “Generator Trouble” alarm.

2.14 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

- A. Comply with NEMA MG 1 and specified performance requirements.
- B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.
- C. Electrical Insulation: Class H or Class F.
- D. Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.
- E. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.
- F. Excitation shall use no slip or collector rings, or brushes, and shall be arranged to sustain generator output under short-circuit conditions as specified.
- G. Enclosure: Dripproof.

- H. Instrument Transformers: Mounted within generator enclosure.
- I. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified.
 - 1. Adjusting rheostat on control and monitoring panel shall provide plus or minus 5 percent adjustment of output-voltage operating band.
 - 2. Provide with under-frequency protection and moisture-resistive protection.
 - 3. Regulation shall be within +/-2% of rated voltage from no load to full load.
 - 4. On application of rated load at rated power factor, instantaneous voltage dip shall NOT exceed 20%, with recovery within one second.
- J. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.
- K. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.
- L. Subtransient Reactance: 12 percent, maximum.
- M. Provide Permanent Magnet Generator (PMG) system.
- N. Alternator shall be self-ventilated, one-piece cast aluminum alloy, uni-directional internal fan shall provide high volume, low noise air delivery with broad range, 12-lead reconnectable, four pole rotating field unit.
- O. Temperature rise shall be within NEMA MG1-22.40, IEEE and ANSI Standards for standby duty at rated output.
- P. Provide front-end mounted junction box for load connections. Junction box shall have space to mount regulator and voltage adjust rheostat inside box and to relocate same to opposite side without unit modification.

2.15 OUTDOOR GENERATOR-SET ENCLOSURE – SKIN TIGHT TYPE

- A. Description: Vandal-resistant, weatherproof steel housing, wind resistant up to 100 mph (160 km/h). Multiple panels shall be lockable and provide adequate access to components requiring maintenance including rear-hinged control panel door. Panels shall be removable by one person without tools. Instruments and control shall be mounted within enclosure.
 - 1. Provide locking hasps (keyed alike) on engine side panels and control door.
 - 2. Hinged Doors: With padlocking provisions.
 - 3. Thermal Insulation: Manufacturer's standard materials and thickness selected in coordination with space heater to maintain winter interior temperature within operating limits required by engine-generator-set components.
 - 4. Muffler Location: Within enclosure.
 - 5. Enclosure Panelboard: NEMA 3R panel external to enclosure, serving lights, receptacles, heaters, controls, battery charger and devices within enclosure. All electrical components and devices served by the enclosure panelboard shall be factory prewired and field wired

- to this panelboard. Enclosure panelboard may only serve equipment that serves the EPSS within the generator enclosure.
6. Sound level of 79 dBA at 25 feet (minimum 25 DB attenuation) or level to comply with local requirements at the property line, whichever is more restrictive.
 7. Enclosure can be up to 376" long x 122" wide x 198" high, including generator, silencer and fuel tank.
- B. Engine Cooling Airflow through Enclosure: Maintain temperature rise of system components within required limits when unit operates at 110 percent of rated load for 2 hours with ambient temperature at top of range specified in system service conditions.
1. Louvers: Fixed-engine cooling-air inlet and discharge. Storm-proof and drainable louvers prevent entry of rain and snow.
 2. Automatic Dampers: At engine cooling-air inlet and discharge. Dampers shall be closed to reduce enclosure heat loss in cold weather when unit is not operating.
- C. Interior Lights with Switch: Factory-wired, vapor-proof type fixtures within housing; arranged to illuminate controls and accessible interior.
- D. Generator Access Platform: Prefabricated Code compliant heavy duty working platform along both sides of generator. Platform to include:
1. 48" wide steel frames (or larger to accommodate door swing) with 1" aluminum bar grate platform with OSHA compliant railings minimum of 42" high with posts top and mid railing of 1-1/2" schedule 40 pipe.
 2. Leg height to set platform at base of enclosure, above fuel tank.
 3. Final dimensions of platform to be based on dimensions of approved generator and sub-base fuel tank.
 4. Stair system shall be designed for installation outdoors, with 1" aluminum bar grate in accordance with U.S. OSHA Standard for Fixed Industrial Stairs, 29 CFR 1910.24.
 5. Guard and handrails shall be painted safety yellow.

2.16 FINISHES

- A. Indoor and Outdoor Enclosures and Components: Manufacturer's standard enamel over corrosion-resistant pretreatment and compatible standard primer.

2.17 SOURCE QUALITY CONTROL

- A. Prototype Testing: Factory test engine-generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.
1. Tests: Comply with NFPA 110, Level 1 energy converters.
 2. Generator Tests: Comply with IEEE 115.

3. Test Components and Accessories: Items furnished with installed unit that are not identical to those on tested prototype shall have been factory tested to demonstrate compatibility and reliability.
 4. Test generator, exciter and voltage regulator as a unit.
- B. Project-Specific Equipment Tests: Before shipment, factory test engine-generator set and other system components and accessories manufactured specifically for this Project. Perform tests at rated load and power factor. Include the following tests:
1. Full load run.
 2. Maximum power.
 3. Voltage regulation.
 4. Transient and steady-state governing.
 5. Single-step load pickup.
 6. Safety shutdown.
 7. Observation of Factory Tests: Provide 14 days' advance notice of tests and opportunity for observation of tests by Owner's representative.
- C. Report factory test results within 10 days of completion of test.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine-generator performance.
- B. Examine roughing-in of piping systems and electrical connections. Verify actual locations of connections before packaged engine-generator installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CONCRETE BASES

- A. Coordinate size and location of concrete bases with manufacturers requirements. Verify structural requirements with structural engineer.
- B. Concrete base design, materials and installation requirements are specified in Division 3.

3.3 INSTALLATION

- A. Comply with packaged engine-generator manufacturers' written installation and alignment instructions and with NFPA 110.

- B. Install packaged engine generators level on concrete base.
 - 1. Seismic Restraint: Mount packaged engine generator on restrained spring isolators to provide seismic restraint and vibration isolation.
- C. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.
- D. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.
 - 1. Verify that electrical wiring is installed according to manufacturer's submittal and installation requirements in Division 26 Sections. Proceed with equipment start up only after wiring installation is satisfactory.
 - 2. Provide interconnecting wiring between generator and automatic transfer switch(es).
 - 3. Provide interconnecting wiring between generator and remote annunciator panels.
 - 4. Provide interconnecting wiring between generator and BMS to signal the BMS that normal power is lost and the generator will be powering loads.
 - 5. Provide interconnecting wiring between generator fuel consumption meter and generator running time meter to the BMS.
 - 6. Provide interconnecting wiring from the generator controller to the BMS that the generator is overloaded and to shut down one of the existing chillers and its auxiliary equipment.
 - 7. Provide interconnecting wiring between generator NEMA 3R enclosure panel and devices in the enclosure.
 - 8. Provide data wiring from generator to the High School BMS to enable generator status points to be read and recorded.
- E. Electrical Contractor to provide fuel for testing and start-up of the engine-generator. Quantity shall be sufficient to complete testing and start-up, but not less than 4 hours at 100% load.

3.4 CONNECTIONS

- A. Piping installation requirements are specified in Division 23 Sections. Drawings indicate general arrangement of piping and specialties. The following are specific connection requirements:
 - 1. Install fuel, cooling-system, and exhaust-system piping adjacent to packaged engine generator to allow service and maintenance.
 - 2. Connect cooling-system water supply and drain piping to diesel-engine heat exchangers. Install flexible connectors at connections to engine generator and remote radiator.
 - 3. Connect fuel piping to engines with a gate valve and union.
 - 4. Connect exhaust-system piping to engines.
- B. Ground equipment according to Division 26 Section "Electrical Grounding."
- C. Connect wiring according to Division 26 Section "Conductors and Cables."

- D. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 IDENTIFICATION

- A. Identify system components according to Division 23 Section "Mechanical Identification" and Division 26 Section "Basic Electrical Materials and Methods."

3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test and adjust field-assembled components and equipment installation, including connections, and to complete in field testing. Report results in writing.
- B. The factory-authorized service representative shall perform the following field tests and inspections and prepare test reports: Furnish required materials, equipment and services to perform on-site tests, in presence of Architect and Owner, to demonstrate system operation. Correct defects and re-test system until proper operation is guaranteed. Materials and equipment shall include: temporary power and wiring; temporary cooling; 480 Volt, 1500 KW, infinitely variable, outdoor load bank and operator; monitoring devices; etc.
 - 1. Perform each electrical test and visual and mechanical inspection according to current Edition of ANSI/NETA Standards for Acceptance Testing as outlined in Section 7 (except for vibration baseline test). Certify compliance with test parameters. Tests shall be conducted by applying load (via load bank) to load side of automatic transfer switch or to other load point acceptable to Engineer. Test shall include a minimum of four hours operating at 100% rated load.
 - 2. Perform tests recommended by manufacturer.
 - 3. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here including, but not limited to, the following:
 - a. Single-step full-load pickup test.
 - 4. Battery Tests: Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.
 - a. Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions.
 - b. Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery.
 - c. Verify acceptance of charge for each element of the battery after discharge.
 - d. Verify that measurements are within manufacturer's specifications.

5. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
 6. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine-generator system before and during system operation. Check for air, exhaust, and fluid leaks.
 7. Exhaust-System Back-Pressure Test: Use a manometer with a scale exceeding 40-inch wg (120 kPa). Connect to exhaust line close to engine exhaust manifold. Verify that back pressure at full-rated load is within manufacturer's written allowable limits for the engine.
 8. Exhaust Emissions Test: Comply with applicable government test criteria.
 9. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.
 10. Harmonic-Content Tests: Measure harmonic content of output voltage under 25 percent and at 100 percent of rated linear load. Verify that harmonic content is within specified limits.
 11. Noise Level Tests: Measure A-weighted level of noise emanating from generator-set installation, including engine exhaust and cooling-air intake and discharge, at four locations on the property line, and compare measured levels with required values.
- C. Coordinate tests with tests for transfer switches and run them concurrently. There are multiple transfer switches in the two buildings that must be individually tested to confirm any one of these transfer switches will start the generator and provide generator power to the load.
1. Test each transfer switch operation by opening its normal power feeder breaker.
- D. Load Management Operation: Demonstrate proper operation of the Load Management system.
1. Engage the 2000 Ampere Automatic Transfer switch to start the generator and transfer to generator power.
 2. Increase the load via Loadbank to 1500kW and confirm the BMS signals one of the chillers to shutdown.
 3. Lower the load via Loadbanks to less than 1500kW and confirm the BMS signals the chiller to restart.
- E. Test instruments shall have been calibrated within the last 12 months, traceable to standards of the National Institute for Standards and Technology, and adequate for making positive observation of test results. Make calibration records available for examination on request.
- F. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
- G. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
- H. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

- I. Remove and replace malfunctioning units and retest as specified above.
- J. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.
- K. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.
- L. Infrared Scanning: After Substantial Completion, but not more than 60 days after final acceptance, perform an infrared scan of each power wiring termination and each bus connection while running with maximum load. Remove all access panels, so terminations and connections are accessible to portable scanner.
 - 1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan 11 months after date of Substantial Completion.
 - 2. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
 - 3. Record of Infrared Scanning: Prepare a certified report that identifies terminations and connections checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.7 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
- B. Inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.
- C. Complete installation and startup checks according to manufacturer's written instructions.

3.8 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators. Refer to Division 1.
 - 1. Coordinate this training with that for transfer switches.

END OF SECTION 263213