



Horizon Engineering
Associates LLP
Demand a Higher StandardSM

January 5, 2010

Corey Enck
Director, LEED® Rating System Development
U.S. Green Building Council
2101 L St. NW, Suite 500
Washington, DC 20037

Re: LEED investigation of Northland Pines High School

Dear Mr. Enck;

Horizon Engineering has finished their review of the allegations concerning the LEED investigation of Northland Pines High School. Listed below are the allegations and our review comments for each of the commissioning relates items.

Except for the determination of the date of inclusion of commissioning specifications into the constructions documents, all other prerequisite LEED commissioning requirements were met.

31. Allegation: Violation of 6.2.5.4 System Commissioning. HVAC control systems shall be tested to ensure that control elements are calibrated, adjusted, and in proper working condition. For projects larger than 50,000 ft² conditioned area, except warehouses and semiheated spaces, detailed instruction for commissioning HVAC systems (see Appendix E) shall be provided by the designer in plans and specifications.

Independent consultant review comments: This statement is not referenced anywhere in the LEED 2.1 NC Reference guide.

32. Allegation: Appendix E of ANSI/ASHRAE/IESNA Standard 90.1-1999 contains the reference to ASHRAE Guideline 1, The HVAC Commissioning Process. Under LEED 2.1 NC, Prerequisite EA 1 requires six specific procedures be implemented including review of design intent, basis of design, documentation, and incorporation of commissioning requirements into the Construction Documents. Establishing design intent involves establishing “occupancy requirements, “system functions, energy, and air quality and environmental performance criteria⁸.” One violation is noted for the failure to issue detailed Commissioning requirements with the Construction Documents, however, substantially more may have occurred.

Independent consultant review comments: ASHRAE Standard 90.1 is not a referenced standard in LEED 2.1 NC EA Prerequisite 1. The credit requires that best practice commissioning be provided specifically to:

- Engage a commissioning team that does not include individuals directly responsible for project design or construction management;
- Review the design intent and the basis of design documentation;
- Incorporate commissioning requirements into the construction documents;
- Develop and utilize a commissioning plan;
- Verify installation, functional performance, training and operation and maintenance documentation;
- Complete a commissioning report.

St. Louis

Detroit

Harrisburg

Long Island

Charlotte

New York

Note - Based on the information supplied in the appeal, it is not clear that commissioning requirements were included in documentation before the bid date.

Information Requested		Status
A	Engage the Commissioning Team	Received, Complete
B	Review the Design Intent	Received, Complete
C	Incorporate the Commissioning Documents into Construction Documents	Cx Specifications Received can not verify date.
D	Submit a Commissioning Plan	Received, Complete
E	Functional Performance Data	Received, Complete
F	Complete a Commissioning Report	Received, Complete

33. Allegation: The Commissioning process was (1) not executed in accordance with LEED 2.1 NC, (2) not executed in accordance with ANSI/ASHRAE/IESNA Standard 90.1-1999, and (3) not executed in accordance with ASHRAE Guideline 1, 1996. The requirements of LEED 2.1 NC and ANSI/ASHRAE/IESNA Standard 90.1-1999 were violated.

Independent consultant review comments:

- The date of inclusion of commissioning specifications into the construction documents was not verified by this reviewer. All other prerequisite commissioning requirements were met.
- ANSI/ASHRAE/IESNA Standard 90.1-1999 is not a referenced standard in LEED EA Prerequisite 1.
- ASHRAE Guideline 1-1996 is not a referenced standard in LEED EA Prerequisite 1.

34. Allegation: ANSI/ASHRAE Standard 62.1-1999 and ANSI/ASHRAE/IESNA Standard 90.1-1999 both have substantial design computation and documentation requirements which require design review by the Commissioning Agent. The nature and extent of the deficiencies observed in the design and in the field by the reviewing professionals indicate a high probability that the design team either failed to prepare the necessary computations, failed to engage Commissioning Services in time to provide the required design review process, or that Commissioning Services were not performed in a competent manner by the Commissioning Agent.

Independent consultant review comments:

- ANSI/ASHRAE Standard 62.1-1999 and ANSI/ASHRAE/IESNA Standard 90.1-1999 are not referenced standards in LEED EA Prerequisite 1.
- A design review is not a specified requirement of this prerequisite; rather it is a requirement of EA Credit 3. The scope of the design review includes the following: "The independent Commissioning Authority must review the design at the schematic design (and construction document) phase. This enables the Commissioning Authority to verify that each commissioned feature or systems meets the owner's requirements relative to functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality, and local environmental impacts."
- While this credit covers energy efficiency that the appellant cites, the scope to which the appellant expects of the Commissioning Authority is not a requirement of the credit. To expand the scope to which the appellant is implying, would mean that that the Commissioning Authority would also have to do a complete construction estimate of all trades, sustainability review of all features, including architectural. These activities are not requirement of the commissioning credit.



35. Allegation: The problems with this design should have been readily apparent to anyone familiar with the requirements of ANSI/ASHRAE/IESNA Standard 90.1-1999 and computational procedures of ANSI/ASHRAE Standard 62.1-1999. Indicators of non-compliant designs include:

1. The use of VAV reheat systems using a recirculation path without the benefit of:
 - a. An outdoor air injection fan or parallel dedicated outdoor air system.
 - b. The necessary controls to ensure adequate outdoor air delivery at low flow conditions at all air handling units.
 - c. This would indicate a solution probably noncompliant with both ANSI/ASHRAE Standard 62.1 and ANSI/ASHRAE/IESNA Standard 90.1.
2. Uniform VAV Reheat air terminal unit air flow percentages approximating 30%. This would suggest some awareness of the reheat limitations of ANSI/ASHRAE/IESNA Standard 90.1, but a lack of awareness of the fact that the 30% of peak flow had been deleted from ANSI/ASHRAE/IESNA Standard 90.1-1999 and indicative of failure to perform the Ventilation Rate Procedure computations required by ANSI/ASHRAE/IESNA Standard 90.1-1999.
3. Uniform VAV Reheat air terminal unit air flow percentages greater than 30%. This would suggest both lack of awareness of the reheat limitations of ANSI/ASHRAE/IESNA Standard 90.1-1999 and indicative of failure to perform the Ventilation Rate Procedure computations required by ANSI/ASHRAE/IESNA Standard 90.1-1999.
4. Minimum outdoor air percentages lower than 50%. This indicates the improper use of the Multiple Spaces Equation for VAV systems, if the ANSI/ASHRAE/IESNA Standard 90.1-1999 Ventilation Rate Procedure computations have been performed at all.

Had the Commissioning Process reviews required by LEED 2.1 NC and ASHRAE Guideline-1 been performed, most, if not all of the deficiencies identified by the reviewing professionals should have been identified by the Commissioning Agent and corrected by the design team prior to the issuance of Construction Documents.

Independent consultant review comments: This is a design issue and not a commissioning issue. The Commissioning Authority is not responsible for design.

36. Allegation: As of seven days prior to the Bid Date, the Construction Documents should have, but failed to include detailed commissioning specifications. Issuance of commissioning requirements subsequent to the bid date would not have satisfied the requirements of LEED 2.1 NC and would have caused in the installing Contractors to not including the cost of their Commissioning responsibilities in their bids.

Independent consultant review comments: Based on the information supplied in the appeal, it is not clear that commissioning requirements were included in documentation before the bid day.

Further investigation is required to determine if commissioning was incorporated into contract documents. See response to Allegation #33, Section A.

Respectfully submitted;



Michael C. English, P.E., CCP, LEED AP



A handwritten signature in black ink, appearing to read 'P. Meyer', with a long horizontal flourish extending to the right.

Paul M. Meyer, P.E., LEED AP

Cc: Brendan Owens, P.E., LEED AP

