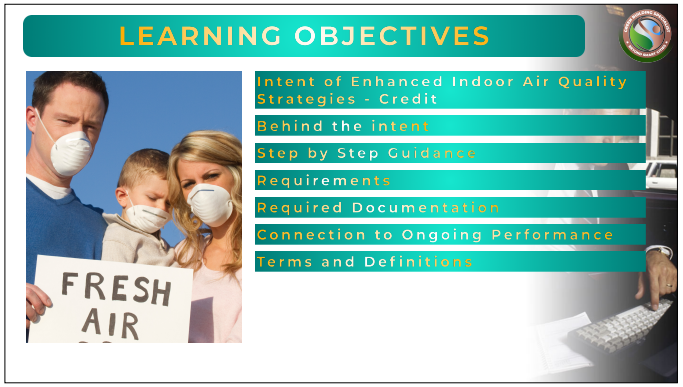
BEYOND
SMART CITIES
INDOOR ENVIRONMENTAL QUALITY - GREEN BUILDING
TECHNOLOGY TRAINING PROGRAM
FOR GREEN BUILDING AND SUSTAINABILITY SPECIALISTS
KRISHNAJI PAWAR,LEED AP BD+C,GSAS CGP,ISO 14001:2015,GCP
GREEN BUILDING SPECIALIST CURRICULUM
825 PPM

BEYOND
SMART CITIES
ENHANCED INDOOR AIR QUALITY STRATEGIES - CREDIT
FOR GREEN BUILDING AND SUSTAINABILITY SPECIALIST
KRISHNAJI PAWAR,LEED AP BD+C,GSAS CGP,ISO 14001:2015,GCP
GREEN BUILDING SPECIALIST CURRICULUM


LEARNING OBJECTIVES
FRESH AIR
Intent of Enhanced Indoor Air Quality Strategies - Credit
Behind the intent
Step by Step Guidance
Requirements
Required Documentation
Connection to Ongoing Performance
Terms and Definitions

IEQ- CR(2) - DESIGN

ENHANCED INDOOR AIR QUALITY STRATEGIES

INTENT

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

REQUIREMENTS

Comply with 3 strategies for 1 point or 6 strategies for 2 points Strategy
1. Entryway Systems
2. Interior Cross-Contamination Prevention
3. Filtration of Outdoor Air
4. Filtration of Recirculated Air
5. Increased Ventilation 15 Percent
6. Increased Ventilation 30 Percent

POTENTIAL TECHNOLOGIES & STRATEGIES

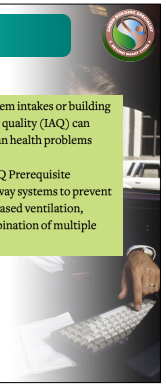
☑ This credit identifies IAQ strategies that extend beyond the outdoor air requirements of EQ Prerequisite Minimum Indoor Air Quality Performance. Design strategies include the installation of entryway systems to prevent contaminants from being brought inside by occupants, use of enhanced filtration media, increased ventilation, and monitoring strategies for ventilation systems. Each strategy alone is beneficial, but a combination of multiple strategies is encouraged

IMPLEMENTATION

REQUIRED DOCUMENTATION

Documentation	Option 1	Option 2
Entryway systems: scaled floor plans showing locations and measurements	X	
Interior cross-contamination prevention: narrative describing type of modeling method used	X	
Filtration: mechanical schedules highlighting MERV or class ratings for all units that supply outdoor air	X	
Natural ventilation design: calculations and narrative demonstrating appropriate strategies per referenced standard	X	
Mixed-mode design: calculations and narrative demonstrating appropriate strategies per referenced standard	X	
Exterior contamination prevention: narrative describing type of modeling; model output reports highlighting contaminant levels and required thresholds		X
Increased ventilation: confirmation ventilation calculations are documented under EQ Prerequisite Minimum Indoor Air Quality Performance		X
Carbon dioxide monitoring: list of climate ecosystem spaces, space type, design CO_2 concentrations, floor plan showing sensor locations, narratives describing CO_2 setpoints		X
Additional source control and monitoring: description of likely air contaminants and how they were identified; description of materials handling plan; plans showing installed monitoring system		X
Natural ventilation: room-by-room calculations, narrative, and diagrams demonstrating effective natural ventilation per referenced standard		X

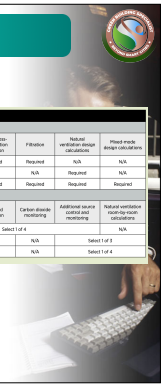
BEHIND THE INTENT



Indoor pollutants and particulates are brought indoors by occupants, through ventilation system intakes or building openings, and from activities conducted within the building. Designing for effective indoor air quality (IAQ) can help produce a comfortable indoor environment for building occupants and prevent the human health problems associated with poor indoor air quality.

This credit identifies IAQ strategies that extend beyond the outdoor air requirements of EQ Prerequisite Minimum Indoor Air Quality Performance. Design strategies include the installation of entryway systems to prevent contaminants from being brought inside by occupants, use of enhanced filtration media, increased ventilation, and monitoring strategies for ventilation systems. Each strategy alone is beneficial, but a combination of multiple strategies is encouraged.

STEP-BY-STEP GUIDANCE



STEP 1. DETERMINE HOW PROJECT IS VENTILATED

Determine whether the project will use mechanical ventilation, natural ventilation, or a mixed-mode approach (see EQ Prerequisite Minimum Indoor Air Quality Performance).

STEP 2. SELECT ONE OR BOTH OPTIONS

Determine which option(s) and strategies the project will pursue, based on the information in Table 2 and the credit requirements.

- Option 1 requires implementing all strategies applicable to the project's ventilation system type.
- Option 2 requires implementing one strategy applicable to the project's ventilation system type. If multiple ventilation system types are used (i.e., mixed mode), only one strategy needs to be attempted. For example, if a space is both naturally and mechanically ventilated, the project team could select carbon dioxide monitoring and implement this strategy by installing monitors that operate whenever the space is operating in mechanical ventilation mode. Similarly, if the project has both naturally and mechanically ventilated spaces, it could also select carbon dioxide monitoring and implement this strategy by installing monitors in all mechanically ventilated spaces.

TABLE 2. Ventilation systems and credit requirements

Option 1. Enhanced IAQ strategies	Entryway systems	Interior cross-contamination prevention	Filtration	Natural ventilation design calculations	Mixed-mode design calculations
Mechanically ventilated space	Required	Required	Required	N/A	N/A
Naturally ventilated space	Required	N/A	N/A	Required	N/A
Mixed-mode system	Required	Required	Required	Required	Required

Option 2. Additional enhanced IAQ strategies	Exterior contamination prevention	Increased ventilation	Carbon dioxide monitoring	Additional source control and monitoring	Natural ventilation room-by-room calculations
Mechanically ventilated space	Select 1 of 4				N/A
Naturally ventilated space	Select 1 of 3	N/A	N/A	Select 1 of 3	
Mixed-mode system	Select 1 of 4		N/A	Select 1 of 4	

STEP-BY-STEP GUIDANCE +

STEP 3. COMPLY WITH APPROPRIATE STRATEGY REQUIREMENTS

For each strategy required for a given space's ventilation system, follow the appropriate set of steps. Prepare a narrative indicating the system type and strategies pursued, detailing how compliance was achieved.

Option 1. Enhanced IAQ Strategies

ENTRYWAY SYSTEMS

STEP 1. IDENTIFY APPLICABLE ENTRIES

Identify all regularly used exterior entrances to the building (see *Further Explanation, Regularly Used Exterior Entrances, Rating System Variations,* and *Project Type Variations*).

STEP 2. INCORPORATE PERMANENT ENTRYWAY SYSTEMS INTO DESIGN

Determine which type of permanent entryway system will be installed and incorporate into the project drawings and specifications (see *Further Explanation, Selecting a Permanent Entryway System*). Indicate the compliant entryways on project plans.

STEP 3. IMPLEMENT MAINTENANCE STRATEGY

Determine how the entryway systems will be maintained on a weekly basis. Consider modifying standard operating procedures, cleaning programs, and vendor requirements to include entryway maintenance.

INTERIOR CROSS-CONTAMINATION PREVENTION

STEP 1. IDENTIFY ALL SPACES NEEDING INTERIOR CROSS-CONTAMINATION PREVENTION

Identify spaces where hazardous gases or chemicals may be handled or used, as indicated in the credit requirements.

- Open garages are exempt from this requirement.
- Include housekeeping and laundry areas even if green cleaning policies are adopted.
- Copying and printing rooms with convenience printers and copiers only may be excluded. The definition of convenience printers and copiers is left to the discretion of the design team; convenience machines are generally small units shared by many office personnel for short printing and copying jobs.

STEP 2. DEVELOP CONTAMINANT CONTROL DESIGN

Work with the architect and mechanical designer to develop a contaminant control design for all spaces needing interior cross-contamination prevention and incorporate strategies into the project drawings and specifications.

- Include self-closing doors and either deck-to-deck partitions or a hard-lid ceiling for each space, as indicated in the credit requirements.
- Design the exhaust system such that each space has negative pressure, as indicated in the credit requirements. Use the exhaust rates from EQ Prerequisite Minimum Indoor Air Quality Performance or 0.50 cfm per square foot, whichever is greater (see *Further Explanation, Exhaust Rates for Interior Cross-Contamination Prevention*).
- Additional ductwork and exhaust fans may be needed to provide the required ventilation. Possible strategies to achieve the necessary ventilation economically include stacking all high-pollutant source areas and locating rooms with hazardous material adjacent to outside walls and each other.

FILTRATION MEDIA

STEP 1. SPECIFY COMPLIANT FILTRATION MEDIA

Identify all HVAC equipment that supplies outdoor air to occupied spaces and specify outdoor air filtration media that meet the credit requirements for minimum efficiency reporting value (MERV) ratings or filtration class. All outdoor air supplied to occupied spaces must be filtered.

- Ensure that specified air-handling equipment is designed to accommodate the required filter media. Otherwise, customization—resizing ductwork, increasing fan capacity to maintain air delivery despite

STEP-BY-STEP GUIDANCE +

the added resistance of MERV 13 (F7) filtration, or other modifications to system design—may be required.

- Mixed return and outdoor air can also be filtered with MERV 13 (F7) or higher, but this is not required.
- If the project design includes a dedicated outdoor air system with local distribution systems, the filtration requirement applies only to the dedicated outdoor air system.

STEP 2. REPLACE FILTRATION BEFORE OCCUPANCY

Replace all filters after completion of construction but before occupancy. For Data Center projects, see *Further Explanation, Rating System Variations*.

NATURAL VENTILATION DESIGN CALCULATIONS

STEP 1. REVIEW STANDARD

Review the basic forms of ventilation strategy presented in Chartered Institution of Building Service Engineers Applications (CIBSE) Manual AM10, Natural Ventilation in Non-Domestic Buildings, Section 2.4: single-sided ventilation, single opening, double opening, cross-ventilation, stack ventilation, double-skin facade ventilation, mechanically assisted strategies, and night ventilation. Identify which ventilation strategies apply to the project.

STEP 2. CONFIRM RULES OF THUMB FOR ESTIMATING EFFECTIVENESS OF NATURAL VENTILATION

Use the rules of thumb or guidance from CIBSE AM10 as applicable to the project. Prepare diagrams and narratives to explain how each applicable rule of thumb or guidance was considered. The documentation should supplement the natural ventilation calculations for EQ Prerequisite Minimum Indoor Air Quality Performance.

Room-by-room calculations found in CIBSE AM10, Section 4, are not required for this option.

MIXED-MODE VENTILATION DESIGN CALCULATIONS

STEP 1. REVIEW STANDARD

Review the mixed-mode design strategies presented in Chartered Institution of Building Service Engineers (CIBSE) Applications Manual AM13, Mixed-Mode Ventilation, Section 2.1: contingency design, complementary design, and zone design. Identify which mixed-mode strategy applies to the project. If the complementary design is selected, also identify the operational strategy based on CIBSE AM13, Section 2.2.

Use CIBSE AM13, Figure 2.1, as the iteration strategy to optimize the mixed mode system.

STEP 2. CONFIRM THAT DESIGN FOLLOWS APPROPRIATE MIXED-MODE STRATEGIES

Use the guidance and strategies from CIBSE AM13 (Section 2.1, Section 2.2, and Figure 2.1) as applicable to the project. Prepare diagrams and narratives to explain how the guidance was considered. The documentation should supplement that prepared for EQ Prerequisite Minimum Indoor Air Quality Performance and requirement D (natural ventilation design calculations) in this credit.

Option 2. Additional Enhanced IAQ Strategies

Determine which strategy the project will implement, based on Table 2.

EXTERIOR CONTAMINATION PREVENTION

STEP 1. DESIGN OUTDOOR AIR INTAKES TO MINIMIZE AND CONTROL ENTRY OF POLLUTANTS

Consider locating outdoor air intakes away from nearby sources of pollutants. Air intakes located one-third of the way up the side of the building tend to work best.[1] Locate air intakes away from loading docks and roadways. Also avoid below-grade locations in areaways and locations near roof-mounted exhausts.[2] ASHRAE 62.1-2010, Table 5-1, lists minimum separation distances for air intakes (see *Further Explanation, International Tips*).

STEP-BY-STEP GUIDANCE +

STEP 2. SELECT MODELING TOOL

Determine which modeling tool, of the list in the credit requirements, will be used to verify compliance with pollution concentration requirements. Consider whether the software can accurately capture expected meteorological conditions, potential pollutant plumes, and contaminant concentrations at the project's outdoor air intakes.

STEP 3. COMPLETE LEVEL 1 SCREENING

Model contaminant travel at worst-case meteorological conditions. Worst-case conditions should be based on the wind speed and direction, with a direct line of sight from each pollutant source to the project building.

Once worst-case conditions have been identified, perform a simulation to determine whether concentrations for the pollutants regulated by National Ambient Air Quality Standards (NAAQS) at outdoor air intakes are below the allowable annual average, eight-hour or 24-hour average where an annual standard does not exist, or the rolling three-month average. If all pollutant concentrations are well below the required thresholds, no further modeling is required.

STEP 4. COMPLETE LEVEL 2 SCREENING

If the Level 1 screening indicates that pollutant concentrations are barely compliant or noncompliant, perform a Level 2 screening to reassess pollutant concentrations. Use more detailed inputs pertaining to atmospheric processes, building geometry, and emissions concentrations. If the precise composition of chemical exhaust from a source is unpublished, document how the team arrived at its components and concentrations.

The Level 2 screening should confirm one of the following outcomes:

- The concentrations for the pollutants regulated by NAAQS at outdoor air intakes are below the allowable annual average, eight-hour or 24-hour average where an annual standard does not exist, or the rolling three-month average.
- The indoor concentrations for the pollutants regulated by NAAQS are below 2.5% of the allowable annual average, eight-hour or 24-hour average where an annual standard does not exist, or the rolling three-month average. Indoor analyses may require a different modeling technique than that used in the Level 1 dispersion analysis. If the Level 2 screening indicates that pollutant concentrations are noncompliant, consider modifying air filtration or the locations of the outdoor air intakes.

INCREASED VENTILATION

STEP 1. DETERMINE VOLUME OF OUTDOOR AIR REQUIRED

Use the ventilation standard or code and the calculation methodology selected for EQ Prerequisite Minimum Indoor Air Quality Performance to determine the 30% increase.

- Follow the prerequisite's steps for mechanical ventilation systems to determine the amount of outdoor air that must be supplied by each ventilation system. To meet the credit requirements, the system must deliver 30% more outdoor air to the occupied spaces at all times the space is occupied. For multiple-zone recirculating systems, this will likely increase the required outdoor air intake for the system by more than 30%.
- For projects that use ASHRAE 62.1-2010, see *Further Explanation, Determining Increased Ventilation Rate*.
- Exhaust rates are excluded from the credit requirements.

STEP 2. REVISE DESIGN TO MEET OUTDOOR AIR REQUIREMENTS, IF NECESSARY

See EQ Prerequisite Minimum Indoor Air Quality Performance for recommended modifications for specific mechanical ventilation system types.

CARBON DIOXIDE (CO_2) MONITORING

STEP 1. IDENTIFY DENSELY OCCUPIED SPACES

Review ventilation calculations developed for EQ Prerequisite Minimum Indoor Air Quality Performance or the project's furniture plans to identify all spaces with an occupant density greater than 25 people per 1,000 square feet (93 square meters).

STEP-BY-STEP GUIDANCE +

STEP 2. DESIGN CO_2 MONITORING SYSTEM

Incorporate CO_2 sensors into the design for each densely occupied space.

- CO_2 sensors must be located in the breathing zone, as defined in the credit requirements. CO_2 sensors installed in return air ducts cannot be used to meet the requirements.
- Determine CO_2 concentration setpoint(s) using the methods in ASHRAE 62.1-2010, Appendix C. See *ASHRAE 62.1-2010 User's Manual, Appendix A*, for calculations and examples.
- Configure the CO_2 monitoring system to generate an alarm if the differential CO_2 concentration exceeds the setpoint by more than 10%. Alarms may be audible or visual indicators to space occupants or building automation system alerts. CO_2 sensors may be incorporated into the HVAC control system, for example, to open zone VAV dampers when the setpoint is exceeded. However, this is not required.

STEP 3. INSTALL AND COMMISSION CO_2 SENSORS

During construction, install CO_2 sensors per the design. Include CO_2 sensors in the commissioning process for EA Prerequisite Fundamental Commissioning and Verification.

ADDITIONAL SOURCE CONTROL AND MONITORING

STEP 1. DETERMINE POTENTIAL CONTAMINANT SOURCES

List potential indoor air contaminants that may be present in the project spaces. Consider typical substances found in the particular building type, and review activities and processes that will occur. Substances might include cleaning supplies, laboratory chemicals, or materials required for manufacturing.

STEP 2. IDENTIFY PRIORITY CONTAMINANTS AND EXPOSURE LIMITS

From the list of potential sources, identify the priority contaminants—those that pose the greatest risk to occupants' health. For each priority contaminant, identify a reference standard and an exposure limit.

STEP 3. DESIGN AND INSTALL MONITORING SYSTEM

Install a permanent monitoring system to continuously monitor concentrations of priority contaminants. Configure the system to generate an alarm when unusual or unsafe concentrations occur.

- Retain documentation that describes how alarm setpoints were established.
- Include the contaminant monitoring system in the commissioning process for EA Prerequisite Fundamental Commissioning and Verification.

STEP 4. DEVELOP AND IMPLEMENT MATERIALS HANDLING PLAN

Develop a materials handling plan to limit human exposure to priority contaminants and ensure that the monitoring system is effective. For example, a materials handling plan may require that a particular solvent be stored and used in a single room that is properly ventilated and equipped with sensors connected to an alarm.

NATURAL VENTILATION ROOM-BY-ROOM CALCULATIONS

STEP 1. DETERMINE REQUIRED FLOW RATES

Follow CIBSE AM10, Section 4.1, to determine the desired airflow rates.

STEP 2. DETERMINE OPENING SIZES

Follow CIBSE AM10, Sections 4.1.2, 4.1.3, 4.1.4, 4.2, and 4.3, as applicable, to determine whether the design will produce sufficient airflow rates and to optimize opening sizes, locations, and characteristics. These sections offer many calculation options. All options are acceptable, provided inputs and results are justified and reasonable.

STEP 3. CONFIRM COMPLIANCE

Create a table of all naturally ventilated spaces in the project, opening characteristics, desired flow rates, and calculated flow rates. Indicate how seasonal conditions and different wind conditions were considered.

Determine the free area of natural ventilation openings and the required opening area. Confirm that natural ventilation openings meet or exceed the sizes calculated for all spaces. The documentation should supplement that developed for EQ Prerequisite Minimum Indoor Air Quality Performance and Option 1, requirement D (natural ventilation design calculations) in this credit.

REQUIREMENTS

Comply with 3 strategies for 1 point or 6 strategies for 2 points

Strategy 1. 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.

Warehouses & Distribution Centers only

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.

Healthcare only

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

Strategy 2. 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.

Strategy 3. Filtration of Outdoor Air

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:

REQUIREMENTS

- minimum efficiency reporting value (MERV) of 13 or higher, in accordance with ASHRAE Standard 52.2-2017; or
- filtration media with media class of ePM1 50% or higher, as defined by ISO 16890-2016, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance.

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

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

Strategy 4. Filtration of Recirculated Air

Each ventilation system that supplies re-circulated 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 52.2-2017; or
- filtration media with media class of ePM1 50% or higher, as defined by ISO 16890-2016, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance.

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

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

Strategy 5. Increased Ventilation (5 Percent
Increase breathing zone outdoor air ventilation rates to 105% of all occupied spaces by at least 15% above the minimum rates as determined in EQ Prerequisite Minimum Indoor Air Quality Performance.

Strategy 6. Increased Ventilation 30 Percent
Increase breathing zone outdoor air ventilation rates to 130% of all occupied spaces by at least 50% above the minimum rates as determined in EQ Prerequisite Minimum Indoor Air Quality Performance.

Strategy 7. Operable Windows
75% of the regularly occupied spaces have operable windows that provide access to outdoor air. The windows must meet the opening size and location requirements of ASHRAE 62.1-2016 with addendum l, section 6.4.1.2.

Strategy 8. Engineered Natural Ventilation
Design and install a mechanically engineered natural ventilation system compliance path under EQ prerequisite Minimum Indoor Air Quality Performance.

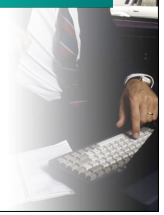
Strategy 9. Carbon Dioxide Monitoring
Monitor CO_2 concentrations within all densely occupied spaces. CO_2 monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor. CO_2 monitors must have an audible or visual indicator or alert the building automation system if the sensed CO_2 concentration exceeds the setpoint by more than 10%. Calculate appropriate CO_2 setpoints using methods in ASHRAE 62.1-2016, Appendix B.

Strategy 10. 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.

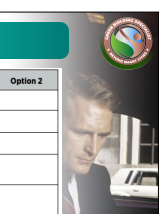
CONNECTION TO ONGOING PERFORMANCE

LEED O+M EQ prerequisite Indoor Environmental Quality Performance: Strategies undertaken for improving indoor air quality such as having permanent entryway systems, specific filtration requirements as well as monitoring of contaminants can contribute to better indoor environmental quality performance for the occupants during the operations phase.



REQUIRED DOCUMENTATION

Documentation	Option 1	Option 2
Entryway systems: scaled floor plans showing locations and measurements	X	
Interior cross-contamination prevention: list of rooms, areas, exhaust rate, separation method	X	
Filtration: mechanical schedules highlighting MERV or class ratings for all units that supply outdoor air	X	
Natural ventilation design: calculations and narrative demonstrating appropriate strategies per referenced standard	X	
Mixed mode design: calculations and narrative demonstrating appropriate strategies per referenced standard	X	
Exterior contamination prevention: narrative describing type of modeling; model output reports highlighting contaminant levels and required thresholds		X
Increased ventilation: confirmation (calculations are documented under EQ Prerequisite Minimum Indoor Air Quality Performance)		X
Carbon dioxide monitoring: list of densely occupied spaces, space type, design CO_2 concentrations, floor plan showing sensor locations, narrative describing CO_2 setpoints		X
Additional source control and monitoring: description of likely air contaminants and how they were identified, description of materials handling plan, plans showing installed monitoring system		X
Natural ventilation: room-by-room calculations, narrative, and diagrams demonstrating effective natural ventilation per referenced standard		X



REFERENCED STANDARDS

- ASHRAE 52.2-2010, ASHRAE 52.2-2017
- EN779-2002,ISO16890-2016 ASHRAE 62.1 2010,ASHRAE62.1-2016
- Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005: cibse.org
- Chartered Institution of Building Services Engineers (CIBSE) Applications Manual 13, 2000: cibse.org National Ambient Air Quality Standards (NAAQS): epa.gov/air/criteria.html

TERMS AND DEFINITIONS

Densely occupied space an area with a design occupant density of 25 people or more per 1,000 square feet (93 square meters)

Occupied space an enclosed space intended for human activities, excluding those spaces that are intended primarily for other purposes, such as storage rooms and equipment rooms, and that are only occupied occasionally and for short periods of time. Occupied spaces are further classified as regularly occupied or non-regularly occupied spaces based on the duration of the occupancy, individual or multi-occupant based on the quantity of occupants, and densely or non-densely occupied spaces based on the concentration of occupants in the space.

Regularly occupied space an area where one or more individuals normally spend time (more than one hour per person per day on average) seated or standing as they work, study, or perform other focused activities inside a building. The one-hour timeframe is continuous and should be based on the time a typical occupant uses the space. For spaces that are not used daily, the one-hour timeframe should be based on the time a typical occupant spends in the space when it is in use.