

**LEGAL NOTICE
NOTICE TO BIDDERS**

NOTICE IS HEREBY GIVEN, that the Town Board of the Town of Thompson will receive bids in accordance with specifications prepared therefore, which may be obtained without charge at the Office of the Town Clerk of the Town of Thompson, Town Hall, 4052 State Route 42, Monticello, New York for the following item:

Two (2) Standby Power Generators

Said bids shall be mailed or delivered so that they shall be received at the office of the said Town Clerk on or before 2:00 o'clock P.M., Prevailing Time on Thursday, March 11, 2021 at which date and hour all bids shall be publicly opened and read.

By Order of the Town Board
Dated Monticello, New York
February 02, 2021
Marilee J. Calhoun
Town Clerk

RE: NOTICE TO BIDDERS:

Attached you will please find a copy of the Town of Thompson Bid Specifications
For **Two (2) Standby Power Generators**

Your bid is due no later than 2:00 P.M. on the 11th day of March, 2021, and should be
returned to the Town Clerk in a **SEALED ENVELOPE** clearly marked **Bid Enclosed:**
Standby Power Generators

If you have any questions regarding the Bid Specifications, please feel free to contact me
at the above telephone number.

Thanking you in advance for your participation in this bid.

Very truly yours,

Michael Messenger
Superintendent

TOWN OF THOMPSON

4052 ROUTE 42 – TOWN HALL
Monticello, New York 12701
845-794-2500

COMPETITIVE BID PACKAGE Two (2) Standby Power Generators

INSTRUCTIONS TO BIDDERS
SPECIFICATIONS
BIDDER PROPOSAL

WILLIAM J. RIEBER
Supervisor

MICHAEL B. MEDNICK
Attorney for the Town

The enclosed Instructions to Bidders, Specifications and Bidder's Proposal are forms upon which the Town of Thompson accepts competitive bids pursuant to the provisions of the General Municipal Law. As a bidder you are expected to know and understand the terms and conditions contained in this package. Your failure to comply with the terms and conditions upon which bids are accepted may result in disqualification of your bid. Be certain of the time when your bid must be submitted.

INSTRUCTIONS TO BIDDERS

DESCRIPTION. Two (2) 40 KW Generac Model SD 40 engine generator

PRICE. Price shall be net and shall include delivery of generators to the location specified upon ordering, and all transportation and delivery charges shall be included to point of delivery.

DELIVERIES & LOCATIONS. Deliveries are ordered for a Town owned Wastewater Treatment Facility located at 128 Rock Ridge Drive, Monticello, NY 12701. No drop shipments will be accepted, and all deliveries must be signed for by a Town representative upon delivery.

TAXES. Purchases by the Town of Thompson for its use are not subject to any sales, use or federal excise taxes and exemption certificates will be executed upon request and payment.

AWARD. Award of the bid shall be made by the appropriate officer of the Town of Thompson. In cases where two or more responsible bidders submit identical bids as to price, the contract may be awarded to either of such bidders. The award shall be made on the most advantageous bid, on a quality versus price basis, taking into consideration the responsibility of the bidder and materials or items deemed to be best adapted to the uses of the Town of Thompson. Failure on the part of the successful bidder to comply with all terms of the contract and specification as set forth herein, may result in disqualification of the bidder from future bidding, and/or termination of the contract. The Town of Thompson or department awarding the bid reserves the right to waive any formalities or reject any and all bids, or to accept any bid which its deems in the best interests of the Town of Thompson.

INFORMATION FURNISHED WITH BID. Bidder must submit with its bid-detailed specifications, illustrated circulars and all other necessary data on the materials or items it proposes to furnish.

METHOD OF SUBMITTING BIDS. All bids shall be made upon and in accordance with the forms, which contain these instructions to bidders and the specifications, which shall be available from the Town Clerk. Bids shall be completed on the page provided and submitted in **sealed envelopes, marked on the outside, “STANDBY POWER GENERATOR BID”** addressed to the **Town Clerk, Town of Thompson, 4052 Route 42, Monticello, New York 12701**, and shall bear upon the face thereof the name and address of the bidder.

SUBMISSION AND OPENING OF BIDS. Bids for consideration must be submitted to the above address or be in the possession of the Town Clerk not later than **2:00pm on March 11, 2021**, at which time the bids will be publicly opened and read.

BIDDER GUARANTEES TO MEET STANDARDS ESTABLISHED BY THE SPECIFICATIONS.

NO BID MAY BE WITHDRAWN BY ANY BIDDER FOR A PERIOD OF 45 DAYS FROM THE DATE OF BID OPENING.

BIDS MUST BE SUBMITTED WITH EACH ITEM BID SEPRATELY AND AS A PACKAGE, TOWN RESERVES THE RIGHT TO ACCEPT BID BY ITEM OR AS A PACKAGE.

BID AS CONTRACT. This bid, including the Instructions to Bidders, Specifications and Proposal annexed hereto, shall constitute a contract between the Town of Thompson and the bidder, upon acceptance and award, in accordance with its terms, unless otherwise provided herein. The “Standard Contract Rider” attached hereto shall apply to and be incorporated herein by reference. If there shall be a conflict between the terms of these instructions and the Standard Contract Rider, the terms of the Standard Contract Rider shall prevail. For the purposes of the Standard Contract Rider, the term “VENDOR” shall mean the bidder herein. Supervision of performance of this bid and contract shall be performed by the Superintendent or Assistant Superintendent of Water & Sewer.

EQUAL OPPORTUNITY. The bidder will return the bid proposal with the Contractor’s Assurance on Equal Opportunity duly signed, a finding by any governmental agency that the bidder has discriminated against any individual shall be grounds for any future termination of the contract to which this bid relates and ineligibility for any future contract with the town, unless a certificate of compliance with any decision, ruling or order is obtained.

INSURANCE. The provisions of paragraph 11 of the Standard Contract Rider are hereby modified to provide that insurance to be furnished to the Town by the bidder is as follows:

Public Liability Limit: \$1,000,000

Other Insurance: Property Damage Insurance \$1,000,000

Except as modified with respect to limits of liability, all other provisions of said paragraph shall remain in full force.

NOTICE: *No contractor to whom this contract is let, granted or awarded, shall assign, transfer, convey, sublet otherwise dispose of same, or his right, title and interest herein, including the performance of this contract, or the right to receive monies due or to become due, or of his power to execute this contract to any person or corporation without the prior written consent of the officer, board or agency which awarded this contract. In the event that the contractor shall, without prior written consent, assign, transfer, convey, sublet otherwise dispose of same, or his right, title and interest herein, including the performance of this contract, or the right to receive monies due or to become due, or of his power to execute this contract to any person or corporation, or upon receipt by the Town of an attachment, levy, or execution on the proceeds due or to become due under this contract against the contractor, the Town and the officer, board or agency shall be relieved and discharged from any and all liability and obligations growing out of such contract to such contractor, and the person or cooperation to which such contract shall have been assigned transferred, conveyed, sublet, or otherwise disposed of, and such contractor and his assignees, transferees or subleases shall forfeit and lose all monies theretofore earned under this contract, except so much as may be required to pay his employees.*

PROPOSAL

TO: Superintendent of the Town of Thompson Water & Sewer Department,

The undersigned, having a principal place of business at the address set forth below being experienced and responsible for the performance of same, agrees to furnish and deliver to the Town of Thompson at the locations, herein specified, the following described item, material or service in accordance with the attached specifications and described in detail below (attach material to proposal, if necessary).

NON-COLLUSIVE BIDDING CERTIFICATION

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid, each party thereto certifies as to its own organization, under the penalty of perjury, that to the best of his knowledge or belief: (1) The prices of this bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor; (2) unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and (3) no attempt has been made or will be made by any bidder to insure any other person, partnership or corporation to submit or not to submit a bid for the purposes of restriction competition.

Two (2) Standby Power Generators

Price: _____

_____	_____
Company Name	Telephone
_____	_____
Contact Person(s)	Address
_____	_____
Title(s)	City, State, Zip
_____	_____
Signature	Date

*****Do not write below this line*****

ACCEPTED [] Date: _____

REJECTED []

Comments:

Signature

**Sackett Lake Sewer District
Town of Thompson
STANDBY POWER GENERATOR**

SECTION 16000

STANDBY POWER GENERATOR

PART 1 - GENERAL

1.1 SCOPE:

- A. Scope of work includes but is not limited to:
 - 1. Standby engine generator unit
 - 2. Muffler, battery charger, automatic transfer switch and other accessories to make system complete and ready to operate.
 - 3. Wiring of block heater, and battery charger.
 - 4. Weatherproof Sound Attenuated Enclosure
 - 6. Automatic Transfer Switch
 - 7. Warranty

1.2 QUALITY ASSURANCE:

- A. Codes and Standards: Refer to Section 16000.

1.3 SUBMITTALS:

- A. Shop Drawings: Submit for approval all items listed in Paragraph 1.1.B.

1.4 WARRANTY:

- A. Provide a two (2) year warranty for the standby power system. The standby power system shall consist of the generator set, controls and automatic transfer switch. The warranty shall cover all parts, labor and travel expenses. The warranty shall be effective from date of substantial completion. The contractor shall submit the manufacturer's warranty for approval.

PART 2 - PRODUCTS

2.1 ENGINE - GENERATOR SET:

- A. Standby generator shall be furnished as Generac Model SD 40 engine - generator set
- B. Set shall be rated for 40 KW, 50 KVA, at 0.8 PF, 60 Hz. 3 phase 4 wire, 120/240 Volts on a continuous standby basis. Engine generator set shall be mounted on a heavy duty steel base to maintain proper alignment between components, and shall incorporate vibration isolators of the type and quantity as specified by the set manufacturer.
- C. Generator sets furnished by Detroit Diesel Cummins or Caterpillar Manufacture shall be considered equal providing all aspects of this specification are met.

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D. Engine: Engine shall be stationary, 4 cycle, turbocharged, liquid cooled, 1800RPM. Engine shall be capable of driving the generator of this rating on a continuous standby basis for the duration of normal source interruptions per SAE J1349 conditions.

E. **Engine components shall include the following:**

1. A 12/24 volt DC, solenoid shift, electric starter as required by manufacturer.
2. Positive displacement, mechanical full pressure lubrication oil pump, full flow lubrication spin-on oil filter, pressure relief valve, dipstick oil level indicator, and oil drain valve with hose extension.
3. Heavy duty dry element air cleaner.
4. Electronic governing system to control generator system frequency.
5. Engine mounted thermostatically controlled water jacket heater to aid in quick starting. Heater shall be rated single-phase, 120volts, 1,500 watts and shall be disconnected whenever the engine starts. Or Manufacturers recommended size for this specific engine.
6. Engine protection devices shall have sensing elements located on the engine to initiate the following preliminary alarms and engine shutdowns:

Low coolant temperature alarm	Low Lubrication oil pressure alarm
High coolant temperature alarm	Low lubrication oil pressure shutdown
High coolant temperature shutdown	Overspeed shutdown
Overcrank lockout	

7. The use of a 925CCA engine starting battery with a 45 amp charging alternator, with solid-state voltage regulator.

F. **Engine Cooling System:**

1. The engine shall be cooled by a unit-mounted closed loop radiator system including belt-driven pusher fan, coolant pump and thermostat temperature control. The cooling system shall be rated for full rated load operation in 104 degrees F (40 degrees C) room ambient condition with the ambient temperature as measured at the generator air inlet. The cooling capability of the generator set shall be demonstrated by prototype tests on a representative generator set model. These tests will be conducted by the generator set manufacturer; calculated data from the radiator manufacturer only is not sufficient.
2. The cooling system shall be filled with 50/50 ethylene glycol/water mixture by the equipment supplier.
3. Rotating parts shall be guarded against accidental contact.

G. **Engine Exhaust System:**

1. Exhaust muffler shall be provided for engine of size recommended by manufacturer. Muffler shall be of the critical type. Furnish with 1/2" drain. Muffler shall be mounted inside the generator enclosure.

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Town of Thompson
STANDBY POWER GENERATOR**

2. Flexible stainless exhaust connection shall be provided as required for connection between the engine manifold and exhaust line, in compliance with applicable codes and regulations.
3. Provide rain cap at exhaust pipe termination.

H. Fuel System:

1. Engine fuel piping shall be factory installed, ready for final connection by contractor.

I. Generator:

1. Alternator shall be 40kW to assist in motor starting and harmonic content mitigation.
2. Generator shall be single-bearing, self-aligning, four-pole, synchronous type, revolving field 2/3 pitch, with amortisseur windings, with direct drive centrifugal blower for proper cooling and minimum noise, with temperature compensated solid-state voltage regulator, with Permanent Magnet Generator (PMG) exciter system.
3. Generator shall be directly connected to engine flywheel housing and driven through a flexible coupling to insure permanent alignment; gear driven generators are not acceptable under this specification.
4. Insulation shall meet NEMA standards for Class H. The maximum temperature rise shall not exceed 120 deg.C. at 40 deg.C. ambient under standby ratings. Generator design shall prevent potentially damaging shaft currents.
5. The broad range reconnectable generator shall have 12 leads brought out to allow connection by user to obtain any of the available voltages for the unit.
6. Voltage regulator shall be solid-state design and shall function by controlling the exciter magnetic field between stator and rotor to provide no load to full load regulation of rated voltage within 2% during steady-state conditions. The engine set and regulator must sustain at least 90% of no load voltage for ten (10) seconds with 250% of rated load at near zero power factor connected to its terminals.
The voltage regulator shall be of an asynchronous pulse width modulated design that it insensitive to severe load induced waveshape distortion from SCR or thyrister circuits such as those used in battery charging (UPS) and motor speed control equipment.
A rheostat shall provide a minimum of 5% voltage adjustment from rated value.
7. The generator, exciter and voltage regulator shall be designed and manufactured by the engine-generator set manufacturer so that the characteristics shall be matched to the torque curve of the prime mover. This design allows the prime mover to use its fullest power producing capacity (without exceeding it or over compensating) at speeds lower than rated, to provide the fastest possible system recovery from transient speed dips. A system that routinely selects a linear-type (straight line) constant volts/hertz characteristic, without regard for the engine power and torque characteristics will not meet this specification. These characteristics shall be demonstrable as follows:

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STANDBY POWER GENERATOR**

- a. With engine-generator set operating at rated speed voltage and load, reduce engine speed to half rated by manually overriding the engine speed governor control. Engine-generator set must recover to full speed with the rated load connected when the engine speed governor control is returned to its normal mode.
 - b. Calculation must demonstrate that the exciter and voltage regulator will permit utilization of at least 80% of maximum available prime mover torque at all engine speeds between 50% and rated speed, and with rated unity power factor load connected to its terminals.
8. A Permanent Magnet Generator (PMG) shall be provided for excitation power.
 9. Generator design shall be of the self-protecting type, as demonstrated by the prototype short-circuit test as described under "Testing" herein. All other generator performance criteria shall be equal to that of the specified equipment.
 10. Provide auxiliary contact, normally closed when engine/generator unit is not running and open when engine/generator unit is running.

J. Engine-Generator Set Control:

1. Provide an "H-100" unit mounted control module that is factory built, wired, tested, and shock-mounted by the generator manufacturer. Controls and features shall include the following:
 - NFPA 99 and 110 compliant
 - Digital Microprocessor
 - Full system status – 2 two 4-line X 20 character displays
 - 3 phase sensing digital voltage regulation
 - Suitable for operation in ambient temperatures from -40 degrees C to +70 degrees C
 - RS232 and RS485 Canbus remote ports
 - Waterproof connections
 - Programmable I/O
 - Built-in PLC
 - Engine function monitoring and control
 - Full range standby operation
 - Programmable auto-crank
 - Emergency stop
 - Auto-off-manual switch
 - Full system status on all AC output and engine function parameters
 - Service reminders, trending, fault history
 - Selectable low-speed exercise
 - 2-wire start controls
 - Electronic governor frequency regulation
 - Isochronous steady state regulation

Engine Protection

- Overspeed shutdown.

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- Low oil pressure shutdown.
- High coolant temperature shutdown.
- Low coolant shutdown.
- Crank limiter.
- Fail to crank shutdown.

Operator Interface

- Off/manual/auto mode switch.
- Manual run/stop switch.
- Panel lamp/test switch.
- Emergency stop switch.
- Not in auto position
- ATS selection
- Exercise speed

AC Alternator Data

- Voltage (all phases)
- Power factor
- KVAR
- 3 phase AC current.
- Frequency.
- KW
- Overvoltage

Engine Data

- DC voltage.
- Lube oil pressure.
- Coolant temperature.
- Engine speed

Other Data

- Genset model data.
- Run hours.
- Fault history
- Service reminders

Governing

- Integrated digital electronic voltage regulator.
- Three phase L-N sensing.
- Configurable torque matching.
- PMG

K. Main Circuit Breaker:

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1. Provide one molded case circuit breaker rated 150 AMP, 80% Thermal-Magnetic. The circuit breaker shall be installed in the generator.
- L. Auxiliary Equipment:
1. Starting Battery: Batteries shall be supplied for engine and shall be mounted in a battery rack within the engine-generator set skid-base. Furnish all cables and connectors. Batteries shall be either 12 or 24 Volt DC as recommended by the generator set manufacturer. Batteries shall have sufficient capacity to provide 925 Amps of cranking current at 32 degrees F for a minimum of 10 minutes.
 2. Provide a 10 Amp Battery Charger: Factory mounted and wired in generator enclosure
 3. Vibration Isolators: Engine-generator set shall be mounted on vibration isolators either internal or external to the set skid base.
- M. Sound Attenuated Weather Protective Enclosure:
1. Provide the manufacturers Sound Attenuated weather protective housing emitting not more than 78.0 dB at 7 meters at engine full load.
 2. A Critical Muffler shall be installed inside the Enclosure

ASCO Series 300 Service Entrance Rated Automatic Transfer Switch

PART-1- GENERAL

1.01 Scope

- A. Furnish and install automatic transfer switch (ATS) with number 3 poles, 200 amps at 120/240 volts, and withstand current ratings of 22k. Each automatic transfer shall consist of an inherently double throw power transfer switch unit and a microprocessor controller, interconnected to provide complete automatic operation. All transfer switches and control panels shall be the product of the same manufacturer.
- B. Furnish a 3R enclosure for the ATS that is for service entry. It shall provide all of the proper disconnecting, protection, grounding and bonding required for service entrance equipment.

1.02 Acceptable Manufacturers

Service Entrance Automatic transfer switches shall be ASCO Series 300SE. Any alternate shall be submitted in writing at least 10 days prior to bid. Each alternate bid must list any deviations from this specification.

1.03 Codes and Standards

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The automatic transfer switches and accessories shall conform to the requirements of:

- A. UL 1008 - Standard for Automatic Transfer Switches
- B. NFPA 70 - National Electrical Code
- C. NFPA 110 - Emergency and Standby Power Systems
- D. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications

NEMA Standard ICS10-1993 (formerly ICS2-447) - AC Automatic Transfer Switches

NEC Articles 700, 701, 702

International Standards Organization ISO 9001

*UL 891 According to this UL standard the equipment shall be labeled:
"Suitable for use only as service equipment."*

UL 508 Industrial Control Equipment

PART 2 PRODUCTS

2.01 Mechanically Held Transfer Switch

- C. The transfer switch unit shall be electrically operated and mechanically held. The electrical operator shall be a single-solenoid mechanism, momentarily energized. Main operators which include overcurrent disconnect devices will not be accepted. The switch shall be mechanically interlocked to ensure only one of two possible positions, normal or emergency.
- D. The switch shall be positively locked and unaffected by momentary outages so that contact pressure is maintained at a constant value and temperature rise at the contacts is minimized for maximum reliability and operating life.
- E. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. A manual operating handle shall be provided for maintenance purposes. The handle shall permit the operator to manually stop the contacts at any point throughout their entire travel to inspect and service the contacts when required.
- F. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof which are not intended for continuous duty, repetitive switching or transfer between two active power sources are not acceptable.
- G. The neutral conductors are to be solidly connected, a neutral terminal plate with fully-rated AL-CU pressure connectors shall be provided.

2.02 Microprocessor Controller with Membrane Interface Panel

- A. The controller shall direct the operation of the transfer switch. The controller's sensing and logic shall be controlled by a built-in microprocessor for maximum reliability, minimum

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maintenance, and inherent serial communications capability. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance.

- B. The controller shall be enclosed with a protective cover and be mounted separate from the transfer switch unit for safety and ease of maintenance. Sensing and control logic shall be provided on printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers.
- C. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:
 - 1. ANSI C37.90A/IEEE 472 Voltage Surge Test
 - 2. NEMA ICS – 109.21 Impulse Withstand Test
 - 3. IEC801-2 Electrostatic discharge (ESD) immunity
 - 4. ENV50140 and IEC 801 – 3 Radiated electromagnetic field immunity
 - 5. IEC 801 – 4 Electrical fast transient (EFT) immunity
 - 6. ENV50142 Surge transient immunity
 - 7. ENV50141: Conducted radio-frequency field immunity
 - 8. EN55011: Group 1, Class A conducted and radiated emissions
 - 9. EN61000 –4 – 11 Voltage dips and interruptions immunity

2.03 Enclosure

- A. The ATS shall be furnished in a NEMA type 3R enclosure.
- B. Controller shall be flush-mounted display with LED indicators for switch position and source availability. It shall also include test and time delay bypass switches.
- C. The complete assembly shall be degreased, and thoroughly cleaned through a five-stage aqueous process. The finish shall be ANSI-61, light gray, electrostatically charged polyester powder paint over a phosphate coating, at a minimum of 2.0 mils in density. Finish shall be suitable for indoor and outdoor environments.
- D. A pressure disconnect link shall be provided to disconnect the normal source neutral connection from the emergency and load neutral connections for 4-wire applications. A ground bus shall be provided for connection of the grounding conductor to the grounding electrode. A pressure disconnect link for the neutral to ground bonding jumper shall be provided to connect the normal neutral connection to the ground bus.
- E. Control wiring shall be rated for 600 volt, UL 1015. Wires shall be placed in wire duct or harnessed and shall be supported to prevent sagging or breakage from weight or vibration. All wiring to hinged doors shall be run through door terminal blocks or connection plugs.

2.04 Disconnecting and Overcurrent Protection Device

- A. For those automatic transfer switches less than 1000 amperes, the normal connection shall

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be provided with a thermal magnetic rated molded case circuit breaker with current ratings as shown within this specification. It shall have a thermal magnetic trip unit.

End of Section

**Rock Hill Business District
Town of Thompson
STANDBY POWER GENERATOR**

SECTION 16000

STANDBY POWER GENERATOR

PART 1 - GENERAL

1.1 SCOPE:

- A. Scope of work includes but is not limited to:
 - 1. Standby engine generator unit
 - 2. Muffler, battery charger, automatic transfer switch and other accessories to make system complete and ready to operate.
 - 3. Wiring of block heater, and battery charger.
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 - 6. Automatic Transfer Switch
 - 7. Warranty

1.2 QUALITY ASSURANCE:

- A. Codes and Standards: Refer to Section 16000.

1.3 SUBMITTALS:

- A. Shop Drawings: Submit for approval all items listed in Paragraph 1.1.B.

1.4 WARRANTY:

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PART 2 - PRODUCTS

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3. Rotating parts shall be guarded against accidental contact.

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2. Flexible stainless exhaust connection shall be provided as required for connection between the engine manifold and exhaust line, in compliance with applicable codes and regulations.
3. Provide rain cap at exhaust pipe termination.

H. Fuel System:

1. Engine fuel piping shall be factory installed, ready for final connection by contractor.

I. Generator:

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5. The broad range reconnectable generator shall have 12 leads brought out to allow connection by user to obtain any of the available voltages for the unit.
6. Voltage regulator shall be solid-state design and shall function by controlling the exciter magnetic field between stator and rotor to provide no load to full load regulation of rated voltage within 2% during steady-state conditions. The engine set and regulator must sustain at least 90% of no load voltage for ten (10) seconds with 250% of rated load at near zero power factor connected to its terminals. The voltage regulator shall be of an asynchronous pulse width modulated design that it insensitive to severe load induced waveshape distortion from SCR or thyrister circuits such as those used in battery charging (UPS) and motor speed control equipment. A rheostat shall provide a minimum of 5% voltage adjustment from rated value.
7. The generator, exciter and voltage regulator shall be designed and manufactured by the engine-generator set manufacturer so that the characteristics shall be matched to the torque curve of the prime mover. This design allows the prime mover to use its fullest power producing capacity (without exceeding it or over compensating) at speeds lower than rated, to provide the fastest possible system recovery from transient speed dips. A system that routinely selects a linear-type (straight line) constant volts/hertz characteristic, without regard for the engine power and torque characteristics will not meet this specification. These characteristics shall be demonstrable as follows:

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- a. With engine-generator set operating at rated speed voltage and load, reduce engine speed to half rated by manually overriding the engine speed governor control. Engine-generator set must recover to full speed with the rated load connected when the engine speed governor control is returned to its normal mode.
 - b. Calculation must demonstrate that the exciter and voltage regulator will permit utilization of at least 80% of maximum available prime mover torque at all engine speeds between 50% and rated speed, and with rated unity power factor load connected to its terminals.
8. A Permanent Magnet Generator (PMG) shall be provided for excitation power.
 9. Generator design shall be of the self-protecting type, as demonstrated by the prototype short-circuit test as described under "Testing" herein. All other generator performance criteria shall be equal to that of the specified equipment.
 10. Provide auxiliary contact, normally closed when engine/generator unit is not running and open when engine/generator unit is running.

J. Engine-Generator Set Control:

1. Provide an "H-100" unit mounted control module that is factory built, wired, tested, and shock-mounted by the generator manufacturer. Controls and features shall include the following:
 - NFPA 99 and 110 compliant
 - Digital Microprocessor
 - Full system status – 2 two 4-line X 20 character displays
 - 3 phase sensing digital voltage regulation
 - Suitable for operation in ambient temperatures from -40 degrees C to +70 degrees C
 - RS232 and RS485 Canbus remote ports
 - Waterproof connections
 - Programmable I/O
 - Built-in PLC
 - Engine function monitoring and control
 - Full range standby operation
 - Programmable auto-crank
 - Emergency stop
 - Auto-off-manual switch
 - Full system status on all AC output and engine function parameters
 - Service reminders, trending, fault history
 - Selectable low-speed exercise
 - 2-wire start controls
 - Electronic governor frequency regulation
 - Isochronous steady state regulation

Engine Protection

- Overspeed shutdown.

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- Low oil pressure shutdown.
- High coolant temperature shutdown.
- Low coolant shutdown.
- Crank limiter.
- Fail to crank shutdown.

Operator Interface

- Off/manual/auto mode switch.
- Manual run/stop switch.
- Panel lamp/test switch.
- Emergency stop switch.
- Not in auto position
- ATS selection
- Exercise speed

AC Alternator Data

- Voltage (all phases)
- Power factor
- KVAR
- 3 phase AC current.
- Frequency.
- KW
- Overvoltage

Engine Data

- DC voltage.
- Lube oil pressure.
- Coolant temperature.
- Engine speed

Other Data

- Genset model data.
- Run hours.
- Fault history
- Service reminders

Governing

- Integrated digital electronic voltage regulator.
- Three phase L-N sensing.
- Configurable torque matching.
- PMG

K. Main Circuit Breaker:

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1. Provide one molded case circuit breaker rated 150 AMP, 80% Thermal-Magnetic. The circuit breaker shall be installed in the generator.

L. Auxiliary Equipment:

1. Starting Battery: Batteries shall be supplied for engine and shall be mounted in a battery rack within the engine-generator set skid-base. Furnish all cables and connectors. Batteries shall be either 12 or 24 Volt DC as recommended by the generator set manufacturer. Batteries shall have sufficient capacity to provide 925 Amps of cranking current at 32 degrees F for a minimum of 10 minutes.
2. Provide a 10 Amp Battery Charger: Factory mounted and wired in generator enclosure
3. Vibration Isolators: Engine-generator set shall be mounted on vibration isolators either internal or external to the set skid base.

M. Sound Attenuated Weather Protective Enclosure:

1. Provide the manufacturers Sound Attenuated weather protective housing emitting not more than 78.0 dB at 7 meters at engine full load.
2. A Critical Muffler shall be installed inside the Enclosure

ASCO Series 300 Service Entrance Rated Automatic Transfer Switch

PART-1- GENERAL

1.01 Scope

- A. Furnish and install automatic transfer switch (ATS) with number 3 poles, 200 amps at 120/240 volts, and withstand current ratings of 22k. Each automatic transfer shall consist of an inherently double throw power transfer switch unit and a microprocessor controller, interconnected to provide complete automatic operation. All transfer switches and control panels shall be the product of the same manufacturer.
- B. Furnish a 3R enclosure for the ATS that is for service entry. It shall provide all of the proper disconnecting, protection, grounding and bonding required for service entrance equipment.

1.02 Acceptable Manufacturers

Service Entrance Automatic transfer switches shall be ASCO Series 300SE. Any alternate shall be submitted in writing at least 10 days prior to bid. Each alternate bid must list any deviations from this specification.

1.03 Codes and Standards

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The automatic transfer switches and accessories shall conform to the requirements of:

- A. UL 1008 - Standard for Automatic Transfer Switches
- B. NFPA 70 - National Electrical Code
- C. NFPA 110 - Emergency and Standby Power Systems
- D. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications

NEMA Standard ICS10-1993 (formerly ICS2-447) - AC Automatic Transfer Switches

NEC Articles 700, 701, 702

International Standards Organization ISO 9001

*UL 891 According to this UL standard the equipment shall be labeled:
"Suitable for use only as service equipment."*

UL 508 Industrial Control Equipment

PART 2 PRODUCTS

2.01 Mechanically Held Transfer Switch

- C. The transfer switch unit shall be electrically operated and mechanically held. The electrical operator shall be a single-solenoid mechanism, momentarily energized. Main operators which include overcurrent disconnect devices will not be accepted. The switch shall be mechanically interlocked to ensure only one of two possible positions, normal or emergency.
- D. The switch shall be positively locked and unaffected by momentary outages so that contact pressure is maintained at a constant value and temperature rise at the contacts is minimized for maximum reliability and operating life.
- E. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. A manual operating handle shall be provided for maintenance purposes. The handle shall permit the operator to manually stop the contacts at any point throughout their entire travel to inspect and service the contacts when required.
- F. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof which are not intended for continuous duty, repetitive switching or transfer between two active power sources are not acceptable.
- G. The neutral conductors are to be solidly connected, a neutral terminal plate with fully-rated AL-CU pressure connectors shall be provided.

2.02 Microprocessor Controller with Membrane Interface Panel

- A. The controller shall direct the operation of the transfer switch. The controller's sensing and logic shall be controlled by a built-in microprocessor for maximum reliability, minimum

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maintenance, and inherent serial communications capability. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance.

- B. The controller shall be enclosed with a protective cover and be mounted separate from the transfer switch unit for safety and ease of maintenance. Sensing and control logic shall be provided on printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers.
- C. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:
 - 1. ANSI C37.90A/IEEE 472 Voltage Surge Test
 - 2. NEMA ICS – 109.21 Impulse Withstand Test
 - 3. IEC801-2 Electrostatic discharge (ESD) immunity
 - 4. ENV50140 and IEC 801 – 3 Radiated electromagnetic field immunity
 - 5. IEC 801 – 4 Electrical fast transient (EFT) immunity
 - 6. ENV50142 Surge transient immunity
 - 7. ENV50141: Conducted radio-frequency field immunity
 - 8. EN55011: Group 1, Class A conducted and radiated emissions
 - 9. EN61000 –4 – 11 Voltage dips and interruptions immunity

2.03 Enclosure

- A. The ATS shall be furnished in a NEMA type 3R enclosure.
- B. Controller shall be flush-mounted display with LED indicators for switch position and source availability. It shall also include test and time delay bypass switches.
- C. The complete assembly shall be degreased, and thoroughly cleaned through a five-stage aqueous process. The finish shall be ANSI-61, light gray, electrostatically charged polyester powder paint over a phosphate coating, at a minimum of 2.0 mils in density. Finish shall be suitable for indoor and outdoor environments.
- D. A pressure disconnect link shall be provided to disconnect the normal source neutral connection from the emergency and load neutral connections for 4-wire applications. A ground bus shall be provided for connection of the grounding conductor to the grounding electrode. A pressure disconnect link for the neutral to ground bonding jumper shall be provided to connect the normal neutral connection to the ground bus.
- E. Control wiring shall be rated for 600 volt, UL 1015. Wires shall be placed in wire duct or harnessed and shall be supported to prevent sagging or breakage from weight or vibration. All wiring to hinged doors shall be run through door terminal blocks or connection plugs.

2.04 Disconnecting and Overcurrent Protection Device

- A. For those automatic transfer switches less than 1000 amperes, the normal connection shall

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be provided with a thermal magnetic rated molded case circuit breaker with current ratings as shown within this specification. It shall have a thermal magnetic trip unit.

End of Section