

Executive Summary

The American Society of Heating, Refrigerating and Air-Conditioning Engineers Standard 90.1 (ASHRAE 90.1) provide a source to ensure proper energy efficiency is met within a building. Standard 90.1 was utilized to verify compliance for the Xanadu Sports Complex Building A retail section. The Snowdome portion of the building is not a commercial space and is a very special case. For this reason 90.1 does not apply to this part of the building. Areas that were analyzed consisted of minimum thermal properties of the building envelope; minimum wattages on the interior and exterior lighting; minimum efficiencies of heating, ventilating, air conditioning, and hot water service equipment; and minimum efficiencies of motors. Since Xanadu resides in East Rutherford, New Jersey, a climate zone of 5A was used to determine the proper values to meet compliance with the standard. Calculations were carried out as prescribed by the ASHRAE Standard 90.1, and the Department of Energy's Energy Code software, ComCheck, was also used to verify the findings. Table 1 below summarizes the findings of the ASHRAE Standard 90.1-2004 compliance check.

Table 1 ASHRAE Standard 90.1-2004 Compliance Summary

Building Envelope	Interior Lighting	Exterior Lighting	HVAC Equipment Efficiencies	HVAC Economizer	Duct Insulation	Pipe Insulation	Motor Efficiencies
30% Better Than Requirements	37% Better Than Requirements	Does Not Comply	Complies	Complies	Not Applicable	Not Applicable	Does Not Comply

The LEED-New Construction Green Building Rating System was used to determine whether or not the building could obtain a LEED certification. After deciding whether or not certain credits were possible it was determined that only 4 credits were already obtained and that with some changes another 17 could be achieved giving the building 21 LEED credits. To gain LEED certification a building must obtain 26 credits; therefore, Building A falls 5 credits short after minor changes were made.

The retail section's mechanical system provides ventilation, heating, and cooling to the common areas of the space. This work is currently the only mechanical work in the contract and costs \$4,902,688. However, the Snowdome is on a separate contract, and the mechanical work alone will cost \$9,493,073. All retail leasable spaces that are not included in the current contract will be finished by the leaser; however, mechanical risers have been provided for the leasers to run any ductwork necessary. The total current mechanical system, along with the designated leaser mechanical risers, consumes 10,480 square feet or 1.8% of the total building floor area. Finally, TRACE 700 was used to perform building design loads, energy usage, and annual utility costs. All data from design documents were used to accurately model all conditions. From the TRACE results, it was estimated that it would cost \$389,797.