

Commercial Building Energy Auditing

Assignment 2C: Report

Introduction: The primary deliverable of the energy audit is the report. The main purpose of the report is to provide clients with information upon which they can base a course of action to save energy in their buildings. The audit report also provides background information on the facility energy use and energy using systems.

Reports should be written in a manner that is easy to understand by the intended audience.

In this Assignment you will generate your own energy audit report based on the calculations you completed in Assignments 1A, 1B, 2A and 2B.

Report Outline

Each report will have the following:

- Title page
- Executive Summary
- Building Efficiency Measure (EEM) Summary
- Building Description
- Energy Cost Analysis
- Energy Star Report
- Detailed Energy Efficiency Measures

Use the notes below to generate your Building Description. These are to be considered as notes – rewrite as necessary; don't just copy and paste.

Facility was originally constructed in 1983. A major addition was added around 2002. The facility is a two story structure, flat roof, masonry construction, brick façade. A basement level houses mechanical equipment. The 1983 portion houses classrooms and faculty offices. The 2002 newer construction consists of classroom teaching labs. The Science Building, located near the center of the Community College campus, was originally built in 1985 and primarily contained classrooms and faculty offices. In 2003, a new wing was constructed to provide greater learning opportunities for the community, making it one of the most advanced educational science laboratories in the city. This addition brought the Community College six new science laboratories and four classrooms. 22,370 square feet was added to the facility's original 26,740 square feet.

The facility is a two-story structure with a masonry construction, brick façade, and flat roof. The basement level houses mechanical equipment. In addition to the construction of the new wing, renovations were completed.

Classrooms: The site visit began in one of the classrooms. The majority of the facility was operational, but with very limited occupancy. Typical classroom control is with Variable Air Volume terminal units



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(VAV) located above the ceiling. The VAV units have electric resistance reheat coils. The temperature in the classroom was 72°F, based on facility Building Automation System (BAS).

AHU-1: Air Handling Unit. This unit is the original air handling unit. It consists of supply fan, return fan, chilled water coils, filters and full economizer capability. It has variable speed drives on both supply and return fans.

Chiller 1: This chiller is a split system reciprocating chiller with condensing coils located on the roof of the facility. Trane Mfg (1982). Chiller-1 has R22 refrigerant.

Furnace 1: Gas fired unit originally installed in 2004. It has a nominal efficiency of 80%

Classroom Labs: The major function of the facility consists of teaching labs. The labs have room hoods that are connected to a general exhaust system.

Offices: These provide teachers offices

Schedule: In general the facility operates from 6:00 am to 10:00 pm M-F. During school session there are approximately 350 students and 50 staff. There is reduced student population during season breaks in December, March and August.

Setpoints: The facility maintains an average of 72 deg F in summer and 68 deg F in winter. Nights and weekends the temperatures are maintained at 80 deg F summer and 50 deg F winter.

Lighting: The majority of the lighting is T8 fluorescent fixtures. All lighting control is by manual wall switches.

Building Envelope: Masonry construction, approximately 15-20% window area, flat roof with white membrane roofing.

Potential EEMs

EEM #1 – Replace T8 bulbs with LED

EEM #2 – Lighting Controls: Replace manual wall switches with occupancy sensor control.

EEM #3 – Replace 80% efficient furnace with high efficiency with condensing unit.



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