Daemen's LEED Buildings: Reaching their Target or Falling Short?

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Green Buildings Course

Introduction

- LEED stands for Leadership in Energy and Environmental Design
- US Green Building Council green building certification
- Program started in 1998 and has had 5 versions, the newest being LEED 4.0
- RIC- certified Gold under version 2.1; VPAC- certified Gold under version 2009

How has LEED changed?

- Criticisms of early version
  - Was created as a design tool and not a performance measurement tool.
  - Was not originally climate-specific, so the guidelines in hot/dry climates, same as cold climates
- Changes
  - Requirement for building-level water and energy metering
  - Includes acoustics in design
- Our buildings: do they meet LEED 4.0 and have enough points for Gold?

Visual and Performing Arts and Research and Information Commons earned LEED Gold under early LEED versions

- For LEED 4.0 Disqualifications-
  - Added permanent irrigation- not allowed
  - No building-level submetering for energy- now required as a prerequisite
- Points lost if reviewed under LEED 4.0
  - Repainted with non-compliant paints -1 point
  - Recarpeted with different type -1 point
  - No ongoing energy documentation for verification
  - Building earned point under Alternative transportation/low-emitting vehicles for parking spaces designated for carpool vehicles only; however, spaces were discontinued.

The Visual and Performing Arts Building (VPAC)

Energy Efficiency

- Currently, both the RIC and VPAC would not be able to receive a certification in LEEDv4.1
- Lack of separate meters for both buildings would prevent current certification; prevent us from measuring energy use and documenting efficiency
- Positive features- albedo roofs (reflect sunlight to reduce heat gain), geothermal heating system in VPAC, occupancy sensors and enhanced refrigeration (reduces ozone damage by using safer chemicals), passive solar design to use sun to warm buildings in winter, increased insulation
- Most of the features implemented to reduce energy consumption such as, the albedo roof, HVAC system, Geothermal heating system Occupancy sensors, and enhanced refrigeration would no longer qualify towards LEED certification

In the RIC

- Double doors for temperature control
- High ceilings and platform floors for heat to rise
- Electricity port to accommodate changing times
- Large windows and sun blockers both for natural sunlight
- Energy Star-compliant highly reflective and high emissivity roof
- CFC reduction in HVAC system
- Ozone protection
- High efficiency lighting
- Increased roof and exterior wall insulation

The Research and Information Commons Building (RIC)

Passive Solar Heating and Daylighting in the RIC

- Façade on front (south) of building blocks peak summer sun
- Building also has blinds that can be shut when it is too hot in the building
  - This helps to block any unnecessary incoming light
- Dots on the windows help block glare while allowing daylight to enter
- Lightshelves on inside above windows direct light farther into the building

Improved stormwater control and water purification

Water Use: Inside and Outside

Downsides

- No separate meters for these buildings, only combined data from multiple buildings so there is no way to tell what just one building does.
- No permanent installation of irrigation allowed, now installed in front of both buildings

Conclusions

Would our buildings meet LEED 4.0 standards if they were evaluated today? No, they don't have some required elements like building submetering for energy and water.

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