SECTION 263214- DIESEL-ALTERNATOR EMERGENCY SYSTEM

See information at end of section.

1. GENERAL
	* + 1. RELATED WORK SPECIFIED ELSEWHERE
				1. Fuel Tanks For Diesel-Alternators: Section 335617.
				2. Ductwork: Section 233114.
				3. Automatic Transfer Switch: Section 263623.
			2. SYSTEM DESCRIPTION
				1. The diesel-alternator emergency system operates in coordination with the automatic transfer switch to provide power in the event of failure of the normal power source.
				2. In normal operating condition, the mechanism of the transfer switch is in the normal position and the diesel-alternator unit shut down. Sequence of transfer operation occurs as follows:

Upon signal from the automatic transfer switch the diesel-alternator unit automatically starts.

10 second maximum is required for essential electrical systems (nfpa 99). Most projects should be treated as essential and meet this requirement. It can be omitted for non-critical uses when specifically requested.

Complete transition from onset of normal feeder failure to emergency feeder transfer shall not exceed 10 seconds.

After the normal power source is restored to specified parameters, the diesel-alternator unit continues to run until the automatic transfer switch signals for the unit to shut down.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.
				5. Submittals Package: Submit the product data, shop drawings, and quality control submittals specified below all at the same time as a package.
				6. Shop Drawings:

Show the construction (outline) of the diesel-alternator unit and accessories.

Installation details.

Housing details including layout of equipment, raceways, piping, etc.

* + - * 1. Product Data:

Catalog sheets, specifications and installation instructions.

Bill of materials.

Detailed sequence of operations (format similar to 1.02 SYSTEM DESCRIPTION).

Name, address and telephone number of nearest fully equipped service organization.

* + - * 1. Quality Control Submittals:

Design Data:

Company’s data indicating HP, KW and KVA ratings with proof that the unit will meet the full load test without exceeding NEMA temperature rise specified.

Ampere requirements of the starting system (at the batteries specified minimum ambient temperature) during cranking.

Include engine manufacturer’s recommended battery ampere-hour capacity at the minimum ambient temperature condition for the specified duration and number of crank cycles.

Include battery manufacturer’s data proving that the batteries will meet the ampere-hour requirements at the batteries minimum ambient temperature.

Include details of battery charger and battery rack recommended by battery manufacturer.

Company Field Advisor Data: Include:

Name, business address and telephone number of Company Field Advisor secured for the required services.

Certified statement from the Company listing the qualifications of the Company Field Advisor.

Services and each product for which authorization is given by the Company, listed specifically for this project.

Completed Installation Lists.

* + - * 1. Contract Closeout Submittals:

Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Director’s Representative. Include name, address and telephone number of nearest fully equipped service organization.

Test Report: System acceptance test report.

Certificate: Affidavit, signed by the Company Field Advisor and notarized, certifying that the system meets the contract requirements and is operating properly.

* + - 1. QUALITY ASSURANCE
				1. Equipment Qualifications For Products Other Than Those Specified:

At the time of submission provide written notice to the Director of the intent to propose an “or equal” for products other than those specified. Make the “or equal” submission in a timely manner to allow the Director sufficient time to review the proposed product, perform inspections and witness test demonstrations.

If products other than those specified are proposed for use furnish the name, address, and telephone numbers of at least 5 comparable installations that can prove the proposed products have performed satisfactorily for 3 years. Certify in writing that the Director’s Representative of the 5 comparable installations will allow inspection of their installation by the Director's Representative and the Company Field Advisor.

Make arrangements with the Director’s Representative of 2 installations (selected by the Director) for inspection of the installations by the Director's Representative. Also obtain the services of the Company Field Advisor for the proposed products to be present. Notify the Director a minimum of 3 weeks prior to the availability of the installations for the inspection, and provide at least one alternative date for each inspection.

Only references from the actual Director or Director’s Representative (Security Supervisor, Maintenance Supervisor, etc.) will be accepted. References from dealers, system installers or others, who are not the actual Director’s Representative of the proposed products, are not acceptable.

Verify the accuracy of all references submitted prior to submission and certify in writing that the accuracy of the information has been confirmed.

The product manufacturer shall have test facilities available that can demonstrate that the proposed products meet the contract requirements.

Make arrangements with the test facility for the Director's Representative to witness test demonstrations. Also obtain the services of the Company Field Advisor for the proposed product to be present at the test facility. Notify the Director a minimum of 3 weeks prior to the availability of the test facility, and provide at least one alternative date for the testing.

Provide written certification from the manufacturer that the proposed products are compatible for use with all other equipment proposed for use for this system and meet all contract requirements.

* + - * 1. Source Quality Control: The Company producing the diesel-alternator unit shall have test facilities available which can demonstrate that the proposed system meets contract requirements.

Edit number of hours in paragraph below as required.

* + - * 1. Company Field Advisor: Secure the services of a Company Field Advisor for a minimum of 16 working hours for the following:

Render advice regarding installation and final adjustment of the system.

Witness final system test and then certify with an affidavit that the system is installed in accordance with the contract documents and is operating properly.

Edit number of sessions and hours in subparagraph below as required.

Train facility personnel on the operation and maintenance of the system (minimum of two 2 hour sessions).

Explain available service programs to facility supervisory personnel for their consideration.

* + - * 1. Service Availability: A fully equipped service organization capable of guaranteeing response time within 8 hours to service calls shall be available 24 hours a day, 7 days a week to service the completed Work.
			1. PROJECT CONDITIONS
				1. The diesel-alternator unit shall meet all requirements at the following elevation and ambient temperatures (actual site conditions):

Fill in blanks in 3 subparagraphs below. Maximum ambient should be the temperature of the room or enclosure when the unit is running. Coordinate with hvac. Delete underlining before entering information.

Elevation Above Sea Level: \_\_\_\_\_\_\_\_ feet.

Maximum Ambient Temperature: \_\_\_\_\_\_\_\_ degrees F.

Minimum Ambient Temperature: \_\_\_\_\_\_\_\_ degrees F.

* + - 1. MAINTENANCE
				1. Spare Parts:

Two sets of gaskets for routine engine maintenance.

Two spare heating elements for water jacket heater (liquid cooled unit). Furnish spare water jacket heater if elements are not replaceable.

Two spare heating elements for lube oil heater (air cooled unit).

Set of belts.

Set of oil filter elements.

Set of fuel filter elements.

Set of air cleaner elements.

Hydrometer for testing anti-freeze solution (liquid cooled unit).

Test kit for checking chemical condition of coolant (liquid cooled unit).

One year supply of coolant conditioner (liquid cooled unit).

Special tools if required for the regular maintenance and minor repairs of the unit.

1. PRODUCTS
	* + 1. DIESEL-ALTERNATOR UNIT

Rate single phase units at 1.0 pf. Fill in blanks in a. Example: 12kw (15kva at 0.8 pf). When elevators are to be connected to emergency system, check with elevator designers to verify that there is sufficient load to overcome regenerative effect from elevator motors. Delete underlining before entering information.

* + - * 1. Rating: \_\_\_\_\_\_\_\_KW (\_\_\_\_\_\_\_\_KVA at 0.8 power factor), 120/208 volts, 3 phase, 4 wire, 60 Hertz. See 3.02 System Acceptance Test, for load test ampere values at unity power factor.
				2. Acceptable Companies: Generac, Kohler Co., or Cummins/Onan Corp.
				3. Engine:

Industrial type diesel engine, water or air cooled, pressure lubricated, medium speed (1800 rpm maximum), full diesel with mechanical fuel injection.

Engine Accessories: Equip engine with the Company’s standard accessories. Exception: In addition to, or in lieu of the Company’s standard accessories for the following, equip engine with:

Electric starting system, 12 V dc.

Fuel filters, spin on type.

Heavy duty air cleaners are available for subparagraph below for extreme conditions.

Dry type air cleaner (replaceable element).

Lubricating oil filters, full flow (with by-pass valve), spin-on type.

Use subparagraph below when precise control is required. Omitting subparagraph below will result in unit usually being supplied with a mechanical governor with 5 percent regulation.

Governor that maintains speed at precise isochronous control for 60 Hz operation. The frequency at any constant load (including no load) shall remain within a steady state band width of + 0.25 percent of rated frequency. Frequency modulation (defined as the number of times per second that the frequency varies from the average frequency in cyclic manner) shall not exceed one cycle per second.

* + - * 1. Engine Control and Instrumentation:

Timer for selective number of cranking cycles.

Circuit for bypassing oil pressure protective device during starting.

Selector switch for stop, automatic and manual positions.

Indicating Instruments and Safety Devices:

Audible alarm to sound when any safety device operates.

High engine temperature cutout and indicating light.

Low lubricating oil pressure cutout and indicating light.

Overspeed shutdown and indicating light.

Overcranking cutout and indicating light.

Alarm system reset.

Lamp test switch.

Lubricating oil pressure gage.

Jacket water temperature gage (liquid cooled unit).

Running time meter.

Sensor and warning device to indicate jacket water temperature below 70 degrees F. (liquid cooled unit).

Auxiliary contacts or relays to control opening and closing of motorized dampers.

Use subparagraph below when article 2.06 is required.

Provisions for remote annunciation.

Omit last sentence in subparagraph below if unit is installed in heated area.

Engine gages and control switches may be installed directly on an engine mounted panel or on instrument panel of an engine starting control panel. Equip panel with strip heater to control condensation.

* + - * 1. Engine Cooling and Heating Equipment:

Liquid Cooled Unit:

Engine mounted radiator system and pusher type fan designed to cool the jacket water.

Thermostatically controlled electric water jacket heater in the cooling system to maintain engine temperature at minimum 70 degrees F.

Permanent type anti-freeze (ethylene glycol) for the cooling system as manufactured by Dow Chemical Co. or Union Carbide. Coolant mixture suitable for use to minus 50 degrees F.

Coolant conditioner corrosion prohibitive chemical additive that controls acidity, softens water and leaves protective film on cooling passages. Type and method of application as recommended by engine manufacturer.

Radiator flange for duct connection.

Air Cooled Unit:

Single inlet positive head centrifugal fan capable of discharging the heated air from the ambient air.

Thermostatically controlled electric lube oil heater in the oil sump to maintain temperature at minimum of 70 degrees F.

Hot air discharge duct adapter.

* + - * 1. Engine Exhaust Equipment:

Silencer specified in subparagraph below is suitable for all areas including critical noise areas.

Omit next 3 subparagraphs below for units under 6kw.

Silencer: Suitable for critical noise areas; Burgess-Manning’s BEO, Donaldson Co. Inc.’s TCU, Riley-Beaird Inc.’s Maxim Model M51, or Universal Silencer’s EN5 with:

Omit subparagraph below for outdoor housed units.

Hangers and supports (vibration isolation type).

Exhaust Pipe: Schedule 40 black steel pipe with:

Corrugated (bellows) stainless steel flexible section for connection between exhaust manifold and exhaust pipe.

Omit next 2 subparagraphs for outdoor housed units.

Hangers and supports.

Omit subparagraph below for short exhaust pipe runs.

Condensate drain at low point.

Edit next 2 subparagraphs as required.

Rain cap (vertical pipe).

Bird screen (horizontal pipe).

Omit subparagraph below for outdoor housed units.

Insulation: 3 inch thick calcium silicate pipe insulation; Johns-Manville Corp.’s Thermo-12, or Owens-Corning’s Kaylo with Type 304 stainless steel metal jacketing, .010 inch thick, held in place with snap-in locking joints and stainless steel bands with snap straps.

* + - * 1. Alternator and Accessories: Multipole alternator meeting NEMA Standards, having:

Brushless solid state rotating exciter system.

Temperature compensated solid state voltage regulator. Voltage regulation within plus or minus 3 percent of rated voltage from no load to full load. Transient voltage dip not greater than 20 percent of rated voltage when full load at rated power factor is applied to the alternator.

Stable alternator operating conditions re-established within 2 seconds following any change in load between no load and full load or between full load and no load.

Temperature rise in accordance with NEMA MG1-22.40, determined by resistance method, rated on continuous basis at full load, reference ambient temperature 40 degrees C (Class B insulation system 80 degrees C maximum rise; Class F insulation system 105 degrees C maximum rise; Class H insulation system 125 degrees C maximum rise).

Alternator directly connected to engine and driven through a semi-flexible driving flange or rigid coupling.

For subparagraph below, remember to include section 262817.

Main circuit breaker mounted on unit, or on mounting frame adjacent to unit. Circuit breaker shall meet the requirements of Section 262817 - Enclosed Circuit Breakers. Field circuit breaker not acceptable as the main circuit breaker.

Instruments in panel, shock mounted on the unit:

Dial type frequency meter.

Omit subparagraph below for units under 6kw.

Rheostat Control.

AC voltmeter.

AC ammeter.

Individual or combination type selector switches for the voltmeter and ammeter.

Panel lights and switch.

* + - 1. BATTERIES AND ACCESSORIES
				1. Nickel-cadmium batteries; Hoppeke Battery Systems Inc. FNC, Marathon’s Alcad UHP, McGraw Edison Power Systems Div.’s Americad HED, or SAB Nife Inc.’s Block Battery Type H, with:

Number of cell units as required for voltage of starting system (cell voltage shall be based on l.2 volts per cell).

Plastic cell containers.

Use subparagraph below for standard application.

Ampere-hour capacity as recommended by engine manufacturer for a minimum of 3 consecutive starting attempts of 15 seconds each.

Use subparagraph below for essential electrical system (nfpa 99).

Ampere-hour capacity as recommended by engine manufacturer for 60 seconds of continuous cranking. Note: Engine overcrank device shall terminate cranking with enough reserve power to permit additional cranking after an investigation to find the reason for a failure to start.

Change 32 degrees f. In subparagraph below to lowest temperature batteries will be exposed to.

Full ampere-hour capacity delivered at ambient temperature of 32 degrees F.

* + - * 1. Battery Charger: Constant voltage, current limiting type as recommended by the battery manufacturer, having:

Fully automatic, 2 rate (float and high-rate/equalize) charging control.

DC ammeter.

DC voltmeter.

High-rate indicator light.

Use next 2 subparagraphs for essential electrical system (nfpa 99).

Common audible alarm and individual indicating lights (with provision for connection to remote annunciator) for:

Ground fault (if ungrounded type dc system).

AC input failure.

Low dc voltage.

High dc voltage.

No dc voltage at batteries.

Remote annunciator panel with common audible alarm and individual indicating lights for:

Ground fault (if ungrounded type dc system).

AC input failure.

Low dc voltage.

High dc voltage.

No dc voltage at batteries.

Use subparagraph below for standard application.

Common audible alarm and individual indicating lights for:

Ground fault (if ungrounded type dc system).

AC input failure.

Low dc voltage.

High dc voltage.

No dc voltage at batteries.

* + - * 1. Battery Rack: As recommended by battery manufacturer.

Use article below for unit installed within a building. Investigate use of security fencing to prevent tampering with the unit (omit the housing).

* + - 1. HOUSING
				1. Factory installed housing, completely enclosing unit, having:

Minimum 16 gage sheet steel construction. All metal painted with rust inhibiting primer and minimum 2 coats of finish paint.

Louvered openings in both sides plus screened, free openings at base, for heat removal air flow.

Flange for connection to ductwork.

Removable doors to allow access to the unit.

Rear housing panel with hinged door to allow access to the instrument panel.

CO2 type fire extinguisher, minimum 15 pound unit as manufactured by the Amerex Corp., Fire-End & Croker Corp., or Kidde Fire Extinguisher Co.

Type NC emergency lighting unit (see Section 265200). Light switch for emergency lighting at conspicuous location. Light switch shall interrupt AC power to emergency lighting unit, thereby illuminating emergency lighting.

Use article below for unit installed outside of building in mild areas of the state.

* + - 1. HOUSING
				1. Custom fabricated weather protective housing to completely enclose unit, as manufactured by Chillicothe Metal Co. or Pritchard Brown, having:

All equipment and devices installed within the housing (except muffler) including main circuit breaker, day tank, batteries, panelboard, etc. connected and ready for use as complete package.

Welded and bolted sheet steel construction, minimum 16 gage, reinforced with welded stiffened channels, or minimum .050 aluminum construction.

Minimum 40 pounds per sq ft snow loading for roof.

Floor plate (minimum 14 gage) and/or end shields to make housing rodentproof.

Electric motor-operated shutters with wire mesh screens at 3 locations.

Size shutters for required air flow at maximum ambient.

Shutters shall automatically open when the unit is operating.

Shutters to open in same direction as air flow.

One of the shutters shall be modulating type controlled by a temperature controller, adjusted to allow some of the radiated heat of the engine to be captured inside the housing. Set the modulating shutters in relation to the temperature controller as recommended by engine manufacturer.

Two full height doors on each side to allow access to the unit. Doors hinged to housing with full length continuous brass or stainless steel piano hinge.

Large single door at rear housing panel.

All doors hinged and equipped with key-lock door handles.

Hinges constructed of brass or stainless steel.

All metal painted with rust inhibiting primer and minimum 2 coats of finish paint.

Fuel heater in day tank, thermostatically controlled (maintain fuel temperature at 40 degrees F.).

Batteries mounted in an heated, insulated enclosure.

Battery Heaters: As manufactured by Kim Hotstart Mfg., with thermostat to maintain the air temperature around the batteries at 60 degrees F minimum and 80 degrees F maximum at an outside ambient of -20 degrees F.

Oil and water drains and crankcase vent piped to outside of enclosure.

Silencer mounted horizontally on top of unit, above housing.

All wiring from auxiliary equipment (battery heaters, day tank, motor-operated shutters, water jacket heater and oil heaters) to diesel-alternator panelboard installed in rigid steel conduit.

Type NC emergency lighting unit (see Section 265200). Light switch for emergency lighting at each door. Light switch shall interrupt AC power to emergency lighting unit, thereby illuminating emergency lighting.

CO2 fire extinguisher, minimum 15 pound unit as manufactured by the Amerex Corp., Fire-End & Croker Corp., or Kidde Fire Extinguisher Co.

Use article below for unit installed outside of building in areas subject to extreme environmental conditions. Also investigate use of heated, insulated constructed or prefab buildings.

Show size of enclosure on the drawings. Indicate walk around space of minimum 3 feet on each side of engine and 4 feet at alternator end of unit.

Show lighting, outlets, panelboard, etc.

Details available in the office.

* + - 1. HOUSING

Edit paragraph below for equipment to be installed in enclosure.

* + - * 1. Custom fabricated, walk-in, extreme conditions weatherproof housing to completely enclose unit, as manufactured by Chillicothe Metal Co. or Pritchard Brown, having:

All equipment and devices installed within the housing (except muffler) including main circuit breaker, day tank, batteries, panelboard, etc. connected and ready for use as complete package.

Base:

Minimum 6 inch channel iron with minimum 4 inch x 11 gage formed crossmembers.

Painted with black epoxy (6 mil).

Lifting hooks.

Grounding lugs.

Rodentproof skirt.

Floor:

Exterior grade 3/4 inch plywood.

12 gage steel overlay over plywood. Steel overlay covered with anti-slip surface; Garon Products Co.’s Stop Slip.

Skid base of diesel-alternator unit bolted to floor.

Walls and Roof:

Minimum .050 aluminum exterior panels. Color of exterior - white.

Furring strips.

3 inch foam insulation (R value 19.8).

18 gage galvanized steel or .050 aluminum interior lining.

Minimum 60 pounds per sq ft snow loading for roof.

Insulated exterior door in side of housing. Door equipped with interior panic bar and key lock exterior latch handle. Key locks - Yale #511S with #47 keys.

All doors hinged. Hinges constructed of brass or stainless steel.

Thermostatically controlled electric space heater.

Fluorescent light.

Type NC emergency lighting unit (see Section 265200). Light switch for emergency lighting at each door. Light switch shall interrupt AC power to emergency lighting unit, thereby illuminating emergency lighting.

Motorized air intake louver with insect screen. Louver controlled by thermostat and engine.

Roof mounted exhaust fan with thermostat control.

Emergency stop button at door.

Oil and coolant piped to outer perimeter of engine.

Crankcase breather and day tank vented to outside of housing.

Exhaust silencer with tail pipe and bird screen, mounted horizontally on top of unit, above housing.

Coordinate subparagraph below with 2.01 e. (delete engine mounted radiator system).

Radiator and Fan (Liquid Cooled Unit):

Mounted remotely in separate compartment on extension of housing base.

Isolated from engine compartment with metal partition (no fan air flow through engine compartment).

Roof extended to cover radiator.

Wire mesh side panels (for air intake), hinged for access.

Gravity louver in front of radiator.

Electric motor driven fan. Motor starter mounted in engine compartment.

Light and switch in radiator compartment.

Engine or wall mounted control panel.

Panelboard (LP-GEM).

All wiring from auxiliary equipment (day tank, motor-operated louver lighting, receptacle outlets, water jacket heater, electric space heater, etc.) to diesel-alternator panelboard LP-GEM installed in rigid steel conduit.

CO2 type fire extinguisher, minimum 15 pound unit as manufactured by the Amerex Corp., Fire-End & Croker Corp., or Kidde Fire Extinguisher Co.

* + - 1. ENGINE FUEL EQUIPMENT
				1. For any fuel storage tanks that are to be removed from the site coordinate with Director’s Representative to “delist” the fuel storage tanks with the local county. Coordinate with Director’s Representative to “List” any fuel storage tanks that are installed.
				2. Day Tank: Simplex Inc.’s SFT Series Day Tank System, or Tramont Corp.’s Model TR Day Tank System, with:

10 gallon tank capacity.

Auxiliary hand pump, rotary type, 5 gpm capacity.

Wall mounting brackets or pipe stand adapters.

Selector switch “Run-Off-Auto”.

Input circuit suitable for operation on single phase 120 V ac.

* + - * 1. Fuel storage tank and piping, see Section 335617.
				2. Provide labeled fill cap or metal plaque set in concrete pad near fill pipe stating “Diesel Fuel”.
			1. FIRE EXTINGUISHER
				1. CO2 type fire extinguisher, minimum 20 pound unit as manufactured by Amerex Corp., Fire-End & Croker Corp., or Kidde Fire Extinguisher Co.
1. EXECUTION
	* + 1. INSTALLATION
				1. Connections: Make all connections to unit with flexible connections designed for the specific purpose.
				2. Diesel Fuel:

Provide diesel fuel as required to initially fill the fuel storage tank and day tank before commencing the preliminary system test.

Upon completion of all tests provide additional diesel fuel as required to fill the fuel storage and day tank.

Diesel fuel shall have characteristics as recommended by the diesel-alternator unit engine manufacturer.

* + - * 1. Phase Relationship: Correctly phase emergency and normal service so that motor rotation will not reverse upon transfer from normal to emergency feeder.

Include paragraph below for unhoused unit within a building.

* + - * 1. Locate fire extinguisher proximate to diesel-alternator unit.
			1. FIELD QUALITY CONTROL
				1. Preliminary System Test:

Preparation: Have the Company Field Advisor adjust the completed system including the contract automatic transfer switch, and coordinate with automatic transfer switch company field advisor switch/system test requirements. Operate the completed system long enough to assure that it is performing properly.

Run a preliminary test for the purpose of:

Determining whether the system is in a suitable condition to conduct an acceptance test.

Checking and adjusting equipment.

Training facility personnel.

* + - * 1. System Acceptance Test:

Preparation: Coordinate test with automatic transfer switch manufacturer and notify the Director’s Representative at least 3 working days prior to the test so arrangements can be made to have a Facility Representative witness the test.

Make the following tests:

Test each system function step by step as summarized under SYSTEM DESCRIPTION.

Test starting system and battery capacity. Crank engine for the required time and number of consecutive starting attempts.

Load test at unity (1.0) power factor and rated voltage in the following sequence (run each test segment continuously):

Fill in blanks in next 4 subparagraphs. Use the kw rating of the unit and find full load current a = kw x 1000 divided by 1.73 x v for 3 phase system. Do not use full load current found in manufacturer’s catalogs or stamped on machine (it is usually amperes based on the KVA rating).

One hour at half load (\_\_\_\_\_\_\_\_ amperes).

One hour at three-quarters load (\_\_\_\_\_\_\_\_ amperes).

Four hours at full load (\_\_\_\_\_\_\_\_ amperes).

During the test period take voltage, current, frequency and all engine instrument readings and record results at the beginning and end of test and at fifteen minute intervals during test.

Supply an adjustable resistive load bank or other approved apparatus to load unit for variations of test loads.

Supply equipment necessary for system adjustment and testing.

Submit written report of test results signed by Company Field Advisor and the Director’s Representative. Mount a copy of the final report in a plexiglass enclosed frame assembly adjacent to the engine instrument panel.

END OF SECTION 263214

The remainder of this section is for information only. Not to be included in project specifications.

 1. Codes, standards and references applicable to the installation of diesel-alternators:

 a. State Building Construction Code: general building construction 1032.

 b. NFPA-37 - standard for the installation and use of stationary combustion engines and gas turbines.

 c. NFPA 110 - standard for emergency and standby power systems.

 d. IEEE 446 - recommended practice for emergency and standby power systems for industrial and commercial applications.

 e. EGSMA (Electrical Generating Systems Marketing Assoc.).

 f. DEMA (Diesel Engine Manufacturer’s Assoc.).

 g. NEC (art. 517, 700, 701, 702).

 h. NFPA 99 standard for health care facilities - essential electrical systems.

 i. NFPA 101 - life safety code.

 2. Refer to standard dwg. No. 83/e-l for installation design details.

 3. Diesel-alternator should be sized so that it will be fully loaded. In no case should a unit be sized so that it will be less than 40 percent loaded. An unloaded diesel engine is prone to wet-stacking (unburned fuel running out of the exhaust pipe) and internal carbon fouling that may cause fuel injector and piston ring damage.

 4. Exhaust system: show details (including sizes) of exhaust piping on drawings. Calculate exhaust back pressure of entire exhaust system to verify that back pressure does not exceed engine manufacturer’s limits. See manufacturer’s catalogs for calculation methods.

 5. Fuel supply:

 a. In section 335617 specify no. 2 diesel fuel for the tank charge. Do not use furnace oil for diesel engines. Furnish separate fuel storage tank for engine.

 b. Do not install common suction lines to run 2 or more engines. Common return lines are acceptable.

 c. For details of fill, extractor, supply piping, etc., refer to standard drawing no. 83/e1 for installation details. Coordinate with section 335617 and edit the fittings that conflict with those shown on the standard drawing.

 d. Install tank of sufficient capacity for minimum of 72 hours fuel supply.

 e. Certain areas (such as Suffolk County) may require special types of tank installations to meet code requirements. Check with Plumbing Engineers.

END OF INFORMATION 263214