PART 1 - GENERAL

1.1 RELATED SECTIONS:

Refer to Section 15300 for requirements regarding fire protection systems.

Refer to Section 260573 Power Systems Studies for requirements related to short-circuit, coordination and arc-flash hazard analysis.

1.2 SCOPE OF SECTION:

This section contains the requirements for equipment, including installation, for other than normal electrical systems. The Designer is required to utilize the latest revision of Requirements for Permanently Installed Emergency Generator Systems (15KW and Higher), as published by the North Carolina Department of Insurance. Exceptions, additions, and modifications of the above referenced document are as noted within this section.

1.3 EMERGENCY POWER GENERATION:

A. GENERAL REQUIREMENTS:

1. The type of fuel shall be limited to diesel fuel.

2. Generators located outdoors shall be mounted on a steel reinforced concrete pad, raised 6” above adjacent grade, a minimum of 12” thick, or as recommended by generator manufacturer. Pad shall extend a minimum of 24” beyond edge of generator frame on the three normally used service sides and extended 6” beyond the frame at the radiator end. Concrete pad shall be chamfered on all four edges. Pad shall be sloped to prevent the collection of water.

3. Generators located indoors shall be mounted on spring deflection type vibration isolators, on pads designed equal to outdoor pads, except pads to be 4” above adjacent floor surfaces. Generator pad shall be isolated, separated by expansion joint, from building slab.

4. A drip pan shall be installed under indoor units to collect leaks and spills. Provide drain line, with valve, to floor drain.

5. Provide day tanks for interior mounted generator sets.

6. Outdoor generators shall be installed in aluminum skinned sound attenuated enclosures. Enclosure to have convenience GFCI type receptacle and fluorescent lighting to provide 75 fc around generator for service. Doors shall be located in the enclosure so that service points are directly accessible.
7. Generators that are mounted where the service door opening is greater than 30" above surrounding finished grade shall have platforms installed with handrails and steps that facilitate maintenance and servicing of the generator. Materials of construction shall be hot dipped galvanized steel, stainless steel or aluminum. Service platforms shall be a minimum of 48" wide or 12" wider than the width of any swinging service door in generator housing.

8. All electrical connections to the unit shall have a section of flexible conduit for vibration isolation.

9. Provisions must be made for sufficient make-up air for cooling of generators mounted inside buildings. Make-up air louvers shall be designed to prevent the entrance of rain when generators are operating.

10. Exterior units shall have a drain with a plugged ball valve accessible from the outside of any enclosure for draining oil. Exterior service points, such as valves, drains, etc. shall be secured w/ locks to prevent unauthorized access or tampering.

11. Any manufacturers' requirements that are more stringent than these shall be adhered to.


13. Exact location and size of fuel tank is to be verified on as-built drawings.

14. Locate tank so as to facilitate taking fuel level readings and performing other tasks which may require access to the inside of the storage tank through the filler neck.

15. Diesel tanks shall be capable of holding sufficient fuel for running under full load for a minimum of 36 hours. Generators serving fire pumps shall have sufficient fuel capacity for 6 hours of fire pump run time plus that fuel needed for 36 hours of building loads.

16. Day tank shall have an electric pump with pump test switch, automatic level control switches, overflow return to main tank, and fuel capacity for four hours running time.

17. Galvanized pipes, fittings and tanks shall not be used on diesel fuel systems.

18. Diesel storage tanks located in the ground must comply with EPA, DEP, and any applicable local regulations. ECU does not prefer underground storage tanks. Designs for underground tanks must be pre-approved by the ECU Project Manager.
19. Emergency generators serving buildings with fire pumps shall be equipped with a dedicated breaker meeting NFPA requirements for fire pump electrical services.

20. Generator must be capable of being independently started from multiple automatic transfer switches, such as fire pump controller.

21. Generators requiring permits according to NCDENR regulations shall have written confirmation from the Office of Environmental Health & Safety (EH&S) that the generator has been permitted. This letter shall be received prior to any construction of pad or generator being located on site. Generator shall not be operated, even for testing, until all of the permit requirements have been met. For planning purposes, request for permits should be requested 17 weeks in advance of the generator arriving on site. Designer must coordinate with ECU EH&S on information that must be submitted by Generator supplier for permit request.

B. GENERATOR EXHAUST EQUIPMENT:

1. Generator exhaust, of indoor generators, should be vented above the roof. The exhaust system must keep fumes away from the immediate area of the generator, and from building fresh-air intakes.

2. When outdoor generators are located near AHU outdoor air intakes, provisions shall be provided to ensure that exhaust gases are not allowed to enter into AHU intakes. Where generators are located adjacent to building exteriors that have individual window AC units or Fan Coil units, provisions shall be made to ensure that generator exhaust doesn't re-enter building through these outdoor air sources. An acceptable method is to extend generator exhaust stack up side of building to above roof top level. In these cases, aesthetic considerations shall be given high priority.

3. Provide all generators with Critical Grade mufflers to keep sound levels down to a minimum. Indoor generator exhaust piping and mufflers shall be insulated and wrapped with stainless steel or aluminum skin wrap.

4. The exhaust system shall include a condensation trap with drain.

5. For indoor generators, provide a rain cap and thimble, and vibration isolation, for through-the-roof/wall penetrations.

C. AUTOMATIC TRANSFER SWITCHES:

1. Automatic Transfer Switches (ATS's) shall have the following capabilities: Adjustable time delays on starting (1-30 sec.), retransfer (1-30 min.), and shutdown or cool-down (1-30 min.); control switch with "test-off-auto"
SECTION 263000 – ELECTRICAL POWER GENERATING AND STORING EQUIPMENT

positions; indicator lights for "normal power-available", "normal power-connected", "emergency power-available", "emergency power-connected"; and manual transfer capability.

2. ATS’s shall be 4-pole type, with a bypass isolation switch for maintenance purposes.

3. Indicating lights on ATS’s shall be the LED type.

END OF SECTION