



# LEED 2009 for Existing Buildings: Operations and Maintenance

## IEQ PREREQUISITE 1: MINIMUM INDOOR AIR QUALITY PERFORMANCE

All fields and uploads are required unless otherwise noted.

### ALL OPTIONS

This static sample form has been modified for offline access. All sections of the form are visible. Sample forms are for reference only.

Select all that apply to the project building:

- ☐ The project building is mechanically ventilated, in part or in whole.
- ☐ The project building is naturally ventilated, in part or in whole.

**Note:** For projects with mechanical ventilation and natural ventilation, complete the Mechanical Ventilation section for all mechanically ventilated spaces, and the Natural Ventilation section for all naturally ventilated spaces.

A floor plan for the project space indicating the areas served by a combination of natural and mechanical ventilation or conditioning systems is required to demonstrate credit compliance. The representative floor plans for the project space upload below is a linked submittal. If one is not present, you may upload one now.

**Upload L-1.** Representative floor plans of the project space.

Files:

Select one of the following:

- ☐ The floor plan above shows the areas served by a combination of natural and mechanical ventilation or conditioning systems.
- ☐ A different document is better suited to satisfy the requirement.

**Upload L-1.1.** Floor plan for the project space indicating the areas served by a combination of natural and mechanical ventilation or conditioning systems.

Files:

### MECHANICAL VENTILATION

Performance period start:

*Invalid Date range: The performance period must be between 89 and 731 days, and must end within 90 days of the overall project performance period given in PI Form 4: Schedule and Overview Documents..*

Performance period end:

Select all that apply to the project building:

- ☐ **Case 1:** One or more AHUs are able to meet ASHRAE Standard 62.1-2007 outdoor air requirement
- ☐ **Case 2:** One or more AHUs are unable to meet ASHRAE Standard 62.1-2007 outdoor air requirement

## MECHANICAL VENTILATION - Case 1

Complete the following table for each air-handling unit in the project building that is able to meet the ASHRAE Standard 62.1-2007 outdoor air ventilation rate requirement .

**Table.** Case 1: ASHRAE 62.1-2007 Ventilation Rate Procedure

AHU	System Type <sup>1</sup>	Zone	Occupancy Category	R <sub>p</sub> (cfm / person)	R <sub>a</sub> (cfm/sf )	Total Occupants	A <sub>z</sub> (sf)	V <sub>bz</sub> (cfm)	E <sub>z</sub>	V <sub>oz</sub> (cfm)	E <sub>v</sub>	V <sub>ot</sub> (cfm)

1. Users should select CV if outside air provision associated with this AHU never operates in VAV mode under normal operating conditions; otherwise enter VAV.

**Note:** CV = Constant Volume, VAV = Variable Air Volume, OA = Outdoor Air Flow. Refer to ASHRAE Standard 62.1-2007 Ventilation Rate Procedure and ASHRAE 62MZCalc spreadsheet for detailed definitions and calculation procedures.

**Table.** Case 1: Outdoor Air Flow

AHU	Zone	Occupancy Category	V <sub>ot</sub> (cfm)	Measured OA Intake Flow (cfm)	Date of Measurement	Zone Complies with IEQp1	Zone Complies with IEQc1.3
Compliance with IEQ Prerequisite 1: <b>Note:</b> The measured outdoor air intake flow for all zones must be equal to or greater than the outdoor air ventilation rate required by ASHRAE Standard 62.1-2007, ventilation rate procedure.							
Compliance with IEQ Credit 1.3: <b>Note:</b> The measured outdoor air intake flow for all zones must be 30% greater than the minimum outdoor air ventilation rate required by ASHRAE Standard 62.1-2007, ventilation rate procedure.							

*Invalid measurement date. The date of measurement should fall within the performance period of the credit.*

## MECHANICAL VENTILATION - Case 2

Complete the following table for each air-handling unit in the project building that is unable to meet the ASHRAE Standard 62.1-2007 outdoor air ventilation rate requirement.

**Table.** Case 2: AHU Compliance with Minimum Outdoor Air Flow Requirement

AHU	System Type <sup>1</sup>	Zone	Occupancy Category	Total Occupants	Minimum OA Intake Flow Required 10cfm/ person (cfm)	Measured OA Intake Flow (cfm)	Date of Measurement	Zone Complies with IEQp1
Compliance with IEQ Prerequisite 1: <b>Note:</b> The measured outdoor air intake flow for all zones must be equal to or greater than the minimum outdoor air flow required (10 cfm per person)								

1. Users should select CV if outside air provision associated with this AHU never operates in VAV mode under normal operating conditions; otherwise enter VAV.  
**Note:** CV = Constant Volume, VAV = Variable Air Volume, OA = Outdoor Air Flow. Refer to ASHRAE Standard 62.1-2007 Ventilation Rate Procedure and ASHRAE 62MZCalc spreadsheet for detailed definitions and calculation procedures.

*Invalid measurement date. The date of measurement should fall within the performance period of the credit.*

A Licensed Professional Exemption is available for Professional Engineers in lieu of completing Table. CASE 2: Ventilation Rate Procedure and additional documentation detailing why the ASHRAE Standard 62.1-2007 ventilation rates are infeasible.

Select one of the following:

- ☒ Streamlined Path: LPE (PE)
- ☐ Full Documentation

Complete the following table for each air-handling unit in the project building that is unable to meet the ASHRAE Standard 62.1-2007 outdoor air ventilation rate requirement .

**Table.** Case 2: Ventilation Rate Procedure

AHU	Zone	Occupancy Category	R <sub>p</sub> (cfm/person)	R <sub>a</sub> (cfm/sf)	Total Occupants	A <sub>z</sub> (sf)	V <sub>bz</sub> (cfm)	E <sub>z</sub>	V <sub>oz</sub> (cfm)	E <sub>v</sub>	V <sub>ot</sub> (cfm)	Min 10cfm/person (cfm)	Measure OA Intake Flow

**Note:** OA = Outdoor Airflow. Refer to ASHRAE Standard 62.1-2007 Ventilation Rate Procedure and ASHRAE 62MZCalc spreadsheet for detailed definitions and calculation procedures.

For all AHUs incapable of supplying the flow required by ASHRAE Standard 62.1-2007, as listed in Table.

Case 2: AHU Compliance to Minimum Outdoor Air Flow Requirement, upload EITHER:

- (1) Design documentation.
- (2) A summary of outdoor air flow measurements taken at maximum flow conditions (with an explanation of the steps taken to ensure the ventilation system was operating at maximum flow conditions).
- (3) Other technical evidence confirming that this limitation is true for all system operating conditions, even when functioning properly.

**Upload IEQp1-1.** Provide supporting documentation for AHU's unable to meet the ASHRAE outdoor ventilation airflow requirement.

Files:

Describe any additional details related to the AHUs incapable of meeting the outdoor air ventilation rates required by ASHRAE 62.1-2007. (Optional)

For all variable air volume systems, describe how the VAV outside air flow was set up during the air flow measurements to operate at the worst-case condition expected during normal operations (i.e., fan speeds set at minimum normal operating level, OA dampers set at their minimum normal operating opening, etc.)

All values of occupancy used to define minimum outside air flow requirements for this prerequisite are based on the maximum occupancy expected during normal facility operation (e.g., not design occupancy, minimum occupancy, or unusual or emergency conditions).

Signatory	
Initial here:	

The project team has performed or overseen tests on all project building exhaust systems during the performance period to confirm proper function.

Signatory	
Initial here:	

Describe the outside air flow measurement method or protocol used for each AHU, explaining the measurement device or system, its accuracy, and how the measurements were taken.

Describe the ventilation maintenance program, including a description of the periodic checks and scheduled maintenance performed, and whether the checks are manual, based on a building automation system, or both.

**Upload IEQp1-2.** Provide documentation verifying an HVAC system maintenance program related to outdoor air introduction and exhaust was implemented for the project building during the performance period. If a building automation system is used for any ventilation components, include a periodic system status report taken during the performance period. For ventilation components handled manually, include the maintenance log written during the performance period.

*Files:*

**Upload IEQp1-3.** Upload a testing report for each type of exhaust system in the project building.

*Files:*

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## NATURAL VENTILATION

- ☐ The space is an engineered natural ventilation system approved by the authority having jurisdiction. The project takes an exception to the prescriptive requirements of ASHRAE Standard 62.1-2007 sections 5.1.1 and 5.1.2.

**Upload IEQp1-4.** Provide the regulatory approval letter or document indicating the engineered system has been approved by the authority having jurisdiction.

*Files:*

**Upload L-14.** Provide a graphic and numeric summary of the airflow analysis performed. Include the boundary conditions used for the analysis, simulation algorithm, solution variables, temperatures, airflow volumes and mean age of air for the spaces modeled.

*Files:*

Complete the following table for each naturally ventilated space in the project building.

**Table.** Natural Ventilation Floor/Window Ratio

Room Name or ID	Occupiable Floor Area (SF)	Description of Operable Window Openings	Openable Window Area <sup>1</sup> (SF)*	Ratio of Window Area to Occupiable Area(%)	Is the Window to Occupiable Area Ratio Sufficient?	Is the Entire Occupiable Area Within 25' of the Window(s)?	Zone Complies with IEQp1
Compliance with IEQ Prerequisite 1: <b>Note:</b> Naturally ventilated spaces shall be permanently open to and within 8 m (25 ft) of operable wall or roof openings to the outdoors, the openable area of which is a minimum of 4% of the net occupiable floor area to meet the requirements of the prerequisite.							

1. Openable window area is the area of operable window that can be open to the outside.

ADDITIONAL DETAILS

- ☐ Special circumstances preclude documentation of prerequisite compliance with the submittal requirements outlined in this form.

SPECIAL CIRCUMSTANCES

Describe the circumstances limiting the project team's ability to provide the submittals required in this form. Be sure to reference what additional documentation has been provided, if any. Non-standard documentation will be considered upon its merits.

**Upload IEQp1-SC.** Provide additional documentation that supports the claim to special circumstances. (Optional)

Files:

- ☐ The project team is using an alternative compliance approach in lieu of standard submittal paths.

## ALTERNATIVE COMPLIANCE PATH

Describe the alternative compliance path used by the project team. Include justification that this path meets the prerequisite intent and requirements. Be sure to reference what additional documentation has been provided, if any. Non-standard documentation will be considered upon its merits.

**Upload IEQp1-ACP.** Provide additional documents that support the alternative compliance path approach. (Optional)

*Files:*

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## SUMMARY

IEQ Prerequisite 1: Minimum Indoor Air Quality Performance Compliance

Documented: