



LEED 2009 for Existing Buildings: Operations & Maintenance

IEQ CREDIT 1.2: INDOOR AIR QUALITY BEST MANAGEMENT PRACTICES

OUTDOOR AIR DELIVERY MONITORING

All fields and uploads are required unless otherwise noted.

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 has mechanical ventilation systems that predominantly serve densely occupied spaces¹.
- ☐ The project building is naturally ventilated, in part or in whole.

¹ Densely occupied space is defined as an area with a design occupant density of 25 people or more per 1,000 square feet (40 square feet or less per person)

MECHANICALLY VENTILATED BUILDINGS

Describe the ventilation system design and the outdoor airflow measurement device(s) in the system, including the device design and monitoring capabilities and specific details on the location of the measurement devices.

Describe the alarm system and the protocol for making system adjustments when ventilation rates fall below acceptable levels.

I have reviewed the information above and it is accurate to the best of my knowledge.

Signatory	
Initial here:	

A Licensed Professional Exemption (LPE) is available for Professional Engineers in lieu of an Outdoor Air AHU Table.

Select one of the following:

☐ Streamlined path: LPE (PE).

☐ Full Documentation.

NOTE: For each Licensed Professional Exemption claimed, the relevant licensed professional must complete the corresponding Exemption Signature on the Licensed Professional Exemptions tab in order to be considered a valid submittal. Elements highlighted in gray below are exempt.

Licensed Professional Exemption claimed by:

For each air handling unit (AHU) that supplies outside air to the building's occupied spaces, complete the table below.

Table IEQc1.2-1. Outdoor Air AHUs

AHU Designation	Outdoor Airflow Measurement Device Present?	Minimum outside air flow ¹ (CFM)	Measurement Interval (minutes)	Alarm Setpoint
Percent of outdoor air monitored(%) (must be 80% or greater. Only AHU's with outdoor airflow measurement devices having measurement intervals of 15 minutes or less contribute towards this total)				

¹Required outside air flow rate is derived from spreadsheet calculations.

Select one of the following:

- ☐ **Summary Calibration Report:** The project team will provide dated summary calibration report and system testing, performed and completed within the manufacturer recommended interval, as measured from the conclusion of the performance period.
- ☐ **Maintenance Plan:** The project team will provide a maintenance plan outlining procedures that ensure sensor accuracy and precision, proper operation of the overall system and repair/replacement of any malfunctioning components.

Upload IEQc1.2-1. Upload a summary report of calibration and system testing performed. The report must be dated within the manufacturer recommended interval, as measured from the conclusion of the performance period .

Upload IEQc1.2-2. Upload a maintenance plan outlining procedures that ensure sensor and actuator accuracy and precision, Proper operation of the overall system, and repair/replacement of any malfunctioning components.

Upload IEQc1.2-3. Upload a trend graph from at least one outdoor airflow measurement device showing airflow for a continuous 24 hour period during a typical operational day.

MECHANICAL VENTILATION SYSTEMS SERVE DENSELY OCCUPIED¹ SPACES

Select one of the following:

- ☐ The total square footage of all densely occupied¹ spaces is less than 5% of total occupied square footage within the project scope.
- ☐ The total square footage of all densely occupied¹ spaces is equal to or greater than 5% of total occupied square footage within the project scope.

AREA OF DENSELY OCCUPIED¹ SPACES IS EQUAL TO OR GREATER THAN 5% OF TOTAL AREA

Describe the alarm system and the protocol for making system adjustments when ventilation rates fall below acceptable levels.

Please indicate whether demand control ventilation is utilized. If so, explain how the control strategy complies with ASHRAE Standard 62, including maintaining the area-based component of the design ventilation rate.

I have reviewed the information above and it is accurate to the best of my knowledge.

Signatory	
Initial here:	

A Licensed Professional Exemption (LPE) is available for Professional Engineers in lieu of a CO₂ sensor table.

Select one of the following:

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

NOTE: For each Licensed Professional Exemption claimed, the relevant licensed professional must complete the corresponding Exemption Signature on the Licensed Professional Exemptions tab in order to be considered a valid submittal. Elements highlighted in gray below are exempt.

Licensed Professional Exemption claimed by:

A floorplan or sketch for each occupied floor in the project building with a unique layout or ventilation design is required to document credit compliance. The floorplan below is a linked submittal. (If no document is present, you may upload one now.)

Upload L-1. Upload representative floorplans for the project building.

Select one of the following:

- ☐ The floorplan(s)/sketch(es) above shows each occupied floor in the project building with a unique layout or ventilation design, and it highlights densely occupied areas, the floor area of each densely occupied space, & the location of CO₂ sampling points. If a single floor plan/sketch represents more than one floor, the plan/sketch is clearly labeled with the floors to which it applies.
- ☐ A different document is better suited to satisfy this requirement:

Upload IEQc1.2-4. Upload floorplan(s)/sketch(es) for each occupied floor in the project building with a unique layout or ventilation design. Highlight densely occupied areas, the floor area of each densely occupied space, & the location of CO₂ sampling points. If a single floor plan/sketch represents more than one floor, the plan/sketch is clearly labeled with the floors to which it applies.

Select one of the following:

- ☐ **Summary Calibration Report:** The project team will provide dated summary calibration report and system testing, performed and completed within the manufacturer recommended interval, as measured from the conclusion of the performance period.
- ☐ **Maintenance Plan:** The project team will provide a maintenance plan outlining procedures that ensure sensor accuracy and precision, proper operation of the overall system and repair/replacement of any malfunctioning components.

Upload IEQc1.2-5. Upload a summary report of calibration and system testing performed. The report must be dated within the manufacturer recommended interval, as measured from the conclusion of the performance period .

Upload IEQc1.2-6. Upload a maintenance plan outlining procedures that ensure sensor and actuator accuracy and precision, proper operation of the overall system, and repair/replacement of any malfunctioning components.

Upload IEQc1.2-7. Upload a trend graph from at least one CO₂ monitor, showing CO₂ concentrations for a continuous 24 hour period during a typical operational day.

For each densely occupied room required to have a CO₂ sensor, complete the table below.

Table IEQc1.2-2. CO2 Data Sensors

Ambient outdoor CO ₂ concentration	
The Ambient Outdoor CO ₂ concentration figure above was derived from	

Densely Occupied Space ID	Area (sf)	CO ₂ Sensor Distance from Floor (ft)	Measurement Interval (minutes)	Maximum CO ₂ Delta from Ambient based on ASHRAE 62, Appendix C (PPM)	Alarm Setpoint (PPM)

Each space complies with the requirement if the CO₂ sensor distance is between 3 and 6 feet above the floor, the measurement interval is less than 30 minutes, and the Alarm setpoint (in ppm) is no greater than the sum of the Ambient outdoor CO₂ concentration (in ppm) and the Maximum CO₂ delta from ambient based on ASHRAE 62 (in ppm). Spaces less than 150 square feet do not need to be included in the table.

NATURALLY VENTILATED BUILDINGS

Select one of the following:

- ☐ The total square footage of all naturally ventilated spaces is less than 5% of total occupied square footage within the project scope.
- ☐ The total square footage of all naturally ventilated spaces is equal to or greater than 5% of total occupied square footage within the project scope.

(NOTE: The project scope is generally 100% of total building floor area, but may be as low as 90% if the project team pursues the 10% exemption because of separate management/control.)

AREA OF NATURALLY VENTILATED SPACES IS EQUAL TO OR GREATER THAN 5% OF TOTAL AREA

A Licensed Professional Exemption (LPE) is available for Professional Engineers in lieu of a CO₂ data sensor table.

Select one of the following:

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

NOTE: For each Licensed Professional Exemption claimed, the relevant licensed professional must complete the corresponding Exemption Signature on the Licensed Professional Exemptions tab in order to be considered a valid submittal. Elements highlighted in gray below are exempt.

Licensed Professional Exemption claimed by:

Select one of the following:

- ☐ **Summary Calibration Report:** The project team will provide dated summary calibration report and system testing, performed and completed within the manufacturer recommended interval, as measured from the conclusion of the performance period.
- ☐ **Maintenance Plan:** The project team will provide a maintenance plan outlining procedures that ensure sensor accuracy and precision, proper operation of the overall system and repair/replacement of any malfunctioning components.

Upload IEQc1.2-8. Upload a summary report of Building Automation System calibration and system testing performed. The report must be dated within the manufacturer recommended interval, as measured from the conclusion of the performance period .

Upload IEQc1.2-9. Upload a Building Automation System maintenance plan outlining procedures that ensure sensor and actuator accuracy and precision, proper operation of the overall system, and repair/replacement of any malfunctioning components.

A floorplan or sketch for each occupied floor in the project building with a unique layout or ventilation design is required to document credit compliance. The floorplan below is a linked submittal. (If no document is present, you may upload one now.).

Upload L-1. Upload representative floorplans for the project building.

Select one of the following:

- ☐ The floorplan(s)/sketch(es) above highlights each naturally ventilated area, and labels the associated naturally ventilated floor area(s) (SF) and CO₂ sampling point locations. If a single floor plan/sketch represents more than one floor, the plan/sketch is clearly labeled with the floors to which it applies.
- ☐ A different document is better suited to satisfy this requirement:

Upload IEQc1.2-10. Upload floorplan(s)/sketch(es) for each occupied floor in the project buliding with a unique layout or ventilation design. Highlight each naturally ventilated area, and label the associated naturally ventilated floor area (s) (SF) and CO₂ sampling point locations. If a single floor plan/sketch represents more than one floor, the plan/sketch is clearly labeled with the floors to which it applies.

Upload IEQc1.2-11. Upload a trend graph from at least one CO₂ monitor, showing CO₂ concentrations for a continuous 24 hour period during a typical operational day.

For each naturally ventilated room required to have a CO₂ sensor, complete the table below.

Table IEQc1.2-3. CO2 Data Sensors

Ambient outdoor CO ₂ concentration					
The Ambient Outdoor CO ₂ concentration figure above was derived from					
Naturally Ventilated Space ID	Area (sf)	CO ₂ Sensor Distance from Floor (ft)	Measurement Interval (minutes)	Maximum CO ₂ Delta from Ambient based on ASHRAE 62, Appendix C (PPM)	Alarm Setpoint (PPM)

Each space complies with the requirement if the CO₂ sensor distance is between 3 and 6 feet above the floor, the measurement interval is less than 30 minutes, and the Alarm setpoint (in ppm) is no greater than the sum of the Ambient outdoor CO₂ concentration (in ppm) and the Maximum CO₂ delta from ambient based on ASHRAE 62 (in ppm). Spaces less than 150 square feet do not need to be included in the table.

TENANTS

Select one of the following:

- ☐ The project building is a single management/control building, pursuing no tenant-related exemptions and needs no tenant-related special calculations.
- ☐ The project building is a multi-tenant building.

MULTI-TENANT BUILDING

Select one of the following :

- ☐ No Exemption: The above declarations and calculations are based on actual data collected for the entire project building and for the associated grounds over the performance period. All tenants have provided actual data to the project team.
- ☐ Multi-Tenant Exemption: Because of the occupancy/management composition of the project building, the project team is exempting up to 10% of the floor area for this credit. The above declarations and calculations are based on actual data collected for the remaining spaces and associated grounds over the performance period. For these spaces, all tenants have provided actual data to the project team.

MULTI-TENANT EXEMPTION

TIP: The "Space Usage Type" table is a required General Submittal. Be sure to consider contextual overlaps (e.g., with exempted tenant space) when documenting compliance with this credit.

Gross square footage of the project building(s): sf

Table Pf3-1. Space Usage Type

Enter information for all general usage types within the project building; group spaces with similar characteristics. Non-regularly occupied support spaces (e.g., storage, mechanical spaces, bathrooms, etc.) should be included in the Gross Area of the Space Usage Type for which they are ancillary.

Space Usage Type	Space Name / Description (Optional)	Gross Area (sf)	Owned or Leased	Lease Type	Regularly Occupied Gross Area (sf)	Unconditioned Gross Area (sf)	Prerequisites/ Credits From Which Space is Excluded, if any

Total gross area (sf)	
Total leased gross area (sf)	
Percentage leased gross area (%)	
Total regularly occupied gross area (sf)	
Total unconditioned gross area (sf)	

Total gross area must equal the total project gross square footage entered above.

Percent of project building floor area exempted for IEQ Credit 1.2:

 %

ADDITIONAL DETAILS

- ☐ Special circumstances preclude documentation of credit 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 IEQc1.2-SC. Provide any additional documentation that supports the claim to special circumstances. (Optional)

- ☐ 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 credit 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 IEQc1.2-ACP. Provide any additional documents that support the alternative compliance path approach. (Optional)

SUMMARY

IEQ Credit 1.2: Indoor Air Quality Best Management Practices-Outdoor Air Delivery Monitoring Points Documented: