Project Manual

Mc Call Foundation Inc.
Emergency Natural Gas Stand-By Generator
883 Main Street, Torrington, CT June 26, 2024

For

McCall Foundation Inc.
58 High Street
Torrington, CT

June 26, 2024

Boe Studio Architects

19 Tioga Street, Torrington, CT

email: boestudio1@optimum.net

phone: 860-307-6816

Boe Studio Architects
19 Tioga Street
Torrington, CT 06790

Mc Call Foundation Inc.
Emergency Natural Gas Stand-By Generator
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Cover Sheet

Boe Studio Architects
19 Tioga Street
Torrington, CT 06790

001116 INVITATION TO BID
June 26, 2024

Mc Call Foundation Inc.
Emergency Natural Gas Stand-By Generator
883 Main Street, Torrington, CT June 26, 2024

The Mc Call Foundation Inc, 58 High Street, Torrington, CT will receive sealed bids in duplicate for a single firm fixed price contract for a 40 KW Natural Gas fueled stand-by generator. Make all necessary connections provide panel boxes, circuit breaker, wiring, junction boxes, 3 phase automatic switch gear, and 200 AMP Electrical Panel. All trenching and back filling, gas lines and electrical lines at 883 Main Street, Torrington, CT

A. Provide and install 40 KW Natural Gas fueled stand-by generator. Make all necessary connections provide panel boxes, circuit breaker, wiring, junction boxes, 3 phase automatic switch gear, and 200 AMP Electrical Panel.
   1. Provide all required trenching of gas line from generator to existing natural gas line. Provide a Natural Gas Piping as required from generator to exiting natural gas line, and make connection to same.
   2. Provide all electrical conduit from electrical transfer switch to generator and all associated connections.
   3. Contractor to remove existing 3 phase 100 amp Electrical Panels and provide a a new 3 phase 200 amp panel and install it and make all electrical connections from existing circuits. Label Electrical Panel Circuits.
   4. Contractor to provide and install Automatic Transfer Switch.
   5. Contractor to provide New Main Shut off switch
   6. Contractor to remove and relocate existing Electrical meter, which is located in furnace room to the exterior of the building as per Eversource Electric Utility requirements.
   6. Contractor to provide electrically grounded concrete pad with woven wire fabric reinforcement, size of pad as per manufacturers recommendation.

B. Bids will be received at the administrative offices of McCall Foundation Inc located a 58 High Street, Torrington, Ct. up until 2.30 p.m. July 15, 2024, upon which time all bids will be opened and read aloud. An abstract of the bids will be made available to all bidders.

C. A pre bid walk through shall be held July 9, 2024 at 10:00 A.M. at 883 Main Street, Torrington, CT. All contractors are required to attend to review the existing building and current site conditions in order for their bid to be considered in awarding the contract.

D. A Performance and Payment Bond per A.I.A. document A312, 2010 edition is required for this project.

E. McCall Foundation Inc., reserves the right to reject any or all bids, to waive technicalities, and to award the contract as will best serve the public interest. It is anticipated that the contract will be awarded within 10 days after the bid opening. McCall is and equal opportunity Employer.
The contractor who is selected to perform this State project must comply with CONN. GEN. STAT. §§ 4a-60, 4a-60a, 4a-60g, and 46a-68b through 46a-68f, inclusive, as amended by June 2015 Special Session Public Act 15-5.

END OF SECTION

INSTRUCTION TO BIDDERS:

1.Please refer to Project Documents

The Contractor shall have adequate equipment, and materials for this project to insure completion of project by sixty (business) days from the time the contractor is awarded.

All Bidders shall observe the following instruction and specifications:

2. General Provisions and Milestone Dates

Site Walk: 883 North Main Street, Torrington, CT July 8, 2024 at 9:00 am.
Date of Final Questions: July 11, 2024 at……5:00 pm

3. Receipt Deadline and Opening:

Bid Return Envelope: Bidders shall submit bids in an envelope clearly marked, with the bid title and opening date to prevent a sealed bid from being opened prior to the opening date. Any bid not so marked and opened by The Mc Call Foundation shall be rejected.

The following forms must be submitted in the return envelope:

A. Bid Schedule
B. Hold Harmless Agreement and Supplemental Agreement
C. Completed Projects and References
D. Non Collusion Form
E. Non Discrimination Form.

Mail or deliver this entire completed bid package in a sealed envelope. It is to be received no later than 2:00 PM. on July 15, 2024

TO: Albert Stokes
Director of Contracts and Utilization
The McCall Foundation, INC.
58 High Street
Torrington, CT 06790

To Be noted on the outside of Envelope:
DO NOT OPEN UNTIL 2:15 P.M. on July 15, 2024

4. Proposal Questions

Any questions pertaining to the scope of the work or content or procedure for submitting proposals should be directed to Michael Boe, Architects by email (mboestudio@gmail.com), to be received no later than 5:00 pm Thursday, July 11, 2024. Any questions received after that date will not be answered.
Contact information is as follows:

Michael Boe, Architects
19 Tioga Street,
Torrington, CT 05790
(860) 307-6816
mboestudio@gmail.com

5. Basis of Award

It is intended this Contract shall be awarded to the Bidder that best meets the needs of The McCall Foundation Inc. with respect to qualifications as referred on the "Qualification of Bidder" page, contractor's submitted start date, and cost. Qualification shall include the ability of the Contractor to complete all work within the stated time frame.

6. Notice of Award

The McCall Foundation shall give notice of Acceptance of a bid to the successful bidder by mail or email to the Bidder's address stated in the bid. Individuals are invited to attend the bid opening, with official bid results pending notification of the successful bidder.

7. Award of Contract

The McCall Foundation Inc. reserves the right to reject any and all bids for any reason the Town deems advisable, and to award contract or contracts to any Contractors bidding on the work, regardless of the amount of bid. Contract may be awarded by item to multiple bidders based on price and ability of individual bidders to complete the work in the time frame required.

8. **Performance: Labor and Material Bond**
A 100% Performance bond or certified check is required for the bid.

9. Scope of Work Change
McCall Foundation Inc, reserves the right to change the scope of the project after the bid is awarded, without penalty to the Owner. All changes in scope will be issued in writing by Architects.

10. Substitution of Named Brands:
Brand name and product for this project has been spelled out. If contractor wishes to qualify different Manufacturer, they must provide full documentation to the owner at time of project walk thru. Owner will review data submitted and approve or disapprove by an issued addendum.

11. Prices
Bid shall not include any taxes, Local, State or Federal as McCall Foundation is a not for profit organization.

12. Assignment of Contract
Contractor shall not sublet, sell, transfer, assign, or dispose of contract or any portion thereon or of right, title, or interest therein of obligations there under, without written consent of , The McCall Foundation Inc.

13. Basis of Payment
Payment for this work shall be made in two (2) payments.

14. Payments for Extra Work
Written notice of claims for extra work shall be given by the Contractor within ten (10) days after receipt of written instructions from the Architects and approved by the McCall Foundation, to proceed with extra work and also before any work is commenced, except in an emergency endangering life or property. No claim shall be valid unless so made. In all cases, Contractor's itemized sheet showing all labor and material must be submitted to the Architects and to the Owner. Order for extra work shall specify any extension of contract time and one of the following payment methods.

A. Unit Prices or combination of unit prices
B. A change order lump sum based Contractor's estimate accepted by owner and approved by Architects.
C. Actual Cost plus 10% for overhead and profit.

15. Payment Requests, Retainage and Guarantee Period
Contractor must submit a payment request for payment once each month for work done and materials delivered and on site. Each request for payment must be computed for work completed, less (10%) to be retained until completion of project and Final Inspection by City of Torrington Building Official has been completed and project closed out by the City of Torrington.

16. Insurance

Contractor will file with The McCall Foundation , the follow evidence of insurance. Certificate must be on file with The McCall Foundation before acceptance of Bid for work to commence.

Workers Compensation

Coverage A: Statutory	
Coverage B: Employers Liability:	
Bodily injury by accident	$100,000 per person
Bodily injury by disease	$100,000 per person
Bodily injury	$500,000 aggregate

Comprehensive Commercial Liability

Bodily injury; General Limit	$2,000,000 aggregate
Products/ Completed Operations	$1,000,000 aggregate
Personal and Advertising Injury	$1,000,000 aggregate
Each Occurrence	$1,000,000 aggregate
Fire Damage Limit	$100,000 aggregate
Medical Expenses	$10,000 per person

Premises/Independent Contractors
Contractual/Completed Operations/Products
Contractual/Liability with Broad Form
XCU (explosion/collapse/underground utilities)
Comprehensive Broad Form Liability endorsement or Equivalent

Broad Form Property Damage Liability

Automobile Liability

Bodily Injury	$1,000,000 per person
Aggregate	$1,000,000 per person
Property Damage	$1,000,000 per person

Coverage:
All owned/non owned/hired/ borrowed
Contractual liability to be included

Contractor must name The McCall Foundation Inc. 58 High Street, Torrington Connecticut on all certificates.

All policies will provide thirty (30) days' notice of cancellation as well as ten(10) days' notice of material change in the policies. Written documentation shall be sent to the Albert Stokes, The McCall Foundation, 58 High Street, Torrington, CT.

17. Environmental Health and Safety Compliance
The contractor must comply with all local, state and federal environmental health and safety regulations. The contractor to submit a Health and Safety Plan to Ray Donahue prior to commencing the project.

18. Hold Harmless Agreement
The Contractor agrees to hold harmless The McCall Foundation Inc. and it's respective officers, agents, and employees from any loss, costs, damages, expenses, judgments, and liability whatsoever kind of nature however so the same may be caused resulting directly or indirectly by an act of omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of sickness and death, personal injury, or damage to property directly or indirectly, including the loss of use resulting there from as permitted by law. The Contractor will be required to sign the enclosed Hold Harmless Agreement prepared the McCall Foundation Inc.

19.Supplemental Agreement

The contractor is an independent contractor and neither the Contractor nor its employees nor the Contractor's Subcontractors(s) under any circumstances, will be considered servants or agents of the McCall Foundation Inc. and at no time legally responsible for any negligence or other wrong doing by the Contractor, it servants or agents or the Subcontractors(s). The McCall Foundation Inc. will not withhold from contract payments to the Contractor any Federal or State unemployment taxes, Federal or State Income taxes, Social Security tax, or any other amount for benefits to the Contractor. The lump sum or unit charges for service provided does not represent gross wages and further the McCall Foundation will not provide the Contractor any insurance coverage or other benefits, including Worker's Compensation. The contractor shall sign the enclosed Supplemental Agreement prepared by the McCall Foundation Inc.

20. Nondiscrimination Agreement

(1) The contractor agrees and warrants that in the performance of the contract such contractor 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 contractor that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the state of Connecticut; and the contractor 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 contractor that such disability prevents performance of the work involved;
(2) The contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of the contractor, 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 contractor agrees to provide each labor union or representative of workers with which such contractor has a collective bargaining agreement or other contract or understanding and each vendor with which such contractor 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 contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment;

(4) The contractor 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 contractor 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 contractor as relate to the provisions of this section and section 46a-56. The authorized signatory of the contract shall demonstrate their understanding of this obligation by (A) initialing the nondiscrimination affirmation provision in the body of the contract, (B) providing an affirmative response in the required online bid or response to a proposal question which asks if the contractor understands its obligations, or (C) signing the contract.

22. Nondiscrimination statutes and set-aside requirements.

The contractor who is selected to perform this State project must comply with CONN. GEN. STAT. §§ 4a-60, 4a-60a, 4a-60g, and 46a-68b through 46a-68f, inclusive, as amended by June 2015 Special Session Public Act 15-5.
State law requires a minimum of twenty-five (25%) percent of the state-funded portion of the contract be set aside for award to subcontractors holding current certification from the Connecticut Department of Administrative Services ("DAS") under the provisions of CONN. GEN. STAT. § 4a-60g. (25% of the total state-funded value with DAS-certified Small Businesses and 6.25% of the total state-funded value with DAS-certified Minority-, Women-, and/or Disabled-owned Businesses.) The contractor must demonstrate good faith effort to meet the 25% set-aside goals.

INSTRUCTION TO BIDDERS:

Mail or deliver this entire completed bid package in a sealed envelope. It is to be received no later than 2:30 PM. on July 15, 2014.

TO: Albert Stokes
Director of Contracts and Utilization
The McCall Foundation, INC.
58 High Street
Torrington, CT 06790

To Be noted on the outside of envelope:

DO NOT OPEN UNTIL 2:15 P.M. on July 24,2024

Project Name: Mc Call Foundation Inc.
Emergency Natural Gas Stand-By Generator
883 Main Street, Torrington, CT June 26, 2024

Address: 883 North Main Street. Torrington, CT 06790

There will be a mandatory Pre-bid meeting at 9:00:am on Wednesday July 8, 2024 at 883 Migeon Ave, Torrington, CT. Sign in is required for all prospective bidders, prior to the start of the Meeting. No attends will be allowed to register after the advertised start time. They shall list name and address of company they represent on Form provided by Architects. Encourage contactors to leave business card with contact information. Bids submitted by contractors who have not properly registered and attended the mandatory Pre-bid meeting shall be rejected as non-responsive.

The Contractor shall place order for generator no later than 10 business days after the award of contract.

All Contractors are encouraged to bring their job foreman and any/all sub-contractors to this meeting so that all question are asked/answered at this time.

Mc Call Foundation Inc.
Emergency Natural Gas Stand-By Generator
883 Main Street, Torrington, CT June 26, 2024

NOTE: CONTRACTOR IS TO SUBMIT THE **ENTIRE** BID PACKAGE AND ANY ADDENDUM ISSUED. ALL BIDS MUST BE FILLED COMPLETELY. IT IS SUGGESTED THAT THE CONTRACTOR RETAIN A COPY OF THE ENTIRE BID PACKAGE FOR THEIR FILE.

ALL BIDS SHALL REMAIN IN EFFECT FOR FORTY-FIVE (45) CALANDER DAYS AFTER THE RECEIPT OF BIDS.

CONTRACTORS BUSINESS NAME:_____

CONTACT NAME:_____

CONTACT PHONE NUMBER: _____

CONTACT E-MAIL ADDRESS: _____

CONTRACTORS TAX ID NUMBER: _____

AN AFFIRMATIVE ACTION/EQUAL OPPORTUNITY EMPLOYER
This contract is subject to state set-aside and contract compliance requirements.

Boe Studio Architects
19 Tioga Street
Torrington, CT 06790

Project: Mc Call Foundation Inc.
Emergency Natural Gas Stand-By Generator
883 Main Street, Torrington, CT June 26, 2024

Bid SCHEDULE

TO: McCall Foundation Inc. 58 High Street, Torrington, CT

1. The Undersigned, having examined the proposed Contract Documents titled: Mc Call Foundation Inc.
Emergency Natural Gas Stand-By Generator
883 Main Street, Torrington, CT June 26, 2024
and having visited the site as part of the mandatory site visit and examined the conditions affecting the Work, hereby proposes and agrees to furnish all labor and materials, equipment, and to perform operations necessary to complete the Work as required by said Contract Documents, for the stipulated sum of

Lump Sum Bid_____Dollars

($_____)

2. When work is required in which no specific payment is listed in the proposal form, the cost of such work shall be included in the unit prices bid.
All unit prices, lump sum, ect. listed in the Bid Proposal are firm and not subject to change for Ninety (45) Calendar days from the day bids are opened. Provide list of Unit Prices with Bid Form.

3. Within ten (10) calendar days from the date of a Notice of Acceptance for this proposal, the undersigned agrees to execute the Contract and to furnish to the McCall Foundation Inc, 58 High Street, Torrington, CT a satisfactory "Faithful Performance Bond" and "Labor and Material Bond" in the amount of 100 percent of the contract price.

4. The Bidder Acknowledges receipt of Addenda listed bellow and further acknowledges that the provision of each Addendum have been include in the preparation of this Bid.

5. Acknowledge Receipt of Addendum:

Addendum No.	Date Received
_____	_____

COMPANY NAME (BIDDER) _____

Address of Bidder:_____

_____

Phone No: Area Code ( )_____

6. The undersigned understands and agrees to comply with and be bound by the instructions of bidders issued in this Work.

Printed Name:_____

Title of Company: _____

Address: _____

Signature of Bidder:_____(Date)_____

Typed or hand lettered Name of Bidder:

_____

Typed or hand lettered Title of individual Signing as Bidder

_____

Names, Titles and Addresses of Members of Firm:

_____

State of Connecticut Contractors License Number:_____

Name associated with State of Connecticut _____

Mc Call Foundation Inc.
Emergency Natural Gas Stand-By Generator
883 Main Street, Torrington, CT June 26, 2024

Hold Harmless Agreement

The Contractor named below agrees that it will indemnify and hold harmless the McCall Foundation Inc. and its respective officers, agents and employees from any loss, cost, damages, expenses, judgments and liability whatsoever kind of nature however the same may be caused resulting directly or indirectly by any neglect act or omission of the contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable resulting in bodily injury including sickness and death, personal injury of damage to property directly or indirectly, including the loss of use resulting there from a permitted by law, unless to the extent caused by Mc Call Foundation Inc.

Supplemental Agreement

The Contractor named below is an independent contractor and neither the Contractor not its employees nor the Contractor's subcontractors under any circumstances, will be considered servants or agents of the McCall Foundation Inc. and the McCall Foundation Inc. will be at no time legally responsible for any negligence or other wrong doing by the Contractor, its servants or agents or the Contractor's subcontractors. The Mc Call will not withhold from the contract payments the Contractor for any federal or state unemployment taxes, federal or state income taxes, Social Security tax, or any other amounts for benefits to the Contractor. The lump sum or unit charges for services provide does not represent gross wages and further the McCall Foundation will not provide the Contractor any insurance coverage or other benefits, including Worker's Compensation.

State of Connecticut)
) ss:
County of)
Signed:_____

Print Name:_____

Title:_____

Company:_____

Address:_____

_____

Subscribed and sworn to before me on

this _____ day of _____, 2024

Notary Public:_____

NON-CONLLUSION AFFIDAVIT OF PRIME BIDDER

State of _____)

County of _____)

_____ being first duly sworn,
(Individual's Name)
deposes and says :

1. They are_____ the
(Official Title of Cooperate Officer, Agent or Individual)
Bidder who has submitted the attached Bid for: Re-Roofing Project at 883 North Main Street, Torrington, CT for The McCall Foundation Inc. and they having read, understood , and agreed to all the terms and provisions thereof, signed this affidavit: and the accompanying bid: and that such bid is genuine and not a sham or collusive or made in the interest or on behalf of any person not there in named; and that said Bidder has not directly or indirectly, induced or solicited any other Bidder to put in a sham bid, or any other person, firm or corporation to refrain from bidding and that said Bidder has not in any manner sought by collusion to secure said Bidder any advantage over any other Bidder; and that said Bidder has not otherwise taken any action to restraint of free competitive bidding in connection with said bid.

2. He is fully informed respecting the preparation and contents of the attached bid.

State of Connecticut)
) ss:
County of) Signed:_____

Print Name:_____

Title:_____

Company:_____

Address:_____

_____

Subscribed and sworn to before me on

this _____ day of _____, 2024

Notary Public:_____

NONDISCRIMNATION CERTIFICATION
Representation by Entity

Written representation that complies with the Nondiscrimination agreements and warranties with the Connecticut General l Statutes ss/ss 4a-60 (a)(1) and 4a-60a (a) (1) as amended.

Instructions:
For use by and entity (corporation, limited liability company, or partnership, when entering into any contract type with The McCall Foundation Inc. 58 High Street, Torrington, CT.

Representation of an Entity:

I, _____, _____.of_____
(Authorized Signatory) (Title) (Name of Entity)

An entity duly formed and existing under the laws of _____
(Name State Commonwealth)

Represent that I am authorized to executer and deliver this representation on behalf of

_____ and that_____has a
(Name of Entity) (Name of Entity)

Policy in place that complies with the non discrimination agreements and warranties of Connecticut General Statutes ss/ss 4a-60(a)(1) and 4a-60(a)(1) as amended.

_____ _____
(Authorized Signatory) (Date)

_____
(Print Name)

NONDISCRIMNATION CERTIFICATION
Representation by Individual

Written representation that complies with the Nondiscrimination agreements and warranties with the Connecticut General Statutes ss/ss 4a-60 (a)(1) and 4a-60a (a) (1) as amended.

Instructions:
For use by an individual who is not and entity (corporation, limited liability company, or partnership) when entering into any contract type with the McCall Foundation Inc, 58 High Street, Torrington, CT, regardless of contract value. Submit to Mc Call Foundation 58 High Street, Torrington, CT. 06790

Representation of an Individual:

I, _____, of_____.
(Signatory) (Business Address)

Represent that I will comply with the nondiscrimination agreements and warranties of Connecticut General Statutes ss/ss 4a-60 (a)(1) and
ss/ss 4a-60 (a)(1) as amended.

_____ _____
(Signatory) (Date)

_____
(Printed Name)

1. The Contractor, unless otherwise specified, shall provide all labor, materials, tools and equipment, and related items, and pay all fees, and permits necessary to complete all of his work as detailed on the attached scope of work.

2. All rehabilitation, alterations, repairs or extensions shall be in compliance with all applicable codes of the City of Torrington CT. All concrete, electrical,plumbing and gas work shall comply with the rules and regulation of the National, State and Local Codes. Before commencing work, contractors and /or subcontractors shall obtain all necessary permits and post at site.

3. The Contractor certifies that he has familiarized himself with the requirements of the specifications and plans and understands the extent and character of work to be done, and inspected the premises and given his full attentions to any and all areas with which he might become specifically involved. He must familiarize himself with all condition relating to and affecting his work and bid.

4. The selected Contractor must, prior to contract signing, supply the Owner with the original certificates of insurance for general liability, auto liability, and worker's compensation, as applicable. General liability insurance shall be a broad form contractual endorsement with minimum limits of one million ($1,000,000.00) dollars per occurrence for bodily injury and five hundred ($5 00,000.00) dollars per occurrence for property damage. Auto Liability shall cover hired and non-hired autos in accordance with the State of Connecticut Law. Workers Compensation Insurance shall have a minimum limit of one hundred thousand ($100,000.00) dollars for each accident. The Contractor shall indemnify and save harmless the owner, The McCall Foundation Inc., its agents under this policy. The Contractor shall name The McCall Foundation Inc, as additional insured as their interest my appear on the General Liability Insurance.

5. The Contractor agrees that all services offered by the Architects (hereinafter referred to as the "Consultant", which may affect the Contractor, are offered by the owner in order to assist in the project implementation and the necessary program compliance. The Contractor agrees to, upon review and acceptance of such

services provide, indemnify, defend, save and hold harmless, The McCall Foundation Inc, their consultants, their officers, agents and employees from and against any and all damage, liability, loss, expense, judgment or deficiency of any nature whatsoever (including, without limitation, reasonable attorney's fees and other cost and expenses incident to any suit, action or proceeding) incurred or sustained by The McCall Foundation which shall arise out of a result from Consultants performance in good faith of services pursuant to the Professional Service Contract. The contractor agrees that the Consultant shall not be liable to the Contractor, it heirs, successors or assigns, for any act performed with in the duties and scope of the employment pursuant to Professional Services Contract.

6. All materials shall be new and of acceptable quality. The property Owner shall select all colors, models, etc. All materials and work must be applied in accordance with the acceptable manufacturer's latest instruction and specification and in accordance with Federal prohibition against the use of lead paint. All manufacturers' warranties are to be extended Owner free and clear of all liens. Unless otherwise specified, all labor, material, and workmanship provided by the Contractor shall be guaranteed by the Contractor for a one (1) year period from the date of Certificate of Occupancy. This guarantee shall be in addition to and not in limitation of, in lieu of, or modify any other guarantee that is due the property owners from any manufacturer.

7. The Contractor shall repair or replace all work materials, and equipment which are found to be defective during construction and the guarantee period. Repair shall include all damage to surrounding work caused by the failure and/ or necessary for the repair or replacement of the defect. All repairs and replacement shall be performed at no additional l expense to the owner and shall be completed promptly after the Contractor receives notice of the defect.

8. The Contractor shall take all necessary measures and precautions to protect the surrounding form damage occurring due to performance of the work. If such damage occurs it will be repaired by the Contractor at no cost to the Owner.

9. The Contractor shall dispose of all debris and remove all material resulting from his work in accordance with Local and State law. The contractor shall police and maintain a clean and safe site daily. He shall reinstall accessories taken down and clean up all scrap around project and remove all fingerprints. All on-site

maintenance relating to the performance of the work shall be the responsibility of the Contractor until the Final Certificate of Occupancy has been issued and provided to the owner. The project shall be maintained in a habitable and safe condition daily as the project site is to remain occupied by McCall Foundation Staff and Clients

10. The work shall be neat and accurate and done in a manner in accordance with customary trade practices.

11. The Contractor shall not make any changes to the scope of work unless a written change order is proposed and fully executed by the Owner and the Project Architects.

12. The Contractor shall place order for generator within ten days of signing of contract.

13. If the Contractor is delayed at any time in the progress of the work by any act or neglect of the Owner or by any employee of the Owner, or by any separate Contractor employed by the Owner, or by changes ordered in the work or by labor disputes, fire, unusual delay in delivery of material, transportation, adverse weather condition not reasonably anticipatable, unavoidable causalities, or any cause beyond the Contractor's control, or by the delay, the contract time shall be extended by Change Order for such reasonable time as my be agreed upon by all parties. It shall be the responsibility of the Contractor to request and document in writing such extension within three (3) calendar days.

14. In the event that the Contractor does not commence or pursue the work as herein after state, then the Owner shall have the right to terminate this agreement and to hire a successor Contractor to perform the work. Any such termination shall be by certified mail to the address noted in this agreement, and shall be effective as of the date of mailing.

15. It, through any cause, the Contractor shall fail to fulfill in a timely and proper manner his obligation under this Contract, or if the Contractor shall violate any of the covenants, agreements, or stipulation of this Contract, the Owner shall, thereupon, have the right to terminate this Contract by giving notice to the Contractor of such termination and specifying the effective date of such

termination. In such even, all unfinished work required by the Contractor under this Contract shall, at the option of the Owner, be completed or not.

16. The Contract may request a maximum of two (2) payments. The first payment application shall be accompanied by a copy of the Building Permit, Electrical Permit, and Plumbing Permit. Lien waivers from the Prime Contractor, sub contractors and material supplies will be required on a form provided to the Architects. Final payment is contingent upon receipt of the Certificate of Occupancy Permit issued by the City of Torrington, CT for this project.

17. All claims or disputes between the Owner and contractor arising out of or related to the work shall be resolved in accordance with the Construction Industry arbitration rules of the American Arbitration Association (AAA), unless the parties mutually agree otherwise. The Owner and Contractor shall submit all disputes or claims, regardless of the extent of the work's progress to the American Arbitration Association. Notice of the demand for arbitration shall be filed in writing with a copy to the other Party to this Construction agreement, and shall be made within a reasonable time after the dispute has arisen. The award rendered by the arbitrator shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof. It the arbitrator's award is in a sum which is less than that which was offered in settlement by the Owner, the arbitrator may award cost and attorney's fees in favor of the Owner. If the award of the arbitrator is a sum greater than that which was offered in settlement by the Contractor, the arbitrator may award cost and attorney's fees to the Contractor. I is understood and agreed by the parties hereto that neither party will institute any form of legal action, including, but not limited to, attaching the assets of the other party, unless and until it has made a good faith attempt to have the dispute resolved in accordance with the provision of this Section. Noncompliance with the condition precedent constitutes a waiver of the right to assert said claim.

18. The contractor who is selected to perform this State project must comply with CONN. GEN. STAT. §§ 4a-60, 4a-60a, 4a-60g, and 46a-68b through 46a-68f, inclusive, as amended by June 2015 Special Session Public Act 15-5. State law requires a minimum of twenty-five (25%) percent of the state-funded portion of the contract be set aside for award to subcontractors holding current certification from the Connecticut Department of Administrative Services (“DAS”) under the

provisions of CONN. GEN. STAT. § 4a-60g. (25% of the total state-funded value with DAS-certified Small Businesses and 6.25% of the total state-funded value contractor must demonstrate good faith effort to meet the 25% set-aside goals.

19. The contractor agrees and warrants that in the performance of the contract such contractor 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 contractor that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the state of Connecticut; and the contractor 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 contractor that such disability prevents performance of the work involved.

20. The premises herein will occupied during the course of the construction work.

21. No officer, employee or member of the Governing Body of McCall Foundation Inc, shall have any financial interest, direct or indirect, in this contract.

22. The Owner retains the right to reject any and all bids or any part of any bid in part or in whole if deemed to be in the best interest of , The McCall Foundation Inc.

23. Substitutions of materials from that specified are only allowed on and approval/equal basis. The Contractor must submit written documentation of the substitute item or material for approval by the Owner prior to making such substitution. Any items or materials substituted b the Contractor without prior written approval of the Owner will at the Contractor's expense be replaced if it is determined not to be and equal to the item or material specified. Any surrounding, adjoining, or dependant items affected by replacement of unequal

substituted material shall also be replaced, reworked, and reinstalled at no cost to Owner.

24. Bids shall contain prices for general categories of work and /or items as specified on the attached sheets. In the event of discrepancy between prices listed in the specifications and those on the cost summary sheet, the prices listed on the specification for that section shall prevail In the case of mathematical error by the Contractor, the correct sum of the individual line item in the specifications (not in the cost summary) shall be the Contractor's bid.

25. All bids shall remain in effect for forty-five (45) calendar days.

26. The Owner shall supply all necessary electrical power required by the Contractor at no additional cost to complete this work. Power shall be limited to the use of existing outlets and shall not exceed the existing capacity of the system. Power required over the capacity of the existing electrical system shall be the responsibility of the Contractor. Exterior tented areas are not provided by the Owner. Contractor to provide tenting and heating of exterior components of project.

27. The Specification and drawings, if any, are complimentary. Work described in the specifications does not necessarily have to appear on the drawings, not does work described on the drawing necessarily have to appear in the specifications. The Contractor is responsible for estimating all work whether described in the specifications, the drawings or both. If there is a discrepancy between the drawings and the specifications, or the drawings is to be included in the bid summary sheet by appropriate line item. The contract will only be awarded General Contractors Bidding all line items.

28. Refer to Special Conditions attached which are hereto and a part of this Agreement.

29. Power shutdown while New Electrical Panel is being installed shall take place after McCall business hours on Friday and shall be put back into service before Monday morning McCall business hours. McCall facilities Director shall be notified 48 hours before shut down is occur.

30. The Project Includes:

A. Removal of asphalt driveway as required to run Electrical wiring conduit and gas piping from building to generator.
B. All trenching for electrical wiring conduit and gas piping lines.
C. Removal of any landscaping bushes or trees.
D. Running of new gas line from generator to existing natural gas line.
E. Running of new electrical conduit from building underground to generator location.
E. Provide and Install 40 KW Natural Gas Emergency Stand-by Generator, including 3 phase automatic transfer switch and replace existing 3 phase 200 amp electrical panel.
F. The Contractor to provide all routine service and maintenance of emergency back-up generator for a period of one year at no cost to owner. Provide owner with service maintenance schedule at end of project and before final payment.

31. The intent of this project is to have existing electrical circuits wired to new three phase 200 amp electrical panel energized to supply full back up electrical power from the 40 KW generator to those circuits via an automatic transfer switch in the event of an electrical power grid failure.
32. The Contractor is to hold a State of Connecticut Electrical Contractor license and be in good standing, provide proof of insurance, and must use State of Connecticut licensed sub-contractors who will need to provide proof of insurance.

33. With regard to communication, the Contractor is responsible to communicate with the owner via phone calls, text messages, or emails regularly, but at an minimum once a week during the duration of the project. Any Changes or add/alternates to the contract must be reviewed by the Architects and approved by the owner in writing prior to carrying out work.

34. The contractor is to obtain and pay for all permits, arrange all inspections and schedule all work with the sub-contractors to be hired and paid by Contractor)
A complete scope of work for all components of the project is as follows:
a). Remove all debris from site daily or store in contractor supplied dumpster until full and then remove dumpster.

35). Contractor to leave site each day clean and unobstructed.
All work area doors to be locked at end of work day.

a). Coring thru walls or any loud operations are to be carried out during normal work hours. Notify building tenant prior to when these operations are to occur.
b). Contractor is to provide a safe work environment during construction taking precaution to keep dust to a minimum.
c). Contractor is responsible to coordinate inspections with City of Torrington as per required inspections. Obtain required inspections from City of Torrington Building Department prior to start of construction. Notify Architects of when inspections are to be carried out by City of Torrington Department.
d). Ensure all materials are on site prior to work beginning to ensure the job runs smoothly and without delays. This included consistent supervision of all sub-contractors as well.
e). Parking is provided on site . If contractor decides to park on street they are to pay for parking and any parking tickets issued by the City of Torrington.
f). Provide Non- Collusion Affidavit of Prime Bidder.
g). Contractor must conduct final walk thru with Owner and Architects prior to completion of project for a final inspection any additional items discovered at this time are to be corrected and Architects to review and sign off prior to submittal to City of Torrington for final inspection.
h). Contractor to provide owner with full operations manual, warranty, and verbal instructions to the operation of the Generator.
i). Foul language on site will not be tolerated.
j). No smoking allowed in building. No cigarette butts discarded on site.
k). Contractor shall deliver a high quality job. This includes but not limited to: clean neat installation, all wiring is to be in conduit or armored cable, neatly and properly secured to ensure tight connections.
l). Payment schedules will be made as follows: 1/2" at contract signing, 1/2 upon completion of project, after receipt of certificate of occupancy by City of Torrington Building Department.
m). Contractor schedule power shutoff with Ray Donahue, McCall Foundation Facilities Manager. Give 48 hour notice. Building will be occupied by Mc Call Foundation staff during installation of Generator.

n). Power shut off to occur on the weekend after workday hours, as the building will be occupied while the project is being carried out.

o). The Contractor shall perform the work to accommodate to the greatest reasonable the normal use of the premises by the Owner during the construction period.

p). Coordinate with the Owner's Representative in all construction operations to minimize conflict, and to facilitate the Owners use of building, parking and access to the building.

q). The Contractor shall assume full responsibility for the protection and safekeeping of his materials and products under this Contract stored on site. The Contractor shall move and stored products under the Contractor's control which interfere with operations of the Owner.

r). The selected Contractor shall attend a contract signing and preconstruction meeting as scheduled by Owner with Project Manager and Architects.

s). The Contactor shall verify critical dimension, operations and functions in the field before ordering or fabricating items which must fit adjoining construction. The Contractor shall verify all existing conditions and dimension prior to work. Any and all discrepancies shall be reported to the Owner and Architects prior to ordering any materials or performing work.

t). The Contractor shall follow manufacturer's instructions for assembly, installation and product adjustment. In the event of conflicting specifications, the manufacturer's specifications shall prevail.

u). In the event an unforeseen circumstance, the Contractor shall notify the Owner and Project Manage within 24 hours of discovery. If the work is deemed additional or extra by the Architects than a change order will be negotiated, executed and authorized by the Contractor, Architects and Owner prior to the commencement of the work. Any work performed prior to the execution of a change order may or may not be considered for payment.

v). The specifications do not attempt to detail every task and procedure required to perform the work in full. The Contractor shall perform the work as required to complete the work in a professional manner using customary trade practices and stand work practices.

w). The Contractor is to operate generator at end of project as per Manufacturer's start up instructions.

x). The Contractor is to Meet with Owner at end of project and provide a complete operational review us of all installed equipment. Provide owner with operation manuals and warranty information

y). The Contractor to coordinate with owner times for exercising equipment and program those times accordingly.

z). The Contractor to provide all routine service and maintenance of Emergency back-up generator for a period of one year at no cost to owner. Provide owner with service maintenance schedule at end of project and before final payment.

36). " Kohler" KG40 Natural Gas Powered Generator, with RXT 200 amp 3 phase Automatic Transfer is used for a basis for the Specifications. "Kohler" KG40 (40 kw) generator and "Kohler" RXT 200 amp 3 phase Automatic Transfer Switch. "Cummins" Quiet Connect Series RS40,and Cummins 200 amp, 3 phase Automatic Transfer Switch by "Cummins", and Genrac SG40 (40 kw) and 3 phase 200 Amp , 3 phase Automatic Transfer Switch by Genrac. Electrical Panel shall be regarded as equals. Contractor to supply and install new 200 amp Mainbreaker switch and 200 amp Electrical panel compatible with Transfer switch.

Project: Mc Call Foundation Inc.
Emergency Natural Gas Stand-By Generator
883 Main Street, Torrington, CT June 26, 2024

00 25 00 GENERAL DEMOLITION

1.0 General

1.1 Scope:

A. Contractor to remove bituminous concrete asphalt between existing gas line owner side of meter as required to new generator.
B. Excavate as required to run new underground gas line and electrical lines from building to new generator concrete pad.
C. Core holes in brick masonry wall for new electrical conduit
D. Remove topsoil and all organics to establish base course for concrete generator pad.
E. Remove existing steel bollards near gas meter as required, save for reinstallation.
F. Contractor to remove existing Electric Meter
G. Contractor to remove existing main shut off switch
H. Contractor to remove (2) 100 Amp electrical panels

2.20 Materials:

A. Bituminous Concrete Asphalt
B. Earth
C. Brick Masonry
D. Electrical

3.0 Workmanship:

A. Protect existing building from damage.
B. Provide dumpster for Construction Debris and remove from site when full. Do not over fill. Do not use owners dumpster or recycling dumpster.
C. Pick up debris in and around work area, everyday and place In dumpster.
D. When demolition work is occurring, take safety precautions to keep area of work clearly identified as a work area by using caution tape if in the area of the general public or McCall Foundation Inc. staff.
E. Remove all excavated bituminous concrete asphalt and excavated earth from site.

4.0 Execution:

A. Carry out demolition in a timely manner.
B. Provide and install Caution tape around all open excavations.

Project: Mc Call Foundation Inc.
Emergency Natural Gas Stand-By Generator
883 Main Street, Torrington, CT June 26, 2024

1.1 DESCRIPTION OF WORK

A. Furnish all labor, supervision, materials, tools and equipment necessary or reasonably incidental to completion of all cast-in-place concrete as shown in the contract documents.

B. Concrete Pad for Emergency Generator

1.2 RELATED WORK

A. Concrete form work
B. Concrete reinforcement
1. See Drawings for Woven Wire Fabric at Emergency Generator Concrete Pad.

1.4 QUALITY ASSURANCE

A. Concrete work shall conform to all requirements of ACI-301 "Specifications for Structural Concrete" latest edition.
B. ACI 302.R-15 Guide to Concrete Floor and Slab Construction

2.1 MATERIALS

A. Cement: domestic portland cement conforming to ASTM C150, Type I or Type II
B. Fine Aggregate: natural sand conforming to ASTM C33.
C. Course aggregate: crushed stone or crushed washed gravel conforming to ASTM 33.
D. Water: Clean potable.
E. Concrete exterior flatwork: 5,000 psi at 28 days
1. Min. compressive strength: 5,000
2. Slump: 2 1/2"-4"
3. Max water concentration: .04
4. Max course aggregate 1 1/2"
5. Min cement factor (sacks per cubic yard): 6.5
F. Air-entrainment by volume: 4-7

G. Vapor Barrier 15 mil
1. Stego Wrap
2. Perminator
3. Viper Vaporcheck II

3.1 EXECUTION

A. All debris, sawdust, ice, leaves it to be cleared for Dumpster slab prior to placing concrete.
B. All water is to be removed from slab area prior to placing concrete
C. Follow warm or cold weather placement practices of ACI 305 or ACI 306
D. Install vapor barrier in accordance with ASTM E1643.
E. All Concrete Sidewalks and Foundations for granite road curbing shall be in accordance with City of Torrington Engineering Department standards.

4.1 PLACING CONCRETE

A. Depositing of Concrete shall be in accordance with ACI304.
B. Slabs should be sloped to drain
C. Provide 1/8" radius tooled edging at all exposed slab or side walk edges.
D. Provide medium broom finish

End of Section

PART 1 - GENERAL

1.0 GENERATOR, 3 PHASE 200 AMP TRANSFER SWITCH, 200 AMP MAIN BREAKER, 200 AMP ELECTRICAL PANEL.

A. " Kohler" KG40 Natural Gas Powered Generator, with RXT 200 amp 3 phase Automatic Transfer is used for a basis for the Specifications. "Kohler" KG40 (40 kw) generator and "Kohler" RXT 200 amp 3 phase Automatic Transfer Switch. "Cummins" Quiet Connect Series RS40,and Cummins 200 amp, 3 phase Automatic Transfer Switch by "Cummins", and "Genrac" SG40 (40 kw) and 3 phase 200 Amp , 3 phase Automatic Transfer Switch by "Genrac". Electrical Panel shall be regarded as equals. Contractor to supply and install new 200 amp Main breaker switch and 200 amp Electrical panel compatible with Transfer switch.

1.1 SUMMARY

A. Section Includes:

1. Gas-engine generator assembly.
2. Gas engine.
3. Gas fuel system.
4. Control and monitoring.
5. Generator over current and fault protection.
6. Generator paralleling.
7. Alternator, exciter, and voltage regulator.
8. Load bank.
9. Outdoor generator-set enclosure.
10. Remote radiator motors.
11. Vibration isolation devices.
12. Finishes.

B. Related Requirements:

1. Section 262313 "Paralleling Low-Voltage Switchgear" for controls and paralleling equipment for large or multiple parallel engine generators.

2. Section 263600 "Transfer Switches" for transfer switches including sensors and relays to initiate automatic-starting and -stopping signals for engine generators.

1.2 DEFINITIONS

A. ECM: Engine control module.

B. EPS: Emergency power supply.

C. EPSS: Emergency power supply system.

D. LP: Liquid propane.

E. 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.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
2. Include thermal damage curve for generator.
3. Include time-current characteristic curves for generator protective device.
4. Include fuel consumption in cubic feet per hour (cubic meters per hour) at 0.8 power factor at 0.5, 0.75 and 1.0 times generator capacity.
5. Include generator efficiency at 0.8 power factor at 0.5, 0.75, and 1.0 times generator capacity.
6. Include air flow requirements for cooling and combustion air in cubic feet per minute at 0.8 power factor, as per Manufacturer's requirements to meet temperature conditions for Torrington, CT cooling system rating. Provide radiator air flow restriction data for ambient rating.
7. Include generator characteristics, including, but not limited to, kilowatt rating, efficiency, reactance's, and short-circuit current capability.

B. Shop Drawings:

1. Include plans and elevations for engine generator and other components specified.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Identify fluid drain ports.
4. Vibration Isolation Base Details: Detail including anchorages and attachments to structure and to supported equipment. Include base weights.
5. Include diagrams for power, signal, and control wiring. Complete schematic, wiring, and interconnection diagrams indicating terminal markings for EPS equipment and functional relationship between all electrical components.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer manufacturer and testing agency.

B. Seismic Qualification Data: Certificates, for engine generator, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation. Shake testing is preferred for Industrial and Light Commercial generators.

2. Dimensioned Outline Drawings of Equipment Unit: With engine and generator mounted on rails, identify center of gravity and total weight, supplied enclosure
3. and each piece of equipment not integral to the engine generator, and locate and describe mounting and anchorage provisions.
4. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Source Quality-Control Reports: Including, but not limited to, the following:

1. Certified summary of prototype-unit test report.
2. Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.

3. Report of factory test on units to be shipped for this Project, documenting evidence of compliance with specified requirements.
4. Report of sound generation.
5. Report of exhaust emissions documenting compliance with applicable regulations.
6. Certified Torsional Vibration Compatibility: Comply with NFPA 110.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For engine generators to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

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

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials 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 no fewer than one of each.
2. Replaceable Indicator Lamps: Two for every six of each type used, but no fewer than two of each.
3. Filters: One set each of lubricating oil, fuel, and combustion-air filters.
4. Tools: Each tool listed by part number in operations and maintenance manual.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. ISO 9001 certified for design, development, production, and service complete product line.
2. Produced this type of equipment for a period of at least 10 years.
3. Actively maintaining a 24-hour parts and service organization regularly engaged in maintenance contract programs to perform preventive maintenance and service on equipment similar to that specified.
4. Furnish a service agreement that includes system operation under simulated operating conditions; adjustment to the generator set, transfer switch, and switchgear controls as required, and certification in the owner's maintenance log of repairs made and functional tests performed on all systems.
5. Engine-driven generator assembly furnished by a single manufacturer, responsible for design, coordination, and testing of the complete system. Retain "Testing Agency Qualifications" Paragraph below if Contractor selects testing agency or if Contractor is required to provide services of a qualified testing agency in "Field Quality Control" Article. Qualification requirements are in addition to those specified in Section 014000 "Quality Requirements."
   Testing Agency Qualifications: Accredited by NETA.
6. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.8 WARRANTY

A. Manufacturer's Warranty: 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: two years from date of Substantial Completion.
2. Generator set to include a standard warranty covering standby two years or 8700 hours prime, whichever occurs first (hours or years), to warrant against defective material and workmanship in accordance with the manufacturer's published warranty from the date of initial startup.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Kohler Power Systems; KG40 Series (40 kw) or comparable product by one of the following:

1. Cummins Quiet Series RS40 (40 kw)
2. Generac SG040 Series (40 kw)

B. Source Limitations: Obtain packaged engine generators and auxiliary components through one source from a single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Engine generator housing, engine generator, batteries, battery racks, silencers, load banks, and sound attenuating equipment, accessories, and components to withstand the effects of earthquake motions determined in accordance with ASCE/SEI 7 Retain first subparagraph below to define the term "withstand" as it applies to this Project. Definition varies with type of building and occupancy and is critical to valid certification. Option is used for essential facilities where equipment must operate immediately after an earthquake.

1. The term "withstand" means "the unit will remain in place without separation of any parts when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
2. Shake-table testing complies with ICC-ES AC156. Testing to be performed with all fluids at worst-case normal levels.
3. Component Importance Factor: 1.0.

B. B11 Compliance: Comply with B11.19.

C. NFPA Compliance:
1. Comply with NFPA 37.
2. Comply with NFPA [**58**] [**58A**].
3. Comply with NFPA 70.
4. Comply with NFPA 99.
5. Comply with NFPA 110 requirements for Level [**1**] [**2**] EPSS.

D. UL Compliance: Comply with UL 2200.

E. CSA Compliance: Comply with CSA.

F. Engine Exhaust Emissions: Comply with EPA requirements and applicable state and local government requirements.

G. Retain first paragraph below if Project requires compliance with Massachusetts Fuel Gas Code.

1. Maximum exhaust isolated sound pressure emitted by engine generator 81 dBA at a distance of **23 ft.** while operating at 100 percent load and including engine, engine exhaust, after treatment, engine cooling-air intake and discharge, and other components of installation.

2. Maximum sound pressure emitted by engine generator within sound-attenuating enclosure of [**64**] <**Insert number**> dB(A) at a distance of 23 ft. while operating at 100 percent load and including engine, engine exhaust, engine cooling-air intake and discharge, and other components of installation.

H. Environmental Conditions: Engine generator system withstands the following environmental conditions without mechanical or electrical damage or degradation of performance capability:

1. Ambient Temperature: Range as per National Weather Service Data for Torrington Connecticut minimum and maximum
2. Altitude: Sea level to 660

2.3 ENGINE GENERATOR 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 use.

C. Power Rating: Standby.

D. EPSS Class: Engine generator to be classified as Class 48 in accordance with NFPA 110.

E. Nameplate Rating/ Fuel Type: 40 kW **,** Natural Gas

F. Power Factor: 0.8, lagging.

G. Frequency: 60 Hz.

H. Voltage:. Contractor to field verify voltage prior to bidding

I. Phase: Three-phase, contractor to field verify number of wires prior to bidding, contactor to field verify prior to bidding: wye or delta.

J. Governor: Adjustable isochronous, with speed sensing.

K. 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.

L. 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. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component.

M. Engine Generator Performance:

1. Steady-State Voltage Operational Bandwidth: 0.5 percent of rated output voltage from no load to full load.
2. Transient Voltage Performance: Not more than 20 percent variation for 50 percent step-load increase or decrease and meets ISO 8528-5, Class G2 for standard loads. Voltage recovers and remains within the steady-state operating band within six seconds.

3. Steady-State Frequency Operational Bandwidth: 0.25 percent of rated frequency from no load to full load.
4. Transient Frequency Performance: Less than 20 percent variation for 50 percent step-load increase or decrease and meets ISO 8528-5, Class G2 for standard loads. Frequency recovers and remains within the steady-state operating band within five seconds.
5. Output Waveform: At no load, harmonic content measured line to line or line to neutral will not exceed 5 percent total and 3 percent for single harmonics. Telephone influence factor, determined in accordance with NEMA MG 1, to not exceed 50.
6. Sustained Short-Circuit Current: For a three-phase, bolted short circuit at system output terminals, system will supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to generator system components.

7. Start Time:

Comply with NFPA 110, Type 10 system requirements.

N. Engine Generator Performance for Sensitive Loads:

1. Over sizing generator compared with the rated power output of the engine is permissible to meet specified performance.

    a. Nameplate Data for Oversized Generator: Include ratings required by the Contract Documents rather than ratings that would normally be applied to generator size installed.

2. Steady-State Voltage Operational Bandwidth: 0.5 percent of rated output voltage from no load to full load.
3. Transient Voltage Performance: Not more than 15 percent variation for 50 percent step-load increase or decrease and meets ISO 8528-5, Class G3 for sensitive loads. Voltage recovers and remains within the steady-state operating band within four seconds.
4. Steady-State Frequency Operational Bandwidth: Plus or minus 0.25 percent of rated frequency from no load to full load.

5. Transient Frequency Performance: Less than 15 percent variation for 50 percent step-load increase or decrease and meets ISO 8528-5, Class G3 for sensitive loads. Frequency recovers and remains within the steady-state operating band within three seconds.
6. Output Waveform: At no load, harmonic content measured line to line and line to neutral will not exceed 5 percent total or 3 percent for a single harmonic. Telephone influence factor, determined in accordance with NEMA MG 1, to not exceed 50.
7. Sustained Short-Circuit Current: For a three-phase, bolted short circuit at system output terminals, system supplies 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.
8. Excitation System: Performance will be unaffected by voltage distortion caused by nonlinear load.

9. Start Time:

    a. Comply with NFPA 110, Type 10 system requirements.

2.4 GAS ENGINE

A. Fuel: Natural **gas** vapor withdrawal system.

B. Rated Engine Speed: 1800 rpm.

C. Minimum Standby Load Factor Rating: 82 percent.

D. Lubrication System: Engine or skid-mounted.

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 will be capable of full flow and is designed to be fail-safe.
3. Closed Crankcase Ventilation: System: Prevents crankcase oil vapor from draining or escaping the engine.
4. 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. Jacket Coolant Heater: Electric-tank type, factory installed in coolant jacket system. Comply with UL 499 **and** with NFPA 110 requirements for Level 1 equipment for heater capacity.

F. Integral Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine generator mounting frame and integral engine-driven coolant pump.

1. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
2. Size of Radiator: Adequate to contain expansion of total system coolant to 110 percent of capacity.
3. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gauge glass and petcock.
4. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
5. Coolant Hose: Flexible assembly with inside surface of nonporous rubber and outer covering of aging-, ultraviolet-, and abrasion-resistant material.
    a. Rating: 50-psig maximum working pressure with coolant at 215 deg F, and no collapsible under vacuum.

G. Remote Cooling System: Closed loop, liquid cooled, with remote radiator and integral engine-driven coolant pump. Comply with requirements in Section 232113 "Hydronic Piping" for coolant piping.

1. Configuration: Vertical air discharge.
2. Radiator Core Tubes: Aluminum or Nonferrous-metal construction other than aluminum as recommended by manufacturer.
3. Size of Radiator: Adequate to contain expansion of total system coolant to 110 percent of capacity.
4. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gauge glass and petcock.
5. Vent and Balance Lines: Provisions available between engine and radiator.
6. Fan: Driven by totally enclosed electric motor with sealed bearings.
7. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.

8. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.

H. Muffler/Silencer /Exhaust After treatment:

1. Critical type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.

   a. Minimum sound attenuation of 25 dB at 500 Hz.

2. Hospital type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.

   a. Minimum sound attenuation of 35 dB at 500 Hz.

3. Exhaust After treatment: Selective Catalytic Reduction (SCR) technology.

I. Air-Intake Filter: Standard-duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.

J. Starting System: 12-V electric, with negative ground.

A. Cranking Cycle: As required by NFPA 110 for system level specified. Lead-acid batteries are less expensive and perform as well as or better than nickel cadmium if temperatures are maintained between 0 deg F (minus 18 deg C) and 100 deg F (plus 38 deg C). Note that valve-regulated, lead-acid batteries are even more subject to thermal stresses and are not recommended for engine generator starting service. AGM batteries provide increased durability and require less maintenance compared with standard lead-acid batteries. Nickel cadmium batteries have better characteristics in more extreme temperature applications. Verify requirements for eyewash in the vicinity of the batteries with the authority having jurisdiction. Two cranking cycles complies with NFPA 110 requirements. Three cranking cycles is a more conservative rule used for some industrial applications.

1. Battery: Lead acid or AGM maintenance free or Nickel cadmium, as recommended by Generator Manufacturer with capacity within ambient temperature range specified in "Performance Requirements" Article to provide specified cranking cycle at least three times without recharging.
2. Battery Cable: Size as recommended by engine manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.
3. Battery Heater: Thermostatically controlled heater will be arranged to maintain battery above 50 deg F regardless of external ambient temperature within range specified in "Performance Requirements" Article. Include accessories required to support and fasten batteries in place. Provide ventilation to exhaust battery gases.
4. Battery Stand: Unit mounted with acid-resistant finish designed to hold the quantity of battery cells required and to maintain the arrangement to minimize lengths of battery interconnections.
5. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and continuous rating per manufacturer's standard.

B. Battery Charger:

1. Source Limitations: Obtain battery charger from engine-driven generator manufacturer.
2. UL Compliance: Comply with UL 1236 for Category BBHH.
3. CE Certified.
4. NFPA Compliance: Comply with NFPA 110.
5. Environmental Conditions: Battery charger to withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:

    a. Ambient Temperature: Minus 40 to plus 185 deg F with full charger output available up to 122 deg F.
    b. Relative Humidity: 0 to 95 percent.
    c. Altitude: Meets full performance requirements from sea level to 5000 ft. Chargers installed at higher altitudes may automatically derate output power to prevent overheating of internal components but remain operable.

6. Charger Operation: Current-limited, constant-voltage, automatic-boost-type charger designed for lead-acid or AGM maintenance-free or nickel-cadmium batteries as recommended by generator manufacturer, with the following features:

a. Automatic three-stage charge cycle for up to three independent batteries simultaneously per charger.

b. Output Voltage Regulation: Charger regulates output to within plus or minus 0.5 percent of manufacturer-provided voltage settings despite variations of input voltage, input frequency, and output current.

c. Battery Thermal Compensation: Battery temperature compensation with adjustable slope, factory set at minus 0.18 percent per degree C, and equipped for sensing battery temperature. Include battery temperature sensor mounted on battery negative terminal.

d. AC Input: Charger operates from any 45 to 65 Hz ac source with voltage ranging from 105 to 264 V rms.

7. LCD Digital Display: AC input voltmeter, DC output voltmeter, and ammeter (1 percent accuracy).
8. LED Lamp Indicators: Current limit, AC ON, and charger fail.
9. Charger Fail Alarm Contact: Voltage-free (dry type) form "C" output.
10. Filtered output for type VRLA AGM batteries.
11. Charger Enclosure: NEMA 250, Type 1 (IP20), wall mounted and rated for generator duty with charger enclosure vibration resistance.

2.5 GAS FUEL SYSTEM

A. Natural Gas Piping: Comply with requirements in Section 231123 "Facility Natural Gas Piping."

B. Gas Train: Comply with NFPA 37.

C. Engine Fuel System:

1. Carburetor.
2. Secondary Gas Regulators: One for each fuel type, with atmospheric vents piped to the building exterior.
3. Fuel-Shutoff Solenoid Valves: UL-listed, normally closed, safety shutoff valves; one for each fuel source.
4. Fuel Filters: One for each fuel type.
5. Manual Fuel Shutoff Valves: One for each fuel type.
6. Flexible Fuel Connectors: Minimum one for each fuel connection.
7. LP gas orifice provision.

8. The fuel inlet should be integrated into the side of the generator skid from the factory for ease of installation. Both LP and NG fuel inlets must be on the same side integrated into the generator skid.

2.6 CONTROL AND MONITORING

A. Automatic Starting System Sequence of Operation: 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 engine generator. When mode-selector switch is switched to the on position, engine generator starts. The off position of the same switch initiates generator-set shutdown. When the engine generator is running, specified system or equipment failures or derangements automatically shut down engine generator and initiate alarms.

B. Comply with UL 508A.

C. Configuration:

1. Operating and safety indications, protective devices, basic system controls, and engine gauges will be grouped in a common control and monitoring panel mounted on the engine generator. The mounting method will isolate the control panel from generator-set vibration. Panel will be powered from the engine generator battery.

D. Control and Monitoring Panel:

1. Digital engine generator controller with integrated alphanumeric display, providing two lines of data. The display has back lighting for ease of operator use in high- and low-light conditions. Capable of local and remote control, monitoring, and programming.
2. Operating Temperature: Minus 40 to plus 158 deg F. Maximum Operating Humidity: 95 percent noncondensing.
3. Corrosion Resistant: Tested in accordance with ASTM B117 (salt spray test).

4. Controller Features:

   a. Mode Selector: Allowing selection of one of the following modes:

      1) Off/Reset: Prohibits the generator from starting and resets shutdowns. In this mode, the controller does not respond to remote start and stop commands.
      2) Manual: Allows user to locally start and stop to operate the generator. In this mode, the controller does not respond to remote start and stop commands.
      3) Auto: Allows generator to start and stop based on remote commands. In this mode, the generator does not respond to manual start and stop commands.

   b. Emergency Stop Switch: Latch-type remote stop switch, red in color with mushroom-type head. Depressing the stop button will immediately stop the generator set and lock out any automatic remote starting.
   c. Audible Alarm: Horn sounds for specific warning and shutdown conditions.
   d. Alarm Silence/Lamp Test Pushbutton: Silences audible alarm when depressed. All controller-indicating lights are simultaneously illuminated while actuated.
   e. Fault Light: LED indicating abnormal conditions:

      1) Yellow: Active warning condition or mode selector switch not in automatic.
      2) Red: Active shutdown condition.

   f. Engine Control Features:

      1) Programmable engine start delay.
      2) Programmable engine cool-down delay.
      3) Programmable warm-up delay based on time or engine temperature.
      4) Programmable idle speed.
      5) Programmable cyclic cranking with adjustable on time, off time, and number of cycles.

   g. Event Logging:

      1) Maintain record of a minimum of 1,000 events with date and time locally for warning and shutdown faults.

4. Monitoring Instruments: Accessible through the digital engine generator controller and viewable during operation.

h. Engine-coolant temperature.
i. Battery voltage.
j. Running-time meter.
k. Engine speed.
l. Oil pressure.
m. Fuel pressure.
n. AC output voltage for each phase, 0.5 percent accuracy.
o. AC output current for each phase, 0.5 percent accuracy.
p. AC frequency meter, 0.5 percent accuracy.
q. kW total and per phase, 1 percent accuracy.
r. kVARS total and per phase, 1 percent accuracy.
s. kVA total and per phase, 1 percent accuracy.
t. kW hours.

4. Service Data: Stored in the controller and available for display.

a. Generator model number and serial number.
b. Controller serial number and firmware version.

5. Operational Records: Stored in controller beginning at system startup.

a. Total run-time hours.
b. Total loaded hours.
c. Total kW hours.
d. Controller run-time hours.
e. Number of starts.

6. Controls and Protective Devices: Controls, shutdown devices, and common visual alarm indication, including the following:

a. Mode selector switch not in automatic position.
b. Overcrank shutdown.
c. Low lubricating-oil pressure warning.
d. Low lubricating-oil pressure shutdown.
e. Low coolant temperature warning.
f. High engine temperature warning.
g. High engine temperature shutdown.

i. Overspeed shutdown.
j. Low fuel pressure shutdown.
k. Coolant low-level shutdown.
l. Coolant high-temperature warning.
m. Coolant high-temperature shutdown.
n. ECM Digital Trouble Codes warnings.
o. ECM Digital Trouble Codes shutdown.
p. Loss of ECM Communications shutdown.
q. ECM mismatch shutdown.

r. Battery high-voltage warning.
s. Battery-charger malfunction warning.
t. Battery low-voltage warning.
u. Remote manual stop shutdown.
v. Local manual stop shutdown.
w. Alternator protection shutdown.
x. Overcurrent warning.
y. Overcurrent shutdown.
z. Underfrequency warning.
aa. Underfrequency shutdown.
bb. Overfrequency warning.
cc .Overfrequency shutdown.
dd. Overpower warning.
ee. Overpower shutdown.
ff. Undervoltage warning.
gg. Undervoltage shutdown.
hh. Overvoltage warning.
jj. Overvoltage shutdown.
kk. User-defined input warning.
ll. User-defined input shutdown.
mm. No oil pressure signal shutdown.
nn. No speed sensor signal shutdown.
oo. Fail-to-start shutdown.

E. Connection to Datalink:

1. Provide connections for datalink transmission of indications to remote data terminals via ModBus RTU or ModBus TCP per Generator Manufacturers recommendation. Data system connections to terminals as per Manufacturers installation manual.

F. Supporting Items: Sensors, transducers, terminals, relays, and other devices located on engine or generator unless otherwise indicated.

G. Remote Emergency-Stop Switch: Wall mounted unless otherwise indicated. Push button must be permanently labeled and protected from accidental operation.

H. Remote Alarm Annunciator: LED indicator light labeled with proper alarm conditions will identify each alarm event, and a common audible signal will sound for each alarm condition in accordance with NFPA 110. The silencing switch in face of panel will 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. Controls to include "Lamp Test" momentary switch wired to illuminate all LED indicator lights regardless of alarm state while switch is on. Cabinet and faceplate are surface- or flush-mounting type to suit mounting conditions indicated.

I. Start Signal Wiring Integrity Monitor: UL-listed modular system to monitor condition of generator remote start circuit(s), annunciate faults, and start generator in accordance with NFPA 70, Article 700.10(D)(4).

1. Output Contacts: Two form "C" contacts, one for engine start and one for start circuit alarm.

2.7 GENERATOR OVERCURRENT AND FAULT PROTECTION

A. Overcurrent protective devices will be coordinated to optimize selective tripping when a short circuit occurs.

1. Overcurrent protective devices for the entire EPSS will be coordinated to optimize selective tripping when a short circuit occurs. Coordination of protective devices will consider both utility and EPSS as the voltage source.

2. Overcurrent protective devices for the EPSS will be accessible only to authorized personnel.

B. Generator Overcurrent Protective Device:

1. Molded-case circuit breaker, thermal-magnetic type; [**80**] [**100**] percent rated; complying with UL 489:

   a. Tripping Characteristic: Designed specifically for generator protection.
   b. Trip Rating: Matched to generator output rating.
   c. Shunt Trip: Connected to trip breaker when engine generator is shut down by other protective devices.
   d. Mounting: Adjacent to or integrated with control and monitoring panel.

2. Molded-case circuit breaker, electronic-trip type; [**80**] [**100**] percent rated; complying with UL 489:

   a. Tripping Characteristics: Adjustable long-time and short-time delay and instantaneous.
   b. Trip Settings: Selected to coordinate with generator thermal damage curve.
   c. Shunt Trip: Connected to trip breaker when engine generator is shut down by other protective devices.
   d. Mounting: Adjacent to or integrated with control and monitoring panel.

3. Insulated-case circuit breaker, electronic-trip type; [**80**] [**100**] percent rated; complying with UL 489:

   a. Tripping Characteristics: Adjustable long-time and short-time delay and instantaneous.
   b. Trip Settings: Selected to coordinate with generator thermal damage curve.
   c. Shunt Trip: Connected to trip breaker when engine generator is shut down by other protective devices.
   d. Mounting: Adjacent to or integrated with control and monitoring panel.

4. Molded-case type disconnect switch:

a. Trip Rating: Matched to generator output rating.
b. Shunt Trip: Connected to trip switch when signaled by generator protector or by other protective devices.

5. Initiates a generator overload alarm when 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. Contacts will be available for load shed functions.
6. Under three-phase fault conditions, generator to supply 300 percent of rated full-load current for up to 10 seconds.

C. Ground-Fault Indication: Comply with NFPA 70, "Emergency System" signals for ground fault.

1. Indicate ground fault with other engine generator alarm indications.
2. Trip generator protective device on ground fault.

2.8 ALTERNATOR, EXCITER, AND VOLTAGE REGULATOR

A. Comply with NEMA MG 1.

B. Maximum Temperature Rise: 105 deg C or 130 deg C at full load over 40 deg C ambient as per recommended by Manufacturer.

C. Drive: Alternator shaft directly connected to engine shaft. Exciter rotated integrally with generator rotor.

D. Electrical Insulation: Class H.

E. Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.

F. Construction prevents mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation.

G. Enclosure: Drip proof.

H. Voltage Regulator: Microprocessor-based, high-speed digital voltage regulator, separate from exciter, with three-phase, true RMS sensing, providing performance as specified and as required by NFPA 110.

1. Maintain steady-state voltage within 0.5 percent from no load to full load.
2. Adjusting Feature on Control and Monitoring Panel: Provide plus or minus 10 percent adjustment of output-voltage operating band.

I. Alternator Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.

J. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

K. Subtransient Reactance: percent as manufacturers recommendation, maximum.

2.9 LOAD BANK

A. Description:

1. Permanent, outdoor, weatherproof, remote-controlled, forced-air-cooled, resistive or resistive and reactive (as per Manufacturers recommendation) unit capable of providing a balanced three-phase, delta-connected load to engine generator at 3 0or 100 (as per Manufacturers recommendation. percent rated-system capacity, at 80 percent power factor, lagging. Unit may contain separate resistive and reactive load banks controlled by a common control panel. Unit will be capable of selective control of load in 25 percent steps and with minimum step changes of approximately 5 and 10 percent available.
2. Permanent, radiator-mounted, resistive unit capable of providing a balanced three-phase, delta-connected load to engine generator at 30,50,70 as per manufacturer's recommendation percent rated-system capacity. Unit will be capable of selective control of load in 25 percent steps of load bank rating and with minimum step changes of approximately 5 and 10 percent available.

B. Regulatory Requirements:

1. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.

C. General Characteristics:

1. Reference Standards: UL CCN NMTR and UL 508.

D. Resistive Load Elements: Corrosion-resistant chromium alloy with ceramic and stainless-steel supports. Elements will be double insulated and designed for repetitive on-off cycling. Elements will be mounted in removable aluminized-steel heater cases. Galvanized steel is prohibited. Element's maximum resistance will be between 100 and 105 percent of rated resistance.

E. Reactive Load Elements: Epoxy-encapsulated reactor coils.

F. Load-Bank Heat Dissipation: Integral fan with totally enclosed motor will provide uniform cooling airflow through load elements. Airflow and coil operating current will be such that, at maximum load, with ambient temperature at the upper end of specified range, load-bank elements operate at not more than 50 percent of maximum continuous temperature rating of resistance elements.

G. Load-Element Switching: Remote-controlled contactors switch groups of load elements. Contactor coils are rated 120 V. Contactors will be located in a separate NEMA 250, Type 3R enclosure within load-bank enclosure, accessible from exterior through hinged doors with tumbler locks.

H. Contactor Enclosures: Heated by thermostatically controlled strip heaters to prevent condensation.

I. Load-Bank Enclosures: NEMA 250, Type 3R, aluminized steel complying with NEMA ICS 6. Louvers at cooling-air intake and discharge openings prevent entry of rain and snow. Openings for airflow to be screened with 1/2-inch square, galvanized-steel mesh. Reactive load bank to include automatic shutters at air intake and discharge. Components other than resistive elements will receive exterior epoxy coating with compatible primer. Comply with requirements in Section 099600 "High-Performance Coatings."

J. Protective Devices: Power input circuits to load banks will be fused, and fuses will be selected to coordinate with generator circuit breaker. Fuse blocks to be located in contactor enclosure. Cooling airflow and overtemperature sensors automatically shut down and lock out load bank until manually reset. Safety interlocks on access panels and doors disconnect load power, control, and heater circuits. Fan motor will be separately protected by overload and short-circuit devices. Short-circuit devices will be noninterchangeable fuses with 200,000 A interrupting capacity.

K. Load Bank Remote-Control Panel: Separate from load bank in NEMA 250, Type 1 enclosure with a control power switch and pilot light, and switches controlling groups of load elements.

L. Control Sequence: Control panel may be preset for adjustable single-step loading of generator during automatic exercising.

2.10 OUTDOOR GENERATOR-SET ENCLOSURE

A. Description:

1. Vandal-resistant, sound-attenuating, weatherproof steel enclosure, with 14-gauge- thick walls; wind resistant. Multiple panels to be lockable and provide adequate access to components requiring maintenance, minimum two doors per side. Access to controller and main line circuit breaker in accordance with NFPA 70. Panels to be removable by one person without tools. Instruments and controls be mounted within enclosure.

B. Source Limitations: Obtain enclosure from engine-driven generator manufacturer.

C. Structural Design and Anchorage: Comply with ASCE/SEI 7 for wind loads up to 150 mph.

D. Minimum Snow Load Rating: 70 psf.

E. Seismic Design: Comply with seismic requirements in Section 260548.16 "Seismic Controls for Electrical Systems."

F. Access doors and panels rubber sealed to prevent water intrusion and minimize noise.

G. Hinged Doors: Lockable; keyed alike with recessed locks.

H. External, weatherproof, recessed-mounted emergency stop pushbutton.

I. DC Lighting: Provide weather-resistant LED lighting, powered from starting battery on fused circuit with 0-60 minute "No-Lock-On" timer.

J. Insulation Flammability Classification: UL 94 HF1.

K. Muffler Location: Complete exhaust system located within enclosure.

2.11 REMOTE RADIATOR MOTORS

A. Description: NEMA MG 1, Design B, medium induction random-wound, squirrel-cage motor.

B. Efficiency: Energy efficient, as defined in NEMA MG 1.

C. Service Factor: 1.15.

D. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.

E. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

F. Temperature Rise: Match insulation rating.

G. Code Letter Designation:

1. Motors [**15**] <**Insert number**> HP and Larger: NEMA starting Code F or Code G.
2. Motors Smaller Than [**15**] <**Insert number**> HP: Manufacturer's standard starting characteristic.

H. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

I. Motor Starter: Full-voltage non-reversing (across the line) motor starter installed and wired to the output terminals of the generator per NFPA 70.

2.12 VIBRATION ISOLATION DEVICES

A. Elastomeric Vibration Isolators: Oil- and water-resistant elastomer neoprene or natural rubber, molded with a nonslip pattern and baseplates of sufficient stiffness for uniform loading over pad area, and factory cut to sizes that match requirements of supported equipment. Compliant with ISO 8528.

B. Comply with requirements in Section 232116 "Hydronic Piping Specialties" for vibration isolation and flexible connector materials for steel piping.

C. Comply with requirements in Section 233113 "Metal Ducts" for vibration isolation and flexible connector materials for exhaust shroud and ductwork.

D. Vibration isolation devices will not be used to accommodate misalignments or to make bends.

2.13 FINISHES

A. Indoor and Outdoor Enclosures and Components: Heavy-duty, high-durability, fade-, scratch- and corrosion-resistant finish achieved through a multi-stage finishing process from the genset manufacturer including:

1. Pre-cleaning: Enclosure components cleaned with a two-stage alkaline cleaning process to remove grease, grit, and grime from parts then subjected to a Zirconium-based conversion coating process to prepare the metal for electrocoat (e-coat) adhesion.
2. Primer: All enclosure parts to receive 100 percent epoxy primer electrocoat (e-coat) with high-edge protection.
3. Finish Coating: Powder-baked paint for superior finish, durability, and appearance.
4. Minimum Enclosure Corrosion Resistance: 3000 hours salt spray test in accordance with ASTM B117.
5. Powder coat for fading and abrasion resistance.

2.14 SOURCE QUALITY CONTROL

A. Prototype Testing: Factory test engine generator using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.

1. Tests: Comply with IEEE 115[and with NFPA 110, Level 1 Energy Converters.

B. Project-Specific Equipment Tests: Before shipment, factory test engine generator and other system components and accessories manufactured specifically for this Project. Perform tests at rated load and power factor. Include the following tests:

1. Test alternator, exciter, and voltage regulator as a unit.
2. Load Test: 25, 50, 75, and 100 percent rated load.
3. Single-step load pickup.
4. Safety shutdown.
5. Overcrank.
6. Locked rotor.
7. Mechanical Readings: Oil pressure, ambient temperature, and coolant temperature.
8. Test components and accessories furnished with installed unit that are not identical to those on tested prototype to demonstrate compatibility and reliability.
9. Maximum power.
10. Voltage regulation.
11. Transient and steady-state governing.
12. Provide 14 days' advance notice of tests and opportunity for observation of tests by Owner's representative.
13. Report factory test results within 10 days of completion of test.

PART 3 - EXECUTION

3.1

3.2 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 for 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.

3.3 PREPARATION

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service in accordance with requirements indicated:

1. Do not proceed with interruption of electrical service without Owner's Facilities Manager Representative written permission.

3.4 INSTALLATION

A. Comply with NECA 1 and NECA 404.

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

C. Equipment Mounting:

1. Install engine generators on cast-in-place concrete equipment bases. Comply with requirements for equipment bases and foundations specified in Section 033001 "Cast-in-Place Concrete."
2. Coordinate size and location of concrete bases for engine generators. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.
3. Install engine generator with a skin-tight enclosure.
4. Remote Radiators:

    a. Install remote radiator with elastomeric isolator pads, or restrained spring isolators per manufacturers recommendation on concrete pad, size as specified by Manufacture of Generator, on grade.

D. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.

E. Cooling System: Install Schedule 40, black steel piping with welded joints for cooling water piping between engine generator and **heat exchanger** or **remote radiator** as per Manufacutrer's recommendation. Piping materials and installation requirements are per State of Connecticut Building Code 2022 and State of Connecticut Fire Safety Code 2022.

1. Install isolating thimbles where exhaust piping penetrates combustible surfaces. Provide a minimum of 9 inches clearance from combustibles.
2. Insulate cooling system piping and components in accordance with requirements in Section 230719 "HVAC Piping Insulation."

F. Exhaust System: Install Schedule 40, black steel piping with welded joints and connect to engine muffler. Install thimble at wall. Piping sized in accordance with allowable back pressure for the engine and indicated on mechanical plans.

3. Install flexible connectors and steel piping materials in accordance with requirements in State of Connecticut Building Code 2022, and State of Connecticut Fire Safety Code 2022.
4. Insulate muffler/silencer and exhaust system components in accordance with requirements in accordance with State of Connecticut Building Code 2022 and State of Connecticut Fire Safety Code 2022.
5. Install isolating thimbles where exhaust piping penetrates combustible surfaces with a minimum of 9-inch clearance from combustibles.

F. Drain Piping: Install condensate drain piping to muffler drain outlet with a shutoff valve, stainless steel flexible connector, and Schedule 40, black steel pipe, the full size of the drain connection.

G. Gaseous Fuel Piping:

1. Natural gas piping, valves, and specialties for gas distribution to be in compliance with State of Connecticut Building Code 2022, and State of Connecticut Fire Safety Code 2022 and requirements of Eversource Gas Utility Company requirements.

H. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.

3.5 CONNECTIONS

A. Piping installation Connect fuel, cooling-system, and exhaust-system piping adjacent to packaged engine generator to allow service and maintenance.

B. Connect cooling-system water piping to engine generator and remote radiator or heat exchanger with flexible connectors.

C. Connect engine exhaust pipe to engine with flexible connector.

D. Gaseous Fuel Connections:

1. Connect fuel piping to engines with a gate valve and union and flexible connector.
2. Install manual shutoff valve in a remote location to isolate gaseous fuel supply to the generator.
3. Vent gas pressure regulators outside building a minimum of 60 inches from building openings.

E. Ground equipment in accordance with NFPA 70, and State of Connecticut Building Code 2022 and State of Connecticut Fire Safety cod 2022.

F. Connect wiring in accordance with State of Connecticut Building Code 2022 and State of Connecticut Fire Safety Code. "Low-Voltage Electrical Power Conductors and Cables." Provide flexible conduit routed to the engine generator from a stationary element.

G. Balance single-phase loads to obtain a maximum of 10 percent unbalance between any two phases.

3.6 IDENTIFICATION

A. Identify system components in accordance with Section 230553 "Identification for HVAC Piping and Equipment" and Section 260553 "Identification for Electrical Systems."

B. Install a sign indicating the generator neutral is bonded to the main service neutral at the main service location or is installed as a separately derived source per NFPA 70.

3.7 FIELD QUALITY CONTROL

A. Testing Agency:

1. Owner will engage a qualified testing agency to perform tests and inspections.
2. Engage a qualified testing agency to perform tests and inspections.

3. Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
4. Perform tests and inspections, with the assistance of a factory-authorized service representative].

B. Tests and Inspections:

1. Perform tests recommended by manufacturer and each visual and mechanical inspection and electrical and mechanical test listed in the first two subparagraphs below as specified in the NETA ATS. Certify compliance with test parameters.

    a. Visual and Mechanical Inspection:

        1) Compare equipment nameplate data with drawings and specifications.
        2) Inspect physical and mechanical condition.
        3) Inspect anchorage, alignment, and grounding.
        4) Verify the unit is clean.

    b. Electrical and Mechanical Tests:

        1) Verify phase rotation, phasing, and synchronized operation as required by the application.
        2) Functionally test engine shutdown for low oil pressure, overtemperature, overspeed, and other protection features as applicable.

2. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here, including, but not limited to, single-step full-load pickup test.
3. Battery Tests: Equalize charging of battery cells in accordance with 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.

4. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
5. 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.
6. Exhaust-System Back-Pressure Test: Use a manometer with a scale exceeding 40-inch wg 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.
7. Exhaust Emissions Test: Comply with applicable government test criteria.
8. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 percent step-load increases and decreases and verify that performance is as specified.
9. Noise Level Tests: Measure A-weighted level of noise emanating from generator-set installation, including engine exhaust and cooling-air intake and discharge, at eight locations 23 ft. from edge of the generator enclosure, and compare measured levels with required values.

C. Coordinate tests with tests for transfer switches and run them concurrently.

D. Test instruments will have been calibrated within the last 12 months, traceable to NIST Calibration Services, and adequate for making positive observation of test results. Make calibration records available for examination on request.

E. Leak Test: After installation, inspect exhaust, coolant, and fuel systems and test for leaks. Repair leaks and retest until no leaks exist.

F. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation for generator and associated equipment.

G. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

H. Remove and replace malfunctioning units and retest and reinspect as specified above.

I. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

J. 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.

K. 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.

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.

3.8 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, provide 24 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. Provide parts and supplies same as those used in the manufacture and installation of original equipment

3.9 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators.

END OF SECTION 263213