BREADTH SUMMARY

The Landscape Building at Janelia Farm Research Campus is a 546,436 square foot world-class biomedical research facility owned by Howard Hughes Medical Institute located in Ashburn, Virginia

The building is supplied air by 15 air handling units which feed into one plenum that serves the entire building. There are 2-50,512 MBH and 2-20,125 MBH (one future) boilers The majority of the load is used for the air handling unit's steam coils. The remaining steam is used at various shell and tube heat exchangers. The chiller plant has seven chillers and seven cooling towers (one back-up) each rated at 1200 tons. The portion of the load that does not go to the air handling units serves various equipment within the building.

The primary goal is to modify the existing HVAC system to reduce energy consumption and yearly utility costs. This will consequently reduce emissions as well. Secondary goals include optimizing the artificial lighting in the laboratory spaces and office pods located on the second and third floors as well as resizing affected electrical system components throughout the building.

BREADTH ANALYSIS

While it is important to design a system that is capable of maximizing its energy usage, it is also important to minimize the amount of energy required. To aide in this, an analysis of the lighting in the laboratory spaces and office pods will be performed. Lighting can be one of the largest loads in a commercial building. Therefore, a well designed lighting system can provide adequate lighting and also conserve energy for the owner.

The integration of the plate heat exchangers may have a noticeable impact on electricity demand. Optimizing the lighting of the laboratory and office pods will have a significant impact on the electrical load as those spaces occupy the majority of the second and third floors of the building. Therefore the electrical system to these spaces will need to be updated with new loads.