



Gallaudet University Sorenson Language and Communication Center

TECHNICAL REPORT 2 BUILDING ENERGY ANALYSIS COMPLIANCE WITH ASHRAE STANDARD 90.1-2004 & LEED-NC V2.2

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EXECUTIVE SUMMARY

ASHRAE Standard 90.1-2004: Energy Standard for Buildings sets forth a series of building design criteria regarding building envelope, lighting, HVAC system efficiency, and more. Its goal is to provide acceptable “to provide minimum requirements for the energy-efficient design of buildings.” Furthermore, the U.S. Green Building Council has established building design criteria for sustainability and high performance. These standards attempt to reduce the massive impact that building energy use has on the environment. In fact, according to the U.S. Department of Energy, “buildings in the United States consume more than 30% of our total energy and 60% of our electricity annually.” The purpose of this report is to evaluate the Gallaudet University Sorenson Language and Communication Center (SLCC) for its compliance with these standards.

The SLCC is an 87,700 SF education facility on the campus of Gallaudet University in the heart of Washington, DC. The building is served by six (6) Trane M-Series Climate Changer Air Handling 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. In total, the AHUs are designed to provide 72,875 CFM of conditioned air to 142 terminal VAV units. 21,360 CFM – or about 30% – of this supply is outdoor air. Chilled water service is provided from the Gallaudet Campus Chiller Plant, and hot water is produced from steam service to a plate-and-frame heat exchanger.

The building envelope and lighting power density requirements explained in ASHRAE Std. 90.1 Sections 5 and 9 were used to evaluate the design of the SLCC. The LEED-NC V2.2 and V2.1 Reference Guides were also used to compare the design of the SLCC for its compliance with each standard. Finally, Carrier’s Hourly Analysis Program (HAP) 4.2 was used to build an energy model of the building for analysis. Additional analyses for lost “rentable” space and mechanical system first cost were conducted. The input numbers were derived from mechanical drawings, narratives, and calculations provided by the primary architects and MEP engineers at SmithGroup.

The calculations and evaluations performed in this report show that the design for the SLCC meets the criteria for ASHRAE Std. 90.1-2004 compliance. Also, the building’s design would be able to garner a LEED Certified Rating.

All assumptions, procedures, calculations, analyses and conclusions regarding the design of the SLCC mechanical system may be found within this report.