

Element D Services

Electrical

D5000 Load Calculation Criteria

PART 1 - GENERAL

1.01 OVERVIEW

- A. This Section includes design standards and requirements for electrical load calculation. This is a design standard and is not intended to be used as a Specification.

PART 2 - DESIGN CRITERIA

2.01 GENERAL

- A. The electrical loads are assumed to be the criteria for distribution to allow the stated maximums to occur in localized areas (to be defined during programming). Refer to the latest NEC and ASHRAE 90.1 standards for load calculations.
1. Engine-generator Sets:
 - a. Engine generator sets shall be sized using NEC at a load to capacity not to exceed 80 percent with consideration given to capacity for the addition of load in the future. Also, generator shall be sized for motor starting requirements and harmonic content of the load.
 - b. Engine-generator sets shall be capable of picking up a minimum of 100 percent nameplate kW and power factor, less applicable derating factors with the unit at operating temperature.
 - c. Engine-generator sets shall have a motor starting or surge kVA capability of three times the rated kVA based upon a recovered sustained RMS voltage drop of no more than 10 percent of no load voltage with the specified load kVA at or near zero power factor. Maximum instantaneous voltage dip shall not exceed 10 percent at this load and power factor level.

PART 3 - SPECIAL CONTRACT DOCUMENT REQUIREMENTS

3.01 GENERAL

- A. Specific consideration must be given to the latest edition or addendum of ANSI/ASHRAE/IESNA Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings. The Architect and Engineer of Record will be required to sign and seal a statement that stipulates that the design complies with the requirements of this standard. This written certification with backup documentation must be submitted to MD Anderson at the time of completion of the Construction Documents.
- B. The Engineer shall submit the following calculations to MD Anderson: short circuit calculations. Engineer shall also submit preliminary protective device coordination and arc flash analysis to lower equipment incident energies below Dangerous levels (above 40cal/cm²). Engineer to provide load calculations, generator-set sizing calculations, voltage

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drop calculations, and lighting calculations per ASHRAE 90.1. MD Anderson reserves the right to request additional calculations to suit the Project.

1. Short Circuit Calculations: Prepare calculations for all new Projects and new equipment only for renovation projects.
 2. Protective Device Coordination Study and Arc Flash Risk Assessment: Prepare and submit to MD Anderson a short circuit analysis, preliminary protective device coordination, and arc flash analysis to lower the equipment incident energies below Dangerous levels (40cal/cm²)
 3. Load Calculations: Prepare calculations for all new Projects and renovations to existing Distribution Systems.
 4. Generator Set Sizing Calculations: All applicable Projects.
 5. Lighting Calculations: All Projects.
 6. Voltage Drop Calculations: All Projects, wherever necessary.
 7. Lighting energy density calculations per ANSI/ASHRAE/IESNA 90.1: Applies to all Projects.
- C. The Design Engineer shall coordinate with MD Anderson and the contractor as it relates to all protective device studies and analysis.

PART 4 - PRODUCTS

4.01 GENERAL

- A. Refer to Owner's Master Construction Specifications. These are available on the Owner's Design Guidelines website: <http://www2.mdanderson.org/depts/cpm/standards/specs.html>

PART 5 - DOCUMENT REVISION HISTORY

Issue	Date	Revision Description	Reviser
	20190301	Original Issuance	

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END OF ELEMENT D5000