

Executive Summary

The Hauptman-Woodward Medical Research Institute is a 3 story, 73,000 square foot building which provides a full service biomedical research lab as well as supporting office and classroom spaces to the Buffalo-Niagara Medical Campus in Buffalo, New York. This report develops a detailed energy analysis of the building in addition to determining compliance with a number of standards.

The first analysis considers the U.S. Green Building Council (USGBC) LEED-NC 2004 checklist which provides a nationally-accepted benchmark for the design, construction and operation of energy efficient buildings. The Hauptman-Woodward Medical Research Institute was not initially designed to have a LEED-NC rating; however with moderate design modifications could have achieved certification.

The Hauptman-Woodward Medical Research Institute was also analyzed for compliance with ASHRAE Standard 90.1-2004, which provides minimum requirements for the efficiency of the building. The Standard is broken up into specific sections, of which Building Envelope, Service Water Heating, Power, Lighting and Electric Motor Efficiency were discussed. By use of the prescriptive method, it was determined that the majority of wall, roof, and fenestration assemblies were in compliance. The space-by-space method was used to calculate the performance of the lighting system at HWI. It was found that many of the rooms exceeded the lighting power density requirements set forth by the standard. In addition, electric motor efficiencies were compared to the standard and found to be compliant based on design specifications.

The total amount of lost rentable space was determined to be approximately 12% of the entire building area. This figure is inflated however, since a majority of the mechanical equipment is located in the roof penthouse which was included in the building area. The mechanical first cost was also calculated in this section, with a total cost of \$2.9 Million. This equates to \$40.33 per square foot.

Finally, Trane TRACE-700 was used to perform an energy analysis and calculate design loads at the Hauptman-Woodward Medical Research Institute. By entering design parameters into the program, it is able to estimate cooling and ventilation loads, in addition to providing a detailed breakdown of energy consumption for each part of the system. When utility rates were provided, the program was able to simulate operating costs and utility costs for the building on an annual basis.