

Executive Summary:

This report contains an analysis of the existing conditions of the mechanical systems designed for the Center for the Arts on the University of Delaware campus. Also as part of this report is a brief summary of the previous Technical assignments, the compliance of the Center for the Arts to ASHRAE Standard 62, and the heating and cooling loads and energy analysis determined using Trane TRACE 700.

The mechanical system design was largely influenced by the location and availability of campus wide distribution of chilled water and steam as well as the design criteria of the spaces. The performance spaces in the Center for the Arts are extremely sensitive to noise levels in order to achieve the highest quality performances.

The Center for the Arts is located in Newark, Delaware and is subject to 95°F dry bulb and 78°F wet bulb for summer conditions and 0°F for winter conditions. Instrument tuning is extremely sensitive to changes in humidity levels and therefore requires that indoor conditions be maintained at fairly constant relative humidity levels.

There are six air handling units that supply air to the Center for the Arts. Two of the units are variable air volume units and four are constant volume units. One constant volume unit supplies air through an underfloor distribution system in order to lower background noise levels produced by the air distribution system and achieve the required noise level criteria of RC 15-19. The preheat and reheat coils in the air-handling units receive heating water that originates as steam from the campus main distribution system before it is converted to heating water in the basement of the Center for the Arts. The cooling coils in the air-handling units receive chilled water from the campus distribution system. Schematics for each of the air-handling units, the chilled water system, and the heating water system are contained within this report.

The system as designed attempts to balance minimizing energy use while providing air to acoustically sensitive performance spaces in a way creates minimum background noise levels.