



12. CONCLUSIONS & RECOMMENDATIONS

The findings of this thesis report suggest that adding an extensive green roof to the SLCC would have many benefits on the sustainability of the building. The acoustics, stormwater retention, and urban heat island effect are improved with its installation without the need to redesign the structure. However, there would not be significant energy savings because the original roof included a highly reflective “cool roof.”

DOAS System is a viable alternative to the original VAV system. There are significant energy use and cost savings expected, and much of the mechanical equipment can be downsized. The proposed system supplies 30% more outdoor air than the ASHRAE Standard 62.1 minimum, yet delivers only about 20% of the air to each space that the original VAV system does. Savings in fan energy result from this decrease in air distribution, but these savings are negated by the increase in pumping energy for the chilled water supply to chilled beam units in each space.

A combination of these systems achieves the goals for this thesis of improving energy efficiency and acoustics. The two systems together reduce regulated energy costs by about 44%. Also, the smaller amount of air distributed throughout the building and added acoustic insulation of the green roof are likely to provide optimum conditions based on design noise criteria. The complete proposed design could also earn enough extra LEED points to raise the SLCC’s rating from “Certified” to “Silver.”

The expected first cost is expected to increase by about \$1.03M, and savings in energy, operation, and maintenance costs allow the proposed design to have a 34 year payback. While this payback period is excessively long, the additional intangible benefits of improved acoustics and LEED Rating help justify the additional first cost. With all of these benefits, it is suggested that the SLCC be redesigned to follow the proposals set forth in this thesis.