INFORMATION

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LEED for Schools

PIEACP

Indoor Environmental Quality, Prerequisite 3: Minimum Acoustical Performance

The LEED Steering Committee (LSC) has approved a PIEACP for Indoor Environmental Quality, Prerequisite 3: Minimum Acoustical Performance. PIEACP stands for Performance/Intent Equivalent Alternative Compliance Path, and was established in the LEED Product Development and Maintenance Manual as "a strategy to ensure that LEED products remain technically relevant and market savvy."

The alternate compliance methods below are not intended to replace any of the existing compliance paths currently available. Rather, these methods offer alternatives to the currently available paths. Current paths shall remain in place as accepted approaches for compliance with the acoustics prerequisite. Please note that the intent for this prerequisite remains unchanged:

Provide classrooms that are quiet and in which teachers can speak to the class without straining their voices and students can effectively communicate with each other and the teacher.

The key provisions of this PIEACP are as follows:

1. Two new compliance paths for meeting Reverberation Time (RT) requirements
2. One new compliance path for meeting interior background noise level requirements
3. One new compliance path for limiting sound transmission

A revised template will be made available to accommodate these new paths. Until that time, project teams using alternative compliance paths are to simply upload narratives and additional information as needed to document compliance, clearly indicating which path they wish to follow.

Please note that every LEED for Schools certified project MUST meet the requirements for Reverberation Time, interior background noise level, AND sound transmission. The choice of a compliance path for one of these requirements will not affect the choice for another requirement. For example, if a project team chooses a *new* compliance path for the sound transmission requirement, they may also choose the *existing* compliance path for reverberation time.

PLEASE NOTE THAT THIS DOCUMENT INCLUDES THE 5/13/08 ERRATA (please see page 6). This errata to the PIEACP was approved by the LSC and can be viewed in a separate document on the LEED for Schools Webpage as well.

Alternate Compliance Paths for meeting the Reverberation Time Requirement

In *addition* to the current compliance path stated in the rating system:

> Design classrooms and other core learning spaces to meet the Reverberation Time (RT) requirements of ANSI Standard S12.60-2002, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools.

The following two alternative compliance paths are now available:

> ALTERNATIVE COMPLIANCE PATH 1
>
> Confirm that 100% of all standard classroom ceiling areas are finished with a material that has a Noise Reduction Coefficient (NRC) of 0.70 or higher.* This can typically be achieved with a lay-in acoustical ceiling tile or other acoustical finish material.
>
> OR
>
> ALTERNATIVE COMPLIANCE PATH 2
>
> Confirm that the combined total area of acoustical wall panels, ceiling finishes, and other sound-absorbent finishes equals or exceeds the total ceiling area of the room, and that all materials in the calculation have an NRC of 0.70 or higher.
>
> * *Note: The NRC is an acoustical performance specification that is readily available for most acoustical ceiling tiles and other sound-absorbent finishes.*

Alternate Compliance Path for meeting the Background Noise Level Requirement

In *addition* to the current compliance paths stated in the rating system:

> OPTION 1
>
> Using the methodology described in annexes B through D of ANSI Standard S12.60-2002, achieve a maximum background noise level in classrooms and other primary learning spaces of 45 dBA.
>
> OR
>
> OPTION 2
>
> Design classrooms and other core learning spaces using the methodology listed in the 2003 HVAC Applications ASHRAE Handbook, Chapter 47 on Sound and Vibration Control, and achieve an RC (N) Mark level of 37.

The following alternative compliance path is now available:

> Achieve a maximum background noise level in classrooms and other core learning spaces of 45 dBA by calculating core learning space noise levels for the HVAC system design using mechanical system noise calculation methods as defined in the 2003 HVAC Applications ASHRAE Handbook, Chapter 47 on Sound and Vibration Control. Submit calculations for all core learning spaces, confirming compliance with the 45 dBA limit. Commercially-available software may be used to perform the calculations for core learning space noise levels, provided calculations are based on 2003 HVAC Applications ASHRAE Handbook, Chapter 47 on Sound and Vibration Control.

Alternate Compliance Path for meeting the Sound Transmission Requirement

In *addition* to the current compliance path stated in the rating system:

> Design classrooms and other core learning spaces to meet the Sound Transmission Class requirements, excepting windows, which must meet an STC rating of at least 35.

The following alternative compliance path is now available:

> *for sound transmission between core learning spaces and exterior spaces*
>
> Provide the following:
>
> 1. Description of school location and the local environment, detailing exterior noise sources.
> 2. Exterior sound level measurements, where appropriate, submitted as peak hour Leq during a typical school day or Ldn.
> 3. Narrative describing the project team's review and analysis of the local area (municipal, county or state) zoning and long-range land use plans to determine if other noise impacting uses are planned in the vicinity of the development site (such as highways, industrial zoning, etc.).
> 4. Take measures to reduce exterior to interior sound transmission based on items1-3. Provide a narrative describing measures taken to reduce exterior to interior sound transmission, including measures taken to address the following:
>   a. Exterior glazing assemblies
>   b. Wall construction
>   c. Other exterior elements that impact interior sound isolation
>
> For high-noise sites (peak hour Leq above 60 dBA), include acoustical treatment(s). Provide a narrative describing the acoustical treatment(s) for exterior penetrations, roof assemblies, and other exterior noise control elements.
>
> AND

For sound transmission between core learning spaces and adjacent interior spaces

Take measures to limit sound transmission between core learning spaces and their adjacencies. Provide a narrative describing measures taken to limit sound transmission between core learning spaces and the following adjacencies:

- Other core learning spaces
- Bathrooms
- Corridors
- Offices, conference rooms
- Music rooms
- Mechanical equipment rooms
- Cafeterias, gymnasiums, natatoriums

The narrative should address the following:

- Demising wall constructions
- Interior glazing assemblies
- Door constructions
- Operable partition constructions, including STC rating, if available.
- Measures taken to limit noise transmission through sound paths, including:
    - Open plenums above core learning spaces
    - Connecting doors between core learning spaces
    - Ceiling air return grilles into open plenums
    - “Cross-talk” via mechanical ductwork
- Special circumstances or considerations regarding the project

LEED for Schools

Errata for the April 23, 2008 PIEACP

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a) For Reverberation Time, Alternative Compliance Path 1, diffusers, grilles, and light fixtures are excluded from the calculation of "100% of all standard classroom ceiling areas"

b) For Reverberation Time, Alternative Compliance Paths 1 and 2, individual finishes must have a minimum NRC of 0.70. A weighted average of materials is NOT acceptable.

c) For Reverberation Time, Alternative Compliance Paths 1 and 2 both refer to classrooms and other core learning spaces. Clarified language is as follows:

Alternative Compliance Path 1

Confirm that 100% of all ceiling areas *in classrooms and other core learning spaces* are finished with a material that has a Noise Reduction Coefficient (NRC) of 0.70 or higher.* This can typically be achieved with a lay-in acoustical ceiling tile or other acoustical finish material.

Alternative Compliance Path 2

For each classroom and core learning space, confirm that the combined total area of acoustical wall panels, ceiling finishes, and other sound-absorbent finishes equals or exceeds the total ceiling area of the room, and that all materials in the calculation have an NRC of 0.70 or higher.

d) For Interior Background Noise Levels, the alternative compliance path excludes exterior background noise contributions. It includes only sound from HVAC systems.

e) In Sound Transmission: for sound transmission between core learning spaces and exterior spaces, bullet 2, the project team will be exempted from taking this measurement if the project is at least one-half mile from any significant noise source(s) such as (but not limited to) aircraft over-flights, highways, trains, and industry. A narrative and site plan demonstrating sufficient distance from significant noise sources must be submitted to obtain the exemption from the requirement for exterior sound level measurements.

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