
EXECUTIVE SUMMARY

This report examines if air handling units 1 & 2 of the Landscape Building at Janelia Farm Research Campus is compliant with AHRAE Standard 6.21-2004 ventilation requirements at design conditions.

The Landscape Building is a 546,436 square foot world-class biomedical research facility owned by Howard Hughes Medical Institute. It is currently beginning its third year of construction in Ashburn, Virginia located 45 minutes outside of Washington, D.C. The building is divided into Zones A through G on three different levels.

The building is supplied with 90% outdoor air by both a variable air volume (VAV) system as well as a constant volume system (CAV) supported by 15 air handling units and 5 chillers. Each air handling unit has a capacity of 45,000 cfm of which 100% is outdoor air. This is because the majority of spaces in the building cannot receive recirculated air due to the threat of contamination from laboratory spaces.

One unique feature of the mechanical system is all the air handlers serve one 132x120 plenum that then is distributed throughout the building. AHUs 1 & 2 are isolated from the rest of the system by mechanical dampers located in the main plenum. AHU 4 – 15 collectively serve the remainder of the building. AHU 3 acts as a back up air handler capable of supplying air to either zone.

Air handling units 1 & 2 have been chosen for analysis. This decision was based upon the following considerations. All 15 air handlers provide a total of 675,000 cfm to the building at design load. Analyzing a system of this size is beyond the scope of this report. There are two zones in the building, one served by AHUs 1 & 2 with 90,000 cfm and one by AHU 4-15 with 540,000 cfm. It is impossible to distinguish which air handler serves which space in this large zone. As AHUs 1 & 2 only serve Zone A & B on all three levels and are isolated from the majority of the system, it is possible to determine if the air handlers meet AHRAE 62.1-2004 ventilation requirements.

After following the zone calculation procedure outlined in section 6.2.2, it was determined that air handling units are compliant with AHRAE 62.1-2004 ventilation requirements. They require approximately 88,000 cfm and have a capacity of 90,000 cfm. The difference can be accounted for by assumptions made during analysis. Information such as occupancy and use could not always be determined from known information and therefore had to be assumed.

All assumptions can be found on page 4 and all information was obtained from mechanical and architectural drawings, as well as the actual mechanical ventilation calculations when possible.