Indoor air quality management program

EQ1.1 | Possible point

Glossary

Intent

To enhance indoor air quality (IAQ) by optimizing practices to prevent the development of indoor air quality problems in buildings, correcting indoor air quality problems when they occur and maintaining the well-being of the occupants.

To enhance indoor air quality (IAQ) by optimizing practices to prevent the development of indoor air quality problems in buildings, correcting indoor air quality problems when they occur and maintaining the well-being of the occupants.

Enhance IAQ performance by optimizing practices to prevent the development of indoor air quality problems in buildings correcting indoor air quality problems when they occur and, maintaining the well- being of the occupants.

To maintain the well-being of occupants by preventing and correcting indoor air quality problems.

To promote occupants' comfort, well-being, and productivity by improving indoor air quality.

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To promote occupants' comfort, well-being, and productivity by improving indoor air quality.

Requirements

Develop and implement on an ongoing basis an IAQ management program based on the EPA Indoor Air Quality Building Education and Assessment Model (I-BEAM), EPA Reference Number 402-C-01-001, December 2002, available at http://www.epa.gov/iaq/largebldgs/i-beam/index.html.

Develop and implement on an ongoing basis an IAQ management program based on the EPA Indoor Air Quality Building Education and Assessment Model (I-BEAM), EPA Reference Number 402-C-01-001, December 2002, available at http://www.epa.gov/iaq/largebldgs/i-beam/index.html.

Develop and implement on an ongoing basis an IAQ management program for buildings based on the EPA document "Building Air Quality: A Guide for Building Owners and Facility Managers," EPA Reference Number 402-F-91-102, December 1991, which is available on the EPA Web site, www.epa.gov.

Establishment

Develop and implement an indoor air quality (IAQ) management program based on the EPA Indoor Air Quality Building Education and Assessment Model (I-BEAM).Include the IAQ management program in the project's current facilities requirements and operations and maintenance plan. .

Performance

Conduct an I-BEAM audit on a regular basis (at least once every five years) and revise the IAQ management program as appropriate.

Option 1. Enhanced IAQ strategies (1 point)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces:

1. entryway systems;
2. interior cross-contamination prevention; and
3. filtration.

Naturally ventilated spaces:

1. entryway systems; and

2. natural ventilation design calculations.

Mixed-mode systems:

1. entryway systems;
2. interior cross-contamination prevention;
3. filtration;
4. natural ventilation design calculations; and
5. mixed-mode design calculations.

A. Entryway systems

Install permanent entryway systems at least 10 feet (3 meters) long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances. Acceptable entryway systems include permanently installed grates, grilles, slotted systems that allow for cleaning underneath, rollout mats, and any other materials manufactured as entryway systems with equivalent or better performance. Maintain all on a weekly basis.

Entryway systems are not required at doors leading from the exterior to the loading dock or garage but must be installed between these spaces and adjacent office areas.

B. Interior cross-contamination prevention

Sufficiently exhaust each space where hazardous gases or chemicals may be present or used (e.g., garages, housekeeping and laundry areas, copying and printing rooms), using the exhaust rates determined in EQ Prerequisite Minimum Indoor Air Quality Performance or a minimum of 0.50 cfm per square foot (2.54 l/s per square meter), to create negative pressure with respect to adjacent spaces when the doors to the room are closed. For each of these spaces, provide self-closing doors and deck-to-deck partitions or a hard-lid ceiling.

C. Filtration

Each ventilation system that supplies outdoor air to occupied spaces must have particle filters or air-cleaning devices that meet one of the following filtration media requirements:

- minimum efficiency reporting value (MERV) of 13 or higher, in accordance with ASHRAE Standard 52.2–2007; or
- Class F7 or higher as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance.

Replace all air filtration media after completion of construction and before occupancy.

D. Natural ventilation design calculations

Demonstrate that the system design for occupied spaces employs the appropriate strategies in Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005, Natural Ventilation in Non-Domestic Buildings, Section 2.4.

E. Mixed-mode design calculations

Demonstrate that the system design for occupied spaces complies with CIBSE Applications Manual 13–2000, Mixed Mode Ventilation.

Option 2. Additional enhanced IAQ strategies (1 point)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces (select one):

1. exterior contamination prevention;
2. increased ventilation;
3. carbon dioxide monitoring; or
4. additional source control and monitoring.

Naturally ventilated spaces (select one):

1. exterior contamination prevention;
2. additional source control and monitoring; or
3. natural ventilation room by room calculations.

Mixed-mode systems (select one):

1. exterior contamination prevention;
2. increased ventilation;
3. additional source control and monitoring; or
4. natural ventilation room-by-room calculations.

A. Exterior contamination prevention

Design the project to minimize and control the entry of pollutants into the building. Ensure through the results of computational fluid dynamics modeling, Gaussian dispersion analyses, wind tunnel modeling, or tracer gas modeling that outdoor air contaminant concentrations at outdoor air intakes are below the thresholds listed in Table 1 (or local equivalent for projects outside the U.S., whichever is more stringent).

Table 1. Maximum concentrations of pollutants at outdoor air intakes

Pollutants	Maximum concentration	Standard
Those regulated by National Ambient Air Quality Standards (NAAQS)	Allowable annual average OR 8-hour or 24-hour average where an annual standard does not exist OR Rolling 3-month average	National Ambient Air Quality Standards (NAAQS)

B. Increased ventilation

Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates as determined in EQ Prerequisite Minimum Indoor Air Quality Performance.

C. Carbon dioxide monitoring

Monitor CO_2 concentrations within all densely occupied spaces. CO_2 monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor. CO_2 monitors must

have an audible or visual indicator or alert the building automation system if the sensed CO_2 concentration exceeds the setpoint by more than 10%. Calculate appropriate CO_2 setpoints using methods in ASHRAE 62.1–2010, Appendix C.

D. Additional source control and monitoring

For spaces where air contaminants are likely, evaluate potential sources of additional air contaminants besides CO_2. Develop and implement a materials-handling plan to reduce the likelihood of contaminant release. Install monitoring systems with sensors designed to detect the specific contaminants. An alarm must indicate any unusual or unsafe conditions.

E. Natural ventilation room-by-room calculations

Follow CIBSE AM10, Section 4, Design Calculations, to predict that room-by-room airflows will provide effective natural ventilation.

Option 1. Enhanced IAQ strategies (1 point)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces:

1. entryway systems;
2. interior cross-contamination prevention; and
3. filtration.

Naturally ventilated spaces:

1. entryway systems; and
2. natural ventilation design calculations.

Mixed-mode systems:

1. entryway systems;
2. interior cross-contamination prevention;
3. filtration;
4. natural ventilation design calculations; and
5. mixed-mode design calculations.

A. Entryway systems

Install permanent entryway systems at least 10 feet (3 meters) long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances. Acceptable entryway systems include permanently installed grates, grilles, slotted systems that allow for cleaning underneath, rollout mats, and any other materials manufactured as entryway systems with equivalent or better performance. Maintain all on a weekly basis.

In addition to the entryway system, provide pressurized entryway vestibules at high-volume building entrances.

B. Interior cross-contamination prevention

Sufficiently exhaust each space where hazardous gases or chemicals may be present or used (e.g., garages, housekeeping and laundry areas, copying and printing rooms), using the exhaust rates determined in EQ Prerequisite Minimum Indoor Air Quality Performance or a minimum of 0.50 cfm per square foot (2.54 l/s per square meter), to create negative pressure with respect to adjacent spaces when the doors to the room are closed. For each of these spaces, provide self-closing doors and deck-to-deck partitions or a hard-lid ceiling.

C. Filtration

Each ventilation system that supplies outdoor air to occupied spaces must have particle filters or air-cleaning devices that meet one of the following filtration media requirements:

- minimum efficiency reporting value (MERV) of 13 or higher, in accordance with ASHRAE Standard 52.2–2007; or
- Class F7 or higher as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance.

Replace all air filtration media after completion of construction and before occupancy.

D. Natural ventilation design calculations

Demonstrate that the system design for occupied spaces employs the appropriate strategies in Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005, Natural Ventilation in Non-Domestic Buildings, Section 2.4.

E. Mixed-mode design calculations

Demonstrate that the system design for occupied spaces complies with CIBSE Applications Manual 13–2000, Mixed Mode Ventilation.

Option 2. Additional enhanced IAQ strategies (1 point)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces (select one):

1. exterior contamination prevention;
2. increased ventilation;
3. carbon dioxide monitoring; or
4. additional source control and monitoring.

Naturally ventilated spaces (select one):

1. exterior contamination prevention;
2. additional source control and monitoring; or
3. natural ventilation room by room calculations.

Mixed-mode systems (select one):

1. exterior contamination prevention;
2. increased ventilation;
3. additional source control and monitoring; or

4. natural ventilation room-by-room calculations.

A. Exterior contamination prevention

Design the project to minimize and control the entry of pollutants into the building. Ensure through the results of computational fluid dynamics modeling, Gaussian dispersion analyses, wind tunnel modeling, or tracer gas modeling that outdoor air contaminant concentrations at outdoor air intakes are below the thresholds listed in Table 1 (or local equivalent for projects outside the U.S., whichever is more stringent).

Table 1. Maximum concentrations of pollutants at outdoor air intakes

Pollutants	Maximum concentration	Standard
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B. Increased ventilation

Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates as determined in EQ Prerequisite Minimum Indoor Air Quality Performance.

C. Carbon dioxide monitoring

Monitor CO_2 concentrations within all densely occupied spaces. CO_2 monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor. CO_2 monitors must have an audible or visual indicator or alert the building automation system if the sensed CO_2 concentration exceeds the setpoint by more than 10%. Calculate appropriate CO_2 setpoints using methods in ASHRAE 62.1–2010, Appendix C.

D. Additional source control and monitoring

For spaces where air contaminants are likely, evaluate potential sources of additional air contaminants besides CO_2. Develop and implement a materials-handling plan to reduce the likelihood of contaminant release. Install monitoring systems with sensors designed to detect the specific contaminants. An alarm must indicate any unusual or unsafe conditions.

E. Natural ventilation room-by-room calculations

Follow CIBSE AM10, Section 4, Design Calculations, to predict that room-by-room airflows will provide effective natural ventilation.

Option 1. Enhanced IAQ strategies (1 point)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces:

1. entryway systems;
2. interior cross-contamination prevention; and
3. filtration.

Naturally ventilated spaces:

1. entryway systems; and
2. natural ventilation design calculations.

Mixed-mode systems:

1. entryway systems;
2. interior cross-contamination prevention;
3. filtration;
4. natural ventilation design calculations; and
5. mixed-mode design calculations.

A. Entryway systems

Install permanent entryway systems at least 10 feet (3 meters) long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances. Acceptable entryway systems include permanently installed grates, grilles, slotted systems that allow for cleaning underneath, rollout mats, and any other materials manufactured as entryway systems with equivalent or better performance. Maintain all on a weekly basis.

B. Interior cross-contamination prevention

Sufficiently exhaust each space where hazardous gases or chemicals may be present or used (e.g., garages, housekeeping and laundry areas, copying and printing rooms), using the exhaust rates determined in EQ Prerequisite Minimum Indoor Air Quality Performance or a minimum of 0.50 cfm per square foot (2.54 l/s per square meter), to create negative pressure with respect to adjacent spaces when the doors to the room are closed. For each of these spaces, provide self-closing doors and deck-to-deck partitions or a hard-lid ceiling.

C. Filtration

Each ventilation system that supplies outdoor air to occupied spaces must have particle filters or air-cleaning devices that meet one of the following filtration media requirements:

- minimum efficiency reporting value (MERV) of 13 or higher, in accordance with ASHRAE Standard 52.2–2007; or
- Class F7 or higher as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance.

Replace all air filtration media after completion of construction and before occupancy.

The above filtration media requirements are required only for ventilation systems serving regularly occupied spaces.

D. Natural ventilation design calculations

Demonstrate that the system design for occupied spaces employs the appropriate

strategies in Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005, Natural Ventilation in Non-Domestic Buildings, Section 2.4.

E. Mixed-mode design calculations

Demonstrate that the system design for occupied spaces complies with CIBSE Applications Manual 13–2000, Mixed Mode Ventilation.

Option 2. Additional enhanced IAQ strategies (1 point)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces (select one):

1. exterior contamination prevention;
2. increased ventilation;
3. carbon dioxide monitoring; or
4. additional source control and monitoring.

Naturally ventilated spaces (select one):

1. exterior contamination prevention;
2. additional source control and monitoring; or
3. natural ventilation room by room calculations.

Mixed-mode systems (select one):

1. exterior contamination prevention;
2. increased ventilation;
3. additional source control and monitoring; or
4. natural ventilation room-by-room calculations.

A. Exterior contamination prevention

Design the project to minimize and control the entry of pollutants into the building. Ensure through the results of computational fluid dynamics modeling, Gaussian dispersion analyses, wind tunnel modeling, or tracer gas modeling that outdoor air contaminant concentrations at outdoor air intakes are below the thresholds listed in Table 1 (or local equivalent for projects outside the U.S., whichever is more stringent).

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B. Increased ventilation

Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates as determined in EQ Prerequisite Minimum Indoor Air Quality Performance.

C. Carbon dioxide monitoring

Monitor CO_2 concentrations within all densely occupied spaces. CO_2 monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor. CO_2 monitors must have an audible or visual indicator or alert the building automation system if the sensed CO_2 concentration exceeds the setpoint by more than 10%. Calculate appropriate CO_2 setpoints using methods in ASHRAE 62.1–2010, Appendix C.

D. Additional source control and monitoring

For spaces where air contaminants are likely, evaluate potential sources of additional air contaminants besides CO_2. Develop and implement a materials-handling plan to reduce the likelihood of contaminant release. Install monitoring systems with sensors designed to detect the specific contaminants. An alarm must indicate any unusual or unsafe conditions.

E. Natural ventilation room-by-room calculations

Follow CIBSE AM10, Section 4, Design Calculations, to predict that room-by-room airflows will provide effective natural ventilation.

Option 1. Enhanced IAQ strategies (1 point)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces:

1. entryway systems;
2. interior cross-contamination prevention; and
3. filtration.

Naturally ventilated spaces:

1. entryway systems; and
2. natural ventilation design calculations.

Mixed-mode systems:

1. entryway systems;
2. interior cross-contamination prevention;
3. filtration;
4. natural ventilation design calculations; and
5. mixed-mode design calculations.

A. Entryway systems

Install permanent entryway systems at least 10 feet (3 meters) long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances. Acceptable entryway systems include permanently installed grates, grilles, slotted systems that allow for cleaning underneath, rollout mats, and any other materials manufactured as entryway systems with equivalent or better performance. Maintain all on a weekly basis.

B. Interior cross-contamination prevention

Sufficiently exhaust each space where hazardous gases or chemicals may be present or used (e.g., garages, housekeeping and laundry areas, copying and printing rooms), using the exhaust rates determined in EQ Prerequisite Minimum Indoor Air Quality Performance or a minimum of 0.50 cfm per square foot (2.54 l/s per square meter), to create negative pressure with respect to adjacent spaces when the doors to the room are closed. For each of these spaces, provide self-closing doors and deck-to-deck partitions or a hard-lid ceiling.

C. Filtration

Each ventilation system that supplies outdoor air to occupied spaces must have particle filters or air-cleaning devices that meet one of the following filtration media requirements:

- minimum efficiency reporting value (MERV) of 13 or higher, in accordance with ASHRAE Standard 52.2–2007; or
- Class F7 or higher as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance.

Replace all air filtration media after completion of construction and before occupancy.

D. Natural ventilation design calculations

Demonstrate that the system design for occupied spaces employs the appropriate strategies in Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005, Natural Ventilation in Non-Domestic Buildings, Section 2.4.

E. Mixed-mode design calculations

Demonstrate that the system design for occupied spaces complies with CIBSE Applications Manual 13–2000, Mixed Mode Ventilation.

Option 2. Additional enhanced IAQ strategies (2 points)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces (select one):

1. exterior contamination prevention;
2. increased ventilation;
3. carbon dioxide monitoring; or
4. additional source control and monitoring.

Naturally ventilated spaces (select one):

1. exterior contamination prevention;
2. additional source control and monitoring; or
3. natural ventilation room by room calculations.

Mixed-mode systems (select one):

1. exterior contamination prevention;
2. increased ventilation;
3. additional source control and monitoring; or
4. natural ventilation room-by-room calculations.

A. Exterior contamination prevention

Design the project to minimize and control the entry of pollutants into the building. Ensure through the results of computational fluid dynamics modeling, Gaussian dispersion analyses, wind tunnel modeling, or tracer gas modeling that outdoor air contaminant concentrations at outdoor air intakes are below the thresholds listed in Table 1 (or local equivalent for projects outside the U.S., whichever is more stringent).

Table 1. Maximum concentrations of pollutants at outdoor air intakes

Pollutants	Maximum concentration	Standard
Those regulated by National Ambient Air Quality Standards (NAAQS)	Allowable annual average OR 8-hour or 24-hour average where an annual standard does not exist OR Rolling 3-month average	National Ambient Air Quality Standards (NAAQS)

B. Increased ventilation

Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates as determined in EQ Prerequisite Minimum Indoor Air Quality Performance.

C. Carbon dioxide monitoring

Monitor CO_2 concentrations within all densely occupied spaces. CO_2 monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor. CO_2 monitors must have an audible or visual indicator or alert the building automation system if the sensed CO_2 concentration exceeds the setpoint by more than 10%. Calculate appropriate CO_2 setpoints using methods in ASHRAE 62.1–2010, Appendix C.

D. Additional source control and monitoring

For spaces where air contaminants are likely, evaluate potential sources of additional air contaminants besides CO_2. Develop and implement a materials-handling plan to reduce the likelihood of contaminant release. Install monitoring systems with sensors designed to detect the specific contaminants. An alarm must indicate any unusual or unsafe conditions.

E. Natural ventilation room-by-room calculations

Follow CIBSE AM10, Section 4, Design Calculations, to predict that room-by-room airflows will provide effective natural ventilation.

Option 1. Enhanced IAQ strategies (1 point)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces:

1. entryway systems;

2. interior cross-contamination prevention; and
3. filtration.

Naturally ventilated spaces:

1. entryway systems; and
2. natural ventilation design calculations.

Mixed-mode systems:

1. entryway systems;
2. interior cross-contamination prevention;
3. filtration;
4. natural ventilation design calculations; and
5. mixed-mode design calculations.

A. Entryway systems

Install permanent entryway systems at least 10 feet (3 meters) long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances. Acceptable entryway systems include permanently installed grates, grilles, slotted systems that allow for cleaning underneath, rollout mats, and any other materials manufactured as entryway systems with equivalent or better performance. Maintain all on a weekly basis.

B. Interior cross-contamination prevention

Sufficiently exhaust each space where hazardous gases or chemicals may be present or used (e.g., garages, housekeeping and laundry areas, copying and printing rooms), using the exhaust rates determined in EQ Prerequisite Minimum Indoor Air Quality Performance or a minimum of 0.50 cfm per square foot (2.54 l/s per square meter), to create negative pressure with respect to adjacent spaces when the doors to the room are closed. For each of these spaces, provide self-closing doors and deck-to-deck partitions or a hard-lid ceiling.

C. Filtration

Each ventilation system that supplies outdoor air to occupied spaces must have particle filters or air-cleaning devices that meet one of the following filtration media requirements:

- minimum efficiency reporting value (MERV) of 13 or higher, in accordance with ASHRAE Standard 52.2–2007; or
- Class F7 or higher as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance.

Replace all air filtration media after completion of construction and before occupancy.

D. Natural ventilation design calculations

Demonstrate that the system design for occupied spaces employs the appropriate strategies in Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005, Natural Ventilation in Non-Domestic Buildings, Section 2.4.

E. Mixed-mode design calculations

Demonstrate that the system design for occupied spaces complies with CIBSE Applications Manual 13–2000, Mixed Mode Ventilation.

Option 2. Additional enhanced IAQ strategies (1 point)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces (select one):

1. exterior contamination prevention;
2. increased ventilation;
3. carbon dioxide monitoring; or
4. additional source control and monitoring.

Naturally ventilated spaces (select one):

1. exterior contamination prevention;
2. additional source control and monitoring; or
3. natural ventilation room by room calculations.

Mixed-mode systems (select one):

1. exterior contamination prevention;
2. increased ventilation;
3. additional source control and monitoring; or
4. natural ventilation room-by-room calculations.

A. Exterior contamination prevention

Design the project to minimize and control the entry of pollutants into the building. Ensure through the results of computational fluid dynamics modeling, Gaussian dispersion analyses, wind tunnel modeling, or tracer gas modeling that outdoor air contaminant concentrations at outdoor air intakes are below the thresholds listed in Table 1 (or local equivalent for projects outside the U.S., whichever is more stringent).

Table 1. Maximum concentrations of pollutants at outdoor air intakes

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B. Increased ventilation

Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates as determined in EQ Prerequisite Minimum Indoor Air Quality Performance.

C. Carbon dioxide monitoring

Monitor CO_2 concentrations within all densely occupied spaces. CO_2 monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor. CO_2 monitors must have an audible or visual indicator or alert the building automation system if the sensed CO_2 concentration exceeds the setpoint by more than 10%. Calculate appropriate CO_2 setpoints using methods in ASHRAE 62.1–2010, Appendix C.

D. Additional source control and monitoring

For spaces where air contaminants are likely, evaluate potential sources of additional air contaminants besides CO_2. Develop and implement a materials-handling plan to reduce the likelihood of contaminant release. Install monitoring systems with sensors designed to detect the specific contaminants. An alarm must indicate any unusual or unsafe conditions.

E. Natural ventilation room-by-room calculations

Follow CIBSE AM10, Section 4, Design Calculations, to predict that room-by-room airflows will provide effective natural ventilation.

Option 1. Entryway systems (1 point)

Establishment

Have in place permanent entryway systems at least 10 feet (3 meters) long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances. Acceptable entryway systems include permanently installed grates, grilles, slotted systems that allow for cleaning underneath, rollout mats, and any other materials manufactured as entryway systems with equal to or better performance. Maintain all on a weekly basis.

Buildings are not required to provide entryway systems at doors leading from the exterior to the loading dock/garage, but must provide them between these spaces and adjacent office areas.

Performance

Confirm that entryway systems have been maintained on a weekly basis.

Option 2. Additional enhanced IAQ strategies (1 point)

Comply with the requirements of at least one of the following.

Filtration for mechanically ventilated spaces

Establishment

Each ventilation system that supplies outdoor air to occupied spaces must have particle filters or air cleaning devices. These filters or devices must meet one of the following filtration media requirements:

- minimum efficiency reporting value (MERV) of 13 or higher, in accordance with ASHRAE Standard 52.2–2007;
- Class F7 or higher as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance

Establish a regular schedule for maintenance and replacement of filtration media according to the manufacturer's recommended interval.

Performance

Follow the schedule for maintenance and replacement of filtration media.

Carbon Dioxide Monitors

Establishment

Have in place CO_2 monitors in all densely occupied spaces. Rooms smaller than 150 square feet (14 square meters) are exempt. CO_2 monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor.

Configure the system to generate a visual alarm to the system operator if the differential CO_2 concentration in any zone rises more than 15% above that corresponding to the minimum outdoor air rate required in the ventilation section of EQ Prerequisite Minimum Indoor Air Quality Performance.

Test and calibrate CO_2 sensors to have an accuracy of no less than 75 parts per million or 5% of the reading, whichever is greater.

Performance

Sensors must be tested and calibrated at least once every five years or per the manufacturer's recommendation, whichever is shorter.

Monitor CO_2 sensors with a system configured to trend CO_2 concentrations in intervals no greater than 30 minutes.

Outdoor air monitoring for mechanically ventilated spaces

Establishment

For variable air volume systems, provide a direct outdoor airflow measurement device capable of measuring the minimum outdoor air intake flow for at least 80% of the outdoor air flow. This device must measure the minimum outdoor air intake flow with an accuracy of +/–10% of the design minimum outdoor airflow rate required in the ventilation section of EQ Prerequisite Minimum Indoor Air Quality Performance. An alarm must indicate when the outdoor airflow value varies by 15% or more from the outdoor airflow setpoint.

For constant-volume systems, balance outdoor airflow to the design minimum outdoor airflow rate required in the ventilation section of EQ Prerequisite Minimum Indoor Air Quality Performance, or higher. Install a current transducer on the supply fan, an airflow switch, or similar monitoring device.

Performance

Calibrate all measurement devices within the manufacturer's recommended interval.

Outdoor air monitoring for naturally ventilated spaces

Establishment

Provide a direct exhaust airflow measurement device capable of measuring the exhaust airflow. This device must measure the exhaust airflow with an accuracy of +/–10% of the design minimum exhaust airflow rate. An alarm must indicate when airflow values vary by 15% or more from the exhaust airflow setpoint.

Performance

Calibrate all measurement devices within the manufacturer's recommended interval.

Alarmed openings for naturally ventilated spaces

Establishment

Provide automatic indication devices on all openings intended to meet the minimum opening requirements. An alarm must indicate when any one of the openings is closed during occupied hours.

Performance

None.

Option 1. Entryway systems (1 point)

Establishment

Have in place permanent entryway systems at least 10 feet (3 meters) long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances. Acceptable entryway systems include permanently installed grates, grilles, slotted systems that allow for cleaning underneath, rollout mats, and any other materials manufactured as entryway systems with equal to or better performance. Maintain all on a weekly basis.

Performance

Confirm that entryway systems have been maintained on a weekly basis.

Option 2. Additional enhanced IAQ strategies (1 point)

Comply with the requirements of at least one of the following.

Filtration for mechanically ventilated spaces

Establishment

Each ventilation system that supplies outdoor air to occupied spaces must have particle filters or air cleaning devices. These filters or devices must meet one of the following filtration media requirements:

- minimum efficiency reporting value (MERV) of 13 or higher, in accordance with ASHRAE Standard 52.2–2007;
- Class F7 or higher as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance

Establish a regular schedule for maintenance and replacement of filtration media according to the manufacturer's recommended interval.

The above filtration media requirements are required only for ventilation systems serving regularly occupied spaces.

Performance

Follow the schedule for maintenance and replacement of filtration media.

Carbon Dioxide Monitors

Establishment

Have in place CO_2 monitors in all densely occupied spaces. Rooms smaller than 150 square feet (14 square meters) are exempt. CO_2 monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor.

Configure the system to generate a visual alarm to the system operator if the differential CO_2 concentration in any zone rises more than 15% above that corresponding to the minimum outdoor air rate required in the ventilation section of EQ Prerequisite Minimum Indoor Air Quality Performance.

Test and calibrate CO_2 sensors to have an accuracy of no less than 75 parts per million or 5% of the reading, whichever is greater.

Performance

Sensors must be tested and calibrated at least once every five years or per the manufacturer's recommendation, whichever is shorter.

Monitor CO_2 sensors with a system configured to trend CO_2 concentrations in intervals no greater than 30 minutes.

Outdoor air monitoring for mechanically ventilated spaces

Establishment

For variable air volume systems, provide a direct outdoor airflow measurement device capable of measuring the minimum outdoor air intake flow for at least 80% of the outdoor air flow. This device must measure the minimum outdoor air intake flow with an accuracy of +/–10% of the design minimum outdoor airflow rate required in the ventilation section of EQ Prerequisite Minimum Indoor Air Quality Performance. An alarm must indicate when the outdoor airflow value varies by 15% or more from the outdoor airflow setpoint.

For constant-volume systems, balance outdoor airflow to the design minimum outdoor airflow rate required in the ventilation section of EQ Prerequisite Minimum Indoor Air Quality Performance, or higher. Install a current transducer on the supply fan, an airflow switch, or similar monitoring device.

Performance

Calibrate all measurement devices within the manufacturer's recommended interval.

Outdoor air monitoring for naturally ventilated spaces

Establishment

Provide a direct exhaust airflow measurement device capable of measuring the exhaust airflow. This device must measure the exhaust airflow with an accuracy of +/–10% of

the design minimum exhaust airflow rate. An alarm must indicate when airflow values vary by 15% or more from the exhaust airflow setpoint.

Performance

Calibrate all measurement devices within the manufacturer's recommended interval.

Alarmed openings for naturally ventilated spaces

Establishment

Provide automatic indication devices on all openings intended to meet the minimum opening requirements. An alarm must indicate when any one of the openings is closed during occupied hours.

Performance

None.

Option 1. Entryway systems (1 point)

Establishment

Have in place permanent entryway systems at least 10 feet (3 meters) long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances. Acceptable entryway systems include permanently installed grates, grilles, slotted systems that allow for cleaning underneath, rollout mats, and any other materials manufactured as entryway systems with equal to or better performance. Maintain all on a weekly basis.

Performance

Confirm that entryway systems have been maintained on a weekly basis.

Option 2. Additional enhanced IAQ strategies (1 point)

Comply with the requirements of at least one of the following.

Filtration for mechanically ventilated spaces

Establishment

Each ventilation system that supplies outdoor air to occupied spaces must have particle filters or air cleaning devices. These filters or devices must meet one of the following filtration media requirements:

- minimum efficiency reporting value (MERV) of 13 or higher, in accordance with ASHRAE Standard 52.2–2007;
- Class F7 or higher as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance

Establish a regular schedule for maintenance and replacement of filtration media according to the manufacturer's recommended interval.

Performance

Follow the schedule for maintenance and replacement of filtration media.

Carbon Dioxide Monitors

Establishment

Have in place CO_2 monitors in all densely occupied spaces. Rooms smaller than 150 square feet (14 square meters) are exempt. CO_2 monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor.

Configure the system to generate a visual alarm to the system operator if the differential CO_2 concentration in any zone rises more than 15% above that corresponding to the minimum outdoor air rate required in the ventilation section of EQ Prerequisite Minimum Indoor Air Quality Performance.

Test and calibrate CO_2 sensors to have an accuracy of no less than 75 parts per million or 5% of the reading, whichever is greater.

Performance

Sensors must be tested and calibrated at least once every five years or per the manufacturer's recommendation, whichever is shorter.

Monitor CO_2 sensors with a system configured to trend CO_2 concentrations in intervals no greater than 30 minutes.

Outdoor air monitoring for mechanically ventilated spaces

Establishment

For variable air volume systems, provide a direct outdoor airflow measurement device capable of measuring the minimum outdoor air intake flow for at least 80% of the outdoor air flow. This device must measure the minimum outdoor air intake flow with an accuracy of +/–10% of the design minimum outdoor airflow rate required in the ventilation section of EQ Prerequisite Minimum Indoor Air Quality Performance. An alarm must indicate when the outdoor airflow value varies by 15% or more from the outdoor airflow setpoint.

For constant-volume systems, balance outdoor airflow to the design minimum outdoor airflow rate required in the ventilation section of EQ Prerequisite Minimum Indoor Air Quality Performance, or higher. Install a current transducer on the supply fan, an airflow switch, or similar monitoring device.

Performance

Calibrate all measurement devices within the manufacturer's recommended interval.

Outdoor air monitoring for naturally ventilated spaces

Establishment

Provide a direct exhaust airflow measurement device capable of measuring the exhaust airflow. This device must measure the exhaust airflow with an accuracy of +/–10% of the design minimum exhaust airflow rate. An alarm must indicate when airflow values vary by 15% or more from the exhaust airflow setpoint.

Performance

Calibrate all measurement devices within the manufacturer's recommended interval.

Alarmed openings for naturally ventilated spaces

Establishment

Provide automatic indication devices on all openings intended to meet the minimum opening requirements. An alarm must indicate when any one of the openings is closed during occupied hours.

Performance

None.

Option 1. Enhanced IAQ strategies (1 point)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces:

1. entryway systems;
2. interior cross-contamination prevention; and
3. filtration.

Naturally ventilated spaces:

1. entryway systems; and
2. natural ventilation design calculations.

Mixed-mode systems:

1. entryway systems;
2. interior cross-contamination prevention;
3. filtration;
4. natural ventilation design calculations; and
5. mixed-mode design calculations.

A. Entryway systems

Install permanent entryway systems at least 10 feet (3 meters) long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances. Acceptable entryway systems include permanently installed grates, grilles, slotted systems that allow for cleaning underneath, rollout mats, and any other materials manufactured as entryway systems with equivalent or better performance. Maintain all on a weekly basis.

B. Interior cross-contamination prevention

Sufficiently exhaust each space where hazardous gases or chemicals may be present or used (e.g., garages, housekeeping and laundry areas, copying and printing rooms), using the exhaust rates determined in EQ Prerequisite Minimum Indoor Air Quality Performance or a minimum of 0.50 cfm per square foot (2.54 l/s per square meter), to create negative pressure with respect to adjacent spaces when the doors to the room are closed. For each of these spaces, provide self-closing doors and deck-to-deck partitions or a hard-lid ceiling.

C. Filtration

Each ventilation system that supplies outdoor air to occupied spaces must have particle filters or air-cleaning devices that meet one of the following filtration media requirements:

- minimum efficiency reporting value (MERV) of 13 or higher, in accordance with ASHRAE Standard 52.2–2007; or
- Class F7 or higher as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance.

Replace all air filtration media after completion of construction and before occupancy.

D. Natural ventilation design calculations

Demonstrate that the system design for occupied spaces employs the appropriate strategies in Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005, Natural Ventilation in Non-Domestic Buildings, Section 2.4.

E. Mixed-mode design calculations

Demonstrate that the system design for occupied spaces complies with CIBSE Applications Manual 13–2000, Mixed Mode Ventilation.

Option 2. Additional enhanced IAQ strategies (1 point)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces (select one):

1. exterior contamination prevention;
2. increased ventilation;
3. carbon dioxide monitoring; or
4. additional source control and monitoring.

Naturally ventilated spaces (select one):

1. exterior contamination prevention;
2. additional source control and monitoring; or
3. natural ventilation room by room calculations.

Mixed-mode systems (select one):

1. exterior contamination prevention;
2. increased ventilation;
3. additional source control and monitoring; or
4. natural ventilation room-by-room calculations.

A. Exterior contamination prevention

Design the project to minimize and control the entry of pollutants into the building. Ensure through the results of computational fluid dynamics modeling, Gaussian dispersion analyses, wind tunnel modeling, or tracer gas modeling that outdoor air contaminant concentrations at outdoor air intakes are below the thresholds listed in Table 1 (or local equivalent for projects outside the U.S., whichever is more stringent).

Table 1. Maximum concentrations of pollutants at outdoor air intakes

Pollutants	Maximum concentration	Standard
Those regulated by National Ambient Air Quality Standards (NAAQS)	Allowable annual average OR 8-hour or 24-hour average where an annual standard does not exist OR Rolling 3-month average	National Ambient Air Quality Standards (NAAQS)

B. Increased ventilation

Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates as determined in EQ Prerequisite Minimum Indoor Air Quality Performance.

C. Carbon dioxide monitoring

Monitor CO_2 concentrations within all densely occupied spaces. CO_2 monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor. CO_2 monitors must have an audible or visual indicator or alert the building automation system if the sensed CO_2 concentration exceeds the setpoint by more than 10%. Calculate appropriate CO_2 setpoints using methods in ASHRAE 62.1–2010, Appendix C.

D. Additional source control and monitoring

For spaces where air contaminants are likely, evaluate potential sources of additional air contaminants besides CO_2. Develop and implement a materials-handling plan to reduce the likelihood of contaminant release. Install monitoring systems with sensors designed to detect the specific contaminants. An alarm must indicate any unusual or unsafe conditions.

E. Natural ventilation room-by-room calculations

Follow CIBSE AM10, Section 4, Design Calculations, to predict that room-by-room airflows will provide effective natural ventilation.