LEED BD+C: Multifamily Midrise | v4

Contaminant control

Possible 2 points

Glossary

Intent

To reduce occupants' exposure to indoor airborne contaminants through source control and removal.

Requirements

Option 1. Walk-off Mats (0.5 point)

At each unit's primary entryway from the outdoors, design and install a permanent walk-off mat that is at least 4 feet (1.2 meters) long and allows access for cleaning (e.g., grating with catch basin).

For regularly used common exterior entryways in multifamily buildings, install permanent systems that are at least 10 feet (3 meters) long in the primary direction of travel to capture dirt and particulates. Acceptable entryway systems include permanently installed grates, grilles, and slotted surfaces that allow for cleaning underneath. Roll-out mats are acceptable only if maintained on a weekly basis by a contracted service organization.

AND/OR

Option 2. Shoe Removal and Storage (0.5 point)

In each unit, design a shoe removal and storage space near the entryway, separated from living areas. This space must be a permanent architectural feature, it may not have wall-to-wall carpeting, and it must be large enough to accommodate a bench and at least two pairs of shoes per bedroom.

AND/OR

Option 3. Preoccupancy flush (0.5 point)

The Preoccupancy Flush can be awarded if the requirements are only met for all in-unit spaces.
At installation, seal all permanent ducts and vents to minimize contamination from construction. Remove seals after all phases of construction are completed.

After construction ends and before occupancy, flush the home with fresh air, according to the following guidelines:

- Remove any dust and debris from ducts.
- Flush the entire home, keeping all interior doors open for 48 hours; the hours may be nonconsecutive if necessary.
- Keep all windows open and run a fan (e.g., HVAC system fan) continuously, or flush the home with all HVAC fans and exhaust fans operating continuously at the highest flow rate.

For multifamily buildings, the requirements apply only to all in-unit spaces.

AND/OR

Option 4. Air Testing (1 point)

After construction ends and before occupancy, but under ventilation conditions typical for occupancy, conduct baseline indoor air quality testing using protocols consistent with the methods listed in Table 1. Project teams must follow either the Use current versions of ASTM standard methods, EPA compendium methods, or ISO methods, as indicated. Laboratories that conduct the tests for chemical analysis of formaldehyde and volatile organic compounds must be accredited under ISO/IEC 17025 for the test methods they use.

Demonstrate that contaminants do not exceed concentration levels listed in Table 1.

Table 1. Maximum concentration levels, by contaminant and testing method

Contaminant	Maximum concentration	Maximum concentration (Healthcare only)	ASTM and U.S. EPA methods	ISO method
Formaldehyde	27 ppb	16.3 ppb	ASTM D5197; EPA TO-11 or EPA Compendium Method IP-6	ISO 16000-3
Particulates (PM10 for all buildings; PM2.5 for buildings in EPA nonattainment areas)	PM10: 50 micrograms per cubic meter PM2.5: 15 micrograms per cubic meter	20 micrograms per cubic meter	EPA Compendium Method IP-10	ISO 7708
Ozone (for buildings in EPA nonattainment areas)	0.075 ppm	0.075 ppm	ASTM D5149 - 02	ISO 13964
Total volatile organic compounds (TVOCs)	500 micrograms per cubic meter	200 micrograms per cubic meter	EPA TO-1, TO-15, TO-17, or EPA Compendium Method IP-1	ISO 16000-6
Target chemicals listed in CDPH Standard Method v1.1, Table 4-1, except	CDPH Standard Method v1.1–2010, Allowable Concentrations, Table 4-1	CDPH Standard Method v1.1–2010, Allowable Concentrations, Table	ASTM D5197; EPA TO-1, TO-15, TO-17, or EPA Compendium Method	ISO 16000-3, 16000-6

formaldehyde	1	4-1	Method	
Carbon monoxide (CO)	9 ppm; no more than 2 ppm above outdoor levels	9 ppm; no more than 2 ppm above outdoor levels	EPA Compendium Method IP-3	ISO 4224

ppb = parts per billion; ppm = parts per million; µg/cm = micrograms per cubic meter

Conduct all measurements before occupancy but during normal occupied hours, with the building ventilation system started at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the test.

The number of sampling locations depends on the size of the building and number of ventilation systems but must include the entire building and all representative situations. Include areas with the least ventilation and greatest presumed source strength.

Collect air samples between 3 and 6 feet (900 and 1 800 millimeters) from the floor to represent the breathing zone of occupants over a minimum four-hour period.

Measure particulate concentrations by a gravimetric method. Hand-held or real-time instruments are not acceptable unless they are calibrated on site against the standard gravimetric method.

For each sampling point where the concentration exceeds the limit, take corrective action and retest for the noncompliant contaminants at the same sampling points. Repeat until all requirements are met.

Refer to CA Section 01350, Appendix B, New Single-Family Residence Scenario, for air-testing guidance.