

# Wooster Hospital OR Sub-Cooling

Project Location:    Wooster, Ohio

Project Date:        2001



## Project Description:

The hospital desired to provide additional cooling to Operating Room #1 for better comfort for the surgical team for certain procedures that required lengthy operations. The Operating rooms are served by a custom built rooftop air handling unit of nominal 15,000 CFM capacity providing approximately 1680 CFM to OR #1.

Design challenges included lack of space for additional equipment or ductwork as well as minimal available downtime for implementation.

HEI designed a modification to the existing AHU serving the Operating Rooms to Sub-Cool only OR #1. A description of the methodology is provided below from the original correspondence to Wooster Hospital proposing the modification.

### Sub-Cooling Method; Decreasing the S/A Temperature W/ Auxiliary DX Cooling System:

We would propose to sub-cool the O.R. to 60°F by adding a separate 16" diameter supply air branch within the vestibule of rooftop AHU-6 tapped into the unit downstream of the cooling coil. An auxiliary low temperature evaporator coil would sub cool this air from 53/52.5 down to approximately 45/44. This branch duct would also require another final filter downstream of the sub-cooling coil. This branch would be routed thru the vestibule to the South and then down thru the units floor and the buildings roof into the ceiling space below for connection to the OR VAV Box.

$BTUHT = 4.5 \times CFM \times \text{Enthalpy Difference}$

$BTUHT = 4.5 \times 1680 \times (21.73 - 17.15)$

$BTUHT = 34624.8$

Thus it appears that a nominal 3 - 4 ton air cooled condensing unit will handle the load with a SST of approximately 35°F will handle the application.