TOWN OF WATERTOWN
WATERTOWN, CONNECTICUT

NOTICE OF BID

50kw Generator & Automatic Transfer Switch
Watertown Water & Sewer Authority

Sealed bids are invited and will be received by the Purchasing Agent of the Town of Watertown at the office of the Purchasing Agent, Town Hall Annex, 424 Main Street, Watertown, Connecticut, until 11:00 a.m. Thursday March 15, 2018 at which time and place they will be publicly opened and read aloud for furnishing a new emergency power generator to the Town of Watertown.

The Information for Bidders, Form of Bid, Specifications, and other contract documents may be obtained or examined at the office of the Purchasing Agent, Town Hall Annex, 424 Main Street, Watertown, Connecticut 06795 or by accessing the Town of Watertown’s website at http://www.watertownct.org. Proposals must be submitted on the forms provided and in a sealed envelope plainly marked “Bid –Generator”.

To receive consideration bids must be in the hands of the Purchasing Agent or his authorized representative no later than the day and hour mentioned above.

The Purchasing Agent reserves the right to accept or reject any or all bids; to waive any informality; or to accept any bid deemed in the best interests of the Town of Watertown.

The Town of Watertown reserves the right to take into account the residency of bidders within the Town of Watertown and/or the location of the bidder's business within the Town of Watertown in awarding this bid.

All bids will be considered valid for a period of sixty (60) days.

Jason Warner
Purchasing Agent
Town of Watertown
INFORMATION FOR BIDDERS

TOWN OF WATERTOWN
WATERTOWN, CONNECTICUT 06795

50kw Generator & Automatic Transfer Switch
Watertown Water & Sewer Authority

BID OPENING: 11:00 a.m. Thursday March 15, 2018

PROPOSALS RECEIVED

All bids must be in a sealed envelope and received prior to 11:00 a.m. Thursday March 15, 2018 at the office of the Purchasing Agent, 424 Main Street, Watertown, Connecticut 06795.

PREPARATION OF PROPOSALS

Proposals must be made upon forms contained herein. The blank spaces in the Proposal must be filled in correctly where indicated. The Bidder must state the prices for which he proposes to do each item of the work contemplated. In case of discrepancy where both words and the numerals are requested, the words shall govern. Ditto marks are not considered writing or printing and shall not be used. The Bidder shall sign his Proposal correctly. If the Proposal is made by an individual, his name, post office address and telephone number must be shown. If made by a firm, partnership, or corporation, the Proposal must be signed by an official of the firm, partnership, or corporation authorized to sign contracts, and must show the post office address and telephone number of the firm, partnership, or corporation. Failure to do so may disqualify the bid.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the Bidder, post office address, and name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to: The Purchasing Agent, Town Hall Annex, 424 Main Street, Watertown, CT 06795.

All information shall be entered in ink or by typewriter. Mistakes may be crossed out and corrections inserted before submission of your bid. The person signing the bid shall initial corrections in ink.

Corrections and/or modifications received after the closing time specified will not be accepted.

SUBMISSION OF PROPOSALS

All proposals and literature shall be submitted IN DUPLICATE on the proposal form, which is a part of these specifications.

Descriptive literature containing complete specifications must accompany each bid. If a bidder wishes to furnish additional information, more sheets may be added.
Adobe Acrobat® Reader is required to view electronic documents on-line. If you do not have Adobe Acrobat® Reader, you may download it for free from Adobe at http://www.adobe.com/products/acrobat/readstep.html.

Response summaries will be available online at http://www.watertownc.org on the day of the bid opening.

Responses delivered via fax are received subject to the following qualifications and limitations:
- The Town is not responsible for the confidentiality of the information transmitted.
- The Town cannot guarantee that its fax equipment will be operational and able to receive transmittals by a particular time and date. It is the Bidder's responsibility to ensure that quotations are received in their entirety and on time at the required location. It is recommended that vendors be advised to call immediately after transmitting a document electronically to confirm complete and accurate receipt by the Town. The Town assumes no liability in the event that a bidder’s electronic transmission is not received by the Town in a timely fashion, or is not received either in its entirety or error-free.
- Bids transmitted electronically which have a bond requirement are subject to the same submittal requirements as those responses delivered via traditional means, such as mail or hand delivery, or as otherwise stipulated by appropriate authority.

INCURRING COSTS
The Town of Watertown is not liable for any cost incurred for the preparation of proposals or submission of samples by the firms submitting proposals for the work requested in this bid document or request for proposals.

FAMILIARITY WITH THE WORK
Each bidder is considered to have examined the work to fully acquaint himself with the exact existing conditions relating to the work and has fully informed himself as to the work involved and the difficulties and restrictions attending the performance of this bid. Failure to do so will not relieve a bidder of his obligation to furnish all materials, labor and equipment necessary to carry out the work for the consideration set forth in this bid. The submission of a bid will be considered as conclusive evidence that the bidder has made such examination.

Where exploration or inspection data is shown on the Plans and/or specifications or made available to the Bidder, it is understood that such data where obtained in the usual manner and with reasonable care and are to be interpreted and used as the Bidder sees fit. There is no expressed or implied agreement that the data has been correctly indicated, and the Bidder is cautioned to take into account that conditions affecting the work may differ from those indicated.

The Owner assumes no responsibility whatsoever with respect to ascertaining for the Contractor such facts concerning physical characteristics relating to this project. The Bidder agrees that he shall make no claim for and has no right to additional payment or extension of time for completion of the
work, or any other concession, because of any interpretations or misunderstanding on his part of this bid, or because of any failure on his part to fully acquaint himself with all conditions relating to the work. Permission for making borings, test pits, destructive tests or other investigations of subsurface conditions will be arranged for by the bidder upon receipt of a written approval by the Town.

CONSIDERATION OF PRIOR SERVICE
Previous performance, quality of service and merchandise will be considered.

ADDENDA AND INTERPRETATIONS & ALTERNATE PROPOSALS
Addenda information will be available online at http://www.watertownct.org. Adobe Acrobat® Reader may be required to view this document. It is strongly suggest that Bidders check for any addenda a minimum of forty eight hours in advance of the bid deadline.

At the time of the opening of bids each Bidder will be presumed to have inspected the work and to have read and to be thoroughly familiar with all of the Contract Documents (including all addenda). The failure or omission of any Bidder to receive or examine any form, instruction or document shall in no way relieve any bidder from any obligation in respect to his bid.

If any person contemplating submitting a proposal is in doubt as to the true meaning of any part of these specifications, he may submit a written request for an interpretation to the Purchasing Agent. No interpretations as to the meaning of the plans, specifications or other Contract Documents will be made to any Bidder orally.

Every request for such interpretation should be in writing addressed (duplicate copy) to the Town of Watertown, Purchasing Agent, 424 Main Street, Watertown, Connecticut 06795, and to be given consideration, must be received at least five (5) days prior to the date fixed for the opening of Bids. Any and all such interpretations and any supplementary instructions will be in the form of written Addenda to the Specifications which, if issued, will be mailed by Registered Mail with Return Receipt Requested to all prospective Bidders at the respective addresses furnished for such purposes, not later than three (3) days prior to the date fixed for the opening of bids. Failure of any Bidder to receive any such Addendum or interpretations shall not relieve any Bidder from any obligations under his bid as submitted. All Addenda so issued shall become part of the Contract Documents. Oral explanations will not be binding on the Town.

The specifications listed are to be interpreted as meaning the minimum acceptable by the Town of Watertown. Bidders are requested to submit quotations on the basis of these specifications. Alternative bids providing a broader scope and/or services than requested in these specifications may receive consideration providing such equipment and/or service is clearly explained. Any exceptions to the specifications requested herein must be clearly noted in writing and are to be included as a part of the bid proposal. If none are included it will be assumed that there are none.

Definition of the word "complete" means that each unit of the equipment proposed shall include all appurtenances, fasteners, parts, accessories, and services ordinarily catalogued.
An item equal to that named or described in the specifications may be furnished by the Bidder, except where expressly noted as “no substitutions.” The naming of any commercial name, trademark, or other identification shall not be construed to exclude any item of any manufacturer not mentioned by name, nor limit competition, but shall establish a standard of equality only. An item shall be considered equal to the item so named or described if:

- It is at least equal in quality, durability, appearance, strength and design.
- It will perform at least equally the function imposed by the design for the work being contracted for or the material being purchased.
- It conforms substantially, even with deviations, to the detailed requirements for the item in the specifications.

The Bidder shall hold the Town of Watertown, its officers, agents, servants, and employees, harmless from liability of any nature or kind because of use of any copyrighted or uncopyrighted compositions, secret process, patented or unpatented inventions, articles or appliances furnished or used under this bid, and agrees to defend, at his own expense, any and all actions brought against the Town of Watertown or himself because of the unauthorized use of such articles.

**QUOTATION LIMITATION**

Bidders shall offer only **ONE ITEM AND PRICE** for each line item bid. If an or equal item is to be bid, the bidder is to select the brand and model that meets or exceeds the specified item, and submit his bid for that item.

**ESTIMATE OF WORK**

For bidding purposes, the work has been subdivided into unit price items. The quantities shown are to be considered as approximate only. The Purchasing Agent does not expressly or by implication agree that the actual quantity will correspond therewith, but reserves the right to increase or decrease the amount of any item or portion of the work as deemed necessary.

**WITHDRAWAL OF BID**

Bidders may withdraw their proposals at any time prior to the bid date. No agent/broker shall withdraw or cancel their proposal for a period of sixty (60) days after the bid closing date of **11:00 a.m. Thursday March 15, 2018**. The successful agent/broker shall not withdraw, cancel or modify their proposal.

**POWER OF ATTORNEY**

Attorneys-in-fact who sign contract bonds must file, with each bond, a certified and effectively dated copy of their power of attorney.

**SUBCONTRACTORS**

- Each bidder contemplating the use of any subcontractor shall submit a list of subcontractors as listed on the Bid Form.
- The apparent low bidder shall file with the Town of Watertown, within five (5) days after
the date of bid opening, a complete list of the names and addresses of competent, responsible and qualified subcontractors who are actually to perform major portions of the work. This in no way restricts or limits the requirement that all subcontractors must be approved by the Town.

- Subcontractors listed on the Bid Form or those previously approved may not be changed without the approval of the Town of Watertown.

Local subcontractors, material suppliers, and labor in the Town of Watertown should be considered and sought insofar, as is practical in the performance of this project.

QUALIFICATION OF BIDDER

In determining the qualifications of a bidder, the Town may consider his record in the performance of any contracts for similar work into which he may have previously entered; and the Town expressly reserves the right to reject the bid of such bidder if such record discloses that such bidder, in the opinion of the Town, has not properly performed such contracts or has habitually, and without just cause, neglected the payment of bills or has otherwise disregarded his obligations to subcontractors, suppliers, state or local codes, men or employees of subcontractors.

The Town may make such investigation as he deems necessary to determine the ability of the bidder to perform the work and the bidder shall furnish to the Town all such information and data for this purpose as the Town may request. The Town reserves the right to reject any bid if the evidence submitted by or the investigation of such bidder fails to satisfy the Town that such bidder is properly qualified, or that such bidder misrepresented material facts in the bid documents.

DISQUALIFICATION OF BIDDERS

More than one proposal from an individual, firm, partnership, corporation, or an association under the same or different names will not be considered. Reasonable grounds for believing that any Bidder is interested in more than one proposal for the work contemplated will cause the rejection of all proposals in which such Bidder is interested. Any or all proposals in which such Bidder is interested will be rejected if there is reason for believing that collusion exists among the Bidders and all participants in such collusion will not be considered in future proposals for the same work. Proposals in which the prices are obviously unbalanced may be rejected. No Contract will be awarded except to competent Bidders capable of performing the class of work contemplated.

SERVICE CENTER REQUIREMENTS

Bidders must state the location of the nearest available factory authorized service center and the availability of twenty four (24) hour a day emergency service for all components of the equipment specified.

DELIVERY

Inasmuch as this work concerns a needed public improvement, the provisions of this bid relating to the time of delivery, performance and completion of the work are of the essence of this bid. Accordingly, the successful bidder shall commence work **upon receipt of the signed Purchase**
Order unless the Town shall authorize or direct a further delay, and shall proceed with the work diligently so as to permit completion no later than sixty (60) calendar days after receipt of the Town’s Purchase Order.

Time of delivery shall be stated as the number of calendar days following receipt of the Purchase Order by the Bidder to receipt of the goods or services by the Town of Watertown.

Prices quoted must include delivery to the Town of Watertown as specified on the Purchase Order. No charges will be allowed for parking, crating, freight, express or cartage unless specifically stated and included in this bid.

Time of delivery may be considered in the award.

PAYMENT
The Town, after inspection and acceptance of workmanship, and in consideration of the faithful performance by the Bidder of all and singular his covenants, promises, and agreements contained herein, agrees to pay the Bidder for the full completion by him of the work embraced in this Contract, within (30) Thirty Days of the receipt of the final invoice. When subcontractors or suppliers are utilized, the successful Bidder for this project shall be required to submit a Mechanics Lien Waiver, acceptable to the Town, with each progress payment and/or at time of final payment prior to any payment being made.

Time, in connection with any discount offered, will be computed from the date of delivery to the Town or from the date a correct invoice is received by the Town's Finance Department, if the latter date is later than the date of delivery.

Prices will be considered as NET, if no cash or payment discount is shown.

The successful bidder shall submit invoices to the following address:

Town of Watertown
Water & Sewer Authority
747 French Street
Oakville, CT 06779

IT IS UNDERSTOOD AND AGREED THAT SHOULD A BID BE ACCEPTED, IT WILL AUTOMATICALLY BECOME THE CONTRACT OR AN ADDENDUM TO ANY CONTRACT AGREED UPON.

Notification of the bid award will be made by issuance of a purchase order. Bidders are to list their bids on the appropriate attached sheets. Bidders may attach a letter of explanation. A clear notification should be made on the standard bid sheets at the appropriate point of explanation that there is a letter of explanation attached. All bids must be NET prices.
The successful bidder shall submit an itemized invoice to the Town of Watertown for the work as described herein.

The bidder shall be required to submit a Mechanics Lien Waiver, acceptable to the Town of Watertown, with each progress payment and at time of final payment prior to any payment being made.

At the time of award the successful bidder shall be required to supply the Town of Watertown a Certificate of Good Standing, certifying that the corporation is in fact a valid corporation and presently licensed to conduct business in the State of Connecticut.

SALES TAX
Certain materials and supplies incorporated in the work of this project are exempt from Connecticut Sales Tax. The Bidder shall familiarize himself with current regulations of the State Tax Department. The tax on materials or supplies exempted by such regulations shall not be included as part of the bid. The Town will furnish the successful Bidder sales tax exemption authorization.

CARE AND PROTECTION OF PROPERTY
The Bidder shall take particular care to avoid damages to all private and public property and to private or public improvements within the Town's right of way. He shall make good any damages to the satisfaction of the Town. There shall be no additional compensation for the repair or restoration of private or public property improvements.

COMPLIANCE WITH FEDERAL, STATE AND LOCAL CODES
The Bidder shall be responsible for full compliance with any Federal, State and/or Local codes, laws, regulations and standards, as applicable.

AWARD
The Town of Watertown reserves the right to accept or reject any bid to best serve its interests, or to hold the bids for sixty (60) days before decision.

The Town reserves the right to reject any and all bids (or any part thereof), to waive defects in proposals, or to accept any proposal deemed to be in its best interest.

Exceptions will be considered to the specification provided, providing they are listed and fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS"

Each exception will be considered as to its degree of impact and total effect on the bid. The purchaser shall determine which (if any taken) exceptions are acceptable, and this determination shall be final.
The Town of Watertown reserves the right:

- To award bids received on the basis of individual items, or groups of items, or on the entire list of items.
- To reject any or all bids, or any part thereof.
- To waive any informality in the bids.
- The Town of Watertown reserves the right to take into account the residency of bidders within the Town of Watertown and/or the location of the bidders business within the Town of Watertown in awarding this bid.
- To accept the bid that is in the best interest of the Town of Watertown. The Purchasing Agent's decision shall be final.

**INSURANCE**

**A. General:**
The Bidder shall be responsible for maintaining insurance coverage in force for the life of the contract of the kinds and adequate amounts to secure all of the Bidder’s obligations under the contract with an insurance company with an AM Best Rating of A - VII or better licensed to write such insurance in Connecticut and acceptable to the Town of Watertown.

The insurer shall provide the Town of Watertown with Certificates of Insurance signed by an authorized representative of the insurance company(ies) prior to the performance of this contract describing the coverage and providing that the insurer shall give the Town of Watertown written notice at least thirty (30) days in advance of any termination, expiration, or any and all change in coverage.

Such insurance or renewals or replacements thereof shall remain in force during the Bidder’s responsibility under this agreement.

The Bidder at his own cost and expense shall procure and maintain all insurance required and shall name the Town of Watertown, its employees, departments, boards, committees and commissions, as an additional insured on all contracts except Worker’s Compensation and Professional Errors & Omissions coverage.

In order to facilitate this requirement for insurance, it is recommended that the bidder forward a copy of this exhibit to the bidder’s insurance representative(s).

**B. Specific Requirements:**

(1) **Workers’ Compensation Insurance**
The Bidder shall provide Workers’ Compensation Insurance required by law and the Employer’s Liability Insurance for at least the amounts of liability for Bodily Injury by accident of $100,000 each accident; Bodily Injury by Disease each employee of $100,000; Bodily Injury by Disease, policy limit of $500,000.
(2) **Commercial General Liability Insurance**
The Bidder shall carry Commercial General Liability policy (Insurance Services Office Incorporated Form CG-0001 or equivalent). A per occurrence limit of $1,000,000 is required. The Aggregate Limit will be not less than $1,000,000.

(3) **Business Automobile Liability Insurance**
The Bidder shall carry Business Automobile Liability Insurance. (Insurance Services Office Incorporated Form CA-00001 or equivalent). A per occurrence limit of $1,000,000 is required. “Any Auto” (symbol 1 or equivalent) is required.

C. **Hold Harmless & Subcontractor’s Requirements:**
The Bidder shall require the same insurance that it is required to carry by the Town of Watertown to be carried by any subcontractors and independent contractors hired by the Bidder and to obtain Certificates of Insurance before subcontractors and independent contractors are permitted to begin work.

The Bidder shall require that the Town of Watertown, its employees, departments, boards, committees and commissions, be named as Additional Insured on all subcontractor’s and independent contractor’s policies before they are permitted to begin work.

The Bidder and all subcontractors and independent contractors and their insurers shall waive all rights of subrogation against the Town of Watertown, and its officers, agents, servants and employees for losses arising from the work performed by each on this contract.

The Bidder assumes and agrees to hold harmless, indemnify, protect and defend the Town of Watertown against any and all liability for injuries and damages to Bidder and to Bidder’s employees, agents, subcontractors and guests, third parties or otherwise incident to or resulting from any and all operations performed by a contractor under any terms of this contract.

D. **Other Data:**

NOTE 1: If Bidder is only a vendor shipping goods via Common Carrier only, General Liability is required.

NOTE 2: If Bidder is a Professional, Errors & Omission coverage will be required.

NOTE 3: The Town reserves the right to amend amounts of coverage required and the types of coverage provided based on work or service to be performed.

**GUARANTEE**
The bidder shall unconditionally guarantee for a period of **two (2) years** from the date of acceptance, all materials, supplies, equipment, and services; including but not limited to its workmanship, delivery and installation. If within the guarantee period there are any defects or signs of deterioration the bidder shall repair, adjust or replace the item(s) to the complete satisfaction of
the Town. These repairs, adjustments, or replacements are at the sole expense of the bidder and shall be made at such times that are agreeable to the Purchasing Agent so that it is least detrimental to instructional programs.

**PERMITS**

When required all licenses and permits for complying with any applicable Federal, State, and Municipal laws, codes, regulations in connection with the prosecution of the work shall be obtained by the Bidder, at no additional cost to the Town.

**NONDISCRIMINATION IN EMPLOYMENT**

The successful bidder shall agree and warrant that, in the performance of this contract, he will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, sex, religion, or national origin in any manner prohibited by State, Federal, County, or Municipal law. A certification of Nonsegregated Facilities and a Certification Regarding Equal Employment Opportunity shall be considered a part of this contract.

For further technical or administrative information contact Jason Warner, Purchasing Agent at (860) 945-5260 or via email at warner@watertownct.org.
SECTION 1.0 – GENERAL REQUIREMENTS

1.1 – Scope:
A. Provide a complete and operable Emergency/Standby electric generating system, including all devices and equipment specified herein, as shown on the drawings, or required for the service. Equipment shall be new, factory tested, and delivered ready for installation. To be delivered to WindingBrook Farm Road, Watertown, CT, 06795. Sewer pump station is located in front of #28 Winding Brook Farm Road. Installation will be done by others.

1.2 – Approved Manufacturers:
A. Equipment, documentation, and services described in this specification and shown on the plans are as provided by Cummins Power Generation, Minneapolis, Minnesota.

B. Proposed substitutions shall include complete submittal data, as specified herein, clearly denoting any and all deviations and/or exceptions to the equipment specified. The complete proposal must be submitted to the engineer or architect for approval/disapproval not less than 10 days prior to the scheduled bid date. If approved, the Contractor is responsible for the charges for all necessary revisions.

C. Submit the following information with the proposal package for review and evaluation 10 days prior to scheduled bid date:

- A paragraph by paragraph specification compliance statement, describing the differences between the specified and the proposed equipment.
- Dimensions of the generator sets, transfer switches and accessory hardware, including plan and elevation drawings.
- Sequence of the operations if required to enhance the description included in this specifications.
- Indication of the nearest field service office staffed with factory trained technicians. Provide service organization data and manpower. Indicate typical response time for emergency calls. Provide typical scenario for an emergency service call.
1.3 – Submittals:
A. Within 10 days after award of contract, provide six sets of the following information for review:

- Manufacturer’s product literature and performance data, sufficient to verify compliance to specification requirements.
- A paragraph by paragraph specification compliance statement, describing the differences between the specified and the proposed equipment.
- Manufacturer's certification of prototype testing.
- Manufacturer's published warranty documents.
- Shop drawings showing plan and elevation views with certified overall dimensions, as well as wiring interconnection details.
- Interconnection wiring diagrams showing all external connections required; with field wiring terminals marked in a consistent point to point manner.

1.4 – Warranty:
A. Shall be provided for all products against defects in materials and workmanship for two (2) years period from the start-up date. Warranty must cover parts, labor and travel time. Warranty deductibles are not allowed.

1.5 – Single Supplier:
A. The installer/supplier shall be the manufacturer's authorized distributor, who shall provide initial start-up services, conduct field acceptance testing, and warranty services. The supplier shall have 24 hours/365 days a year service availability and factory trained service technicians authorized to perform warranty service on all products provided.

1.6 – Operator Manuals:
A. Three (3) sets of operators and spare parts manuals shall be provided for all system equipment. The manuals shall include outline, interconnection, wiring, and control drawings accurately describing the equipment provided. Provide ladder logic for all programmable logic controllers in the system.

1.7 – Site Conditions:
A. Ambient temperature: minus 17 deg. C (0 deg. F) to plus 40 deg. C (104 deg. F)
B. Relative humidity: 0 to 95 percent (%)
C. Altitude: sea level to 500 feet (152 m)

SECTION 2.0 – GENERATOR SYSTEM

2.1 – LP Vapor Generator Set:
A. 4-cycle, 1800 rpm, liquid cooled, LP vapor engine generator set. Generator set ratings: 50 kW / 63 kVA at 0.8 PF, stand-by rating, based on site conditions noted above. System voltage of: 277/480 Volts AC, three-phase, four-wire, and 60 hertz.

**Generator set shall be the Cummins model C50N6**
The engine, alternator, generator controls, enclosure and all other associated generator set equipment shall be manufactured by the generator set supplier.

B. Substitutes by Caterpillar or Detroit Diesel that meets this specification in its entirety will also be accepted. No other manufactures will be accepted.

2.2 – **Prototype Test and Evaluation:**
A. Prototype tests shall have been performed on a complete and functional unit, component level type tests will not substitute for this requirement. Prototype testing shall comply with the requirements of NFPA-110 for level 1 systems.

2.3 – **Performance Tests and Evaluation:**
A. Voltage regulation shall be plus/minus (+/-) 1.0 percent for any constant load between no load and rated load.

B. Transient Voltage Performance: Not more than 20 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within 5 seconds. On application of a 100% load step the generator set shall recover to stable voltage within 10 seconds.

C. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.

D. Transient Frequency Performance: Not more than 15 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within 5 seconds. On application of a 100% load step the generator set shall recover to stable frequency within 10 seconds.

E. Output Waveform: At full load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for any single harmonic. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50.

F. Frequency regulation shall be isochronous from steady state no load to steady state rated load. Random frequency variation with any steady load from no load to full load shall not exceed plus or minus 0.25%.
G. The LP vapor engine generator set shall be capable of single step load pick up of 100% nameplate kW and power factor, less applicable derating factors, with the engine generator set at operating temperature.

H. Motor starting capability shall be a minimum of 221 kVA. The generator set shall be capable of sustaining a minimum of 90% of rated no load voltage with the specified kVA load at near zero power factor applied to the generator set.

I. Start Time: Comply with NFPA 110, Level 1, Type 10, system requirements.

J. Ambient Condition Performance: Engine generator shall be designed to allow operation at full rated load in an ambient temperature under site conditions, based on highest ambient condition.

2.4 – Engine:
A. The engine shall be equal to the QSJ5.9G-G1 manufactured and assembled by Cummins Engine Company and designed specifically for generator set duty. The engine shall be 4-cycle, LP vapor fueled, 1800 RPM with forged steel crankshaft and connecting rods. Minimum engine displacement shall be 359 cubic inches. Engine shall have a minimum of 6 cylinders. The cylinder block shall be cast iron and have four valves per cylinder. The engine shall be naturally aspirated and after cooled. Engines that are not designed and manufactured by the generator set manufacturer, and engines that are high-speed rev. and/or turbo charged will not be accepted.

B. Skid mounted radiator and cooling system rated for full load operation in 122 degrees F (50 degrees C) ambient as measured at the generator air inlet. Radiator shall be provided with a duct adapter flange. The cooling system shall be filled with 50/50 ethylene glycol/water mixture by the equipment supplier. Rotating parts shall be guarded against accidental contact per OSHA requirements.

C. Governor: Adjustable isochronous, with speed sensing. The governing system dynamic capabilities shall be controlled as a function of engine coolant temperature to provide fast, stable operation at varying engine operating temperature conditions. The control system shall actively control the fuel rate as appropriate to the state of the engine generator. Fuel rate shall be regulated as a function of starting, accelerating to start disconnect speed, accelerating to rated speed, and operating in various isochronous states.

D. Engine starting system: 12 volts DC, electric motor starter capable of three complete cranking cycles without overheating.
E. Positive displacement, mechanical, full pressure, lubrication oil pump.

F. Full flow lubrication oil filters with replaceable spin on canister elements and dipstick oil level indicator.

G. Replaceable dry element air cleaner with restriction indicator.

H. Flexible supply fuel line.

I. Engine mounted battery charging alternator, 52 ampere minimum, and solid state voltage regulator.

J. Provide a crankcase emission control system that shall remove a minimum of 99% of crankcase emissions. The crankcase emission control system shall reduce NOx, hydrocarbon and oil from the crankcase emissions.

2.5 AC Generator:

A. The AC generator shall be synchronous, four pole, 2/3 pitch, revolving field, single pre-lubricated sealed bearing, air cooled by a direct drive centrifugal blower fan, and directly connected to the engine with flexible drive disc rotating integrally with generator rotor.

B. Comply with NEMA MG 1

C. Enclosure: Drip-proof, Onan-green aluminum level -2 sound attenuated & weather protective enclosure, 69.3 dB(A) at 23 feet.

D. Electrical Insulation: Class H

E. Temperature Rise measured by resistance method at full load shall not exceed 105 degrees Fahrenheit.

F. Permanent Magnet Generator (PMG) shall provide excitation power for optimum motor starting and short circuit performance.

G. Construction shall prevent mechanical, electrical and thermal damage due to vibration, overspeed, up to 125 percent of rating, and head during operation at 110 percent of rated capacity.
H. Voltage regulator: solid-state type, separate from exciter, providing performance as specified. The voltage regulation system shall be microprocessor controlled, 3-phase true RMS sensing, full wave rectified, and provide a pulse-width modulated signal to the exciter. No exceptions or deviations of these requirements will be permitted.

I. The generator shall be capable of delivering rated output (kVA) at rated frequency and power factor, at any voltage not more than 5 percent above or below rated voltage.

J. AC Generator shall provide the full output rating of the generator set.

2.6 Generator Set Control:

A. The generator set shall be provided with a microprocessor-based control system that is designed to provide automatic starting, monitoring, and control functions for the generator set. The control system shall also be designed to allow local monitoring and control of the generator set, and remote monitoring and control as described in this specification.

B. The control shall be mounted on the generator set. The control shall be vibration isolated and prototype tested to verify the durability of all components in the system under the vibration conditions encountered.

C. The generator set mounted control shall include the following features and functions:

   1. Control Switches:
      a. Mode Select Switch: The mode select switch shall initiate the following control modes. When in the RUN or Manual position the generator set shall start, and accelerate to rated speed and voltage as directed by the operator. In the OFF position the generator set shall immediately stop, bypassing all time delays. In the AUTO position the generator set shall be ready to accept a signal from a remote device to start and accelerate to rated speed and voltage.

      b. EMERGENCY STOP Switch: Switch shall be Red "mushroom-head" push button. Depressing the emergency stop switch shall cause the generator set to immediately shut down, and be locked out from automatic restarting.

      c. RESET Switch: The RESET switch shall be used to clear a fault and allow restarting the generator set after it has shut down for any fault condition.

      d. PANEL LAMP Switch: Depressing the panel lamp switch shall cause the entire panel to be lighted with DC control power. The panel lamps shall
automatically be switched off 10 minutes after the switch is depressed, or after the switch is depressed a second time.

2. Generator Set AC Output Metering: The generator set shall be provided with a metering set including the following features and functions:

   a. Digital metering set, 0.5% accuracy, to indicate generator RMS voltage and current, frequency, output current, output KW, KW hours, and Power Factor. Generator output voltage shall be available in line to line and line to neutral voltages, and shall display all three-phase voltages (line-to-neutral or line-to-line) simultaneously.

   b. The control system shall monitor the total load on the generator set, and maintain data logs of total operating hours at specific load levels ranging from 0 to 110% of rated load, in 10% increments. The control shall display hours of operation at less than 30% load and total hours of operation at more than 90% of rated load.

   c. The control system shall log total number of operating hours, total kW-H, and total control on hours, as well as total values since reset.

3. Generator Set Alarm and Status Display

   a. The generator set control shall include LED alarm and status indication lamps. The lamps shall be high intensity LED type. The lamp condition shall be clearly apparent under bright room lighting conditions. Functions indicated by the lamps shall include:

       • The control shall include five configurable alarm-indicating lamps. The lamps shall be field adjustable for function, color, and control action (status, warning, or shutdown).
       • The control shall include green lamps to indicate that the generator set is running at rated frequency and voltage, and that a remote start signal has been received at the generator set. The running signal shall be based on actual sensed voltage and frequency on the output terminals of the generator set.
       • The control shall include a flashing red lamp to indicate that the control is not in automatic state, and red common shutdown lamp.
       • The control shall include an amber common warning indication lamp.

   b. The generator set control shall indicate the existence of the following alarms and shutdown conditions on an alphanumeric digital display panel:
• low oil pressure (alarm)
• low oil pressure (shutdown)
• oil pressure sender failure (alarm)
• low coolant temperature (alarm)
• high coolant temperature (alarm)
• high coolant temperature (shutdown)
• high oil temperature (warning)
• engine temperature sender failure (alarm)
• low coolant level (alarm or shutdown selectable)
• fail to crank (shutdown)
• fail to start/overcrank (shutdown)
• overspeed (shutdown)
• low DC voltage (alarm)
• high DC voltage (alarm)
• weak battery (alarm)
• high AC voltage (shutdown)
• low AC voltage (shutdown)
• under frequency (shutdown)
• over current (warning)
• over current (shutdown)
• short circuit (shutdown)
• over load (alarm)
• emergency stop (shutdown)

c. Provisions shall be made for indication of four customer specified alarm or shutdown conditions. Labeling of the customer-specified alarm or shutdown conditions shall be of the same type and quality as the above-specified conditions. The non-automatic indicating lamp shall be red, and shall flash to indicate that the generator set is not able to automatically respond to a command to start from a remote location.

d. The control shutdown fault conditions shall be configurable for fault bypass

4. Engine Status Monitoring
a. The following information shall be available from a digital status panel on the generator set control:

• engine oil pressure (psi or kPA)
• engine coolant temperature (degrees F or C)
• engine oil temperature (degrees F or C)
• engine speed (rpm)
• number of hours of operation (hours)
• number of start attempts
• battery voltage (DC volts)

b. The control system shall also incorporate a data logging and display provision to allow logging of the last 10 warning or shutdown indications on the generator set, as well as total time of operation at various loads, as a percent of the standby rating of the generator set.

5. Engine Control Functions:
   a. The control system provided shall include a cycle cranking system, which allows for user selected crank time, rest time, and # of cycles. Initial settings shall be for 3 cranking periods of 15 seconds each, with 15-second rest period between cranking periods.
   b. The control system shall include an idle mode control, which allows the engine to run in idle mode in the RUN position only. In this mode, the alternator excitation system shall be disabled.
   c. The control system shall include an engine governor control, which functions to provide steady state frequency regulation as noted elsewhere in this specification. The governor control shall include adjustments for gain, damping, and a ramping function to control engine speed and limit exhaust smoke while the unit is starting.
   d. The control system shall include time delay start (adjustable 0 - 300 seconds) and time delay stop (adjustable 0 - 600 seconds) functions.
   e. The control system shall include sender failure monitoring logic for speed sensing, oil pressure, and engine temperature which is capable of discriminating between failed sender or wiring components, and an actual failure conditions.

6. Alternator Control Functions:
   a. The generator set shall include a full wave rectified automatic digital voltage regulation system that is matched and prototype tested by the engine manufacturer with the governing system provided. It shall be immune from miss operation due to load induced voltage waveform distortion and provide a pulse width modulated output to the alternator exciter. The voltage regulation system shall be equipped with three phase RMS sensing and shall control buildup of AC generator voltage to provide a linear rise and limit overshoot. The system shall include a torque matching characteristic, which shall reduce output voltage in
proportion to frequency below an adjustable frequency threshold. Torque matching characteristic shall be adjustable for roll-off frequency and rate, and be capable of being curve-matched to the engine torque curve with adjustments in the field. The voltage regulator shall include adjustments for gain, damping, and frequency roll off. Adjustments shall be broad range, and made via digital raise-lower switches, with an alphanumeric LED readout to indicate setting level. Rotary potentiometers for system adjustments are not acceptable.

b. Controls shall be provided to monitor the output current of the generator set and initiate an alarm (over current warning) when load current exceeds 110% of the rated current of the generator set on any phase for more than 60 seconds. The controls shall shut down and lock out the generator set when output current level approaches the thermal damage point of the alternator (over current shutdown). The protective functions provided shall be in compliance to the requirements of NFPA70 article 445.

c. Controls shall be provided to individually monitor all three phases of the output current for short circuit conditions. The control/protection system shall monitor the current level and voltage. The controls shall shut down and lock out the generator set when output current level approaches the thermal damage point of the alternator (short circuit shutdown). The protective functions provided shall be in compliance to the requirements of NFPA70 article 445.

d. Controls shall be provided to monitor the KW load on the generator set, and initiate an alarm condition (over load) when total load on the generator set exceeds the generator set rating for in excess of 5 seconds. Controls shall include a load shed control, to operate a set of dry contacts (for use in shedding customer load devices) when the generator set is overloaded.

e. An AC over/under voltage monitoring system that responds only to true RMS voltage conditions shall be provided. The system shall initiate shutdown of the generator set when alternator output voltage exceeds 110% of the operator-set voltage level for more than 10 seconds, or with no intentional delay when voltage exceeds 130%. Under voltage shutdown shall occur when the output voltage of the alternator is less than 85% for more than 10 seconds.

7. Other Control Functions:
   a. The generator set shall be provided with a network communication module to allow LonMark compliant communication with the generator set control by remote devices. The control shall communicate all engine and alternator data,
and allow starting and stopping of the generator set via the network in both test and emergency modes.

b. A battery monitoring system shall be provided which initiates alarms when the DC control and starting voltage is less than 13 Volts DC or more than 17 Volts DC. During engine cranking (starter engaged), the low voltage limit shall be disabled, and DC voltage shall be monitored as load is applied to the battery, to detect impending battery failure or deteriorated battery condition.

8. Control Interfaces for Remote Monitoring:
   a. The control system shall provide two programmable output relays. These relay outputs shall be configurable for any alarm, shutdown, or status condition monitored by the control. The relays shall be configured to indicate: generator set operating at rated voltage and frequency and common shutdown.

   b. A fused 10 amp switched 12VDC power supply circuit shall be provided for customer use. DC power shall be available from this circuit whenever the generator set is running.

c. A fused 10 amp 12VDC power supply circuit shall be provided for customer use. DC power shall be available from this circuit at all times from the engine starting/control batteries.

d. The control shall be provided with a direct serial communication link for the ModBus communication network interface.

2.7 – Base:
   A. The engine-generator set shall be mounted on a heavy duty steel base to maintain alignment between components. The base shall incorporate a battery tray with hold-down clamps within the rails.

2.8 – Outdoor Enclosure:
   A. The generator set shall be provided with a factory installed weather protective housing which allows the generator set to operate at full rated load in the ambient conditions previously specified. The enclosure shall reduce the sound level of the generator set while operating at full rated load to a maximum of 69.3 dB(A) at 23 feet from the generator set in a free field environment. Housing materials shall be aluminum. Fiberglass and plastic are not acceptable. Acoustical materials used shall be oil and water resistant. No foam materials shall be used. Housing shall have hinged side access doors to access the engine and controls. All doors shall be lockable.
B. The enclosure shall include hinged doors for access to both sides of the engine and alternator, and the control equipment. Key locking and pad-lockable door latches shall be provided for all doors. Door hinges shall be stainless steel.

C. The enclosure shall be provided with an exhaust silencer which is mounted within the enclosure, and allows the generator set package to meet the specified sound level requirements. Silencers that are mounted on the roof of the enclosure will not be acceptable.

D. All sheet metal shall be primed for corrosion protection and finish painted with the manufactures standard color using a two-step electro coating painting process, or equal meeting the performance requirements specified below. Metal parts surfaces shall be prepared, primed and painted. The painting process shall result in a coating which meets these following requirements:

1. Primer thickness, 0.5-2.0 mils. Top coat thickness, 0.8-1.2 mils.
2. Gloss, per ASTM D523, 80% plus or minus 5%. Glass retention after one year shall exceed 50%
3. Crosshatch adhesion, per ASTM D3359, 4B-5B.
5. Salt spray, per ASTM B117, 1000+ hours
6. Humidity, per ASTM D2247, 1000+ hours
7. Water soak, per ASTM D2247, 1000+ hours

E. Painting of hoses, clamps, wiring harness, and other non-metallic service parts will not be acceptable. Fasteners used shall be corrosion resistant, and designed to minimize marring of the painted surface when removed for normal installation or service work. The enclosure shall be built and tested by the engine generator manufacturer.

F. Provide oil & coolant drain extension with shut-off maintenance valve.

G. Enclosure shall be rodent proofed

H. Generator Set Auxiliary Equipment and Accessories:
  A. **Engine Block Heater**: Engine mounted, thermostatically controlled, block heater for each engine. The heater shall be sized as recommended by the generator set manufacturer for extreme cold environment conditions. Heater voltage shall be 120 VAC single phase. Provide proper power supply circuits for the heater as required for the voltage and load of the heater, connected to a normally served distribution circuit.
B. **Oil Heater:** A 120 VAC single phase heater shall be provided to keep the engine oil warm for easier starting. Provide proper power supply circuits for the heater as required for the voltage and load of the heater, connected to a normally served distribution circuit.

C. **Exhaust Silencer:** Exhaust muffler shall be provided for each engine, size and type as recommended by the generator set manufacturer. The mufflers shall be critical grade. Exhaust system shall be installed prior to shipment by the manufacturer. Silencer must be located inside of the generator housing. Silencer mounted on the exterior (on the roof) of the generator enclosure are NOT Acceptable.

D. **Starting and Control Batteries/Battery Charger:** Starting battery bank, lead acid type, 12 volts DC, sized as recommended by the generator set manufacturer, shall be supplied for each generator set with battery cables and connectors. Provide an internally 6 amp battery charger shall be pre-mounted with the generator enclosure and pre-wired to the DC output side.

E. **Battery Charger:** A 10 amp voltage regulated battery charger shall be provided loose and installed indoors. Input AC voltage and DC output voltage shall be as required. Charger shall be equipped with float, taper and charger settings. Operational monitors shall provide visual output analog with individual form C contacts rated at 4 amp, 120 Volts AC, 30 volts DC for remote indication of:

   a. Loss of AC power – red light
   b. Low battery voltage – red light
   c. High battery voltage – red light
   d. Power On – green light (no relay contact)

F. **Generator main circuit breaker:** One (1) generator mounted and wired output circuit breaker, UL listed, molded case type, thermal magnetic, rated at 175 amps adjustable, 3-Pole, 600 volts. Submittals shall demonstrate that the circuit breaker provides proper protection for the alternator by a comparison of the trip characteristic of the breaker with the thermal damage characteristic of the alternator. Field circuit breakers shall not be acceptable for generator overcurrent protection.

G. **Remote Annunciator:** Provide and install a 20 light, LED type, remote alarm annunciator panel with horn, located as shown on the drawings or in a location that can be conveniently monitored by facility personnel. The remote annunciator shall provide all the audible and visual alarms called for by NFPA Standard 110 for level 1 systems for the local generator control panel. Provisions for labeling of the annunciator in a fashion consistent with the specified functions shall be provided. Alarm silence and lamp test
switches shall be provided. LED lamps shall be replaceable, and indicating lamp colors shall be capable of changes as needed for specific application requirements. Alarm horn shall be switchable for all annunciation points. Alarm horn (when switched on) shall sound for first fault, and all subsequent faults, regardless of whether first fault has been cleared, in compliance with the NPFA110 3-5.6.2. The interconnecting of the communication wiring between the annunciator and other system components shall be monitored for failure of the interconnections between the components and displayed on the annunciator panel.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Lamp Color</th>
<th>Audible Alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Fault #1</td>
<td>Green</td>
<td>No</td>
</tr>
<tr>
<td>Customer Fault #1</td>
<td>Amber</td>
<td>No</td>
</tr>
<tr>
<td>Customer Fault #1</td>
<td>Red</td>
<td>No</td>
</tr>
<tr>
<td>Genset Supplying Load</td>
<td>Amber</td>
<td>No</td>
</tr>
<tr>
<td>Charger AC Failure</td>
<td>Amber</td>
<td>Yes</td>
</tr>
<tr>
<td>Low Coolant Level</td>
<td>Amber</td>
<td>Yes</td>
</tr>
<tr>
<td>Low Fuel Level</td>
<td>Red</td>
<td>Yes</td>
</tr>
<tr>
<td>Check Generator Set</td>
<td>Amber</td>
<td>No</td>
</tr>
<tr>
<td>Not in Auto</td>
<td>Red (Flashing)</td>
<td>Yes</td>
</tr>
<tr>
<td>Generator Set Running</td>
<td>Amber</td>
<td>No</td>
</tr>
<tr>
<td>High Battery Voltage</td>
<td>Amber</td>
<td>Yes</td>
</tr>
<tr>
<td>Low Battery Voltage</td>
<td>Red</td>
<td>Yes</td>
</tr>
<tr>
<td>Weak Battery</td>
<td>Red</td>
<td>Yes</td>
</tr>
<tr>
<td>Fail to Start</td>
<td>Red</td>
<td>Yes</td>
</tr>
<tr>
<td>Low Coolant Temperature</td>
<td>Red</td>
<td>Yes</td>
</tr>
<tr>
<td>Pre-High Engine Temperature</td>
<td>Amber</td>
<td>Yes</td>
</tr>
<tr>
<td>High Engine Temperature</td>
<td>Red</td>
<td>Yes</td>
</tr>
<tr>
<td>Pre-Low Oil Pressure</td>
<td>Red</td>
<td>Yes</td>
</tr>
<tr>
<td>Low Oil Pressure</td>
<td>Red</td>
<td>Yes</td>
</tr>
<tr>
<td>Overspeed</td>
<td>Red</td>
<td>Yes</td>
</tr>
<tr>
<td>Network OK</td>
<td>Green</td>
<td>No</td>
</tr>
</tbody>
</table>
H. Remote Emergency Stop Switch: Shall be surfaced wall mounted inside the building and labeled. Push button shall be protected from accidental operation. Coordinate final location with owner.

SECTION 3.0 – AUTOMATIC TRANSFER SWITCH

3.1 – Power Transfer Switch:
A. Ratings:
   1. The automatic transfer switch shall be a Cummins/Onan OTECB-225, 3-pole, 277/480 volts AC, 3-phase, 4-wire and furnished in a NEMA Type 1 cabinet.

   2. Main contacts shall be rated for 600 volts AC

   3. Transfer switches shall be rated to carry 100 percent (%) of rated current continuously in the enclosure supplied, in ambient temperatures of 40 to +60 degrees C, relative humidity up to 95% (non-condensing), and altitudes up to 10,000 feet (3,000 Meters).

   4. Transfer switch equipment shall have withstand and closing ratings (WCR) in RMS symmetrical amperes greater than the available fault currents shown on the drawings. The transfer switch and its upstream protection shall be coordinated. The transfer switch shall be third party listed and labeled for use with the specific protective device(s) installed in the application. The automatic transfer switch shall have a minimum withstand and close-on rating of 30,000 amps @ 600 volts AC

B. Construction:
   1. Transfer switches shall be double throw, electrically and mechanically interlocked, and mechanically held in the source 1 and source 2 positions. The transfer switch shall be specifically designed to transfer to the best available source if it inadvertently stops in a neutral position.

   2. Transfer switches rated through 1000 amperes shall be equipped with permanently attached manual operating handles and quick break, quick make over center contact mechanisms. Transfer switches over 1000 amperes shall be equipped with manual operators for service use only under de energized conditions.

   3. Main switch contacts shall be high pressure silver alloy. Contact assemblies shall have arc chutes for positive arc extinguishing. Arc chutes shall have insulating covers to prevent inter-phase flashover.
4. Transfer switch internal wiring shall be composed of pre-manufactured harnesses that are permanently marked for source and destination. Harnesses shall be connected to the control system by means of locking disconnect plug(s), to allow the control system to be easily disconnected and serviced without disconnecting power from the transfer switch mechanism.

5. Transfer switch shall be provided with flame retardant transparent covers to allow viewing of switch contact operation but prevent direct contact with line voltage components.

6. Transfer switches shall be 3-pole shall be provided with a neutral bus and lugs. The neutral bus shall be sized to carry 100% of the current designated on the switch rating.

C. Connections:
   1. Field control connections shall be made on a common terminal block that is clearly and permanently labeled.

   2. Transfer switch shall be provided with AL/CU mechanical lugs sized to accept the full output rating of the generator set.

3.2 Enclosure:
   A. Enclosures shall be UL listed. The enclosure shall provide NEC wire bend space. The cabinet door shall be key locking.

   B. Transfer switches shall be mounted in NEMA Type 1 enclosure. Manual operating handles and all control switches (other than key operated switches) shall be accessible to authorized personnel only by opening the key locking cabinet door. Transfer switches with manual operating handles located on outside of cabinet do not meet this specification and are not acceptable.

   C. The cabinet shall provide code-required wire bend space at point of entry as shown on the drawings.

3.3 Transfer Switch Control:
   A. Solid state under voltage sensors shall simultaneously monitor both sources. Pick up and drop out settings shall be adjustable.

   B. Automatic controls shall signal the engine generator set to start upon signal from normal source sensor. Solid state time delay start, adjustable from 0 to 10 seconds
(factory set at 3 seconds) shall avoid nuisance startups. Battery voltage starting contacts shall be gold-flashed dry type contacts, factory wired to a field wiring terminal block.

C. The switch shall transfer when the emergency source reaches the set point. Provide a solid state time delay on transfer, adjustable from 0 to 300 seconds, factory set at 5 seconds.

D. The switch shall retransfer the load to the normal source after a time delay retransfer, adjustable from 0 to 30 minutes, factory set at 10 minutes. Retransfer time delay shall be immediately bypassed if the emergency power source fails.

E. Controls shall signal the engine generator set to stop after a time delay, adjustable from 0 to 10 minutes, and factory set at 5 minutes, beginning on return to the normal source.

F. The control system shall include field adjustable provisions to control the speed of operation of the transfer switch power contacts. In addition, the control shall include a field-configurable in-phase monitor function that causes the transfer to be initiated only when the sources are in phase. When in-phase transfer is enabled and transfer does not occur within 120 seconds, the control shall automatically transfer the load using delayed transfer.

G. Provide a field-configurable exerciser clock with provisions for operating the generator set for a test period at 7, 14, 21, or 28-day intervals in either with-load or without-load configuration. Operation time of the generator set shall be field configurable. Exerciser clock functions that require setting the test time by pressing an exercise button at the desired time of exercise (only) shall not be acceptable.

H. Power for the transfer switch operation shall be derived from the source to which the load is being transferred.

I. The transfer switch shall be provided with a battery charger for the generator set starting batteries. The battery charger shall be a float type charger rated 2 amps. The battery charger shall include an ammeter for display of charging current and shall have fused DC outputs.

3.4 – Front Panel Devices:
Provide control switches mounted and indicating lights mounted on the cabinet front for:

A. TEST: Simulates normal power loss to control for testing of generator set. Controls shall provide for a test with or without load transfer.
B. OVERRIDE: Momentary position to override retransfer time delay and cause immediate return to normal source, if available.

C. Provide LED-type switch position and source available indicator lamps on the front of the transfer switch cabinet.

3.5 – Control Interfaces:
A. The transfer switch will provide an isolated relay contact for starting of a generator set. The relay shall be normally held open, and close to start the generator set.

B. Provide one set Form C auxiliary contacts, operated by transfer switch position, for remote indication of transfer switch position. Contacts shall be rated 10 amps at 250 VAC.

3.6 – Sequence of Operation (Open Transition):
A. Transfer switch normally connects an energized utility power source (source 1) to loads and a generator set (source 2) to the loads when normal source fails. The normal position of the transfer switch is source 1 (connected to the utility), and no start signal is supplied to the genset.

B. Generator Set Exercise (Test) With Load Mode. The control system shall be configurable to test the generator set under load. In this mode, the transfer switch shall control the generator set in the following sequence:

C. Transfer switch control shall initiate the exercise sequence at a time indicated in the exercise timer program, or when manually initiated by the operator (test).

1. When the control systems senses the generator set at rated voltage and frequency, it shall operate to connect the loads to the generator set by opening the normal source contacts, and closing the alternate source contacts a predetermined time period later. The timing sequence for the contact operation shall be programmable in the controller.

2. The generator set shall operate connected to the load for the duration of the exercise period. If the generator set fails during this period, the transfer switch shall automatically reconnect the generator set to the normal service.

3. On completion of the exercise period, the transfer switch control shall operate to connect the loads to the normal source by opening the alternate source contacts, and closing the normal source contacts a predetermined time period later. The timing sequence for the contact operation shall be programmable in the controller.
4. The transfer switch shall operate the generator set unloaded for a cooldown period, and then remove the start signal from the generator set. If the normal power fails at any time when the generator set is running, the transfer switch shall immediately connect the system loads to the generator set.

D. Generator Set Exercise (Test) Without Load Mode. The control system shall be configurable to test the generator set without transfer switch load connected. In this mode, the transfer switch shall control the generator set in the following sequence:
1. Transfer switch control shall initiate the exercise sequence at a time indicated in the exercise timer program, or when manually initiated by the operator.
2. The control system shall operate the generator set unloaded for the duration of the exercise period.
3. At the completion of the exercise period, the transfer switch control shall remove the start signal from the generator set. If the normal power fails at any time when the generator set is running, the transfer switch shall immediately connect the system loads to the generator set.

SECTION 4.0 – FACTORY TESTING:

4.1 – Factory Testing:
A. The transfer switch supplier shall perform a complete operational test on the generator and transfer switch prior to shipping from the factory.

B. A certified factory test report shall be provided upon request. The process shall include calibration of voltage sensors.

SECTION 5.0 – INSTALLATION, ON-SITE ACCEPTANCE TESTS AND OWNER TRAINING:

5.1 – Installation: (by others, not included in this bid)
A. The equipment shall be installed by the contractor in accordance with final submittals and contract documents. Installation shall comply with applicable state and local codes as required by the authority having jurisdiction (AHJ). Install equipment in accordance with manufacturer's instructions and instructions included in the listing or labeling of UL listed products.
B. Installation of equipment shall include furnishing and installing all interconnecting wiring between all major equipment provided for the on-site power system. The contractor shall also perform interconnecting wiring between equipment sections (when required), under the supervision of the equipment supplier.

C. Equipment shall be installed on concrete housekeeping pads. Equipment shall be permanently fastened to the pad in accordance with manufacturer’s instructions and seismic requirements of the site.

D. Equipment shall be initially started and operated by representatives of the manufacturer.

E. All equipment shall be physically inspected for damage. Scratches and other installation damage shall be repaired prior to final system testing. Equipment shall be thoroughly cleaned to remove all dirt and construction debris prior to final testing of the system.

5.2 – On-Site Acceptance Test:
A. The complete installation shall be tested for compliance with the specification following completion of all site work. Testing shall be conducted by representatives of the manufacturer, with required fuel supplied by Contractor.

B. Installation acceptance tests to be conducted on site shall include a two (2) hour resistive load bank test at full load. Data shall be recorded every 15 minutes. After the load bank test a pull the plug test and a transfer test using the building load shall be performed to test the entire system integrity.

5.3 – Owner Training
A. Provide a manufacturer’s representative to train and instruct the owner on operation and basic maintenance of the generator set and associated equipment. All training shall be performed and demonstrated in front of the equipment. Training shall be scheduled in advance and coordinated with the owner.
PLEASE

IT IS A REQUIREMENT OF THIS BID THAT EACH PROPOSAL SUBMITTED MUST HAVE A DUPLICATE COPY ATTACHED.

YOUR COOPERATION IS APPRECIATED
TOWN OF WATERTOWN
WATERTOWN, CONNECTICUT 06795

BID PROPOSAL
50kw Generator & Automatic Transfer Switch
Watertown Water & Sewer Authority

BID OPENING: 11:00 a.m. Thursday March 15, 2018

TO: Jason Warner, Purchasing Agent
   Town of Watertown
   Town Hall Annex
   424 Main Street
   Watertown, CT 06795

The undersigned, as bidder, agrees to furnish all materials, labor and equipment as specified herein and declares that no person or persons, other than those named herein, are interested in this Proposal; that this Proposal is made without collusion with any person, firm, or corporation; that he has carefully examined the location of the proposed work; that no person or persons acting in any official capacity for the Town is directly or indirectly interested therein or in any portion of the profit thereof; and that he proposes and agrees, if this Proposal is accepted, to provide all necessary equipment, tools, labor and deliver and to do all work and furnish all materials specified in the manner and time herein prescribed, and according to the requirements of the Town as herein set forth, and that he will take in full payment therefor, the following unit prices and lump sums, to wit:

---

NAME ______________________________________________________________________
Please Print

TELEPHONE NUMBER _______________________________________________________

FAX NUMBER  ______________________________________________________________

EMAIL ADDRESS ____________________________________________________________

SIGNED ___________________________ DATE ____________________

---
PROPOSAL

Note: Bidders submitting proposals for more than one generator and/or transfer switch are asked to photocopy this page and submit each on a separate proposal page, marking each as Proposal #1, Proposal #2, etc.

Generator:

Make:___________________________ Model:____________________________________

Kw:____________________________

Total Cost of Generator & Transfer Switch: $____________________________

Payment Terms _________________________________________________________________

Availability _________________________________Working Days

Time to Completion _________________________________ Working Days

Warranty ______________________________________________________________________

Nearest Factory Service Center ____________________________________________
Have you taken any exceptions or have you deviated from our printed specification and if so, are such suggested changes clearly noted on the page provided for exceptions to specifications?

___ yes

___ no

EXCEPTIONS TAKEN TO SPECIFICATIONS:

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________
# RECEIPT OF ADDENDA

<table>
<thead>
<tr>
<th>ADDENDUM #</th>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NAME OF BIDDER: __________________________________________________________

OFFICIAL ADDRESS: _________________________________________________________

PHONE NUMBER: __________________________________________________________

BY: ___________________________ TITLE: ______________________________

(Please Print)

DATE:__________________________________________________________________

SIGNATURE:________________________________________________________________
PROPOSED SUBCONTRACTORS

FIRM ____________________________________________________________

Name __________________________________________________________

Street __________________________________________________________________________

City State Zip Code

CONTACT ____________________________________TELEPHONE____________________

Please Print

TYPE OF WORK TO BE PERFORMED ____________________________________________

______________________________________________________________________________

FIRM ____________________________________________________________

Name __________________________________________________________

Street __________________________________________________________________________

City State Zip Code

CONTACT ____________________________________TELEPHONE____________________

Please Print

TYPE OF WORK TO BE PERFORMED ____________________________________________

______________________________________________________________________________

FIRM ____________________________________________________________

Name __________________________________________________________

Street __________________________________________________________________________

City State Zip Code

CONTACT ____________________________________TELEPHONE____________________

Please Print

TYPE OF WORK TO BE PERFORMED ____________________________________________

______________________________________________________________________________
REFERENCES
Please list a minimum of three references of similar work performed within the last three years.

FIRM ____________________________________________________________________________

Name ____________________________________________________________________________

Street ____________________________________________________________________________

City State Zip Code __________________________________________________________________

CONTACT ________________________________ TELEPHONE ____________________________

Please Print
TYPE OF WORK TO BE PERFORMED ________________________________________________

______________________________________________________________________________

FIRM ____________________________________________________________________________

Name ____________________________________________________________________________

Street ____________________________________________________________________________

City State Zip Code __________________________________________________________________

CONTACT ________________________________ TELEPHONE ____________________________

Please Print
TYPE OF WORK TO BE PERFORMED ________________________________________________

______________________________________________________________________________

FIRM ____________________________________________________________________________

Name ____________________________________________________________________________

Street ____________________________________________________________________________

City State Zip Code __________________________________________________________________

CONTACT ________________________________ TELEPHONE ____________________________

Please Print
TYPE OF WORK TO BE PERFORMED ________________________________________________

______________________________________________________________________________