
1a. LEED Rating Systems: *Assessment for Existing Operations & Maintenance*

Objectives: To compare previous LEED rating for Building Design + Construction with potential LEED rating for Existing Buildings: Operations & Maintenance

The purpose of this laboratory is to assess the performance of the Williams Village North dormitory, based on the Leadership in Energy and Environmental Design rating for Existing Buildings: Operations + Maintenance.



Figure 1 *Williams Village North*

LEED OVERVIEW

The LEED rating systems ranks the performance of green buildings assessed in credit categories that cover the design, construction, and operations of a building or neighborhood. The United States Green Building Council updates the LEED system on a regular basis to enhance its effectiveness and to encourage more holistic design/operations of green buildings and communities. Current LEED guidelines operate under **LEED v4.0**; this lab uses the previous edition, **LEED 2009**.

Every LEED-certified project must follow the following Minimum Project Requirements:

- Must comply with Environmental Laws
- Must be a complete, permanent building or space
- Must use a reasonable site boundary
- Must include all contiguous land
- Must comply with minimum floor area requirements¹

LEED ratings operate on a points-based system, accumulated based on completion of prerequisites and credits for five different categories:

- Sustainable Sites

¹ USGBC (2009). *Green Building and LEED Core Concepts Guide*.

- Water Efficiency
- Materials & Resources
- Indoor Environmental Quality
- Innovation in Operations/Design
- Regional Priority

In LEED 2009, points from each credit category are summed for the entire building. The final building score determines its rating:

- Certified = 40-49 Points
- Silver = 50-59 Points
- Gold = 60-79 Points
- Platinum = 80+ Points

WILLIAMS VILLAGE NORTH BACKGROUND

Completed in 2011, Williams Village North (WVN) is the newest residence hall on the University of Colorado-Boulder campus. The dormitory is the first one of its size in the United States to receive a LEED platinum rating.

Table 1 Residence Hall Statistics

Capital Cost	\$46.5 million
Gross Area	131,246 sq ft
Number of Residents	500
Indoor Amenities	<ul style="list-style-type: none"> • Community kitchen • Study areas • Student lounges
Outdoor Amenities	<ul style="list-style-type: none"> • Bike racks • Volleyball courts • Tennis courts • Outdoor dining space

Publications about the building touted its predicted high levels of energy and water savings, projecting that WVN is “nearly 40 percent more energy and water efficient than modern code-compliant buildings of the same size.”²

INTRODUCTION

Today, we will assess the LEED platinum rating of Williams Village North, conducting surveys of the building in its current operating stage to determine whether the high-performance rating still stands. WVN received its ranking under the LEED rating for Building Design + Construction; this lab will consider its performance under LEED for Existing Building: Operations + Maintenance³. This exercise will require you to conduct a visual inspection of the

² “CU’s William Village North earns platinum rating in LEED certification” (2011). [News Releases: Campus Sustainability](#). University of Colorado-Boulder website: Dec. 1, 2011.

³ Pre-existing LEED certification counts as one credit in the Sustainable Sites category.

building interior and exterior, activate an online tool for building energy/water usage, and conduct basic calculations for energy and water savings.

PROCEDURE

From each category in LEED 2009 for Existing Buildings: Operations + Maintenance, several credits have been selected for you to assess. Complete the attached checklist based on your inspection and calculations. The following list of features that are present at the building may also be helpful (it is up to you to decide to which credits to apply them):

- Photovoltaic solar panel array at covered parking lot
- Heat recovered from air is exhausted directly from bathrooms
- CO₂ monitors supply demand-based ventilation
- Daylight sensors adjust amount of artificial light provided
- High Solar Roof Index (SRI) roofing
- Low Volatile Organic Compound (VOC) paints and sealants

Physical Inspection

Take a walk around the interior of the first floor and the exterior perimeter of the building. Make a list of the things you see that may contribute to the building's sustainability. As you walk, consider questions such as: *What direction does the building face? Where does light enter the building? What types of plants are in the gardens? How are heating/cooling controlled in each room? What forms of transportation can be used to access the building?* (Take no more than 15 minutes for your tour). You may wish to document your tour with some photos.

Energy & Water Calculations

Go online to Energy-CAP Online

- Under "Buildings & Meters," find the building information for Williams Village North. How many square feet is the building? How many kWh of electricity were used in 2013? According to the University of Colorado-Boulder's Facility Management office, the proposed design projected that the building would use 7,605 MBtu/year (compared with a baseline building that uses 12,292 MBtu/year). Based on the kWh used last year, how does the actual performance of the building compare? (Calculate as Btu/sqft/year)
- How many kGal of water did WVN use in 2013? Darley Tower is another residence hall in the same complex. Compare the water usage of Darley Tower and WVN in 2013 based on kGal/sqft/year (Darley Tower is slightly smaller than Williams Village North, but can be considered equivalent in terms of utility usage). Which building performed better?

Assignment: LEED Rating Assessment

Use the attached documents from the Housing & Dining Services website and your observations from the tour of the building to complete your assessment of the building. How many credits should the building achieve in each category? Note that you may have to do some research online about campus sustainability policies.

Answer the following questions with a short paragraph (3-5 sentences) for each.

1. How would you rate the building? (Platinum, Gold, Silver, or Certified) Justify your choice.
2. In which categories does the building perform best? In which categories does it fall short?
3. The Innovations in Operations credit allows for creative, new approaches to operations/maintenance of existing buildings. What building features or facility practices do you propose for improving the sustainability and performance of WVN?

Useful Information

- If SS Credit 4 is met, assume transportation reduction of 75%
- If EA Credit 1 is met, assume Energy Star Rating of 95+
- For WE Credits 2-4, use your best judgment and knowledge about the building to assume a percent reduction
- Assume all prerequisites for each category are met
- See D2L for links to campus websites that may be of assistance in completing the Project