

BALTIMORE COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
DIVISION OF CONSTRUCTION CONTRACTS ADMINISTRATION
111 WEST CHESAPEAKE AVENUE
TOWSON, MARYLAND 21204



Contract No. 25022 PP0
Project No's. 10000636
Essex Police Precinct 11 New Addition & Renovations (LEED SILVER CERTIFICATION) -
216 & 222 North Marlyn Avenue, Essex, Maryland 21221
Essex – District 15c7

ADDENDUM NO. 5

DATE: 1/15/2026

Contact: Anthony Crews, 410-887-3531, tcrews@baltimorecountymd.gov

To All Bidders

This addendum is hereby made a part of the Proposal and the Special Provisions, and is hereby incorporated into the Contract. Should this addendum conflict with any portion of the Special Provisions, the Proposal, or any prior addenda, this addendum shall supersede and control.

Please note the attached changes, corrections, and/or information in connection with the contract and submit bids and be otherwise governed accordingly.

For Your Information

Attached are questions and answers.

In the Specifications

Revised and attached to be inserted: New pages 1661-1682, Section 26 32 00 – Packaged Generator Assemblies.

Attachments – 24

Please sign below acknowledging receipt of this addendum and return with your bid.

Company Name

Signature



Addendum No. 5
January 14, 2026

Essex Police Precinct 11 New Addition & Renovations (25022 PP0)

216 & 222 North Marlyn Avenue, Essex, Maryland 21221.

This Addendum is hereby made part of the 100% Construction Documents dated July 14, 2025 (Project Manual and Drawings) for the above referenced project.

The provisions of this Addendum are intended to supplement and/or supersede the provisions of the Construction Documents only where contrary thereto.

This Addendum contains changes to the requirements of the Project Manual. Such changes shall be incorporated into the Construction Documents and shall apply to work with the same meaning and force as if they had been included in the original Documents. Whenever this Addendum modifies a portion of a paragraph of the Project Manual, the remainder of the paragraph affected shall remain in force.

The conditions and terms of the basic Specifications shall govern work described in this Addendum. Whenever the conditions of work, and the quality or quantity of materials, or workmanship are not fully described in this Addendum, the conditions of work, etc., included in the basic Specifications for similar items of work shall apply to the work described in this Addendum.

If no similar items of work are included in the basic Specifications, the best quality of material and workmanship shall apply, and all work shall be subject to the written acceptance of the Architect.

GENERAL ITEMS

NOTE: Do not send Substitution Requests for products. There will be no substitutions during the Bidding Phase.

Responses to solicitations received prior to the issuance of this addendum are as follows:

- 1. Question:** *Drawing E501, the note at the genset clearly states "generator with 48HR subbase tank". Gen Spec 263200.2.10.A.3, states the fuel tank to be 96 hour. Please clarify the fuel tank size that is required.*
Response: *A 48-hour generator is required. Please see attached revised spec section 263200.*
- 2. Question:** *Addm #4 mentions a new drawing A607 in Q/A #24 & 25. There is no new A607 that we have found in any of the 4 posted adda.*
Response: *A607 was not revised; follow the revised Door Schedule on A603 that was issued as part of Addendum 4. Also refer to details 3/A507, 1/A508, 3/A508.*

Murphy & Dittenhafer, Inc.
805 North Charles Street
Baltimore, Maryland 21201
410•625•4823
410•625•4674 FAX



3. **Question:** What wall type is to be used for Deduct Alt #2? Per the deduct alternate #2 description, you are removing the storefront and providing patterned brick in lieu. No wall type of detail is provide for what this opening is to look like if the deduct is accepted. I have had several subs ask me for clarity. Would it be wall type C1?

Response: Deduct Alternate #2 is to replace Storefront E-A1 with patterned brick. Refer to detail 4/A204 for wall construction. Refer to brick pattern per detail 6/A202.

CHANGES TO THE PROJECT MANUAL, attached as complete Sections

Total number of revised specifications: 1

PROJECT MANUAL	SPEC #	SPECIFICATION NAME & DESCRIPTION	REVISED WITH
	26 32 00	PACKAGED GENERATOR ASSEMBLIES. Revised runtime of generator	Addendum #5

CHANGES TO THE CONSTRUCTION DRAWINGS, attached

Total number of revised drawings: 0

DWG. NUMBER	SHEET DESIG.	SHEET NAME & DESCRIPTION	REVISED WITH

END OF ADDENDUM NO. #5

SECTION 26 32 00

PACKAGED GENERATOR ASSEMBLIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

A. Section Includes:

1. Diesel powered generator(s).
2. Weatherproof Sound Enclosures.
3. Fuel tanks.
4. Auxiliary equipment.

B. Related Sections:

1. Section "Common Work Results For Electrical" for concrete pads and bollards requirements.
2. Section "Grounding & Bonding For Electrical Systems" for grounding, bonding and interconnection of equipment.
3. Section "Low Voltage Electrical Power Conductors and Cables" for grounding conductors and attachments and conductors used of low voltage controls.
4. Section "Raceways and Boxes for Electrical Systems" for raceways and conduit requirements for generator connections, etc.
5. Section "Low Voltage Electrical Distribution" for generator output circuit breaker requirements.
6. Section "Transfer Switches" for coordination with power switching and control equipment.
7. Section "Commissioning of Electrical Systems" for specific commissioning and functional performance testing requirements of the generator system(s).

C. Permits and Fees:

1. Apply, pay for and secure all permits, required by the Authorities Having Jurisdiction prior to start of work, in accordance with contract General Conditions and Division 01.
2. For projects in the State of Maryland, provide the following:
 - a. Contractor shall complete, file, pay for, and secure a "Permit to Construct - Application for Fuel Burning Equipment" (Form 11) from the Maryland Department of the Environment (MDE).
3. Deliver all certificates to the Owner prior to final acceptance of work.

1.3 REFERENCES

A. IEEE:

1. IEEE 241 IEEE Recommended Practice for Electric Power Systems in

- 2. IEEE 446 Commercial Buildings
IEEE Recommended Practice for Emergency and Standby
Power Systems for Industrial and Commercial Applications

B. National Electrical Code (NEC):

- 1. NEC 700 Emergency Systems
- 2. NEC 701 Legally Required Standby Systems
- 3. NEC 702 Optional Standby Systems

C. National Fire Protection Association (NFPA):

- 1. NFPA 70 National Electrical Code
- 2. NFPA 99 Essential Electrical Systems for Health Care Facilities
- 3. NFPA 110 Emergency And Standby Power Systems

B. National Equipment Manufacturers Association (NEMA):

- 1. NEMA Standards of Construction and Testing.
- 2. NEMA MG-1 Motors and Generators

C. Underwriters Laboratories (UL):

- 1. UL 508 Industrial Control Equipment
- 2. UL 2200 Standard for Safety for Stationary Engine Generator Assemblies

1.4 SUBMITTALS

A. Submittal Requirements of this section:

- 1. Engine-generator assembly.
- 2. Sound attenuating enclosure.
- 3. Engine muffler/silencer.
- 4. Engine control panel and instrumentation.
- 5. Remote status panel.
- 6. Subbase fuel tank.
- 7. Engine jacket heater.
- 8. Battery charger.
- 9. Starting batteries.

B. Basis-of-Design Comparable Products Submission:

- 1. Contract Drawings are based on only the named "Basis of Design" manufacturer and model of generator, alternator and specified accessories.
- 2. Engineer has not verified that any Comparable Products by manufacturers other than the "Basis of Design" equipment will properly fit, perform or meet the design intent and contract documents.
- 3. Contractor must verify sizes, ratings, dimensions, clearance requirements, weight, fuel flow and storage requirements, air flow, etc. of any/all manufacturers. Contractor is responsible for the fitment of their proposed equipment within the space, room or area shown, and the resulting impacts to other construction or disciplines, Code compliance, etc.
- 4. Document each Submittal, Comparable Product or Substitution request with supporting data substantiating compliance of proposed product with

- Basis-of-Design product.
5. Use the attached “Comparable Product Submittal Form” in addition to the requirements specified herein.
 6. Comparable products will not be reviewed without completion of the attached form.
- C. Descriptive Data:
1. Clearly indicate or state options, etc.:
 - a. Manufacturer/cat. number.
 - b. Manufacturer’s options.
 - c. Accessories.
 2. Manufacturer’s specifications, data sheets.
 3. Catalog cuts.
 4. Dimensional drawings.
 5. Drawing(s) to indicate muffler mounting location (in or on) enclosure).
 6. Drawing(s) to indicate exhaust discharge direction and angle, pipe cap, etc.
 7. Installation Instructions.
 8. Wiring & connection diagrams. Indicate point of connections with other equipment or systems.
 9. Capacity ratings of all components and accessories..
 10. Manufacturer or vendor furnished load/starting calculations.
 11. Clearly indicate the exact size or rating proposed.
- D. Shop Drawings:
1. For all weatherproof and sound attenuating enclosures.
 2. Factory drawings shall clearly show the mounting height to top of all breakers and controls (EPO, etc.) to verify maximum mounting height of 72” per NEC.
- E. Product Test Reports:
1. Prototype test reports for proposed engine-generator assemblies.
 2. Prototype testing shall have been performed on an identical generator unit, per ISO 8528, as configured for this project, including all accessories which can affect power output, including: water pump, fuel pump, radiator fan, alternator, etc.
 3. Certified copies of manufacturer’s design and routine factory tests required by the referenced standards.
 4. Computer load acceptance, starting and running calculations, when requested, performed by the manufacturer’s authorized vendor.
 5. Sound level test results of assembled engine-generator and sound attenuating enclosure. Demonstrate unenclosed sound levels versus enclosed levels. Provide calculations and test reports from the sound enclosure manufacturer or authorized vendor.
- F. Factory Test Reports:
1. Perform in-factory testing of the actual generator to be shipped for this project.
 2. Factory testing shall include:
 - a. Full load running test at rated load for minimum of two (2) hours.
 - b. Record all engine, alternator, fuel and alternator system parameters every 10 minutes.
 - c. Cold start testing.

- d. 100% load acceptance testing.
 - e. Safety Shutdown testing.
 3. Factory test reports of the engine-generator assembly shall include the specific model and serial number of the unit.
 4. Certified copies of manufacturer's design and factory tests required above or per the referenced standards.
- G. Closeout Submittals: Submit in accordance with the General Conditions and Division 01 requirements, spec section "Common Work Results For Electrical", and as follows:
1. Original load acceptance, starting and running load calculations.
 2. All post-installation inspection checklists.
 3. Installer's pre-startup checklist.
 4. Post installation load test results.
 5. Preventative maintenance schedule for each unit.

1.5 QUALITY ASSURANCE

A. Manufacturer's Requirements:

1. Coordinate the components of the system and their arrangements electrically and mechanically.
2. Manufacturer shall be experienced in manufacturing equipment of the types and capacities indicated that have a record of successful in-service performance for a minimum of 10 years.
3. Maintain, within 50 miles from site, a maintenance and service organization complete with parts inventory and repair facility. Service shall be available on a 24-hour basis.
4. Start up services and post installation tests, as specified.
5. Preventative Maintenance program as specified.

B. Single-Source Responsibility:

1. The complete performance of the assembled engine generator system, including all accessories shall be the sole responsibility of the generator supplier. It is the installer's responsibility to ensure that all factory and field installed accessories and loose components used in the system, meet these specifications, and perform up to the stated and tested standards.
2. For exterior units, the manufacturer shall be responsible for the proper fit and performance of the weatherproof enclosure, exhaust system, including attachment hardware, support of mufflers, etc.

C. Certification and Compliance with Standards: Comply with the following specific Code and/or Standards requirements, and all other applicable Codes/standards of these agencies or publications.

1. Underwriters Laboratories (UL):
 - a. UL2200 Listed Generator Assembly,
 - 1) Minimum working space requirements per UL2200.
 - 2) Wire bending space per UL2200 and NEC.
 - 3) Unit shall bear a UL2200 label.
 - b. UL Listing of loose components, individually, where such standards exist.
2. National Electrical Code (NFPA 70)

- a. NEC Article 700 Emergency Systems
 - b. NEC Article 701 Legally Required Standby Systems.
 - c. NEC Article 702 Optional Standby Systems.
3. National Fire Protection Association (NFPA):
- a. NFPA 110 Emergency Power Systems
- D. Installer Qualifications:
- 1. Has installed a minimum of five (5) generators of similar size and conditions.
 - 2. Has installed a minimum of three (3) generators manufactured by the proposed manufacturer.
- E. Installation Quality: In accordance with recognized trade organizations and standards.
- 1. ANSI American National Standards Institute
 - 2. ASME American Society of Mechanical Engineers
 - 3. IEEE Institute of Electrical and Electronics Engineers
 - 4. IEEE C2 National Electrical Safety Code
 - 5. NEC National Electrical Code
 - 6. NECA National Electrical Contractors Association “Standards of Installation”
 - 7. NEMA National Electrical Manufacturer’s Association
 - 8. NETA National Electrical Testing Association
 - 9. NFPA National Fire Protection Association
 - 10. UL Underwriter’s Laboratories

1.6 DELIVERY, STORAGE AND HANDLING

- A. Packing, Shipping, Handling and Unloading:
- 1. Provide all transportation of unit(s) to site.
 - 2. Provide for rigging needed for unloading, and setting into final position.
- B. Storage and Protection:
- 1. Where unit is to be installed indoors, without enclosure, store in covered building or offsite to prevent exposure to weather, etc.

1.7 PROJECT CONDITIONS

- A. The emergency power system level, classification and type shall meet the requirements of NFPA 110, as follows:
- 1. Level: 1 (critical to Life safety)
 - 2. Classification: Class **4B** (**4B** hour operation)
 - 3. Type: 10 (power restored in 10 seconds)
- B. The generator shall be capable of starting and operating the following loads in step increments under the specified parameters.

C. Step Load:

Group 1 (Non-Concurrent)	Miscellaneous : Fire Alarm 1 X 2.50 kVA @ 1.00 PF Harmonics: THID = 0.00%	2.5	2.5	2.5	2.5	0%	0%	0	25.00%	15 Hertz
Group 1 (Non-Concurrent)	Motor : Sprinkler - Compressor 1 X 0.30 HP Code G (6 kVA/HP) Across the Line Rated torque at start running at 100%	1.08	1.8	0.6	0.8	0%	0%	0	35.00%	15 Hertz
Group 1 (Non-Concurrent)	Lighting : Life Safety Lighting 1 X 2.00 kVA @ 0.95 PF Harmonics: THID = 20.00%	1.9	2	1.9	2	20%	20%	2	25.00%	10 Hertz
Group 2 (Non-Concurrent)	Miscellaneous : Water Heaters 1 X 226.10 kVA @ 1.00 PF Harmonics: THID = 0.00%	226.1	226.1	226.1	226.1	0%	0%	0	35.00%	15 Hertz
Group 2 (Non-Concurrent)	Resistive : Resistive #1 (Heating) 1 X 77.00 kVA @ 1.00 PF Harmonics: THID = 0.00%	77	77	77	77	0%	0%	0	35.00%	15 Hertz
Group 2 (Non-Concurrent)	Miscellaneous : Receptacles 1 X 94.00 kVA @ 1.00 PF Harmonics: THID = 0.00%	52.4	52.4	94	94	0%	0%	0	35.00%	15 Hertz
Group 2 (Non-Concurrent)	Battery Charger : EV Chargers 4 X 6.20 kVA @ 0.97 PF Harmonics: THID = 30.00%	6.01	6.2	24.06	24.8	30%	30%	24.8	15.00%	5 Hertz
Group 2 (Non-Concurrent)	Miscellaneous : IT, Sec, Etc 1 X 8.00 kVA @ 0.90 PF Harmonics: THID = 0.00%	7.2	8	7.2	8	0%	0%	0	35.00%	15 Hertz
Group 2 (Non-Concurrent)	Motor : DOAS 1 X 324.00 Amps Code G (6 kVA/HP) 6 Pulse Rectifier VFD Commercial(115%) Rated torque at start running at 100%	73.55	81.72	255.22	283.58	30%	30%	283.6	15.00%	5 Hertz
Group 2 (Non-Concurrent)	Motor : CU's 1 X 145.50 Amps Code G (6 kVA/HP) Across the Line Rated torque at start running at 100%	212.98	734.4	107.63	120.93	0%	0%	0	35.00%	15 Hertz
Group 2 (Non-Concurrent)	Motor : FCU Units 1 X 121.00 Amps Code G (6 kVA/HP) Across the Line Rated torque at start running at 100%	83.36	252.6	37.91	43.57	0%	0%	0	35.00%	15 Hertz
Group 2 (Non-Concurrent)	Elevator-Cable : Elevator-Cable #1 1 X 13.00 Amps Code H (6.7 kVA/HP) 6 Pulse Rectifier VFD Commercial(115%) Rated torque at start running at 100%	2.24	2.67	9.54	11.36	30%	30%	11.4	15.00%	5 Hertz
Group 2 (Non-Concurrent)	Lighting : Lighting #2 1 X 15.70 kVA @ 0.95 PF Harmonics: THID = 0.00%	14.91	15.7	14.91	15.7	0%	0%	0	25.00%	10 Hertz

D. Performance Parameters:

1. Max loading 100% of rated generator capacity.
2. Max frequency dip 5%.
3. Starting voltage dip max 25%.
4. Max running voltage dip max 5%.

1.8 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling and Unloading:

1. Provide all transportation of unit(s), fuel tanks, enclosures and all components to site.
2. Provide for rigging needed for unloading generators and equipment.
3. Provide all rigging for setting equipment into final position.

B. Storage and Protection:

1. Store generators and all accessories in covered building or in factory weatherproof housing to prevent exposure to weather, etc. until building is weathertight and suitable for installation.
2. Maintain unit in factory shrink-wrap or similar protection until installed in final position.
3. After setting in final position, cover unit to protect from construction debris, fireproofing sprays, paint, etc. until ready for connections and startup.
4. Do not install control panels, PLC's, or other electronic components or systems in

buildings unless the room is stabilized with permanent or temporary HVAC and humidity control.

1.9 SEQUENCING

A. General Sequencing:

1. Coordinate generator installation with exterior grading, utilities and site construction.
2. Provide for sub-grade rough-ins.
3. Coordinate construction of concrete pads with final grading and underground utilities.

1.10 WARRANTY

A. Special Warranty: Extended product warranty over and above that required by General Conditions of this contract.

1. Covers complete standby power generation system:
 - a. Engine.
 - b. Alternator.
 - c. Controls.
 - d. Accessories.
 - e. Transfer switches.
 - f. Remote annunciation devices.
2. Warranty shall be by the manufacturer or authorized representative.
3. Warranty period of five (5) years or 1500 operating hours, whichever occurs first, from initial startup.
4. Warranty includes all parts, labor, travel expenses, with no deductibles.
5. Installer shall complete and file all necessary documents to assure fulfillment of warranty requirements.
6. Deliver warranty documents to Owner in O & M manuals.

1.11 SYSTEM STARTUP

A. Manufacturer's Services: Provide services of a factory-authorized service representative to supervise the field assembly and connection of generator, associated components and accessories, and the pre-startup adjustment of all settings, components and accessories.

1.12 MAINTENANCE

- ##### A. Provide all materials and services of factory authorized service company to return at the end of twelve (12) and twenty four (24) months following completion of original contract. Preventative maintenance and testing of each new generator shall be performed at each visit, including, but not limited to the following items:
1. 4-hour full rated load test with test load bank, as specified previously.
 2. Test and adjust all monitoring systems and annunciation devices.
 3. Test and adjust all safety, starting and shutdown systems and devices, including all manual and automatic controls.
 4. Test and adjust operation of all associated ATS's, battery chargers, daytanks and pumps, louvers, etc.
 5. Replace all oil, air and coolant filters. Drain and replace associated fluids.
 6. Adjust tension on all belts. Replace belts, as needed.

7. Check battery condition, specific gravity, electrolyte level. Add water as needed. Clean all terminals and connections. Apply anti-corrosion treatment.
 8. Make adjustments to engine, fuel and starting systems to insure optimum starting and running efficiency.
 9. Perform a fuel quality test on the fuel stored in the tank(s) in accordance with ASTM and the generator manufacturer's recommendations. Advise owner of any conditions which require attention.
- B. Provide a full report on each engine-generator at each adjustment/testing visit listing all maintenance procedures performed, all filter/fluid changes, adjustments, replacements, etc. Report shall also document the load test, indicating, voltages, amperes, oil pressure, alternator amps, engine temperature, battery charging current/voltage, etc. every 15 minutes. Also indicate any changes to the normal readings and at which point it/they occurred.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Available Manufacturers: Subject to compliance with requirements, provide a system by the named "Basis of Design" manufacturer, or a comparable product of one of the other following named manufacturers:
1. Kohler (Basis of Design)
 2. Cummins
 3. Caterpillar

2.2 RATINGS AND CONDITIONS

- A. The following is based upon Kohler Model KD900.
- | | | |
|----|------------------|----------|
| 1. | KW/kVA @ 0.8 PF: | 900/1125 |
| 2. | Voltage: | 277/480V |
| 3. | Phase: | 3 ϕ |
| 4. | Wire: | 4 W |
- B. Engine Generator Specs:
- | | | |
|----|-------------------------------|-------------|
| 1. | Fuel Consumption @ Full Load: | 64.7 gal/hr |
| 2. | Housed/Wet Weight: | 61,113 lbs. |
| 3. | Motor Starting kVA: | 3,774 skVA |
| 4. | Max. Voltage Dip for skVA | 35 % |

2.3 ENGINE

- A. Engine shall be specifically matched to the generator to provide specified performance.
1. Full pressurized lubrication system, gear driven pump.
 2. Vertical, multi-cylinder.
 3. Manufacturer's nameplate identifying engine type, serial number, etc. for proper servicing.
 4. Factory prototype testing, with test results available.
 5. Engine shall not exceed greater than 10% lubricating oil consumption/loss over 100 hours of operation at any load (0-100%).

6. 4 cycle diesel (2 cycle engines are not permitted).
 7. Designed for commercial grade ASTM D975 Number 2 diesel fuel.
 8. Solid injection, full diesel type. The lubrication system shall be of the full pressure type.
- B. Emissions: Provide an engine certified to meet EPA Non-road Source Emissions Standards, 40 CFR 89, Tier 3 or the appropriate Tier Schedules, based on engine kW and application. Contractor is responsible for providing proper Tier rating, coordination of manufacturing, shipping and startup dates. Owner will not accept incorrect Tier rating due to delays in installation, etc. which affect the required Tier rating.
- C. Furnish engine with the following accessories:
1. Replaceable full flow oil filters.
 2. Dry type air cleaners.
 3. Fuel filter with replaceable element.
 4. Battery charging alternator.
 5. Isochronous governor to control engine speed. Frequency variation shall not exceed $\pm 0.25\%$ for constant loads from 0-100%. Cummins EFC or Woodward DSLC.
 6. Heavy duty 12 or 24 volt starting system.
 7. Gear driven starter motor. Cranking via gear drive.
 8. Safety shutdown via control panel.
 9. Water cooled oil cooler.
 10. Coolant water pumps, centrifugal type, gear driven by engine, starting simultaneously with engine. System shall be designed for operation up to 125°F without derating.
 11. Engine mounted radiator, belt-driven fan, and thermostat.
 12. No exposed moving parts. Guards installed on all rotating belts, blades, etc. per UL2200, "Standard for Safety for Stationary Engine Generator Assemblies."
 13. Jacket water heater, thermostatically controlled. Sized per manufacturer to maintain engine for cold start and load acceptance per NFPA 110. 4 KW (480V/60Hz/1 ϕ), or as required by manufacturer. Provide isolation valves for servicing. Provide disconnect switch at generator.

2.4 GENERATOR

- A. Generators shall be rated for continuous standby operation.
1. Heavy duty, single bearing, pre-lubricated type.
 2. Temperature Rise: 125°C.
 3. Self-ventilating via direct drive blower.
 4. Maximum speed not greater than 1800 rpm.
 5. Flexible coupling of generator shaft to engine flywheel.
 6. Self-regulating: Revolving field, 4-pole, brushless AC exciter with rotating rectifiers or static-exciter regulator assembly.
 7. Stator twice impregnated with varnish, skewed to minimize heating and harmonics.
 8. Excitor shall be full-wave rectified with silicon diodes mounted on rotor shaft. Manual reset circuit breaker shall protect field circuit.
 9. Class "H" for 150°C rise over a 40°C ambient, as defined by NEMA Standard MG1-1.65, "Motors and Generators."
 10. 2/3 pitch. Sub-transient Reactance: Maximum of 12%
 11. Re-connectable 12-lead bus bar system.

- B. Solid state automatic voltage regulator with manual digital voltage adjustment.
 - 1. Terminal voltage regulation of $\pm 0.5\%$ from 0-100% load.
 - 2. Synchronous operation for immunity to SCR tracking.
 - 3. Steady state output voltage maintained at $\pm 0.5\%$ of rated voltage from 0-100%
 - 4. Output voltage recovery to $\pm 1\%$ of final voltage in less than 4 seconds after adding/removal 25 % load increments.

2.5 OUTPUT CIRCUIT BREAKERS

- A. UL Listed output circuit breaker(s) on or at the generator.
 - 1. Thermal magnetic, molded case type.
 - 2. All generator-mounted circuit breakers shall be UL Service Entrance rated and shall bear a UL nameplate indicating this rating.
 - 3. Breaker(s) shall have Form C aux contacts that indicate the position (open or closed) for each output breaker.
 - 4. Rating as per drawings.
 - 5. Breaker(s) shall meet requirements of Section “Low Voltage Electrical Distribution”.

2.6 CONTROLS

- A. Integrated Control System: Control shall be via integrated generator set control system providing governing, voltage regulation, engine protection and operator interface functions. Major features include:
 - 1. Integral Protective Relay providing a full range of alternator protection functions that are matched to the alternator provided.
 - 2. Battery monitoring and testing features and smart starting control system.
 - 3. Three phase sensing, full wave rectified voltage regulation system, with a PWM output for stable operation with all load types.
 - 4. Standard PCC Net™ and optional Echelon LONWORKS® network interface.
 - 5. Control suitable for operation in ambient temperature from $-40\text{ }^{\circ}\text{C}$ to $+70\text{ }^{\circ}\text{C}$ ($-40\text{ }^{\circ}\text{F}$ to $+158\text{ }^{\circ}\text{F}$) and altitudes to 5000 meters (13,000 feet).
 - 6. Prototype tested; UL, CSA, and CE compliant.
- B. Operator/display panel:
 - 1. Off/manual/auto mode switch
 - 2. Manual run/stop switch
 - 3. Panel lamp test switch
 - 4. Emergency stop switch
 - 5. Alpha-numeric display with pushbutton access for viewing engine and alternator data and providing setup, controls and adjustments
 - 6. LED lamps indicating genset running, not in auto, common warning, common shutdown.
 - 7. Configurable LED lamps (5).
- C. Engine protection:
 - 1. Over-speed shut down
 - 2. Low oil pressure warning and shut down

3. High coolant temperature warning and shut down
 4. High oil temperature warning (some models)
 5. Low coolant level warning or shut down
 6. Low coolant temperature warning
 7. High and low battery voltage warning
 8. Weak battery warning
 9. Dead battery shut down
 10. Fail to start (over-crank) shut down
 11. Fail to crank shut down
 12. Redundant start disconnect
 13. Cranking lockout
 14. Sensor failure indication.
- D. Engine data:
1. DC voltage
 2. Lube oil pressure
 3. Coolant temperature
 4. Lube oil temperature (some models)
 5. Engine speed.
- E. AC protection:
1. Over current and short-circuit shut down
 2. Over current warning
 3. Single and three phase fault regulation
 4. Over and under voltage shut down
 5. Over and under frequency shut down
 6. Overload warning with alarm contact
 7. Reverse power and reverse Var shut down
 8. Excitation fault
- F. Alternator data:
1. Line-to-line and line-to-neutral AC volts
 2. Three phase AC current
 3. Frequency
 4. Total and individual phase power factor, kW and KVA
- G. Other Data:
1. Genset model data
 2. Start attempts, starts, running hours
 3. kW hours (total and since reset)
 4. Fault history
 5. Load profile (hours less than 30% and hours more than 90% load)
- H. Governing:
1. Digital electronic isochronous governor
 2. Temperature dynamic governing
 3. Smart idle speed mode
 4. Glow plug control (some models)

- I. Voltage regulation:
 - 1. Digital PWM electronic voltage regulation
 - 2. Three phase line-to-neutral sensing
 - 3. Suitable for PMG or shunt excitation
 - 4. Single and three phase fault regulation
 - 5. Configurable torque matching

- J. Control functions:
 - 1. Data logging on faults
 - 2. Time delay start and cooldown
 - 3. Cycle cranking
 - 4. Configurable customer inputs (4)
 - 5. Configurable customer outputs (4)
 - 6. Remote emergency stop

- K. Control Panel:
 - 1. Generator mounted, microprocessor based control panel.
 - 2. Sealed front panel with gasketed doors.
 - 3. Meets requirements of NFPA 99, "Health Care Facilities," NFPA 110, "Emergency and Standby Power Systems" for Level 1 systems
 - 4. Dead front type, NEMA 1 construction.
 - 5. Separate customer interconnection/termination box, completely separate from control panel.
 - 6. Vibration absorbing mountings.
 - 7. Listed under UL 508, and UL2200.

- L. Control Panel Functions:
 - 1. Cycle cranking control.
 - 2. Emergency stop switch/button.
 - 3. Idle mode control.
 - 4. Panel backlighting with switch.
 - 5. Reset switch.
 - 6. Run-Off-Auto switch.
 - 7. Lamp test switch.
 - 8. Audible alarm sounder.
 - 9. "NOT IN AUTO" light signal at generator and remote panels whenever if out of "Automatic" position.
 - 10. Automatic starting controls.
 - 11. Auxiliary Run relays.
 - 12. Common Failure Relays.
 - 13. Spare pre-wired, Form C, dry contacts for remote monitoring, to indicate functions listed under Remote Monitoring Panel.

- M. Standard Gauges, Meters & Warnings:
 - 1. Ammeter (Analog or digital).
 - 2. AC Voltmeter (Analog or digital).
 - 3. Ammeter and voltmeter phase selector switches (L-L, L-N).
 - 4. Voltage adjusting rheostat.
 - 5. Current and potential transformers.

6. Frequency meter (Analog or digital).
7. DC Voltmeter
8. Engine oil pressure gauge.
9. Engine temperature gauge.
10. Running time meter.
11. Indicator lamps for the following:
 - a. Over-crank
 - b. Low Oil Pressure
 - c. High Engine Temperature
 - d. Over-speed
 - e. Not In Auto
 - f. System Ready
 - g. Low Battery Voltage
 - h. Battery Charger Fault
 - i. Low Fuel
 - j. Pre-Alarm - High Engine Temperature
 - k. Pre-Alarm - Low Oil Pressure
 - l. Low Water Temperature
 - m. Auxiliary Alarm
 - n. Auxiliary Pre-Alarm
 - o. Liquid in rupture Tank
 - p. Ground Fault Indication

N. Starting controls (Initiated via contact closure in ATS):

1. Starting control shall disconnect automatically after firing via speed sensing switch.
2. Lock out of start control for start failure or any safety shutdown. Manual reset required.
3. 3 start attempts of 15 seconds cranking each
4. 15 seconds between each attempt.
5. Total actual cranking time for the complete cranking cycle shall be 45 seconds during a 90 second interval.
6. After the engine has stopped, the cranking control shall reset.
7. OVER-CRANK signal light shall energize, start system shall lock-out and audio/visual alarm for failure.

O. Automatic Shutdown Controls:

1. Emergency Stop
2. Fail to Crank
3. High AC Voltage
4. High Coolant Temp
5. Low AC Voltage
6. Low Oil Pressure
7. Over-crank
8. Over-speed
9. Short Circuit
10. Under-frequency
11. Low Coolant Level

2.7 REMOTE MONITORING PANEL

- A. Solid state remote monitoring panel with audible and LED visual alarm lamps to indicate

the following functions:

1. Generator Running
2. Normal Power
3. Low Coolant Temperature (A)
4. High Coolant Temperature (A)
5. Pre-High Coolant Temp. (A)
6. Low Oil Pressure (A)
7. Pre-Low Oil Pressure (A)
8. Over-crank (A)
9. Over-speed (A)
10. Low Battery Voltage
11. Charger Fault (A)
12. Normal Battery Voltage
13. Low Engine Temp. (A)
14. Not in Auto Mode (A)
15. Emergency Stop (A)
16. Low Fuel (Main Tank) (A)
17. Liquid in Rupture Tank (Subbase Tank)

(A) indicates audio/visual alarm. Others are visual only.

- B. Panel test button shall be provided to check all indicator lights. An audible alarm with silence button shall warn user of generator trouble in addition to visual lamps.

2.8 BATTERY CHARGER

- A. The battery charger shall be furnished as part of the engine/generator package from the manufacturer.

1. NEMA 1 enclosure.
2. Automatic equalize-charge & float modes.
3. DC volt and ammeter.
4. On-Off" control switch.
5. Fused AC input and DC output, with terminals for input and output connections.
6. DC output of 12 or 24 volts, as required.
7. Dry output contacts for AC input or DC output failure.
8. Relays for high and low DC voltage.
9. Inherently self-protected against shorts, overloads and reversed leads.
10. Fuses accessible from the front of the charger.

2.9 BATTERIES

- A. For engine starting, provide heavy duty battery.

1. Lead calcium type batteries.
2. 12 or 24 volt as required by engine.
3. Batteries shipped dry.
4. CCA rated per engine manufacturer for 0°F starting.
5. Non-metallic, corrosion resistant rack.
6. All cabling, connections and accessories.
7. Champion, Interstate, Exide, C&D Charter, or equal.

2.10 SUBBASE FUEL STORAGE TANK

- A. Provide a sub base fuel storage tank under generator.
1. Listed per UL 142, “Steel Aboveground Tanks for Flammable and Combustible Liquids.”
 2. Double wall tank, pressure tested to 5 psi on both inner and outer tank.
 3. **3426** gallon capacity (**48** hour runtime).
 4. 12 gauge corrosion resistant steel tank.
 5. 12 gauge top bottom and baffles, 7 gauge steel channel side supports.
 6. All required fittings and connections, including, but not limited to, fuel supply and return, fuel level gauge, low fuel alarm, manual fill, vent, fuel in rupture tank alarm, etc. Pressure relief vent caps shall be supplied for both the inner and outer tank.
 7. Normal vent and Emergency relief valve per NFPA 30, “Flammable and Combustible Liquids Code.”
 8. Maximum height of 30 inches.
 9. Manufacture shall insure that top of all circuit breakers and controls (ie EPO) shall be less than 72”, per NEC. Where higher mounting heights are required, manufacturer shall include permanent service platforms at all such devices.
 10. Dimensions of tank shall be the same as the generator skid dimensions.
 11. Finish shall be black, or shall match the color of Generator Enclosure.

2.11 WEATHERPROOF ENCLOSURE

- A. The generator set shall be housed in a weatherproof outdoor housing as follows:
1. Welded and bolted, reinforced sheet steel.
 2. Weatherproof enclosure, electrostatically painted with paint inside and out.
 3. Inspection doors located for access to control equipment and maintenance points.
 4. Doors with continuous piano hinge (on units up to 350 KW) and key locking handles.
 5. Expanded metal louvers for air intake and radiator.
 6. Exhaust piping and silencer mounting sealed or flanged to insure a weatherproof installation.
 7. Enclosure bolted to the generator set base.
 8. Coolant and oil drain line extensions.
 9. Two lifting eyes.
 10. Sized to house the various control components herein specified. Mounting of components shall be accomplished in such a way that vibration effect is not an inherent problem.
 11. Enclosure factory assembled/installed with generator and shipped as single unit.
- B. Sound Attenuation:
1. Provide manufacturer's Level 2 custom designed enclosure to provide additional sound attenuation.
 2. Construction shall include additional features listed below:
 - a. Fully enclosed exhaust system.
 - b. Non-hygroscopic internal sound absorbing materials.
 - c. Vertical radiator discharge, as noted on drawings, with discharge plenum bird screen and drain.
 - d. All access and inspection doors fully gasketed.
 3. Expanded metal louvers or hoods shall be located for cooling air inlet.

4. Sound attenuation shall limit the sound to 75 db(A), measured at 7 meter distance from the enclosure, within the 500Hz - 2000Hz frequency range. Kohler Sound enclosure, or equal

2.12 FLUIDS

- A. All fluids of type and rating per engine manufacturer:
 1. Engine oil.
 2. Ethylene Glycol Coolant with corrosion inhibitors.

2.13 REMOTE EMERGENCY SHUTDOWN SWITCH

- A. Description: Remote Emergency Shutdown Switch for shut down of generator from each ATS location.
 1. Mounted adjacent to ATS within each building's electrical room.
 2. With all required wiring, contacts, and interface for interrupting generator "run" circuit to cause immediate engine/generator shutdown.
 3. Yellow lexan housing, surface mounting.
 4. Maintained position, red pushbutton (Turn to reset). PUSH label on center of button.
 5. Label as EMERGENCY GENERATOR SHUTOFF
 6. Safety Technology International, Inc. #SS2-2-3-1, or equal.

2.14 STEEL SERVICE PLATFORM:

- A. Provide a permanent, elevated service platform providing level access to all internal electrical and mechanical components for service, inspection, etc. Platform shall include permanent access stairs, railings, grating, supports, etc. Platform is not required on the radiator discharge end of the unit, unless the unit has serviceable equipment requiring access on that end.
- B. Platform Construction and Features:
 1. All steel, hardware, etc. shall be hot-dipped galvanized.
 2. 54 inch wide service platform on sides and rear for accessing engine, alternator and internal components at level of the generator base rails. Exact extent of platform required shall be coordinated with generator manufacturer.
 3. Steel grating walking surface with openings approximately 1" x 4".
 4. Galvanized pipe safety railings on all elevated portions and on stairs.
 5. Integrated access stairs from concrete pad level to service platform, complying with all building codes. Step surfaces shall be metal grating to match platform.
 6. Steel support columns, with anchor bolts into generator's concrete pad.

2.15 CONCRETE EQUIPMENT PADS

- A. As specified in Section "Common Work Results For Electrical."

PART 3 EXECUTION

3.1 EXAMINATION

- A. Site Verification of Conditions: Examine the conditions under which the equipment shall

be delivered, installed, and operated. Make all allowances required for operation and maintenance of the equipment, per Codes and manufacturer.

3.2 INSTALLATION

A. General Requirements:

1. Install all equipment, as indicated.
2. Maintain minimum working space at live parts according to manufacturer's written instructions. Provide all required access space per NEC for controls, fuses and items requiring maintenance access.

B. Rough-in:

1. Rough-in all underslab, below grade or below roof conduits, ducts, etc. prior to setting generator in place.
2. Coordinate exact stub-ups with proposed manufacturer's equipment installation drawings. All conduit shall be within the generator footprint.
3. Rough-in for all required circuits, controls, connections, etc. as required by proposed equipment, even if not explicitly indicated on plans.

C. Generator Installation On Exterior Concrete Equipment Pad:

1. Provide concrete foundation/equipment pad or housekeeping pad, per "Common Work Results For Electrical."
2. Construct concrete pads such that pad is a minimum of 6 inches above surrounding grade.
3. Coordinate conduit and fuel line stub-ups within generator frame and/or sub-base tank. No conduit is permitted outside of generator footprint.
4. Install generator so as to direct radiator airflow away from buildings, fences, walls, etc. Maintain clear airflow for a minimum of 10 LF, or as per manufacturer.
5. Install exhaust discharge parallel to ground in same direction as radiator discharge, or vertically upward, per drawings.
6. Ensure that all service access doors can be fully opened for access.
7. Maintain 42" minimum width around entire generator set for maintenance access.
8. Seal all penetrations for conduit, piping, exhaust, etc. to maintain weatherproof and/or sound attenuating properties.
9. Where generator is mounted atop a sub-base fuel tank, securely anchor the subbase tank to concrete pad.
10. Provide ribbed rubber sound pads between tank and concrete pad.
11. Mount generator assembly steel skid on a minimum of four spring type vibration isolators (where required by specifications) between skid and subbase fuel tank.
12. Adjust internal isolator leveling bolts for level installation.
13. Where gensets use internal vibration isolation, securely bolt the genset skid directly to the subbase tank.
14. Provide steel service platform, stairs and railings, as indicated.

D. Generator Fuel Line Connections:

1. Provide flexible stainless steel fuel lines in within first 18" between engine and all rigid fuel supply and/or return line(s), sub-base tanks, skid mounted day-tanks, or connections to rigid gas piping system.

E. Generator Sub-base Tank:

1. Securely attach sub-base tank to the concrete slab.
 2. Provide all required fittings and connections, including, but not limited to, fuel supply and return, fuel level gauge, low fuel alarm, manual fill, vent, fuel in rupture tank alarm, etc.
 3. Provide pressure relief vent caps for both the inner and outer tank.
 4. Connect all alarms to the control panel and remote annunciator, where applicable.
 5. Coordinate tank installation with electrical and plumbing connections.
 6. Make provisions for electrical stub-up access after tank installation.
 7. Vent all tank(s) per NFPA 30, "Flammable and Combustible Liquids Code."
- F. Fluids: Provide all fluids of type and rating per engine manufacturer, for initial starting, testing and final delivery to Owner including:
1. Engine oil.
 2. Completely fill entire system including radiator and all piping with coolant and softened water in 50:50 ratio. Add corrosion inhibitor.
 3. ASTM D975 Number 2 Diesel Fuel:
 4. Provide as required for startup and testing.
 5. Completely fill storage tanks, sub-base tank, and/or all daytanks prior to delivery to owner, after all startup and testing.
- G. Electrical Accessories:
1. Provide local disconnecting means for all generator accessories for servicing, to comply with NEC:
 - a. Battery Chargers - provide toggle switch.
 - b. Jacket Heaters - provide non-fused safety switch.
- H. Starting Batteries:
1. Fill dry battery cells with distilled water per manufacturer's instructions.
 2. Provide hold-downs for each battery cell to prevent movement.
 3. Apply spray-on corrosion inhibitor with red dye to all battery terminals.
- I. Remote Equipment: Install all remote equipment, as specified, indicated on contract drawings, or required for proper operation of generator system. Provide all raceways, wiring, connections, testing of remote equipment:
1. Remote Monitoring Panels.
 2. Emergency Generator Stop Buttons.
 3. Connections to sensors and other equipment displayed and/or monitored by the generator control system and status panel.
 - a. Fuel leak detection sensors.
 - b. High/low fuel level sensors.
 - c. Daytank alarms.
 - d. Battery charger failure.
 4. Connections to automatic transfer switch(es) connected to the generator control system.
 - a. Engine start/stop controls.

3.3 CONSTRUCTION

- A. Interface with Other Work:
 - 1. Provide connections between generator and other work of this contract:
 - a. Auto transfer switch(es).
 - b. Panelboards, switchboards, etc.
 - c. Fire alarm system.
- B. Sequences of Operation: Where multiple automatic transfer switches are coupled to a single generator, the starting control system shall be such that Engine Start contacts at any transfer switch will start the engine. Engines shall not shut down until all associated transfer switches have transferred back to normal source and all cool-down time delays have expired.

3.4 GROUNDING & BONDING

- A. Connections: Ground generators, frame and enclosures per NEC Article 250, "Grounding" and as specified in Section "Grounding & Bonding for Electrical Systems."
- B. Ground generator system as follows:
 - 1. Connect alternator equipment ground lug to generator frame and housing.
 - 2. Provide grounding electrode conductor to bond generator ground bus to the building ground system through the ATS ground lug.
 - 3. Driven ground rod at the generator location for grounding frame and housing.
 - 4. For rooftop units, bond generator steel skid frame to the structural steel on roof via #4/0AWG copper conductor and exothermic welds.
 - 5. All sizes shall be as per NEC or as indicated on drawings, whichever is larger.
- C. Provide a separately derived system:
 - 1. Ground the generator neutral bus to the ground lug on the generator frame.
 - 2. The size of the neutral grounding conductor (jumper) shall equal the size of the neutral conductor indicated on the plans on the load side of the circuit breaker.

3.5 REPAIR/RESTORATION

- A. Restore all finishes, equipment, surfaces and/or grade to original condition, where affected by the work of this section.

3.6 FIELD QUALITY CONTROL

- A. Independent Testing Agency: Provide services of an independent electrical testing agency, according to the requirements of Section "Quality Control" to perform tests on generator installations.
- B. Test Objectives: To ensure generator installation complies with Contract Documents, is operational within industry and manufacturer's tolerances, is adjusted to specific project parameters, and is suitable for energizing.
- C. Site Tests:
 - 1. Schedule tests and provide notification at least one week in advance of test commencement.
 - 2. Pre-Startup Testing: After completing system installation, perform the following

- preparations for tests:
- a. Make insulation-resistance tests for generator, output breaker(s).
 - b. Make continuity tests of windings and remote alarm circuits.
 - c. Verify(measure) frame and equipment ground resistance.
 - d. Verify (measure) alternator neutral bonding to, or isolation from ground, as applicable.
 - e. Check torque on cable terminations.
 - f. Provide a set of Contract Drawings to the testing agency.
 - g. Provide manufacturer's installation and testing instructions to the testing agency.
 - h. Provide complete shop drawing data on all equipment.
3. Start-Up Services:
- a. The complete installation shall be initially started and checked for operational compliance by factory trained manufacturer's representative(s).
 - b. Inspect accessible components for cleanliness, mechanical, and electrical integrity, for presence of damage or deterioration, and to ensure removal of temporary shipping bracing. Do not proceed with tests until deficiencies are corrected.
 - c. Inspect bolted electrical connections for tightness according to manufacturer's published torque values or, where not available, those of Standards 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors."
 - d. All settings, as specified in this section, shall be properly set and verified by start-up personnel.
 - e. Provide a written start-up and testing checklist, which verifies all settings and features are properly set and functioning. Written report shall indicate final setting of all adjustable features.
4. Generator Tests: After installing generator, perform the following tests, at a minimum:
- a. Phase rotation. Matched to load requirements.
 - b. All protective and shutdown features tested.
 - c. Complete integrated test of generator and automatic transfer switch and control.
 - d. Specified pickup, dropout, transfer, retransfer, engine start and cool down, and exercise timer settings.
 - e. Operation of transfer and retransfer operation, including failure of emergency source.
 - f. Operation of auxiliary contacts and devices.
 - g. Operation of all gauges, displays and control equipment.
 - h. Ground-Fault Systems: Perform inspections and tests stated in NETA ATS, Section 7.14.
- D. Remove and replace malfunctioning components with new, and retest.
- E. Test Failures: Compare test results with specified performance or manufacturer's data. Correct deficiencies identified by tests and retest.
- F. Load Testing:
1. Schedule and perform a post-installation load test to demonstrate the load capacity of the unit. Installer shall be present during the start-up and testing. Notify Owner and Architect at least one week in advance of start up/test date.
 2. A resistive load bank shall be used to test the generator.

- a. Load generator to nameplate rating.
 - b. Maintain records for duration of test. Record:
 - c. Time of day.
 - d. Ambient air temperature
 - e. Coolant temperature.
 - f. Cranking time to start.
 - g. Output voltage, frequency, current.
 - h. Oil pressure.
 - i. Battery charger rate at 5 minute intervals for the first 15 minutes and at 15 minute intervals thereafter.
 - j. Load test shall be run as follows, recording load changes and the result on voltage and frequency.
 - k. 25% rated load for 20 minutes
 - l. 50% rated load for 20 minutes
 - m. 75% rated load for 20 minutes
 - n. 100% rated load for 3 hours
3. Following running load test, allow generator to run unloaded for a cool down period of 5 minutes.
 4. After shutdown and another 5 minute period (not running), apply full rated load (nameplate KW). Apply load in one increment of 100% full load pick-up immediately upon reaching rated RPM. Test shall be run at full load for 30 minutes. Allow all proper cool down periods.

3.7 IDENTIFICATION

- A. Provide permanent warning signs on generator housings and on fenced yards containing generators and associated equipment. Warning signs shall be as specified in section "Common Work Results for Electrical".
- B. Provide Red identification plate(s) with white engraved letters on the main service equipment to identify the type and location of emergency generator, per NEC articles 700, 701, 702, as applicable.

3.8 ADJUSTING

- A. General:
 1. Set all field adjustable parameters to those as specified.

3.9 CLEANING

- A. Inspect interior and exterior of installed generators and enclosures. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

3.10 DEMONSTRATION

- A. Training: Arrange and pay for the services of a factory-authorized service representative to demonstrate generator and accessories and train Owner's staff. Include a minimum of 8 hours of training in operation and maintenance. Provide both classroom training and hands-on equipment operation covering the following:
 1. Safety precautions.
 2. Features and construction of project equipment and accessories.

3. Routine inspection, test and maintenance procedures.
 4. Routine cleaning.
 5. Changing of filters, fluids, etc.
 6. Features, operation, and maintenance of unit and protective devices.
 7. Interpretation of readings of indicating and alarm devices.
 8. Coordination with transfer switch(es).
 9. Ground fault protection systems.
- B. Schedule training with at least 7 days' advance notice.
- 3.11 COMMISSIONING
- A. This project includes Commissioning of selected systems and components. Provide for commissioning of the generator system(s), as required per Section “Commissioning of Electrical Systems”, and the Commissioning Plan.

END OF SECTION