
EXECUTIVE 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.

MECHANICAL REDESIGN

In order to achieve the desired energy reduction, a heat recovery system which prevents losing a large amount of energy in the conditioned air will be incorporated into the current mechanical system. The integration of a plate-type heat exchanger will be analyzed for effectiveness and amount of energy saved. The heat exchangers must be able to transfer both sensible and latent energy, but the air streams remain completely isolated from each other. This is the critical feature due to the high risk of contamination.

