Gallaudet University
Sorenson Language and Communication Center

THESIS PROPOSAL

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EXECUTIVE SUMMARY

The Sorenson Language and Communication Center (SLCC) on the Gallaudet University campus in Washington, DC is a one-of-a-kind facility designed for the deaf. Its visu-centric design appeals to the visual communication and way of being within the deaf culture. The owners want the building to be an example not only for other deaf building projects, but also for its energy efficiency and sustainability. The mechanical system in particular is charged with meeting these criteria.

The 87,000 SF facility is served by six (6) Trane M-Series Climate Changer Air Handing Units. Each unit serves a distinct zone within the facility that is unique in use and occupation schedule. The spaces served include classrooms, offices, conference rooms, computer labs, media studios, therapy rooms, audiology labs, and typical support spaces. VAV terminal units with hot water reheat control airflow and supply air temperature to each zone. Chilled water from the Central Utilities Building directly serves the cooling coils in the system. High pressure steam service also comes from the Central Utilities Building and heats the heating hot water and domestic hot water through heat exchangers.

Previous reports found that the overall the design of the SLCC mechanical system is efficient and practical. Energy saving equipment such as variable speed drives for fan and pump motors and energy saving techniques such as zoning help reduce total energy consumption. Also, the building envelope, glazing, and roofing decisions reduce energy lost/gained from the environment. However, there is room for improvement in the energy efficiency, acoustics, and system access of the SLCC. The goal for this thesis will be to improve the energy efficiency of the building and to address these acoustic issues.

This thesis proposal addresses the energy efficiency and acoustics of the SLCC through the application of active and passive chilled beams with a dedicated outdoor air system. The total airflow conditioned and distributed throughout the building will be decreased, and equipment and ductwork can be downsized. Energy recovery would reduce energy waste from exhausted room air by heating the outdoor air. In addition, a green roof would be applied for potential energy savings, storm water management, acoustic insulation, and aesthetics. Breadth topics will include an acoustic analysis of the mechanical system and green roof, structural analysis for the green roof, and life cycle cost analysis. Several preliminary research resources have been noted as a starting point for the information described in this proposal. Finally, a schedule for the next semester is provided as an outline of steps that need to be taken for sufficient completion of this thesis.