

Mechanical Technical Report 3
Mechanical Systems Existing Conditions Evaluation
November 21, 2006

Executive Summary

The Straumann USA renovation project featured the replacement of the airside systems of the facility while using the existing heating and cooling central plants of the building. Ten rooftop units serve a variety of spaces including manufacturing areas, offices, an auditorium, and dental operatory suites. The project was designed to comply with the requirements of the Massachusetts State Building Code 780 CMR.

Based on an ASHRAE Standard 62.1-2004 analysis, all rooftop units comply with the required ventilation rates even though the project was designed around ASHRAE Standard 62.1-2001. An energy analysis of the building found that the predicted electric (\$671,489) and fuel costs (\$42,958) of the building was close to the actual costs for 2005. The total estimated costs were \$714,456 and the actual costs were \$697,650.

The rooftop air-handling units operate in one of six different modes: occupied, warm-up, cool-down, unoccupied (normal off), night heating, and night cooling. A zero to one hundred percent airside economizing option is also included with each of the rooftop units. A detailed explanation of rooftop unit operation can be found in the full report.

The system selected for Straumann USA was certainly a logical one, and serves the building well. However, given the time and resources, it would be very interesting to estimate how some other systems would compare. One possible system to compare would be a DOAS system with parallel sensible cooling system. During the design of the Straumann USA project renovations to the central plants were considered but the decision was made to use the existing plants. This could also allow for some interesting options to be explored such as thermal storage, or direct-fired absorption chillers.