LEED Interpretation

3/4/2008 ID# 2049

MPR/Prerequisite/Credit: EAc1: Optimize Energy Performance

Primary Rating System: New Construction v2.2

Inquiry and Ruling | Applicability | Tools

Ruling

In requesting clarification on the proposed modeling methodology, it is unclear, based on the information provided, whether the project team is modeling the existing building as well as the addition. From ASHRAE Table G3.1 #2, the project will not meet all of the conditions to exclude parts of the existing building, as the requirements of (b) are not satisfied. Therefore, the project team must model the entire building, taking care to follow the requirements of Table G3.1. This includes #5, where the existing envelope must be modeled equally for the proposed and baseline cases, as well as the HVAC Systems requirements in #10. Please note that #10 portion (a) states that when an existing HVAC system exists, the proposed model shall reflect the actual system type, etc.

<< Less

Formal Inquiry

Our project consists of adding a new 5,000 square foot education building addition to an existing 17,500 square foot education building. The original building was not submitted for LEED certification but we are submitting for LEED certification on the new addition. The original project was constructed with a complete four pipe hydronic system including chillers, pumps, and boilers that have the capacity to handle the new addition with no added plant capacity. The scope of this project is to provide new air handling equipment and extend the existing four pipe hydronic distribution system to the new air handling equipment. Our approach to satisfying the newly established mandatory 14% energy efficiency improvement is outlined as follows: A base case model was established by using the criteria set by ASHRAE Standard 90.1-2004, Energy Standard for Buildings except Low Rise Residential Buildings. The minimum requirements established for this model are as follows: -Walls: Mass Assembly with U-value = 0.58 Btu/hr.ft2-§F. -Roof: Low Concrete with U-value = 0.063 Btu/hr.ft2-§F. -Glazing: U-value = 1.22 Btu/hr.ft2-§F -Shading Coefficient (SC) = 0.17 The Heating, Ventilation, and Air Conditioning (HVAC) system was based on ASHRAE 90.1-2004 table G3.1.1B and determined to be a packaged rooftop air conditioner, constant volume direct expansion (DX) system with minimum EER of 9.7 with fossil fuel furnace. The proposed design model was created based on the same square footage as the base case and the new building design parameters. The new building design parameters consist of the following: -Walls: Mass Assembly with U-value = 0.07692 Btu/hr.ft2-§F (R-13) -Roof: Low Concrete with U-value = 0.04 Btu/hr.ft2-§F (R-25). -Glazing: U-value = 0.29 Btu/hr.ft2-§F -Shading Coefficient (SC) = 0.41 The HVAC system for this model consists of two hydronic four pipe air handling units. The air handling units were modeled as variable air volume units with variable frequency drives. Trane TRACE 700 was used to perform the energy modeling and to obtain and compare the energy consumption of both cases (base and design models). The total mechanical load for the new addition was calculated to be 25 tons. In the base case the system was modeled as stand alone constant volume rooftop DX units. In the design model, the 25 ton load was modeled as two hydronic, variable air volume AHUs. The AHUs were connected to the existing campus plant distribution system. The existing plant consists of two (2) installed 1000 MBH boilers and hot water distribution pumps and two (2) installed eighty ton air cooled chillers and chilled water distribution pumps. The existing plant was modeled on a base load need. In this method, chiller 1 will be base loaded and will handle the load until it reaches its design capacity of 80 tons. When the building load has exceeded the capacity of chiller 1, then chiller 2 will stage on to handle the additional load. The Trane TRACE 700 energy consumption output sheets were used to compare the two cases. The base case total building consumption was calculated to be 1,437 MBTUh where the design case total building consumption was calculated to be 1,088 MBTUh. The comparison qualifies the project to earn the minimum energy points required to meet the mandatory requirements for certification. This request is to obtain a clarification and interpretation on the methodology and modeling that was used to achieve the minimum requirement of Energy and Atmosphere Credit 1 (EA Cr1). Is this approach acceptable to meet the intent and requirement of the LEED credit. If not would you please provide an alternate procedure to meet the requirements.

<< Less

Supplemental Documentation: none