



INGRAM & ASSOCIATES
CONSULTING ENGINEERS, LLC

ADDENDUM NO. 4

PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS

June 22, 2021

PROJECT: Stand-By Power for the Jones County Government Center, The EMA Office,
The 911 Tower and The Haddock Wells
I&A Project No.: 1160-108-01

OWNER: Jones County Board of Commissioners

REVISED BID DATE: June 25, 2021 at 3:00 p.m.

**Item 1: INCLUDE the attached REVISED Specification Section 16210 – Engine Driven
Emergency Power Supply System**

All exterior mounted transfer switches shall be NEMA 3R enclosures.

All exterior mounted enclosed circuit breakers shall be NEMA 3R enclosures.

**Item 2: Jones County Board of Commissioners will fill the existing generator fuel tank
at the Government Center.**

Jones County BOC will fill the propane tank at the 911 Tower.

The Contractor is required to coordinate with Eatonton Gas for the connections
for the EMA generator.

Contractor shall fill the generator tanks in Haddock

Item 3: Contractor is to provide batteries for all generators as needed.

END ADDENDUM NO. 4

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SECTION 16210

ENGINE DRIVEN EMERGENCY POWER SUPPLY SYSTEM

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The work required under this section of the specifications consists of the installation of the complete Engine Driven Emergency Power Supply System. All materials and devices which are an integral part of this system shall be provided under this section of the specifications.
- B. Definition: The Emergency Power Supply System (EPSS) shall consist of one or more engine driven generator sets, each of which contains an engine directly coupled to an electric generator, together with the necessary switchgear, controls, accessories, transfer devices, and fuel supply to provide electric power for the duration of any failure of the normal power supply.

1.3 QUALITY ASSURANCE

- A. The following specifications and standards are incorporated into and become a part of this specification by reference.
 - 1. National Fire Protection Association (NFPA):
 - a. NFPA-37 Combustion Engines
 - b. NFPA-70 National Electrical Code
 - c. NFPA-110 Emergency and Stand-By Power Systems
 - 2. Electrical Generating Systems Association (EGSA) Standards:
 - a. EGSA CEP2 Codes for Emergency Power by States and Major Cities
 - b. EGSA GTD3 Glossary of Standard Industry Terminology and Definitions
 - c. EGSA ECB1 Performance Standard for Engine Cranking Batteries
 - d. EGSA BCES1 Performance Standard for Battery Chargers
 - e. EGSA ICAE1 Performance Standard for Electric Generator Set Instrument Control and Auxiliary Equipment
 - 3. Institute of Electrical and Electronics Engineers (IEEE) Standards:

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- a. IEEE 446 IEEE Recommended Practices for Emergency and Standby Power Systems
 - b. IEEE 472 Voltage Surge Withstand Capabilities
 4. National Electric Manufacturers Association (NEMA) Standards:
 - a. MG-1 Motors and Generators
 5. American National Standards Institute (ANSI):
 - a. C37.90a Voltage Surge Withstand Capability
- B. Acceptable Manufacturers: Products of the following manufacturers, which comply with these specifications, are acceptable:
1. Engine Driven Generator Sets:
 - a. Cummins
 - b. Caterpillar
 - c. MTU
 - d. Kohler
- C. Equipment Dimensions:
1. Dimensions indicated on the drawings are maximum allowable and shall not be exceeded. Where equipment of acceptable manufacturers listed exceeds the maximum dimensions, products of such manufacturers shall not be acceptable.
- D. Coordination:
1. Review shop drawings submitted under this and other sections, as well as other divisions, to insure coordination between work required among different trades. Coordinate the installation sequence with other contractors to avoid conflicts and to provide the fastest overall installation schedule. Coordinate installation with architectural and structural features, equipment installed under other sections of the specifications, and electrical equipment to insure access and to insure clearance minimums are provided.

1.4 SUBMITTALS

- A. Refer to the SHOP DRAWINGS, PRODUCT DATA AND SAMPLES Section for required procedures.
- B. Manufacturer's Product Data:
1. Submit material specifications and installations data for products specified under Part 2 - Products to include:
 - a. Engine driven generator sets
- C. Shop Drawings: Submit shop drawings to indicate information not fully described by the product data to indicate compliance with the contract drawings. Submittals containing less than the information listed below will be rejected.
1. Shop drawings for the engine driven generator sets shall contain not less than the information listed as follows:

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- a. Certification that the engine driven generator set(s) furnished will serve electrical loads indicated including motor starting loads with type(s) of starting indicated. Provide computer generator load analysis report.
- b. Continuous and stand-by rating of engine driven generator set(s) including voltage and phase.
- c. Frequency and voltage regulation with maximum instantaneous voltage dip and time of recovery to stable operation.
- d. Output voltage adjustment range in percentage of rated plant voltage.
- e. Alternator type and method of connection to prime mover.
- f. Components contained in alternator instrument panel.
- g. Rating of engine at operating speed, engine cycle and number of cylinders.
- h. Type of engine lubrication system and verification of components specified.
- i. Type of engine governor.
- j. Components contained in engine instrument panel.
- k. Fuel consumption at rated load.
- l. Starting batteries including ampere hour rating.
- m. Verification that all accessories specified are to be provided. This includes cold weather starting aid with rating and voltage indicated, exhaust system with muffler type indicated, and outdoor housing (where applicable) with verification of space available within housing for batteries.
- n. Line and machinery constants of the generator furnished.

D. Quality and Service:

1. All materials and parts of the EPSS shall be new and unused. Each component shall be of current manufacture from a firm regularly engaged in the production of such equipment. Units and components offered under these specifications shall be covered by the manufacturer's parts and labor warranty for a minimum of five years from date of Owner acceptance of the project on a new machine, a copy of which shall be included in the shop drawings submittal.
2. Submittals will be accepted only on engine driven generator sets which can be properly maintained and serviced without requiring the Owner to stock spare parts or wait longer than twenty-four hours for service. Submittals shall include the nearest location of permanent parts outlet from which parts may be obtained and written assurance that trained service personnel will be available on twenty-four hour's notice. Units with service centers more than 50 miles from project site will not be accepted.

E. Record Drawings

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1. Include in each set three sets of operating, maintenance, and parts manuals covering all components for the EPSS. Each supplier shall provide instructions to the Owner in operation and maintenance of his equipment, both in written form and with on-site personnel for a minimum of eight hours..

PART 2 PRODUCTS

2.1 ENGINE DRIVEN EMERGENCY POWER SUPPLY (EPS)

A. Engines

1. 911 Tower: The engine driven emergency power supply (EPS) shall be an internal combustion propane fueled driven prime mover. The generator set shall have the following characteristics:
 - a. 20 KW Capacity
 - b. 25 KVA Capacity
 - c. 240/120 Volts
 - d. 60 Hertz
 - e. 0.8 Power Factor
 - f. 1 Phase
 - g. 3 Wire
2. EMA Office: The engine driven emergency power supply (EPS) shall be an internal combustion natural gas driven prime mover. The generator set shall have the following characteristics:
 - h. 80 KW Capacity (minimum*)
 - i. 100 KVA Capacity (minimum*)
 - j. 208Y/120 Volts
 - k. 60 Hertz
 - l. 0.8 Power Factor
 - m. 3 Phase
 - n. 4 Wire
3. The rated net horsepower of the engine at the generator synchronous speed, with all accessories, shall not be less than that required to product the KW specified in paragraph 1 above. The horsepower rating shall take into account generator efficiency and all accessory losses such as fans, battery charger, etc. The generator set shall be capable of producing the specified KW (without overload) for the duration of the power outage, under the following ambient conditions:
 - a. Altitude: 100 feet above mean sea level.
 - b. Air temperature at engine intake: 104 degrees F.
 - c. Humidity Range: 25 - 95 %.
4. Included with the shop drawing submittal shall be the manufacturer's estimate of supply fuel and oil consumption for the engine. The engine shall have an oil filter with replaceable elements and a lube oil cooler.

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5. The engine shall be equipped with a suitable governor (engine speed control) to maintain frequency within limit specified below by controlling engine and generator speed. Manufacturer shall indicate in submittal data whether mechanical, hydraulic, electrical, or hybrid governors are provided.
 - a. Type: Droop - $\pm 1/4\%$ maximum
 - b. Stability: $\pm 1/2\%$ maximum steady state frequency variation at any constant load from no load to full load.
 - c. Regulation: 5% maximum frequency deviation between no-load steady state and full load steady state.
 - d. Transient: 3 seconds maximum recovery time for maximum motor start.
6. The engine shall be electric start, provided with a solenoid energized motor with either positive engagement or clutch drive to the engine.

The engine starting batteries shall be sealed lead-acid recombination type. Batteries shall be rack mounted inside the weatherproof plant housing to minimize the distance from the batteries to the starter.
7. A float type battery charger, compatible with the batteries selected, shall be furnished at the engine which shall maintain the starting batteries at full charge. The charging system shall permit charging from either the normal or the emergency power source. It shall have an equalize rate and a float rate charging system. An ammeter and voltmeter shall indicate the charge rate and the circuit shall be protected by either fuses or circuit breakers. The charger or charging circuit shall be so designed that it will not be damaged during the engine cranking cycle, for example, by a current limiting charger or a crank disconnect relay. It shall also be capable of recharging a discharged battery in 12 hours while carrying normal loads. The charger shall be equipped with alarm relays as required for remote annunciation equipment. Provide stranded wire between battery charger and termination points on the generator. Terminate with Stacon connectors. Provide battery strap(s) and heater per NFPA 110.
8. The engine shall be liquid cooled. The type of liquid cooling system shall be unit mounted radiator - consideration shall be given for air temperature rise across the engine in addition to ambient. Minimum capacity shall be rated for 100°F. minimum engine ambient temperature plus air temperature rise across the engine.
 - a. Provide an electric heater, thermostatically controlled, in the engine coolant system as a cold weather starting aid. Heater shall be for operation on 120 volt single phase A.C. for 2000 watt units and shall be permanently connected to a circuit from the pump station electrical system. Heater shall maintain 70°F. to 90°F. Provide isolation valves or quick connects for coolant heater.
9. Air Supply/Exhaust System

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- a. Cleaner: An air cleaner and silencer shall be furnished, located and mounted as recommended by the engine manufacturer.
 - b. Exhaust: An exhaust system of suitable size, configuration, and material in accordance with engine manufacturer's recommendations shall connect the exhaust outlet of the engine to a silencer. The type of silencer shall meet the requirements of engine manufacturers and shall be commercial. The silencer shall be located on top of the outdoor enclosure.
 - c. The exhaust system including silencer shall be of such size that back pressure on the system will not exceed the back pressure permitted by the engine manufacturer's recommendation. A flexible connection shall be mounted at the engine exhaust outlet and the discharge end shall be protected against entry of precipitation. Piping and silencer within reach of personnel or with 8'-0" of finished floor or grade shall be protected by screening and shall be insulated with two inches of calcium silicate insulation with aluminum jacket. All exhaust piping shall be gas tight. Exhaust shall exit vertically.
10. The engine instrument panel shall be mounted at the engine and shall contain the following:
- a. Oil pressure gauge to indicate lubricating oil pressure.
 - b. Temperature gauge to indicate cooling medium temperature.
 - c. Hour meter to indicate total actual running time.
 - d. Battery charging meter to indicate satisfactory performance of battery charging means.
 - e. Other instruments as recommended by the manufacturer for proper maintenance.

B. Generator

1. The generator shall be an engine-driven single or two bearings type, synchronous, brushless, conforming to applicable standards. It shall be connected to the engine flywheel by means of a flexible type coupling for single bearing generators and elastic coupling for two bearing generators.
2. The generator shall be rated for 40°C. ambient. Class of insulation shall be NEMA Class F. The voltage regulation shall be plus or minus 2% from no load to full load with plus or minus 5% speed change and a 15°C. rise in ambient. The generator voltage dip from no load to full load shall not exceed 20%.
3. The generator shall be capable of sustaining at least 250% of rated current for at least ten (10) seconds under a three phase symmetrical short by inherent design or by the addition of an optional current boost system. A resettable line sensing circuit breaker shall be furnished which protects the generator from damage due to its own high current capability. This breaker shall not trip within the ten seconds specified above to allow selective tripping of downstream fuses or circuit breakers under a fault condition.
4. The generator shall be a permanent-magnet type generator.
5. Provide 120 volt condensation heater with thermostat.

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C. Voltage Regulation

1. The generator shall be equipped with a volts-per-hertz type voltage regulator to maintain voltage within limits specified below:
 - a. Stability: $\pm 2\%$ maximum voltage variation at any constant load from no load to full load.
 - b. Regulation: 4% maximum voltage deviation between no load steady state and full load steady state.
 - c. Transient: 30% voltage dip or overshoot on one-step application or removal of 0.8 power factor full load.
 - d. Transient: 3% seconds maximum voltage recovery time with application or removal of 0.8 power factor full load.

D. Generator full main line circuit breaker.

1. A main line circuit breaker shall be supplied to protect the generator and controls from overloads and/or short circuits in the load. It shall be rated as indicated on the drawings. Interrupting current shall be 22000 amps RMS minimum. Breakers shall comply with UL 489 and NEMA AB-3.

E. Start and Stop Controls

1. Reconnect the existing start/stop control conductors.
2. A remote manual stop station similar to a weatherproof break-glass station shall be provided mounted on the face of the automatic transfer switch and generator enclosure and shall be tied into the engine controls to stop the engine when activated. Provide laminated plastic label with 1/4" minimum engraved letters to read "EMERGENCY GENERATOR SHUTDOWN". Background to be red and core to be white.

F. Instrumentation

1. Local engine control and safety panel shall be provided, containing the following:
 - a. Automatic remote start capability.
 - b. "Manual-Off-Auto" switch.
 - c. Controls to shut down and lock out the prime mover under the following conditions: failure to start after specified cranking time, overspeed, low lubricating oil pressure, high engine temperature, operation of remote manual stop station.
 - d. Battery powered individual alarm indication to annunciate visually at the control and safety panel the occurrence of any condition itemized below; contacts or circuits for a common audible alarm signaling locally. Test switch shall be provided to test the operation of all lamps.

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Indicator Function	Level 1	
(At Battery Voltage)	C.V.	S
i. Overcrank	X	X
ii. Low Water Temp.< 70°F (21°C)	X	X
iii. High Engine Temp.Pre-alarm	X	
iv. High Engine Temp.	X	X
v. Low Lube Oil Pressure Pre-alarm	X	
vi. Low Lube Oil Pressure	X	X
vii. Overspeed	X	X
viii. EPS Supplying Load	X	
ix. Control Switch Not In Auto Pos.	X	
x. Battery Charger Malfunctioning	X	
xi. Low Voltage in Battery	X	
xii. Lamp Test	X	
xiii. Contacts for Local & Remote Common Alarm	X	
xiv. Audible Alarm Silencing Switch		
xv. Emergency Stop	X	X

Key:

C.V. -- Control Panel-Mounted Visual Indication

S -- Shutdown of EPS

X -- Required

- e. Controls to shutdown the prime mover upon removal of initiating signal or manual emergency shutdown.
- f. A.C. voltmeter with selector switch off position and positions for phase to phase and phase to neutral.
- g. A.C. ammeter with selector switch with positions for each phase.
- h. Frequency meter -- digital electronic type.
- i. Voltage adjusting rheostat to allow plus or minus 5% voltage adjustment.
- j. Manual reset circuit breaker.
- k. Water temperature gauge.
- l. Manual stop/start control.
- m. Elapsed time meter.
- n. Panel lights.

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- o. Indicator lights for signals from engine instrument panel.
- p. Light to indicate switch has been left in the "off" position.
- 2. All instruments, controls, and indicating lights shall be properly identified. All wires shall be individually identified and must agree with the wiring diagram provided. All wiring shall be harnessed or flexibly enclosed. Terminals on all terminal blocks shall be individually identified. All instrumentation must be isolated from engine generator set vibration.

G. Enclosures and Connections:

- 1. All electrical enclosures, i.e, terminal cabinets, wireways, circuit breaker enclosures, etc., shall be of adequate size to provide minimum bending radii as required by the NEC for the size conductor actually terminated within or passing through the enclosure.
 - 2. All factory provided enclosures shall have gasketing and finish appropriate for the environment in which the unit is to be mounted. All wiring, wiring harness, etc., shall be protected from the elements, such as direct sunlight, moisture, etc. or shall be UL listed for direct exposure to the applicable elements. Include written documentation of the above with the shop drawing submittal.
- H. Provide flexible fuel connections at supply piping. Flexible hoses shall be steel reinforced type. Provide solenoid valve in series with gate valve in supply line. Solenoid valve shall be powered from generator batteries and shall be open only when generator is running.

2.2 FUEL SUPPLY

- A. 911 Tower: Coordinate modifications to the existing propane fuel system generator with Jones County and the generator provided.
- B. EMA Office: Coordinate modifications to the existing natural gas system with Jones County and the generator provided.

PART 3 EXECUTION

3.1 EPS INSTALLATION

- A. The plant shall be anchored to a concrete base whose overall dimensions shall exceed the outside dimensions of the plant base by 12" in each direction. Base depth shall be 12". Reinforce base with No. 5 bars 12" on center in both directions. Use not less than 6-3/4" galvanized anchor bolts.

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- B. The plant shall be on a welded steel base with a minimum of four vibration isolators, with two each located under the generator mounting and the engine front support on each side of the steel base. Isolators shall consist of steel springs designed specifically for this application, mounted on rubber plates to block high frequency vibrations.
- C. Provide a laminated sign at the service entrance equipment indicating type and location of on-site emergency power sources.
- D. For exterior installations, the EPS shall be provided in outdoor, weatherproof housing with removable panels for access to equipment. Provide standard weatherproof housing. The starting batteries shall be rack mounted within the housing. Furnish service light and switch within weatherproof housing. Provide sound attenuated Level II enclosure.
- E. Extend 240 and 120 volt emergency power circuits for battery charger and cold weather starting aids from the building wiring system.

3.2 TESTING

- A. Submit verification letter to Engineer indicating successful completion of sequence of operations testing and certification that all functions are operational. Letter to request load testing approval and schedule of proposed test. Prior to load test, written approval must be provided by Engineer. Representatives of the generator and transfer switch shall be present. The local authority having jurisdiction shall be given advance notification of the time of the final test in order that he may witness the tests.
- B. A failure of any test or any component during a test will require a complete retest program at no additional cost to the Owner.
- C. Provide all lubricants and other consumables for testing.
- D. An on-site acceptance test shall be conducted as a final approval test for all Emergency Power Supply Systems.
 - 1. The test shall be conducted after completion of the installation with all EPSS accessory and support equipment in place and operating.
 - 2. Test Results. The EPSS shall perform within the limits specified for Level I installation per NFPA-110.

3.3 O&M MANUALS

- A. At least three sets of an instruction manual(s) for all major components of the EPS shall be supplied by the Manufacturer(s) of the EPS and shall contain:
 - 1. A detailed explanation of the operation of the system.
 - 2. Instruction for routine maintenance.
 - 3. Detailed instructions for repair of the EPS and other major components of the EPS.

4. Pictorial parts list and part numbers.
5. Pictorial and schematic electrical drawings of wiring systems, including operation and safety devices, control panels, instrumentation and annunciators.

PART IV

I. ACCEPTABLE MANUFACTURERS

Products of the following manufacturers, which comply with these specifications, are acceptable:

- A. Transfer Switches:
 1. ASCO 7000 Series
 2. Cummins/Onan OTPC Series
 3. Russelectric RTS-03 Series with RPTCS Controller
 4. Caterpillar CTS series with MX250 controller.

II. TRANSFER SWITCH

- A. Transfer switch shall be rated at not less than as indicated on the drawings at rated voltage. Transfer switch shall be rated and marked for total system load.
- B. Transfer switch serving 240V three phase four wire loads shall be three poles with an unswitched neutral. Transfer switch serving 240V single phase loads shall be two-pole with unswitched neutral.
- C. Transfer switch shall be the automatic type with intermediate position. In-phase transfer will not be allowed.
- D. Transfer switch shall be wall mounted in a NEMA 3R painted steel enclosure when mounted outside, indoor mounted transfer switches shall be NEMA 1.
 1. Enclosure shall have hinged door with three-point latching and factory installed key locking enclosure door.
- E. Operation shall be inherently double throw whereby all contacts move simultaneously.
 1. Electrical spacing shall be equal to or exceed those listed in Table 15.1 of UL 1008. Only those main contact structures specifically designed for transfer switch service shall be acceptable.

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2. An overload or short circuit shall not cause the switch to go to a neutral position.
 3. A manual operating handle shall be provided.
 4. All main contacts shall be silver alloy type protected by arc quenchers and, for switches rated 600 amps and larger, by arcing contacts.
 5. Operating transfer time shall be 1/15 second or less on switches rated below 600 amps.
- F. All switch and contacts, coils, springs and control elements shall be removable from the front of the transfer switch without removal of the switch panel from the enclosure and without disconnecting power conductors or drive linkages. Control and sensing relays shall be continuous duty industrial type with minimum contact rating of ten amps.
- G. Transfer switch shall be rated to withstand in RMS symmetrical amperes not less than the available symmetrical RMS amperes when protected by the circuit protective device on the line side of the transfer switch.
1. Withstand rating of switch shall be based on switch contacts not welding under fault conditions.
 2. Provide switch with current limiting fuses to increase current withstand rating when switch is not rated for fault duty.
- H. The control panel for each automatic transfer switch shall contain the following accessories:
1. Adjustable 0.5 to 6 second time delay on starting of EPS to override momentary power dips and interruptions of the normal services. Time delay shall be factory set at 1 second.
 2. Time delay on transfer to emergency adjustable from 0 to 60 seconds, factory set at 0 seconds.
 3. Test switch on enclosure door to simulate failure of the normal power source. ATS shall transfer load to the EPS.
 4. Push button to bypass time delay on re transfer to normal.
 5. Close differential voltage sensing shall be provided on all phases of the normal power supply. The pickup voltage shall be adjustable from 85% to 100% of nominal and the dropout voltage shall be adjustable from 75% to 98% of the pickup value. The transfer to emergency will be initiated upon reduction of normal source to 85% of nominal voltage and re transfer to normal shall occur when normal source restores to 95% of nominals.
 6. Independent single-phase voltage and frequency sensing of the emergency source. The pickup voltage shall be adjustable from 85% to 100% of nominal. Pickup frequency shall be adjustable from 90% to 100% of

- nominal. Transfer to emergency upon normal source failure when emergency source voltage is 90% or more of nominal and frequency is 95% or more of nominal.
7. A time delay on re transfer to normal source. The time delay shall be automatically bypassed if the emergency source fails and normal source is available. The time delay shall be field adjustable from 0 to 25 minutes and factory set at 15 minutes.
 8. An unloaded running time delay for emergency generator cool down, factory set at 5 minutes.
 9. The transfer switch shall be the programmed transition type with intermediate position (adjustable time delay) before transfer. In phase monitor transition will not be accepted.
 10. Pilot light for indicating switch in normal position (include fuses and auxiliary contact).
 11. Pilot light for indicating switch in emergency position (include fuses and auxiliary contact).
 12. An exerciser for exercising standby power plant on a weekly basis shall be provided in the transfer switch. Exerciser shall be set to exercise standby plant for one half hour per week under load. Time of plant exercise shall be set in field. Exerciser timer shall have reserve power back up, either by battery or spring wound clock, to ride through power outages to the switch.
 13. Auxiliary contact (gold plated) which closes when normal source fails. (Closed after override delay of 0.5 to 6 seconds).
 14. Auxiliary contact (gold plated) which opens when normal source fails. (Opens after override delay of 0.5 to 6 seconds).
 15. Auxiliary contacts on same shaft as main contacts (closed on normal.)
 16. Auxiliary contacts on same shaft as main contacts (closed on emergency).

III. TRANSFER SWITCH INSTALLATION

- A. Wall mounted transfer switch(es) shall be installed with top of switch no more than seven feet above finished floor.
 1. Locate transfer switch (es) to provide working clearance and full accessibility as required by the National Electrical Code.
- B. Lace and group conductors installed in transfer switch with nylon tie straps.
 1. Only one conductor shall be installed under terminals.
 2. Form and train conductors in enclosure neatly parallel and at right angles to sides of box.

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3. Uninsulated conductor shall not extend beyond one-eights inch from terminal lug.
4. Conductors shall be installed such that no stresses are transferred to terminal lugs.

C. Mounting and Support

1. Mounting
 - a) Enclosure shall be secured to structure by a minimum of four (4) fastening devices.
 - b) Transfer switches 400 amps and larger shall be secured by a minimum of eight (8) devices.
 - c) A 1.5-inch minimum diameter round washer shall be used between head of screw or bolt and enclosure.
2. Enclosures shall be mounted where indicated on the drawings or specified herein. Support from the structure with fastening device specified.
3. Attach enclosure directly to masonry, concrete, or wood surfaces.
4. Mount enclosure on metal channel (strut), which is connected to structure with fastening device specified, for installations on steel structure, sheet metal equipment enclosure, or sheet rock walls.

D. Do not splice conductors in enclosure. Where required, install junction box or wireway adjacent to transfer switch and splice or tap conductors in box.

1. Refer to number of conductors in a conduit limitation defined in the WIRES AND CABLES section of the specifications and do not exceed.

E. Conductors not terminating in transfer switch shall not extend through or enter transfer switch enclosure.

F. Install push-in knock-out closure plugs in any unused knock-out openings.

IV. CLEANING AND ADJUSTMENT

A. After completion, clean the interior and exterior of dirt, paint and construction debris.

B. Touch up paint all scratched or marred surfaces with factory furnished touch up paint of the same color as the factory applied paint.

END OF SECTION