

1 Executive Summary

In recent times, the global energy market is seeing an energy crisis as China and India are demanding more energy than the amount produced. Due to this, many buildings are considering using less energy and developing “greener” designs. Many standards and qualifications have been developed in order to assess current buildings energy and environmental impacts. Such standards and qualifications can be seen in ASHRAE Standard 90.1-2004 and LEED NC 2.2. ASHRAE 90.1-2004 provides “minimum requirements for the energy-efficient design of buildings” and LEED NC 2.2 provides a “national benchmark for high performance green buildings”.

The Hospital for Special Surgery River Building raises twelve stories high on the Upper Eastside of Manhattan, right above the FDR Drive. This report will investigate the HSS River Building plant and energy performance to determine whether or not it complies with ASHRAE 90.1-2004, and meets LEED certification. This report will also calculate and analyze the annual building energy costs, demands, and loss of rentable square footage of the building due to the mechanical system.

During analysis, software programs such as Trane Trace, ComCheck and EnvStd were used to calculate energy modeling, interior lighting and building envelope compliance with ASHRAE 90.1 respectively. Trane Trace also helped in calculating building energy costs. Information needed for the analysis was gathered from the 100% Pricing Set, 2005 ASHRAE Fundamentals Handbook, HSS Specifications Manual, RS Means Mechanical 2007 and Cannon Design HVAC Designers.

In conclusion, the HSS River building did not meet half of the requirements set forth by ASHRAE 90.1-2004. Some areas that did not comply are interior lighting wattage consumption, and mechanical equipment efficiency. But overall, the building had a 7% reduction in wattage usage specified by ASHRAE 90.1. The HSS River building was not designed for LEED certification of any stature and when assessed, it tallied 17 points, falling short to meet the 26 point minimum for the first class of certification. If some changes are made during the final design phase, the HSS River Building may be able to obtain a LEED Silver rating.

The HSS River building’s mechanical system cost \$40/ft² equaling \$3.5 million. The building uses 2,500,000 kWhr of energy a year equaling \$3.5 million in annual energy costs. Overall the HVAC accounted for 38% of the energy use while the majority went to receptacle loads.

The entire building contains 88,425 ft² of gross area, with 88% of that being rentable (78,382 ft²). The HVAC equipment in the building takes up less than 1% of the rentable area as all of the equipment is housed in the penthouse and concealed in the plenum.