

Executive Summary:

In this report, the Grunenwald Science and Technology Building on Clarion University's campus was analyzed to check for compliance with ASHRAE Standard 62.1 and ASHRAE Standard 90.1. The Science and Technology Building are 98,000 square feet of new construction, along with 10,000 square feet of building renovation from the previous science building on the site. The building is comprised of university labs, classrooms, and faculty office space for science and math based areas of study.

ASHRAE Standard 62.1 was the first to be evaluated for Section 5 and 6 of the standard to check for building compliance. The analysis of Section 5 went through and checked for compliance in areas dealing with mold prevention, outdoor air intakes, humidification, particulate filtration, and drain pans employed in the building design. The analysis determined that the building did meet all minimum requirements of Section 5. Following Section 5, an analysis of Section 6 was done to determine whether the building was meeting the ventilation rate requirements set forth by ASHRAE to obtain an acceptable indoor air quality. Through calculations for each of the spaces for the particular systems, it was found through the ventilation rate procedure that all of the systems for the Science and Technology Building did meet the minimum ventilation rates.

ASHRAE Standard 90.1 was performed to see whether the building meet the minimum equipment efficiencies, and building envelope insulation values. In Section 5, the climate zone of the building was determined and used to determine the minimum U-values to be used in the building design. All construction types for walls, roof, and windows were found to comply, while the floor U-value did not comply as the air is conditioned to the same temperature below and above the slab so insulation would not be required. In Section 6, the building's HVAC system was determined to be compliant with all of the mandatory provisions, while some fans did not meet the fan power limitations set by ASHRAE. Section 7 covered the electrical water heater compliance check, in which all heaters did meet the minimum requirements. The voltage drop was then analyzed to check for compliance with Section 8. The voltage drops were designed to be less than 2% for feeders and 3% for branch circuits meeting the section guidelines. The lighting was analyzed in Section 9 using the building area method, which stipulates the Watts per square foot for a particular building type allowed. The Science and Technology Building meet the standard for Lighting Power Density (LPD).

Overall the building met nearly all of ASHRAE Standard 62.1 and 90.1 that were analyzed, with the exception of the fans in Section 6. The building design is to be energy efficient as the designers strive for a LEED Silver or Gold rating for Clarion University.