

Executive Summary:

The Center for the Arts is a performing arts center located on the University of Delaware campus in Newark, Delaware. The 92000 square foot Center for the Arts consists of a Proscenium Theater, Recital Hall, Orchestra Rehearsal, and Theater Rehearsal as the major performing spaces as well as 32 practices rooms.

For the spring 2006 semester, the proposed mechanical redesign is an underfloor air distribution system for Proscenium Theater in the Center for the Arts performing arts building. The underfloor air distribution system will reduce heating, ventilation and air conditioning background noise transferred to the space and reduce energy costs through the addition of an economizer while maintaining thermal comfort for the occupants of the theater seating area. Energy savings also result from downsizing or reducing the speed of the fan due to the elimination of most of the branch ductwork associated with an over head distribution system.

The mechanical redesign affects the structure and acoustics of the theater seating space. The addition of the underfloor plenum will be analyzed to ensure structural stability. The balcony will be analyzed to ensure the feasibility of using the underfloor air distribution to supply air to occupants on that level. An acoustical comparison should show that the mechanical redesign brings the theater well within the prescribed limits of room noise criteria as set forth by the University of Delaware.

This report also contains a summary of the air handling units, heating water system, chilled water system and humidification system as designed. Two alternative redesigns were considered, comparing heat recovery system to save on energy costs and the addition of an absorption chiller to attempt to lower energy costs.