

### Executive Summary:

The Center for the Arts is a performing arts center located on the University of Delaware campus in Newark, Delaware. The 92,000 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.

An underfloor air distribution system utilizes a plenum space between the structural slab and the underside of a raised floor to distribute the conditioned air to the room. An underfloor air distribution system creates a stratified condition where the natural buoyancy of air removes heat and contaminants from the occupied zone.

The Trane program Trace 700 is used to determine the loads and airflow for the Proscenium Theater. The underfloor air distribution system increases the airflow to 14,200cfm and decreases the cooling coil load to 315Mbh. The minimum required outdoor air as specified from ASHRAE Standard 62.1-2004 is cut in half to 22% for the underfloor system.

A four-foot elevated slab will create a plenum for the Proscenium Theater seating levels. The plenum on the first level will require the foundation to be depressed four feet from the original design. The structural support of the balcony will remain at the designed height and the elevated slab, creating the plenum, will be built on top of designed balcony. The additional weight of the elevated slab will increase the beam sizes to W16x31 and the columns to W10x60.

Meeting the acoustical requirements within the Proscenium Theater is of great importance to the owner, the University of Delaware, to preserve the performance quality of the space. With the switch to an underfloor air distribution system the Proscenium Theater has an NC rating of NC-16, which remains within the acceptable limits for noise criteria set forth by the University of Delaware and Kirkegaard Acoustical Consultants.