

Executive Summary

The Xanadu Sports Complex Building A is comprised of a retail section and an indoor ski resort called the Snowdome. Through the analysis found in previous technical reports areas of design improvement were found. Through the analysis the main areas of concern were found to be in the ventilation systems of both the retail section and indoor ski resort and the large amount of energy needed to run such a building. The contributing factor to these concerns can be linked to the use of the Building Officials and Code Administrators (BOCA) 1996 code.

The goal of the mechanical redesign is to address concerns voiced by the community questioning the impact this project will have on the environment. On October 13, 2004 four environmental advocacy groups filed a lawsuit through the New Jersey Appellate Court which requested the halt of construction. This lawsuit, among other lawsuits and financial uncertainties, has greatly delayed the construction ultimately increasing the project budget by \$700 million. These factors create a large liability to the owner. The publicized lawsuit also creates poor public relations with the local community who has come to question the reasoning of an indoor ski resort.

In order to alleviate some of the burden these liabilities inherently present, an environmentally friendly mechanical system redesign will be explored. Through the use of a local landfill providing landfill gas, an engine on the complex site can produce energy to power Building A. In addition to the engine producing electricity on-site, waste heat from the combustion process can also be used to provide steam to provide heating and cooling to the building through the use of an absorption chiller/heater.

The introduction of the new mechanical system equipment will affect other building systems. The changes required due to the redesign will be addressed to fully analyze the feasibility of the new mechanical system. A structural analysis of the building's roof will be used to determine whether or not reinforcing will be needed to support the new equipment. The electrical system will also be analyzed to determine whether feeders, panel boards, and the main distribution lines need to be resized in order to provide the proper capacity to the new equipment.

The goals of the system redesign are to reduce the environmental impact the indoor ski resort and retail section will create, save the owner money, create positive public relations, and benefit the local community. In short, the redesign will attempt to turn a large liability into an asset to all.