

Executive Summary

The following “Electrical Systems Existing Conditions and Building Load Summary Report” provides a detailed analysis of the electrical system within the Duke University Medical School- Duke School of Nursing. As a whole the electrical system found in the building was a rather simple system. The electrical system has an emergency generator that provides power to key elements in the building if the primary power fails. After analyzing the building, it was found that the primary operating voltage throughout the building was 277V, with the exception of 120V for all receptacles.

A detailed electrical load analysis was conducted along with the analysis of the electrical system. Three different methods were used to determine the load conditions within the building. The first method was the Conceptual and Schematic Phase load analysis. This method is a very rough estimate of the building loads and is used early in the design phase of a project. The second method was the Design Development load analysis. This method is a better estimate that provides a better sense of the loading within a building. Finally, the actual building loads were found in the Construction Document load analysis phase. These calculations provide the actual loads in the building, in which the electrical equipment was sized with. After performing these analysis it the margin of difference between actual equipment size and estimated size significantly decreased as you progressed from method 1 to method 3. Method 3 showed that the switchboard was sized appropriately, while the transformer was undersized. This under sizing of the transformer is common practice by utility companies, since transformers can take an overloading for short periods before overheating.