

Executive Summary

The HSS River Building, a part of the Hospital for Special Surgery campus on the Upper East Side of Manhattan, is an 88,245-square-foot building rising 190 feet above the FDR Drive highway. The River Building is an acute care facility containing primarily exam rooms, X-ray rooms, doctor offices, and a rehabilitation gym on the second floor.

The mechanical system for the HSS River building is a constant air volume system (CAV) with heat pump water loop providing cooling and heating for the 100% Outdoor Air Handling Unit (AHU) and provides heat absorption and rejection to the terminal water-to-air heat pumps in occupant spaces on each floor.

This proposal will outline the topics, methods, and timeline that will be approached for the mechanical redesign and the structural and architectural breadth topics. The mechanical redesign proposal will replace the 100% OA AHU unit with one containing a heat recovery wheel. Also, the East River next to the building will be analyzed and used as a heat rejection source for the heat pump loop system.

In addition to the redesign of the air distribution system and heat pump system, two breadth areas will also be developed. The first breadth will look at the new mechanical equipments and its effects on the structural system of the building to see whether or not it can be downsized to save cost. The other area will be the architectural building façade to see whether or not reducing the 60% glass fenestration by solar shades or a different material will be the best option to lower internal thermal loads.

To analysis these topics, a schedule of the spring semester was created to organize research and allocate design hours for the thesis project. In the research phase, available products and previous projects from Cannon Design and other companies will be studied in order to gain familiarity and knowledge of the area of study. In the design phase, Trane Trace, a building energy modeling software will be used along with Microsoft Excel to calculate the necessary information needed to determine whether or not the redesign is feasible and correct. Also, the architectural breadth will require renderings done in Photoshop and Autodesk Revit, a computer aided 3D software.