



BOMA BEST
BUILDING CERTIFICATION
PROGRAM

Creating better spaces
to live, work and play

BOMA BEST 4.1
QUESTIONNAIRE FOR
SUSTAINABLE BUILDINGS

TECHNICAL FIELD GUIDE

November 2024



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General Information

1. What is the gross floor area?

___ m² **OR**

___ ft²

Floor area measurements have many different names (Gross Measured Area, Interior Gross Area, and Exterior Gross Area). For the purposes of benchmarking energy and water in BOMA BEST, the term Gross Floor Area (GFA) will be used to refer to the floor measurement that includes the following areas:

- Lobbies
- Tenant Areas
- Common Areas
- Meeting Rooms
- Break Rooms
- Atriums (ground floor only)
- Restrooms
- Elevator Shafts
- Stairwells
- Mechanical Equipment Areas
- Basements
- Storage Rooms

The following spaces should not be included in this measurement:

- Exterior spaces
- Balconies
- Patios
- Exterior Loading Docks
- Driveways
- Covered Walkways
- Outdoor Courts (Tennis, Basketball, etc.)
- The interstitial plenum space between floors (which house pipes and ventilation)
- Crawl Spaces
- Parking (indoor or outdoor)

2. What year was the building constructed?

3. What asset class is the building?

- Office
- Healthcare
- Enclosed Shopping Center
- Universal

- Multi-Unit Residential
- Light Industrial
- Open Air Retail

4. What was the occupancy rate over the past 12 months (in percentage)?

Occupancy Rate refers to the amount of leasable area that is leased divided by the total leasable area in the building (i.e., it is the percentage of the total rentable space that has been occupied)

5. Is the building being recertified?

- Yes
- No

6. Is the building tenant occupied?

- Yes
- No

If tenant occupied, provide the following:

- A building floor plan outlining areas managed by the owner/landlord vs tenant
- A list of building systems identifying whether the owner/landlord or tenant is responsible for operations
- A list of building systems identifying whether the owner/landlord or tenant is responsible for maintenance and repairs
- If systems are managed by the tenant, provide supporting documentation such as an excerpt from the lease agreement demonstrating that tenant is responsible
- If the owner/landlord is restricted from accessing the tenant space provide supporting documentation such as a lease excerpt or a narrative signed by the owner/landlord or tenant detailing how and why the space is restricted

7. Is this a multiple building submission?

- Yes
- No

For multiple building submissions, provide a narrative describing how the three requirements have been met:

- The buildings must share an actual, physical connection that is complete and indivisible (e.g., a shared functional space that cannot be divided, such as underground parking, an atrium or conference space). Hallways or interior walking paths between buildings are not considered functional, shared space, even if they are lit and/or heated. This requirement is consistent with the ENERGY STAR Portfolio Manager (ESPM) definition of a “single structure”.

- Buildings must have the same primary use type (75% or more of each building is dedicated to the same use, such as “Office”).
- Buildings must be managed by the same management company and share policies.

Energy and Carbon

E0. Baseline Practices

E1.0a – Energy and Carbon Assessment

Focus Area

Energy and Carbon

Topic

Baseline Practice

Question #

E1.0a – Energy and Carbon Assessment

Question

Has a Walkthrough Energy and Carbon Assessment been completed in the past five years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – all systems managed by the owner/landlord

Answer & Scoring

- Yes – this is a baseline requirement
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord

Requirements

The Energy and Carbon Assessment Report must cover:

- a) Building and system Description and review, interviews with building O&M staff
 - If the site visit was completed remotely, describe steps taken to become familiar with the building's construction, equipment, operation and maintenance to demonstrate that the assessment accurately reflects on-site conditions
- b) Energy utility history (at least 12 months of continuous data, typically the previous 24-36 months of data) for each energy source
- c) Greenhouse Gas inventory or Carbon emission history (at least 12 months of continuous data, typically the previous 24-36 months of data) for each carbon source
- d) Baseline energy consumption and carbon emissions, with benchmarking
- e) Low- and no-cost energy conservation and/or carbon reduction measures, with high level costing, simple payback and anticipated savings

The assessment methodology should at a minimum align with an ASHRAE Level I Audit. While the ASHRAE Level I Audit does not cover carbon, it can be used as a general guideline for the carbon assessment component.

The assessment provided is not required to be completed by a professional engineer.

Refer to ENERGY STAR for carbon emission calculations and creating a GHG inventory. If other carbon emission factors are used, explain reasoning and factors applied

For newly constructed high performance and net-zero carbon buildings, an Energy and Carbon Assessment Report is still required. Should there be no low- and no-cost energy conservation and/or carbon reduction measures identified, provide justification beyond the systems being new. Note that while a newly constructed building may be designed to be high performance or net-zero carbon, it does not necessarily indicate that it performs as such or that no further improvements can be made.

Documentation

- Walkthrough Energy and Carbon Assessment Report

OR

- Completed [E1.0a & b – Energy and Carbon Assessment Template](#)

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

Suggested Lead

In-house: Facility Maintenance, Potential in-house energy/sustainable operations staff (e.g. JLL)

Third-party: Energy/engineering consultants

Value

- Understand a building's environmental impact through energy use and carbon emissions data analysis
- Perform an entry-level energy and carbon assessment to define a building's baseline energy consumption and carbon footprint through utility analysis
- Identify ways to reduce energy use and carbon emissions through low-cost energy conservation measures (ECMs) and carbon conservation measures (CCMs)
- This assessment can be performed in-house using the BOMA BEST Template provided in the How-to Manual or by a qualified third-party
- The question is applicable to spaces both inside and outside of the building.
- Engage a qualified third-party professional to provide more detailed recommendations to improve building performance, save on operational costs, and reduce a building's overall environmental impacts

Linked Questions:

E2.0 - Energy Management Plan: Set energy and carbon reduction goals

E2.2 - Capital Plan: Include ECMs and CCMs in future capital planning

E5.1 - Energy and Carbon Conservation Measures: Implementation of ECMs and CCMs

Description

Assessments allow building management to identify opportunities for operational optimization and capital upgrades, focusing on the highest-impact systems and areas. Align methodology with ASHRAE Level I Audit or equivalent.

Buildings with an ENERGY STAR score can obtain GHG information from ENERGY STAR.

To generate recommendations for no- and low-cost energy conservation measures (ECMs) and carbon reduction measures (CRMs) as well as more capital-intensive upgrades, assessments should include estimates of potential savings for proposed measures and consider implementation costs. Measures selected for implementation can then be added to plans and budgets.

References

[ASHRAE Level I Audit](#)

[ENERGY STAR Carbon Emissions](#)

[Carbon Risk Real Estate Monitor \(CRREM\) Global Pathways](#)

Adapted BB 3.0 Question

Best Practice 2 — Has an ASHRAE Level 1 Energy Assessment been conducted in the past five years?

E1.0b — Energy and Carbon Assessment

Focus Area

Energy and Carbon

Topic

Baseline Practices

Question

E1.0b — Energy and Carbon Assessment

Question

Has the energy efficiency and carbon emissions of systems managed by the owner or landlord been assessed in the last five years?

Applicability

All asset classes

Tenant occupied building – some systems managed by the owner/landlord

Answer & Scoring

- Yes – this is a baseline requirement. Complete [BOMA BEST Form E1.0b](#)
- Not Applicable – Owner/landlord occupied building **OR** Tenant occupied building: No systems managed by the owner/landlord

Requirements

For all building components managed by the owner or landlord, provide:

- a) Building and system description and review. Clearly distinguish between systems that are owned vs managed vs maintained by the owner, landlord or tenant
- b) Energy utility history (at least 12 months of continuous data, typically the previous 24-36 months of data) for each energy source
- c) Greenhouse Gas inventory or Carbon emission history (at least 12 months of continuous data, typically the previous 24-36 months of data) for each carbon source
- d) Low- and no-cost energy conservation and/or carbon reduction measures, with high level costing, simple payback and anticipated savings. If no savings measures are identified, state why

The assessment methodology should at a minimum align with an ASHRAE Level I Audit. While the ASHRAE Level I Audit does not cover carbon, it can be used as a general guideline for the carbon assessment component.

The assessment provided is not required to be completed by a professional engineer.

Refer to ENERGY STAR for carbon emission calculations and creating a GHG inventory. If other carbon emission factors are used, explain reasoning and factors applied

For newly constructed high performance and net-zero carbon buildings, an Energy and Carbon Assessment Report is still required. Should there be no low- and no-cost energy conservation and/or carbon reduction measures identified, provide justification beyond the systems being new. Note that while a newly constructed building may be designed to be high performance or net-zero carbon, it does not necessarily indicate that it performs as such or that no further improvements can be made.

If the owner or landlord only manages for example the exterior parking lighting or common-area energy at the building, provide the energy and carbon data for these systems, as well as an assessment of the efficiency of the systems. If the systems were recently upgraded and no energy conservation or carbon reduction is currently feasible, state that too.

For all systems managed by the tenant, the applicant (representing the owner or landlord) is expected to outline those as well, though no energy or carbon assessment is required for these systems.

Documentation

- Limited Scope Energy and Carbon Assessment Report

OR

- [E1.0a & b – Energy and Carbon Assessment Template](#)

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

Suggested Lead

In-house: Facility Maintenance, Potential in-house energy/sustainable operations staff

Third-party: Energy/engineering consultants

Value

- Understand a building's environmental impact through energy use and carbon emissions data analysis
- Perform an entry-level energy and carbon assessment to define a building's baseline energy consumption and carbon footprint through utility analysis
- Identify ways to reduce energy use and carbon emissions through low-cost energy conservation measures (ECMs) and carbon conservation measures (CCMs)
- This assessment can be performed in-house using the BOMA BEST Template provided in the How-to Manual or by a qualified third-party
- The question is applicable to spaces both inside and outside of the building.
- Engage a qualified third-party professional to provide more detailed recommendations to improve building performance, save on operational costs, and reduce a building's overall environmental impacts

Linked Questions:

E2.0 - Energy Management Plan: Set energy and carbon reduction goals

E2.2 - Capital Plan: Include ECMs and CCMs in future capital planning

E5.1 - Energy and Carbon Conservation Measures: Implementation of ECMs and CCMs

Description

The most effective energy reduction strategies will focus efforts on the end uses with the highest consumption. Building operations and management teams should determine the largest end uses and consider opportunities for sub-metering significant loads, such as tenant process loads or mechanical equipment.

References

[ASHRAE Level I Audit](#)

[Benchmarking without an ENERGY STAR score](#)

[ENERGY STAR Greenhouse Gas Emissions](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E2.0 – Energy Management Plan

Focus Area

Energy and Carbon

Topic

Baseline Practice

Question

E2.0 – Energy Management Plan

Question

Is there an Energy Management Plan with specific energy or carbon reduction targets?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – some or all systems managed by the owner/landlord

Answer & Scoring

- Yes – this is a baseline requirement
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord

Requirements

The Energy Management Goal and Plan must cover the following:

- a) Outline the vision for energy management going forward, such as goals or targets in relation to the baseline or managing carbon emissions
- b) Where Portfolio-wide Energy Management Plans are referenced, provide a narrative that describes how the plan is applied at the building level
- c) For each of the Energy Conservation Measures (ECM) listed in the Assessment, determine the following:
 - Whether it will be implemented (if not, explain why)
 - The associated budget (implementation cost, savings, incentive)
 - Overview of metrics to be used to measure progress
 - A timeline for completion (one year, five years and 10 years)
 - The person responsible for implementation

Documentation

- Building-specific Energy Management Goal and Plan

OR

- [E2.0 – Energy Management Plan Template](#)

Suggested Lead

In-house: Facility Maintenance in conjunction with Building Manager/Policy Makers

Value

- Set energy and carbon reduction goals to help reduce their building's environmental impact and improve its efficiency. Create an energy management plan to reach these goals
- Creating a plan keeps the team accountable and facilitates discussions of what is realistic in what timeline
- Building tenants as well as the city or country a building is located in may have energy or carbon reduction goals as a response to global warming and climate change that can inform the energy management plan
- Energy and carbon management plans should include short-term and long-term energy and carbon reduction goals

Linked Questions:

E2.1a - Net-zero Transition Plan: Include net-zero goals (if applicable)

E2.2 - Capital Plan: Include ECMs and CCMs in future capital planning

E10.2 - On-site Combustion: Include building electrification (if applicable)

Description

The development of an energy management plan that includes targets, metrics, approaches and milestones will provide the foundation for building an energy and carbon reduction program. Follow ISO-50001 guidance, or equivalent.

Plans may include carbon emissions from on-site combustion (such as gas-fired boilers), refrigerant leaks (fugitive emissions) and purchased energy (such as electricity or steam), typically referred to as Scope 1 and 2 emissions. The plan may also work toward developing an approach for assessing emissions from fleet vehicles and emissions from service providers (such as snow removal etc.), typically referred to as Scope 3 emissions.

References

[ISO 50001 Overview](#)

[ISO 50001](#)

[NRCan's Energy Management Best Practices Guide – For Commercial and Institutional Buildings](#)

Adapted BB 3.0 Question

Best Practice 4 — Is an Energy Management Plan in place at the building?

Best Practice 5 — Is an energy reduction target in place at the building?

E6.0 – Preventive Maintenance

Focus Area

Energy and Carbon

Topic

Baseline Practice

Question

E6.0 – Preventive Maintenance

Question

Is a Preventive Maintenance Plan in place for the building?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – some or all systems managed by the owner/landlord

Answer & Scoring

- Yes – this is a baseline requirement
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord

Requirements

The Preventive Maintenance Plan must cover the following:

- a) Inventory of the building's systems and equipment components to be reviewed, including gas-fired boilers and other onsite combustion equipment
- b) Type of preventive action required, with frequency of inspection vs. maintenance actions
- c) Sample logs showing that these actions have been taken and that follow-ups were done when needed
- d) Updates recorded when new equipment is added, and when old equipment is removed
- e) Plan must be signed by the building manager, dated within the last 12 months

The assessment methodology should at least align with an ASHRAE Standard 180-2018 — Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems.

The ASHRAE Standard 180-2018 also explains that inspection serves to monitor and document the condition of equipment and components over time regarding appearance, functionality and performance, whereas maintenance serves to preserve equipment condition and performance as required by the facility.

Documentation

- Preventive Maintenance Plan, with maintenance logs

OR

- [E6.0 – Preventive Maintenance Plan Template](#)

Suggested Lead

In-house: Facility Maintenance in conjunction with Building Manager/Policy Makers

Value

- When building systems are not properly maintained, it can lead to operational inefficiencies, affect system's longevity, cause additional carbon emissions, and impact occupants' health
- Establish a preventive maintenance plan to reduce the chance of these issues occurring and help the building management team understand the maintenance requirements at their building
- A Preventive Maintenance Plan is proactive not reactive; the goal is to prevent issues from occurring rather than responding when issues occur
- Review the Preventive Maintenance Plan regularly to ensure that the plan still reflects the building's maintenance practices and any equipment updates
- Keep maintenance logs to track preventive maintenance practices and keep the team accountable

Description

Day-to-day operations and maintenance (O&M) affect energy consumption and carbon emissions and must be considered in every building. Implementation of best practices for O&M increases the longevity and efficiency of building equipment.

Appropriate plans need to be in place and effectively followed to ensure equipment is maintained. Plans should be revisited periodically to ensure building operations are optimized.

References

[ASHRAE Standard 180-2018 — Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems](#)

Adapted BB 3.0 Question

Best Practice 1 — Is a Preventive Maintenance Program in place at the building?

E13.0 — Owner or Landlord Shares Energy and Carbon Practices

Focus Area

Energy and Carbon

Topic

Baseline Practice

Question

E13.0 — Owner or Landlord Shares Energy and Carbon Practices

Question

Has an Energy and Carbon Management Communication Plan been shared with the building tenants?

Applicability

All asset classes

Tenant occupied building

Answer & Scoring

- Yes – this is a baseline requirement
- Not Applicable – Owner/landlord occupied building

Requirements

- a) Develop an Energy and Carbon Management Communication Plan that covers the following:
 - Efforts the building management team are implementing for systems managed by the owner/landlord. If systems are tenant managed, provide efforts the tenant can implement to manage their energy and carbon. This should include tips for operations and maintenance optimization, lighting and HVAC efficiency, and the value of sub-metering
 - Completed energy and carbon assessment from E1.0b and associated initiatives as applicable
- b) Copies of communication with the building's tenants where the content of the building Energy and Carbon communication plan was shared, dated within the past 12 months
- c) Demonstrate that communication was distributed to at least half of the number of tenant organizations occupying the building or to a group that leases at least half of the total building area

Documentation

- Building-specific Energy and Carbon Management Communication Plan
- Proof of communication with representative group of building tenants, covering energy and carbon assessment, tips for operations and maintenance optimization, lighting and HVAC efficiency, and the value of sub-metering

OR

- [E13.0 – Energy & Carbon Management Communication Plan Template](#)

Suggested Lead

In-house: Facility Maintenance in conjunction with Building Manager/Policy Makers

Value

- Increasing occupant awareness and engagement can positively impact the sustainability practices at a building
- Tenant participation is necessary for reaching energy and carbon reduction goals
- Develop an Energy and Carbon Management Communication Plan that defines how the building's energy and carbon reduction goals will be shared with tenants
- Share energy and carbon reduction tips with tenants to encourage tenants to play an active role in energy and carbon reduction at the building

Description

Increasing building tenant and occupant awareness and engagement in environmental and sustainable practices can have a significant positive impact on the performance of the building.

Improving the environmental performance of the building can lead to many positive outcomes for building management, staff and tenants, including but not limited to lower operational costs, lower utility bills, improved indoor air quality, improved management-tenant relationships, etc.

References

None

Adapted BB 3.0 Question

Best Practice 2 – Has an ASHRAE Level 1 Energy Assessment been conducted in the last five (5) years?

Best Practice 16 – Is an Occupant Environmental Communication Program in place at the building?

E1. Assessment

E1.1 — Mechanical System Assessment

Focus Area

Energy and Carbon

Topic

Assessment

Question #

E1.1 — Mechanical System Assessment

Question

Has a condition assessment of the mechanical systems and components been completed in the past five years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – some or all systems managed by the owner/landlord

Answer & Scoring

Select one of the following:

- Yes = 5 points
- No = 0 points
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 5 points

Requirements

The Mechanical Systems Condition Assessment must:

- a) List the mechanical equipment, installation date and anticipated remaining useful life
- b) Indicate required replacement date, highlighting equipment that will require replacement in the next 10 years

Documentation

- Condition Assessment Report of Mechanical Systems (excerpt from Building **OR**
- Property Condition Report containing relevant information is sufficient)

Suggested Lead

Third-party

Value

- Regular assessments of mechanical systems allows building management teams to understand the condition of their equipment and pinpoint any systems operating sub-optimally
- Identify systems that will need attention in the next 5 to 10 years
- When replacing mechanical systems consider upgrading the system to a more efficient, low carbon model

Linked Questions:

E2.2 - Capital Plan: Include mechanical system upgrades or replacements in future capital planning

E10.1 - HVAC Efficiency: Install high-efficiency HVAC equipment

E10.2 - On-site Combustion: Replacing a system is also an opportunity to electrify a system

Description

The condition assessment contains a list of tactical and strategic items that are used to gather a better understanding of how the building is operating in its present state and how funds need to be saved and/or allocated to repair or replace various items. Tactical items are those that will require attention within the first five years of the report's completion. Strategic items are those that are looked at after five years and are typically reviewed in the 10-year capital asset management plan.

References

[Standard Guide for Property Condition Assessments: Baseline Property Condition Assessment Process \(ASTM E2018-08\)](#)

Adapted BB 3.0 Question

Question 09.02.01 — Has a property condition assessment (PCA) report been completed for this building within the past five years?

E1.2 – Envelope Assessment

Focus Area

Energy and Carbon

Topic

Assessment

Question

E1.2 — Envelope Assessment

Question

Has a Condition Assessment of the envelope and envelope components been completed in the past five years?

Applicability

All asset classes

Owner occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Thermal Scan = 1 point
 - Air Tightness Test = 1 point
 - Condition Assessment of Envelope = 3 points
- No = 0 points
- Not applicable – Building was built within the past 3 years with 2 or more of the listed high-performance features = 0/0

Max of 5 points

Requirements

- a) The Thermal Imaging Scan and Air Tightness Test must:
 - Cover all roof and wall components
 - Identify areas where higher-than-normal thermal transfer occurs
- b) The Envelope Assessment must:
 - List all envelope components (including but not limited to roof, walls, windows, doors, floors, underground walls, exterior sealant and caulking, structural components, etc.)
 - Provide a summary of the performance of the building envelope in terms of water infiltration and condensation, moist air transfer, air flow and heat transfer
 - Indicate required replacement date, highlighting components that will require replacement in the next 10 years

If your building has been built within the past 3 years, demonstrate that 2 or more high-performance building envelope features have been implemented:

- Building envelope commissioning completed
- Air sealing with whole building air leakage test completed demonstrating better than typical industry air tightness
- Interior/exterior shading, identifying whether there are automated shading controls
- Triple-paned glazing, including high-performance window assembly OR triple-paned windows with low-emissivity coating, including high-performance window assembly
- Electrochromic glazing or other types of dynamic glazing
- Built-in photovoltaics
- Green roof covering at least 30% of the available roof space
- Reduced thermal bridging to minimize heat transfer through strategies such as continuous insulation and thermal breaks
- Foundation insulation that is 20% better than current code
- Roof insulation that is 20% better than current code
- Wall insulation that is 20% better than current code
- Natural ventilation when outdoor conditions are favorable

For Open-Air Retail, demonstrate that the requirements have been met for 20% of the buildings on-site.

Documentation

Provide the following as applicable to the option(s) selected:

- Thermal Imaging Scan
- Air Tightness Test
- Building drawings
- Signed and/or stamped cutsheets
- Condition Assessment Report of Envelope (excerpt from Building or Property Condition Report containing relevant information is sufficient)

Suggested Lead

Third-party

Value

- The performance of a building is directly related to the performance of the envelope
- A poorly performing envelope can lead to significant energy losses increasing the cost of operations
- Complete an envelope condition assessment to identify components that require updates or replacing in the next 5 to 10 years
- When envelope components need to be replaced, building management should consider upgrading the component to higher performing versions
- To gather further information about the envelope performance, thermal scanning and air tightness testing can be done at the building for additional points. This service will identify areas in the envelope where higher-than-normal heat or air losses occur. Recommendations on how to reduce future energy losses will be made by the service provider

Linked Questions:

E2.2 - Capital Plan: Include envelope repairs in future capital planning

E11.1 - Envelope Improvement: Implement minor improvements identified in the condition assessment

E11.2 - Envelope Upgrade: Implement major envelope upgrades identified in the condition assessment

Description

The Condition Assessment contains a list of tactical and strategic items that are used to gather a better understanding of how the building is operating in its present state and how funds need to be saved and/or allocated to repair or replace various items. Tactical items are those that will require attention within the first five years of the report's completion. Strategic items are those that are looked at after five years and are typically reviewed in the 10-year capital asset management plan.

References

[ASHRAE Level II Audit](#)

[ENERGY STAR Carbon Emissions](#)

[Carbon Risk Real Estate Monitor \(CRREM\) Global Pathways](#)

Adapted BB 3.0 Question

Question 01.02.04 — Has a thermal imaging scan of the roof or walls been performed within the past five years?

Question 09.02.01 — Has a property condition assessment (PCA) report been completed for this building within the past five years?

E1.3a — Detailed Energy and Carbon Assessment

Focus Area

Energy and Carbon

Topic

Assessment

Question

E1.3a — Detailed Energy and Carbon Assessment

Question

Has a detailed Energy and Carbon Assessment been performed in the past five years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – all systems managed by the owner/landlord

Answer & Scoring

Select one of the following:

- Yes – Detailed Energy and Carbon Assessment = 3 points
- Yes – Detailed Energy and Carbon Assessment includes carbon abatement costs = 6 points
- No = 0 points
- Not applicable – Tenant occupied building: Some or no systems managed by the owner/landlord = 0/0

Max of 6 points

Requirements

In addition to items covered under Question E1.0a Walkthrough Assessment, the Detailed Energy and Carbon Assessment Report must cover:

- a) Detailed site review covering current operations and maintenance procedures and operating parameters
- b) End-use breakdown
- c) Detailed energy and carbon calculations for energy conservation and carbon reduction measures, with high-level costing and financial analysis
 - (For additional 3 points) Include an estimate of the cost of carbon abatement (\$/tCO₂e lifetime) of proposed retrofits
- d) High-level assessment of available building electrical capacity

The assessment methodology should at least align with an ASHRAE Level II Audit.

Refer to ENERGY STAR for carbon emission factors. If other carbon emission factors are used, explain the reasoning and factors applied.

Documentation

- Detailed Energy and Carbon Assessment Report
- Carbon abatement costs

Suggested Lead

Third-party

Value

- Building on the Baseline Practice requirements (See E1.0a), engage a qualified professional to complete an ASHRAE Level II energy assessment
- This assessment includes all components of an ASHRAE Level I assessment as well as analysis of how mechanical and building envelope systems impact energy use and carbon emissions.
- A qualified professional will identify low- and high-cost energy and carbon conservation measures (ECMs and CCMs) and detailed savings associated with each
- For additional points, this assessment can also include carbon abatement costs which explores the amount of carbon that can be saved annually if recommended ECMs and CCMs are implemented

*Note that by completing the requirements of this question, a building will also meet all requirements of Baseline Practice E1.0a.

Linked Questions:

E2.0 - Energy Management Plan: Set energy and carbon reduction goals

E2.2 - Capital Plan: Include ECMs and CCMs in future capital planning

E5.1 - Energy and Carbon Conservation Measures: Implementation of ECMs and CCMs

Description

It is recommended that assessments be undertaken at least every five years at a level appropriate for meeting building management's objectives. Align methodology with ASHRAE Level II Audit or equivalent.

A detailed assessment can identify more extensive opportunities with metrics to inform a business case.

References

[ASHRAE Level II Audit](#)

[ENERGY STAR Carbon Emissions](#)

Adapted BB 3.0 Question

Question 01.02.05 — Has an ASHRAE Level 2 Energy Assessment been performed on the building in the past five years?

E1.3b — Owner or landlord informs, tenant manages energy

Focus Area

Energy and Carbon

Topic

Assessment

Question

E1.3b — Owner or landlord informs, tenant manages energy

Question

Does the owner or landlord conduct visual inspections of tenant-managed energy systems each year?

Applicability

All asset classes

Tenant occupied building – some or all systems managed by the tenant

Answer & Scoring

- Yes = 3 points
- No = 0 points
- Not Applicable – Owner/landlord occupied building **OR** Tenant occupied building: All systems managed by the owner/landlord **OR** Tenant occupied building: Lease prohibits owner/landlord from inspecting any tenant-managed systems = 0/0

Max of 3 points

Requirements

- a) Conducting a visual inspection of tenant-managed energy systems that serve tenant leased spaces, covering the following as applicable:
 - Lighting (interior and exterior)
 - HVAC (cooling, heating, air distribution, ventilation and exhaust systems)
 - Heating, chilled, condenser and domestic water systems and associated pumps
 - Refrigeration
 - Onsite power generation equipment, including renewable energy systems
 - Uninterruptible power supplies, power distribution units and critical power systems
 - Data centers and information technology infrastructure
 - Plug loads (including office equipment, personal computers and appliances)
- b) This must cover a group of tenants that lease at least half of the total building area
- c) Visual inspection forms must be shared with tenants

OR

- d) Submit excerpt from lease which details restrictions to landlord access of tenant spaces

OR

- e) Signed letter from owner/landlord or tenant indicating how and why the owner is restricted from the space.

Documentation

- The most recent visual inspection forms of tenant spaces
- Communication in which the results of this visual inspection were shared with tenants
- Evidence that the inspections cover at least half of the area of the building

OR

- Lease Excerpt

OR

- Signed letter from owner/landlord or tenant indicating how and why the owner is restricted from the space.

Suggested Lead

In-house

Value

- Tenant-controlled systems can have a significant impact on energy use and carbon emissions at a building. If systems are not properly operated or maintained, this can lead to additional energy consumption and carbon emissions
- Perform regular visual inspections of tenant-controlled systems to check the general condition of these systems and identify potential opportunities for energy and carbon savings
- Engage tenants in the inspection process and share the results of the assessment with tenants

Description

Assessments allow building management to identify opportunities for operational optimization and capital upgrades, focusing on the highest impact systems and areas.

The purpose of the visual inspection is to identify potential energy savings opportunities and provide general condition oversight.

References

[ASHRAE Level I Audit](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E1.4 – Deep Retrofit Study

Focus Area

Energy and Carbon

Topic

Assessment

Question

E1.4 – Deep Retrofit Study

Question

Has a Deep Energy and Carbon Retrofit Study been performed on targeted building systems in the past 10 years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – all systems managed by the owner/landlord

Answer & Scoring

Select one of the following:

- Yes – Deep Retrofit Study = 6 points
- Yes – Major heating or cooling system retrofit completed in the last five years = 6 points
- No = 0 points
- Not Applicable – Tenant occupied building: Some or no systems managed by the owner/landlord = 0/0

Max of 6 points

Requirements

In addition to items covered under Question E1.3 Detailed Energy and Carbon Assessment, the Deep Retrofit Study must cover:

- a) Assessment of potential capital projects to reduce energy and carbon with multiple options, such as:
 - Like-for-like replacement as a baseline
 - A deep carbon reduction retrofit as the ‘highest savings’ case
 - An optimized approach that meets multiple prioritized criteria
- b) Assessment of building electrical capacity and required service upgrades for each option
- c) Cost of carbon abatement (\$/tCO₂e lifetime) of proposed retrofit solution
- d) Detailed life-cycle cost analysis (LCCA) and risk assessment
- e) Identification of potential incentive opportunities

The assessment methodology should at least align with an ASHRAE Level III Audit.

A Deep Retrofit Study often includes the development of an energy model, which is a simulation of the retrofit scenarios proposed, to better facilitate effective decision-making.

Refer to ENERGY STAR for carbon emission factors. If other carbon emission factors are used, explain the reasoning and factors applied

OR

Provide evidence that the building completed a major heating or cooling system retrofit completed in the last five years.

Documentation

- Deep Retrofit Study

OR

- Evidence of major heating or cooling system retrofit completed in the last five years

Suggested Lead

Third-party

Value

- For some buildings, especially older buildings, larger interventions may be required to meet defined energy goals
- Building off E1.3a - Detailed Energy and Carbon Assessment, engage a qualified professional to perform a deep energy and carbon retrofit study
- This study includes all components of an ASHRAE Level II study as well as includes the creation of a whole-building energy model to analyze all building systems and how they interact
- This study will identify multiple options to upgrade a building to have energy and carbon savings beyond the operational level
- This is a good fit for teams that are looking to greatly improve their building performance through major building upgrades, are looking to pursue net-zero, or are considering building electrification

*Note that by completing the requirements of this question, a building will also meet all requirements of Baseline Practice E1.0a.

Linked Questions:

E2.1a - Net-zero Transition Plan: Make a plan to achieve net-zero

Description

A Deep Retrofit Study is typically focused on a specific system and provides in-depth analysis of carbon reduction options with schematics and specifications for the recommended solution. Align methodology with ASHRAE Level III Audit or equivalent.

Deep carbon retrofits go a step further than a typical detailed energy assessment, providing more in-depth analysis that focuses on a specific system or measure rather than taking a whole-building approach. In deep carbon retrofit studies, detailed assessments are performed on the available electrical capacity for all electrification measures. The study provides detailed cost estimates and a roadmap for implementation. It is the final step required to inform implementation decisions.

References

[ASHRAE Level III Audit](#)

[ENERGY STAR Carbon Emissions](#)

[Carbon Risk Real Estate Monitor \(CRREM\) Global Pathways](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E2. Planning

E2.1a — Net Zero Transition Plan

Focus Area

Energy and Carbon

Topic

Planning

Question #

E2.1a — Net-Zero Transition Plan

Question

Is there a Net-Zero Transition Plan or Decarbonization Roadmap with specific carbon reduction targets?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – all systems managed by the owner/landlord

Answer & Scoring

Select one of the following:

- Yes – Net-Zero Transition Plan = 4 points
- Yes – Net-Zero Transition Plan instead of Energy Management Plan (see Question E2.0) = 4 points
- No = 0 points
- Not Applicable – Tenant occupied building: Some or no systems managed by the owner/landlord = 0/0

Max of 4 points

Requirements

The Net-Zero Transition Plan or Decarbonization Roadmap must include the following for each of the Carbon Reduction Measures (CRMs) listed in the assessment:

- a) If it will be implemented (if not, explain why)
- b) The associated budget (implementation cost, savings, cost of carbon abatement (\$/tCO₂e lifetime), incentives
- c) An overview of the metrics to be used to measure progress
- d) A timeline for completion (one-year, five-year and 10-year)
- e) The person responsible for implementation

Documentation

- Net-Zero Transition Plan

OR

- Decarbonization Roadmap

Suggested Lead

In-house, with third-party support

Value

- A net-zero carbon building is a building that produces zero carbon emissions or offsets its carbon emissions by investing in carbon removal activities (i.e. tree planting, carbon capture technologies)
- Achieving net-zero is a substantial goal and for most buildings is a long-term goal
- Create a net-zero transition plan (aka. decarbonization roadmap) - a building-specific program for reducing carbon emissions with specific interim milestones to keep the building on track
- Prioritize reducing carbon emissions by implementing energy and carbon reduction measures
- Achieving net-zero may require significant operational changes and major building system upgrades

*Note that by completing the requirements of this question, a building will also meet requirements of Baseline Practice E2.0 - Energy Management Plan

Linked Questions:

E10.1 - HVAC Efficiency: Install high-efficiency, low carbon equipment

E10.2 - On-site Combustion: Electrify building systems

Description

Net-Zero Transition Plans include prioritized energy and carbon reduction measures to be implemented to reach net-zero carbon emissions by a date established by the organization, with periodic milestones included. Update previous energy management practices by including carbon specific goals and strategies.

Plans may incorporate assessment of indirect emissions from tenant operations and investigate additional sources of carbon emissions, such as employee commuting, business travel, purchased materials and embodied carbon of materials included in retrofit projects.

References

[Carbon Risk Real Estate Monitor \(CRREM\)](#)

[Task Force on Climate-Related Financial Disclosures \(TCFD\)](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E2.1b — Net-Zero Transition Target

Focus Area

Energy and Carbon

Topic

Planning

Question

E2.1b — Net-Zero Transition Target

Question

Does your organization have a net zero carbon reduction target?

Applicability

All asset classes

Tenant occupied building – some or all systems managed by the tenant

Answer & Scoring

- Yes = 4 points
- No = 0 points
- Not applicable – Owner/landlord occupied building **OR** Tenant occupied building: All systems managed by the owner/landlord = 0/0

Max of 4 points

Requirements

- a. A net-zero reduction target must be identified along with a timeframe for completion
- b. Targets must be put into writing, signed by senior management and reviewed annually.

The net-zero reduction target can be established to encompass either all utilities as a whole or divided into each type (electricity, gas etc.) of utility under the owner or landlord's control.

Documentation

- Building specific documentation that details your organization's net-zero reduction target (how much CO₂e by what year)

Suggested Lead

In-house, with third-party support

Value

- A net-zero carbon building is a building that produces zero carbon emissions or offsets its carbon emissions by investing in carbon removal activities (i.e. tree planting, carbon capture technologies)
- Achieving net-zero is a substantial goal and for most buildings is a long-term goal
- Create a net-zero transition plan (aka. decarbonization roadmap) - a building-specific program for reducing carbon emissions with specific interim milestones to keep the building on track
- Prioritize reducing carbon emissions by implementing energy and carbon reduction measures
- Achieving net-zero may require significant operational changes and major building system upgrades

Linked Questions:

E10.1 - HVAC Efficiency: Install high-efficiency, low carbon equipment

E10.2 - On-site Combustion: Electrify building systems

Description

Net-zero transition plans include prioritized energy and carbon reduction measures to be implemented in order to reach net-zero carbon emissions by a date established by the organization, with periodic milestones included. Update previous energy management practices by including carbon-specific goals and strategies.

Plans may incorporate assessment of indirect emissions from tenant operations and investigate additional sources of carbon emissions, such as employee commuting, business travel, purchased materials and embodied carbon of materials included in retrofit projects.

References

[Carbon Risk Real Estate Monitor \(CRREM\)](#)

[Task Force on Climate-Related Financial Disclosures \(TCFD\)](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E2.2 – Capital Plan

Focus Area

Energy and Carbon

Topic

Planning

Question

E2.2 – Capital Plan

Question

Are higher-cost energy conservation or carbon reduction measures from the assessment included in the capital plan?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – some or all systems managed by the owner/landlord

Answer & Scoring

Select one of the following:

- Yes = 3 points
- No = 0 points
- Not Applicable – Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 3 points

Requirements

The relevant section in the Capital Plan must include:

- a) A list of capital projects identified through the energy, carbon, and condition assessments
- b) Evidence of allocation of budget
- c) Implementation timelines
- d) Evidence that improvement solutions will achieve energy conservation and carbon reduction

Documentation

- Relevant section of the Capital Plan

Suggested Lead

In-house

Value

- Create a capital plan that outlines the building's operational and maintenance costs and capital-intensive projects planned at the building over a 10-year timeframe
- Include carbon and energy conservation measures (ECMs and CCMs) and building system upgrades in capital planning

Description

Energy conservation (ECM) and carbon reduction (CRM) measures require capital investment. The capital plan typically outlines building management and operational spending over a 10-year timeframe. Start planning for ECM or CRM implementation early, spreading costs and efforts across multiple years to manage budget expenditures and scale of retrofit projects.

References

None

Adapted BB 3.0 Question

Question 01.01.03 — Does the Capital Plan include measures to ensure continuous improvement of the energy efficiency of the building envelope?

E3. Benchmarking

E3.1a – Benchmarking Energy Use

Focus Area

Energy and Carbon

Topic

Benchmarking

Question

E3.1a – Benchmarking Energy Use

Question

What is the calculated ENERGY STAR score for the building?

Applicability

Office, Healthcare, Universal, Multi-Unit Residential Building

Owner/landlord occupied building

Tenant occupied building – Owner has access to utility data

Answer & Scoring

- Yes = Points dependent on range
Indicate which range is representative of your building's most recent ENERGY STAR score:
 - 90 and higher = 5 points
 - 83 to <90 = 4 points
 - 75 to <83 = 3 points
 - 65 to <75 = 2 points
 - Lower than 65 = 1 point
- No = 0 points
- Not Applicable – Tenant occupied building: Owner/Landlord does not have access to utility data **OR** Tenant occupied building: Pursuing E3.1b **OR** Universal asset class is not applicable for ENERGY STAR score = 0/0

Max of 5 points

Requirements

To determine the most recent ENERGY STAR score:

- a) Enter whole-building energy use data under the Benchmarking section of the BOMA BEST hub (bomabesthub.com) or in the ENERGY STAR Portfolio Manager portal
- b) If whole-building energy use is calculated by adding data from different bills or sub-meters, provide a brief narrative describing the methodology applied. Show how the 12-month total use was calculated
- c) If any spaces were excluded, describe the methodology applied
- d) For any sub-meters referenced, provide details, such as make, model, location, photo and year of installation

- e) Indicate whether any energy is generated on-site and whether that use has been sub-metered

If E3.1b is being pursued the building is not eligible for this point.

Documentation

- Data Verification Checklist printed from ENERGY STAR, or screenshot from BOMA BEST Benchmarking section showing the normalized Energy Use Intensity
- Narrative of benchmarking methodology and sub-meter data, if available

OR

- Documentation demonstrating that the owner does not have access to utility data (e.g. lease agreement)

OR

- Narrative indicating that E3.1b is being pursued

OR

- Narrative indicating that asset class is not applicable ENERGY STAR

Suggested Lead

In-house or third-party

Value

- Benchmarking energy use is the practice of comparing a building's current energy use to a baseline year
- Benchmarking keeps building management teams accountable for a building's annual energy usage and tracks a building's progress toward energy saving goals
- Establish a baseline for energy usage at a building, by uploading a minimum of 12 months of whole-building utility data to ENERGY STAR Portfolio Manager
- Using ENERGY STAR Portfolio Manager, produce an energy use intensity (EUI) value and ENERGY STAR Score
- An ENERGY STAR Score is a value out of 100 that represents a building's energy performance. The score is normalized by climate, operational hours, occupancy, and building size
- Use the ENERGY STAR Score to compare buildings to identify underperforming buildings in a portfolio and compare a building's performance to other properties of a similar use

Linked Questions:

E3.2a - Benchmarking Carbon Emissions

E4.3 — Data Monitoring: Regularly monitor energy data

Description

It is important to establish energy baselines to enable measurement and tracking of progress toward net-zero goals.

Portfolio owners may want to benchmark their properties against other buildings within their portfolio to evaluate comparative progress and prioritize asset renewals.

References

[Property characteristics](#)

[ENERGY STAR guidance](#)

[ENERGY STAR FAQ](#)

Adapted BB 3.0 Question

Question 01.02.01 — Do you benchmark energy performance using either BOMA BEST or ENERGY STAR Portfolio Manager portal?

E3.1b – Sub-Metered Data

Focus Area

Energy and Carbon

Topic

Benchmarking

Question

E3.1b – Sub-Metered Data

Question

Is any sub-metered energy use available for the most recent 12 months?

Applicability

Enclosed Shopping Center, Universal, Multi-Unit Residential, Light Industrial, Open Air Retail
Tenant occupied building

Answer & Scoring

- Yes = 2 points
- No = 0 points
- Not Applicable – Owner/landlord occupied building **OR** Tenant occupied building: Pursuing E3.1a = 0/0

Max of 2 points

Requirements

For any sub-metered energy data available:

- a) Provide monthly sub-metered energy data in table format – see [BOMA BEST Form E1.0b](#)
- b) Provide energy sub-meter details, such as make, model, location, photo and year of installation
- c) Indicate whether any energy is generated and used on-site and whether that use has been sub-metered

If E3.1a is being pursued the building is not eligible for this point.

Documentation

- Most recent 12 months of sub-metered energy use
- Narrative of data collection methodology and sub-meter data, if available

OR

- Narrative indicating that E3.1a is being pursued

Suggested Lead

In-house

Value

- Analyze sub-metered energy data to better understand energy consumption associated with individual energy intensive systems
- Determine how energy use has changed over the lifetime of the building to assess if adjustments need to be made
- Building management teams are encouraged to document the building's sub-metering practices using the BOMA BEST Form - E1.0b

Linked Questions:

E4.3 — Data Monitoring: Regularly monitor energy data

Description

Sub-meters measure the energy consumption of specific areas or equipment, providing property owners and managers with the ability to understand where and how building energy is being used

References

None

Adapted BB 3.0 Question

Question 01.03.02 — Does building management track and monitor building performance and consumption patterns?

E3.2 — Benchmarking Carbon Emissions

Focus Area

Energy and Carbon

Topic

Benchmarking

Question

E3.2 — Benchmarking Carbon Emissions

Question

Are the building's carbon emissions quantified and benchmarked?

Applicability

All asset classes

Owner/landlord occupied building – whole-building

Tenant occupied building – owner has access to utility data for the whole-building

Tenant occupied building – systems managed by the owner/landlord

Answer & Scoring

Select one of the following:

- Yes – Enter the most recent greenhouse gas (GHG) emissions intensity ($\text{kgCO}_2\text{e}/\text{ft}^2$) from ENERGY STAR = 2 points
- No = 0 points
- Not Applicable – Tenant occupied building: Owner/landlord does not have access to utility data **OR** Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 2 points

Requirements

To determine the most recent whole-building greenhouse gas (GHG) emissions intensity ($\text{kgCO}_2\text{e}/\text{ft}^2$):

- a) Enter whole-building carbon emissions data (direct and indirect) under the benchmarking section of the BOMA BEST hub (bomabesthub.com)
- b) If whole-building carbon emissions are calculated by adding data from different bills or sub-meters, provide a brief narrative describing the methodology applied. Show how the 12-month total use was calculated
- c) If any spaces were excluded, provide a brief narrative describing the methodology applied
- d) For any sub-meters referenced, provide details, such as make, model, location, photo and year of installation
- e) Calculate GHG emissions intensity for the building based on the utility data available, direct and indirect emission factors in the region, systems controlled by the owner/landlord and the floor area.

ENERGY STAR defines Greenhouse Gas (GHG) Emissions as follows:
<https://portfoliomanager.energystar.gov/pm/glossary#GHGEmissions>

Documentation

Provide all of the following:

- Data Verification Checklist printed from ENERGY STAR or a screenshot from BOMA BEST Benchmarking section showing the GHG emissions intensity
- Narrative of benchmarking methodology and sub-meter data, if available
- Emission factors per fuel type and reference source
- Greenhouse gas (GHG) emissions intensity calculations

Suggested Lead

In-house, with third-party support if needed

Value

- Benchmarking carbon emissions helps keep building management teams to be accountable for a building's annual carbon emissions and track a building's progress toward carbon emissions reduction goals
- Upload whole-building utility data to EnergyStar Portfolio manager, to track carbon emissions associated with energy use and determine the building's greenhouse gas (GHG) emissions intensity

Linked Questions:

E3.1a - Benchmarking Energy Use

E4.3 — Data Monitoring: Regularly monitor carbon data

Description

It is important to establish carbon baselines to enable measurement and tracking of progress toward net-zero goals.

Portfolio owners may also benchmark their properties against other buildings within their portfolio to evaluate comparative progress and prioritize asset renewals.

References

[ENERGY STAR](#)

[ENERGY STAR Portfolio Manager](#)

[ENERGY STAR Building Emissions Calculator \(US only\)](#)

[US EPA](#)

[Canadian Regional Median Greenhouse Gas Emissions Intensity](#)

[Building Benchmark BC](#)

[BC Government PSO](#)

[Montreal's Bylaw](#)

[Greenhouse Gas Protocol](#)

[Institute for Global Environmental Strategies](#)

[European Environmental Agency](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E3.3 – Third-party Recognition

Focus Area

Energy and Carbon

Topic

Benchmarking

Question

E3.3 – Third-party Recognition

Question

Has the building's energy use or carbon emissions been certified by, reported to, or recognized by a third-party?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – Owner has access to utility data

Answer & Scoring

- Yes = 1 point per option selected
Select all that apply:
 - Yes — ENERGY STAR Certification or equivalent achieved (Office, Healthcare, MURB) = 1 point
 - Yes — GHGs reported to third-party = 1 point
 - Yes — Organization has disclosed net zero targets publicly = 1 point
 - Yes — Organization's targets are science-based = 1 point
- No = 0 points
- Not applicable – Tenant occupied building: Owner/landlord does not have access to utility data = 0/0

Max of 4 points (Office, Healthcare, MURB)/Max of 3 points (ESC, Universal, Light Industrial, OAR)

Requirements

Complete any of the following:

- a) Obtain certification from the Environmental Protection Agency, NRCAN (or equivalent) that the building's performance meets the required performance threshold
- b) Report GHG emissions (at the organization, portfolio or building level) to a third-party verifier
- c) Disclose commitment to achieving net-zero emissions within the next 40 years publicly
- d) Seek third-party recognition that the net-zero targets are science-based

Only reporting to a third-party does not satisfy the requirements. The applicant needs to provide proof that the data has been validated by a third-party.

Documentation

Provide the following as applicable to the option(s) selected:

- ENERGY STAR Certificate or equivalent
- Evidence of third-party GHG Disclosure
- Evidence of public disclosure of organization's net-zero targets
- Evidence that net-zero targets are science-based

Suggested Lead

In-house, with third-party support

Value

- Third-party recognition is a way for a building to demonstrate their excellence in reducing their energy use and carbon emissions
- Third-party recognition adds validity to a building's energy and carbon reduction claims and adds an element of transparency in the public eye
- A building with certification from a well-respected high-performance building program is more attractive to potential tenants and stands out from other buildings

Description

Third-party verification of data demonstrates accountability to following best practices for collecting and reporting energy and carbon data. Certifications from well-respected, high-performance building programs demonstrate commitment to operational excellence.

References

[The Climate Registry](#)

[Science Based Targets Initiative](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E4. Tracking and Monitoring

E4.1a – Energy Use Tracking

Focus Area

Energy and Carbon

Topic

Tracking and Monitoring

Question

E4.1a – Energy Use Tracking

Question

Was whole-building energy use data tracked before and during Covid?

Applicability

Office, Healthcare, Multi-Unit Residential Building

Owner/landlord occupied building

Tenant occupied building – Owner has access to utility data

Answer & Scoring

- Yes = 2 points
Enter all available information for the following:
 - ENERGY STAR score, if applicable, before Covid (2017, 2018 or 2019)
 - Average Normalized Energy Use Intensity (EUI), before Covid (2017 to 2019)
 - ENERGY STAR score, if applicable, during Covid (2020, 2021 or 2022)
 - Average Normalized Energy Use Intensity (EUI), during Covid (2020 to 2022)
- No = 0 points
- Not Applicable – Tenant occupied building: Owner/Landlord does not have access to utility data **OR** Tenant occupied building: Pursuing E4.1b **OR** Building built during or after the year 2022 = 0/0

Max of 2 points

Requirements

To generate the whole-building energy use intensity, EUI (ekWh/ft²):

- Enter the past years' whole-building energy use data under the Benchmarking section of the online hub (bomabesthub.com)
- Enter any 12-month average EUI under the Answer section, over the 2017 to 2019 years before Covid
- Enter any 12-month average EUI under the Answer section, over the 2020 to 2022 years during Covid
- If whole-building energy use is calculated by adding data from different bills or sub-meters, provide a brief narrative describing the methodology applied. Show how the 12-month total use was calculated

- If any spaces were excluded, provide a brief narrative describing the methodology applied
- For any sub-meters referenced, provide details, such as make, model, location, photo and year of installation
- Indicate whether any energy is generated on-site and whether that use has been sub-metered
- Calculate EUI for the building based on the utility data available and the floor area

OR

- Documentation demonstrating that the building was built during or after the year 2022

Note that tenant occupied buildings that cannot pursue E4.1 a, must answer E4.1 b.

Documentation

Provide all of the following:

- Data Verification Checklist printed from ENERGY STAR or a screenshot from BOMA BEST Benchmarking section showing the past years' energy use (ekWh/ft²) before 2020 and after 2019
- Calculation method used to determine the 12-month average
- Narrative of benchmarking methodology and sub-meter data, if available

OR

- Documentation demonstrating that the owner does not have access to utility data (e.g. lease agreement)

OR

- Narrative indicating that E4.1 b is being pursued

Suggested Lead

In-house

Value

- The COVID-19 pandemic had a significant effect on building energy use
- Analyze whole-building energy data to better understand the building's energy use before and during the COVID-19 pandemic
- Determine how energy use has changed since the pandemic to assess if the building is on track to achieve their energy reduction goals

Description

Utility data must be tracked and monitored to provide information necessary for assessing a building's energy consumption. This measurement will allow the team to set and track progress toward goals, implement corrective actions and inform larger strategies.

References

[ENERGY STAR Portfolio Manager](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E4.1b – Tracking Sub-Metered Use

Focus Area

Energy and Carbon

Topic

Tracking and Monitoring

Question

E4.1b – Tracking Sub-Metered Use

Question

Was any sub-metered energy use data tracked before and during Covid?

Applicability

Office, Healthcare, Enclosed Shopping Centre, Universal, Multi-Unit Residential Building, Light Industrial

Tenant occupied building

Answer & Scoring

- Yes = 2 points
- No = 0 points
- Not Applicable – Owner/landlord occupied building **OR** Building built during or after the year 2022 **OR** Pursuing E4.1a = 0/0

Max of 2 points

Requirements

For any sub-metered energy data available:

- Provide monthly sub-metered energy data in table format – see [BOMA BEST Form E1.0b](#)
- Provide energy sub-meter details, such as make, model, location, photo and year of installation
- Indicate whether any energy is generated and used on-site and whether that use has been sub-metered

Applicants do not need to provide data for all five previous years. Provide the following, at a minimum:

- data from one year before Covid, i.e. any time between 2017 and 2019

AND

- data from one year during Covid, i.e. any time between 2020 and 2022

OR

- Documentation demonstrating that the building was built during or after the year 2022

If E4.1 a is being pursued the building is not eligible for this point.

Documentation

- Most sub-metered energy use before Covid (2017 – 2019) and during Covid (2020 – 2022)
- Narrative of data collection methodology and sub-meter data, if available

OR

- Narrative indicating that E4.1a is being pursued

OR

- Documentation demonstrating that the building was built during or after the year 2022

Suggested Lead

In-house

Value

- The COVID-19 pandemic had a significant effect on building energy use
- Analyze sub-metered energy data to better understand energy consumption associated with individual energy intensive systems and tenants before and after the COVID-19 pandemic
- Determine how energy use has changed since the pandemic to assess if the building is on track to achieve their energy reduction goals
- Building management teams are encouraged to document the building's sub-metering practices using the BOMA BEST Form - E1.0b

Description

Sub-meters measure the energy consumption of specific areas or equipment, providing property owners and managers with the ability to understand where and how building energy is being used.

References

None

Adapted BB 3.0 Question

Question 01.03.02 — Does building management track and monitor building performance and consumption patterns?

E4.2 — Carbon Emissions Tracking

Focus Area

Energy and Carbon

Topic

Tracking and Monitoring

Question

E4.2 — Carbon Emissions Tracking

Question

Are the carbon emissions associated with whole-building energy use tracked beyond the most recent 12 months?

Applicability

Office, Healthcare, Multi-Unit Residential Buildings, Universal
Owner/landlord occupied building
Tenant occupied building – Owner has access to utility data

Answer & Scoring

- Yes = 4 points
Enter:
 - 12-month kgCO₂e/ft² average before Covid (2017, 2018 or 2019)
 - 12-month kgCO₂e/ft² average during Covid (2020, 2021 or 2022)
- No = 0 points
- Not Applicable – Tenant occupied building: Owner/Landlord does not have access to utility data **OR** Building built during or after the year 2022 = 0/0 points

Requirements

To generate the most recent whole-building greenhouse gas (GHG) emissions intensity (kgCO₂e/ft²):

- a) Enter the past years' carbon emissions (direct and indirect) data under the benchmarking section of the online hub (bomabesthub.com)
- b) Enter the annual averages (kgCO₂e/ft²) under the Answer section, from before 2020 and after 2019
- c) If carbon emissions are calculated by adding data from different bills or sub-meters, provide a brief narrative describing the methodology applied. Show how the 12-month total use was calculated
- d) If any spaces were excluded, provide a brief narrative describing the methodology applied
- e) For any sub-meters referenced, provide details, such as make, model, location, photo and year of installation
- f) Calculate GHG emissions intensity for the building based on the utility data available, direct and indirect emission factors in the region, systems controlled by the owner/landlord and floor area.

OR

- g) Documentation demonstrating that the building was built during or after the year 2022

ENERGY STAR defines greenhouse gas (GHG) emissions as

follows: <https://portfoliomanager.energystar.gov/pm/glossary#GHGmissions>

Documentation

Provide all of the following:

- Data Verification Checklist printed from ENERGY STAR or a screenshot from BOMA BEST Benchmarking section showing the past years' carbon emissions (kgCO₂e/ft²), before 2020 and after 2019
- Calculation method used to determine the 12-month average
- Narrative of benchmarking methodology and sub-meter data, if available
- Emission factors per fuel type and reference source
- Greenhouse gas (GHG) emissions intensity calculations

OR

- Documentation demonstrating that the building was built during or after the year 2022

Suggested Lead

In-house, with third-party support

Value

- The COVID-19 pandemic had a significant effect on building carbon emissions
- Analyze whole-building carbon emissions to better understand their carbon emissions before and after the COVID-19 pandemic
- Determine how carbon emissions have changed since the pandemic to assess if the building is on track to achieve their carbon reduction goals

Linked Questions:

E4.1a - Energy Use Tracking: Analyze the effects of the pandemic on whole-building energy use

Description

Carbon emissions due to energy consumption at the building must be calculated to inform progress toward goals and identify priorities for upgrades and optimization.

Emissions vary by fuel source and electricity is regionally dependent. Emission factors should be obtained from local utility, a government source or other credible source.

References

[ENERGY STAR](#)

[ENERGY STAR Portfolio Manager](#)

[ENERGY STAR Building Emissions Calculator \(US only\)](#)

[US EPA](#)

[Canadian Regional Median Greenhouse Gas Emissions Intensity](#)

[Building Benchmark BC](#)

[BC Government PSO](#)

[Greenhouse Gas Protocol](#)

[Institute for Global Environmental Strategies](#)

[European Environmental Agency](#)

Applicability

Office, Healthcare, Multi-Unit Residential Buildings

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E4.3 – Data Monitoring

Focus Area

Energy and Carbon

Topic

Tracking and Monitoring

Question

E4.3 – Data Monitoring

Question

How frequently are energy use and carbon emissions trended and monitored?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building: Owner has access to utility data

Answer & Scoring

- Yes = Points as indicated
Select the most finite:
 - Annually — energy and carbon = 1 point
 - Monthly — energy and carbon = 2 points
 - Daily — electricity and other fuel sources = 3 points
 - In Real-time — electricity and other fuel sources = 4 points
- No = 0 points
- Not applicable – Tenant occupied building: Owner/Landlord does not have access to utility data = 0/0

Max of 4 points

Requirements

- a) Demonstrate that energy use data is regularly tracked and reviewed by the building operations and management team
- b) Graph or table comparing the most recent year's energy use or carbon emission patterns with the patterns of prior years, showing daily, weekly, monthly or seasonal trends as available
- c) Brief narrative outlining building management's approach to data monitoring. This should explain why trends occurred, including weather, occupancy fluctuations, unexpected leaks, meter faults, conservation projects or corrective actions implemented

Documentation

Provide all of the following:

- Sample set of trend reports or screenshots of data monitoring dashboard demonstrating frequency of tracking
- Narrative outlining building management's approach to data monitoring

Suggested Lead

In-house, with third-party support

Value

- Monitor energy and carbon data more regularly to be familiar with the building's energy use and carbon emissions
- Regularly monitor data to more quickly identify potential issues in building systems and respond to operational inefficiencies

Description

Annual energy consumption and carbon emissions can be normalized by floor area for assessment of trends and benchmarking against other properties, using energy use intensity (EUI) and greenhouse gas intensity (GHGI).

Real-time monitoring of energy consumption and demand provides data necessary for assessment and correction of operational issues. Real-time energy management allows for adjustments and identification of potential measures that will optimize building performance.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E5. Conservation Measures

E5.1 – Energy and Carbon Conservation

Focus Area

Energy and Carbon

Topic

Conservation Measures

Question

E5.1 – Energy and Carbon Conservation

Question

Which energy conservation or carbon reduction measures were implemented in the past five years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – systems managed by the owner/landlord

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- >50% of low-and no cost measures (scheduling, sensors, fans etc.) identified in the last energy assessment = 1 point
- >50% of all the ECMs identified in the most recent past two energy assessments = 1 point
- LED retrofit in common or back-of-house areas = 1 point
- LED retrofit in tenant spaces / resident suites = 1 point
- LED retrofit as part of tenant change-over = 1 point
- HVAC retrofit = 2 points
- HVAC retrofit as part of tenant change-over = 2 points
- No = 0 points
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 5 points (Office, Healthcare, ESC, Universal, MURB, Light Industrial)/Max of 3 points (OAR)

Requirements

- a) Review and list energy conservation or carbon reduction measures identified in the past five years
- b) Document what was implemented

Documentation

- Previous energy assessment identifying energy conservation or carbon reduction measures (if applicable)
- Documentation demonstrating the energy conservation or carbon reduction measure has been implemented

Suggested Lead

In-house

Value

- Implementing conservation measures is beneficial in reducing operational costs, energy consumption, carbon emissions, and a building's overall environmental impact
- Implement energy and carbon conservation measures (ECMs and CCMs) identified in the energy and carbon assessment completed for the Baseline Practice requirements

Linked Questions:

E8.1a - LEDs: Install LEDs in interior and exterior spaces

Description

Energy conservation and carbon reduction recommendations identified in assessments are typically identified as no-/low-cost, medium-cost or capital projects. They can also be prioritized by urgency, financial metrics, complexity, environmental impact or other relevant criteria.

Low hanging fruit are generally considered operational efficiency improvements or small upgrades that are simple to implement and easily budgeted but often have lower energy reduction potential than capital measures.

Larger, more complex projects require planning and budgeting, are generally medium- or long-term projects and will significantly reduce energy consumption and carbon emissions. Major capital projects are likely required to achieve net-zero carbon.

No-/low-cost measures to improve operational efficiency are important to implement short-term to reduce as much energy and carbon as possible before larger projects are budgeted and scheduled.

References

[Case Studies](#)

[EPA Checklists of Energy-Saving Measures](#)

Adapted BB 3.0 Question

Question 01.03.04 — Has a low-cost energy conservation measure been implemented in the past three years?

E5.2 – Conservation Achieved

Focus Area

Energy and Carbon

Topic

Energy and Carbon Conservation Measures

Question

E5.2 – Conservation Achieved

Question

Is there evidence that energy efficiency has improved, or carbon emissions reduced due to measures implemented in the past five years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – systems managed by the owner/landlord

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Energy Efficiency Improved = 1 point
 - Carbon Emissions Reduced = 2 points
- No = 0 points
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 3 points

Requirements

- a) Identify the energy and or carbon reduction measures implemented in the past five years that are known to have caused energy efficiency or carbon reductions
- b) Reference measured data and prepare high-level M&V analysis to demonstrate efficiencies or reductions achieved
- c) Describe performance before the measure(s) were implemented and how performance changed after the measure(s) were implemented
- d) Describe how operational changes due to Covid etc. were considered and excluded from the high-level M&V analysis

Savings achieved can be specific to a particular ECM or CRM, or may apply to the whole-building, whatever data is available.

Documentation

- High-level calculations and brief narrative describing reductions achieved

Suggested Lead

In-house

Value

- Use high-level conservation calculations to confirm that implemented conservation measures are significantly reducing the building energy consumption and carbon emissions
- Conservation measures may need to be reassessed if implemented measures are not effective

Description

The real impact of specific energy improvement or carbon reduction measures is often clouded by the impact of ancillary operational activities and equipment performance, as well as pre- and post-retrofit measurement and verification (M&V) methods. Consider to what extent the weather and occupancy contribute to the before and after consumption or emission results and normalize the data accordingly. Operations and maintenance (O&M) activities changed substantially during Covid, and O&M activities post-Covid may also differ from pre-Covid activities. There may be other factors that impact performance before and after implementation, whether it is the consultants providing support, the measurement devices used, the timing of measurement intervals etc. Establish measuring parameters before the implementation of the ECMs or CRMs to develop more reliable results.

References

[Measurement and Verification \(M&V\) Principles](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E5.3 – Energy and Carbon in New Tenancies

Focus Area

Energy and Carbon

Topic

Energy and Carbon Conservation Measures

Question

E5.3 – Energy and Carbon in New Tenancies

Question

Is there a procedure in place for reviewing the efficiency of tenant-controlled HVAC equipment at lease expiration?

Applicability

All asset classes

Tenant occupied building

Answer & Scoring

- Yes = 3 points
- No = 0 points
- Not applicable – Owner/landlord occupied building = 0/0

Max of 3 points

Requirements

- a) Implement a process for reviewing the efficiency of tenant HVAC equipment at lease expiry, with recommendations to address any deficiencies related to:
 - Energy efficiency
 - Carbon reduction
- b) Describe corrective actions planned and implemented, and person responsible

Documentation

- Narrative describing process to assess and improve HVAC equipment at lease expiration

Suggested Lead

In-house

Value

- Poorly maintained and operated systems can negatively affect adjacent building systems leading to operational inefficiencies
- Understand the effect tenant-controlled systems have on base-building and other tenant-controlled systems
- Review tenant operations and implement corrective actions to prevent operational inefficiencies from affecting building performance
- Tenant change-overs are an opportunity to perform in-depth reviews of tenant-controlled systems and upgrade systems to more energy efficient and low-carbon models

Description

Where tenants manage HVAC equipment, owner or landlords should be aware of operations and maintenance practices within tenant spaces to check that tenant practices are not negatively impacting adjacent or base building components that are the owner or landlord's responsibility.

When the lease expires the owner or landlord has the opportunity to replace inefficient equipment and implement strategies that could advance the organization's energy efficiency and net zero goals.

References

[ASHRAE 180 "Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems"](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E6. Operations and Maintenance Optimization

E6.1 — Existing Building Commissioning Investigation

Focus Area

Energy and Carbon

Topic

O&M Optimization

Question #

E6.1 — Existing Building Commissioning Investigation

Question

Has an Existing Building Commissioning, Recommissioning or Retro-Commissioning Investigation or Operational Optimization Study been completed in the last five years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – all systems managed by the owner/landlord

Answer & Scoring

- Yes = 3 points
- No = 0 points
- Not Applicable – Tenant occupied building: Some or no systems managed by the owner/landlord = 0/0

Max of 3 points

Requirements

The Existing Building Commissioning Investigation or Optimization Study must include:

- a) Documentation, detailed site review and interviews with building O&M staff
- b) A review of the building automation system
- c) Preparing for and conducting system functional testing
- d) Sources of performance problems
- e) Energy conservation and/or carbon reduction measures with costing, simple payback and anticipated savings
- f) A demonstration that the investigation methodology applied aligns with the Building Commissioning Association (BCA)'s Existing Building Commissioning Best Practices in Chapter 3 — Investigation Phase at a minimum.

Documentation

- Existing Building Commissioning Investigation or Operational Optimization Study

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

Suggested Lead

Third-party

Value

- Existing building commissioning involves engaging a qualified professional to test and verify existing building systems
- The existing building commissioning process will include correcting potential operational inefficiencies by adjusting the operations of systems and equipment to optimize performance. This can lead to cost savings, energy savings, and a reduction of carbon emissions

Description

Existing building commissioning (EBCx) is an intensive process that tests, verifies and adjusts the operation of systems and equipment to optimize performance. This can be accomplished through periodic commissioning or operational optimization assessment and implementation by qualified professionals or on a continuous basis through automated fault detection and diagnostics (FDD). Commissioning will result in cost savings, energy reduction and carbon reduction.

References

[BCA Existing Building Commissioning Best Practices](#)

[ASHRAE Guideline 0.2-2015 – Commissioning Process For Existing Systems And Assemblies](#)

[Building Operation Optimization: Recommissioning Guide for Building Owners and Managers](#)

[ENERGY STAR Building Upgrade Manual Chapter 5: Retro-commissioning](#)

[Medical Gas Piping Systems](#)

Adapted BB 3.0 Question

Question 01.03.06 — Are the equipment and energy systems regularly re- or retro-commissioned?

E6.2 — Fault Detection

Focus Area

Energy and Carbon

Topic

O&M Optimization

Question

E6.2 — Fault Detection

Question

Is Fault Detection and Diagnosis (FDD) in place?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building - all systems managed by the owner/landlord

Answer & Scoring

- Yes = 3 points
- No = 0 points
- Not Applicable – Tenant occupied building: Some or no systems managed by the owner/landlord = 0/0

Max of 3 points

Requirements

Demonstrate the ability of the technology to provide:

- a) Root cause analysis and functional testing
- b) Fault detection autonomous system adjustment. System has the ability to auto-adjust operations to alleviate potential issues
- c) Prevent recurrences of false or non-critical alarms

Documentation

Any combination of the following that demonstrates requirements have been met:

- Digital Enablement Specifications (BMS, Lighting, EV Charging, Electrical, Fire, Vertical Transportation)
- Vendor Documentation (specifications, commissioning report, technical reports, functionality design reports)
- Compliance Registers
- Use Case – Benefits realization report
- Integrations Report

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

Suggested Lead

In-house

Value

- Fault detection and diagnosis (FDD) is a component in some building automation systems (BAS) that identifies potential operational errors and endeavors to adjust operations to prevent these errors from occurring. This system is autonomous and requires no manual intervention
- An FDD system can help optimize operations which can lead to cost savings, energy savings, and reduce carbon emissions

Linked Questions:

- **E6.1 - Retro-commissioning:** Use for ongoing retro-commissioning

Description

Pre-empt building system faults based on machine learned behavior. Recognize patterns that resulted in faults and send alerts when the same pattern recurs. Optimize maintenance processes. Reduce building system fault occurrences and increase building up time.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E7. Controls

E7.1 – Building Automation

Focus Area

Energy and Carbon

Topic

Controls

Question #

E7.1 – Building Automation

Question

Does the building have an operational building automation system (BAS)?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – systems managed by the owner/landlord

Answer & Scoring

Select one of the following:

- Yes – Direct Digital Control = 2 points
- Yes – Hybrid = 1 point
- Yes – Pneumatic = 1 point
- No = 0 points
- Not Applicable – Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 2 points

Requirements

- a) Identify the type of building automation system (BAS) in use in the building
- b) List types of equipment connected to the BAS
- c) Describe the most recent upgrade

If any major systems or equipment are not connected, provide a brief narrative outlining the rationale and briefly describe how the systems and equipment are controlled.

Direct digital control (DDC): Uses electrical signals or wireless technologies to operate and communicate with parts of a system. Operators use an interface device, typically a computer, to monitor and communicate with devices. If the building operates on small-scale HVAC equipment (e.g., furnaces, rooftop units under 20 tonnes, etc.), then they typically utilize smart controllers, which fall under DDC

Pneumatic: Uses a compressor to keep systems at a constant pressure. Pressure increases or decreases as a valve or actuator moves. Desired operation on a device is based on the pressure set point of the valve or actuator connected to it.

Hybrid: A combination of both DDC and Pneumatic

Documentation

- Narrative outlining the information listed in the requirements
- Photos of BAS installed

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

Suggested Lead

In-house

Value

- Building automation systems (BAS) allow building operations to be centrally controlled and monitored
- Building operations staff can oversee operations through the BAS and make adjustments to ensure systems are operating effectively
- A more advanced BAS can result in a higher level of system optimization
- Install a direct digital control (DDC) BAS as it provides the most control, accuracy, responsiveness, and reliability

Linked Questions:

E6.2 - Fault Detection: Include fault detection in BAS upgrades

E7.2 - Control Strategies: Implement operational control strategies through BAS

E8.3 - Lighting Zones: Control lighting through BAS

Description

Building automation systems (BAS) control equipment and systems, including HVAC and lighting. Building automation systems can take on different forms, including standalone onboard controllers for specific pieces of equipment, legacy pneumatic controls or direct digital control (DDC) systems.

Through automation, building systems can be monitored and adjusted to ensure that they are performing optimally and can facilitate the implementation of energy and carbon reduction measures.

DDC systems are often preferred for controllability, accuracy, reliability, responsiveness, accessibility, connectivity and reduced maintenance.

For some types of buildings and systems, a fully integrated BAS is not practical. Other solutions for responsive controls may be more appropriate.

References

None

Adapted BB 3.0 Question

Question 01.04.01 — What type of BAS is in place at the building?

E7.2 – Control Strategies

Focus Area

Energy and Carbon

Topic

Controls

Question

E7.2 – Control Strategies

Question

What control strategies are in place?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – some or all systems managed by the owner/landlord

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Night or unoccupied setback = 1 point
 - Optimal start-up = 1 point
 - Occupancy and equipment scheduling = 1 point
 - Standby mode (occupied vs. unoccupied) = 1 point
 - Heating water temperature setpoints/reset = 1 point
 - Chilled water temperature setpoints/reset = 1 point
 - Supply air temperature setpoints/reset = 1 point
 - Outdoor air temperature setpoints/reset = 1 point
 - Demand controlled ventilation = 1 point
 - Programmable thermostats in tenant or residential suites = 1 point
 - Economizer control = 1 point
 - Fan/pump speed control through Variable Frequency Drives (VFDs) = 1 point
- No = 0 points
 - Not Applicable – Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 4 points

Requirements

- a) Identify appropriate control strategies for the building
- b) Demonstrate implementation

Documentation

- Screenshots of BAS
- Narrative describing whether control strategies are adjusted to align with changing operating hours. Provide justification if not feasible or appropriate.

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

Suggested Lead

In-house, with third-party support

Value

- Implement operational control strategies to optimize system operations
- Use controls strategies to tailor systems to reflect a building's use, occupancy, and day-to-day needs
- Implement control strategies to improve building operations, save on operational costs, and reduce energy use and carbon emissions

Description

Through automation, building systems can be monitored and adjusted to ensure that they are performing optimally and can facilitate the implementation of energy and carbon reduction measures.

References

[ASHRAE Guideline 13-2015 - Specifying Building Automation Systems](#)

Adapted BB 3.0 Question

Question 01.03.05 – Are control strategies used on the mechanical equipment to reduce energy consumption and demand?

E7.3 — Controls Optimization

Focus Area

Energy and Carbon

Topic

Controls

Question

E7.3 — Controls Optimization

Question

Are mechanisms in place to proactively assess system and/or equipment performance for optimization opportunities?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – some or all systems managed by the owner/landlord

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Review of operational trends in the past three to five years = 1 point
 - In-house (on-site or remote) BAS/optimization technician = 1 point
 - Third-party BAS technician provides at least monthly in-person support = 1 point
- No = 0 points
- Not Applicable – Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 3 points

Requirements

- a. Provide a brief description of the system or process for assessing equipment performance
- b. Include examples of optimization or corrections that were implemented as a result of the monitoring and diagnostic system or process

In-house BAS technician refers to someone on the building operations team who received required training to competently manage the building's BAS.

Documentation

- Describe the impact of the mechanism and any corrections implemented

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

Suggested Lead

In-house, with third-party support

Value

- Building automation systems (BAS), like any other building system, requires maintenance to operate properly
- Have a dedicated in-house and/or third-party BAS technician
- A BAS technician should be well versed in the system and be tasked with ensuring the BAS is operating properly. A BAS technician may be required to make adjustments to building systems to ensure optimized performance

Description

BAS systems require optimization to ensure they are tailored to the systems they serve. Systems need to be assessed periodically as changing requirements (activity types, occupancy rates, operating hours, etc.) often lead to new opportunities.

References

[ASHRAE Guideline 36-2021 – High-Performance Sequences Of Operation For HVAC Systems](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E8. Lighting

E8.1a – LEDs

Focus Area

Energy and Carbon

Topic

Lighting

Question

E8.1a – LEDs

Question

Is LED lighting installed in spaces controlled by the owner or landlord?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes – Points as indicated below:

Select all that apply:

- Yes — More than 50% of owner/landlord managed exterior spaces have LEDs = 1 point
- Yes — More than 50% of owner / landlord managed interior spaces have LEDs = 1 point
- Yes — More than 50% of tenant managed exterior spaces have LEDs = 1 point
- Yes — More than 50% of tenant managed interior spaces have LEDs = 1 point
- No – less than 50% of building lighting is LEDs = 0 points

Max of 2 points

Requirements

- a) Mark up a floor plan or take photos to indicate extent of interior and exterior LED installation
- b) Keep a record of LED product specifications

Documentation

- Sample of floor plans, photos, and product specifications of LED installation

Suggested Lead

In-house

Value

- As LED lighting fixtures are the most energy efficient type of lighting, replacing building fixtures with LED lighting can significantly reduce operational costs and energy use
- Converting to LED lighting has the added benefit of reducing mercury-containing lighting in the building which reduces health risks for occupants and building staff

Description

Lighting represents a significant percentage of electricity end use and contributes to electrical demand (kW) in addition to consumption (kWh).

Reduction of lighting energy consumption can reduce electricity consumption and costs, lower impact on the electrical grid, assist with ensuring there is sufficient capacity for building electrification or EV charging and reduce carbon emissions associated with electricity, particularly where the electrical grid has a high emission factor.

Optimization can be achieved through efficient fixtures and enhanced controls while also maintaining occupant safety.

References

None

Adapted BB 3.0 Question

Question 01.04.04 — What percent of the building exterior and parking lot fixtures have LED lamps or automated controls?

E8.1b – LEDs

Focus Area

Energy and Carbon

Topic

Lighting

Question

E8.1b – LEDs

Question

Are LED lighting installed in spaces controlled by the residents?

Applicability

Multi-Unit Residential Building

Tenant occupied building

Answer & Scoring

- Yes — More than 50% of tenant residential units have LEDs = 3 points
- No = 0 points

Max of 3 points

Requirements

- a) Mark up a sample floor plan or take photos to indicate extent of LED installation
- b) Keep a record of LED product specifications

Documentation

- Sample of floor plans, photos and product specifications of LED installation

Suggested Lead

In-house

Value

- As LED lighting fixtures are the most energy efficient type of lighting, replacing building fixtures with LED lighting can significantly reduce operational costs and energy use
- Converting to LED lighting has the added benefit of reducing mercury-containing lighting in the building which reduces health risks for occupants and building staff

Description

Lighting represents a significant percentage of electricity end use and contributes to electrical demand (kW) in addition to consumption (kWh).

Reduction of lighting energy consumption can reduce electricity consumption and costs, lower impact on the electrical grid, assist with ensuring that there is sufficient capacity for building electrification or EV charging, and reduce carbon emissions associated with electricity, particularly where the electrical grid has a high emission factor.

Optimization can be achieved through efficient fixtures and enhanced controls while also maintaining occupant safety.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E8.2a – Light Sensors

Focus Area

Energy and Carbon

Topic

Lighting

Question

E8.2a – Light Sensors

Question

Are occupancy or daylight sensors installed in owner or landlord-controlled spaces, where appropriate?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Yes — More than 50% owner / landlord-managed interior lights have occupancy sensors = 2 points
- Yes – More than 50% of owner/landlord managed exterior lights have daylight/photocells = 2 points
- Yes — More than 50% tenant-managed interior lights have occupancy sensors = 2 points
- Yes — More than 50% tenant-managed exterior lights have daylight/photocell sensors = 2 points
- No – less than 50% of building lights have sensors / controls = 0 points

Max of 4 points

Requirements

- a) Mark up a floor plan or take photos to indicate extent of occupancy and/or daylight sensors installed

Documentation

- Sample of floor plans or photos of light sensor or controls installation

Suggested Lead

In-house

Value

- Traditionally, lighting at a building is scheduled for its operational hours. This method of lighting does not account for occupant use or natural light which often results in unnecessary artificial lighting
- Implement lighting controls, to turn lights on and off based on occupant needs and the weather conditions to save on energy associated with lighting

Description

Reduction of lighting energy consumption can reduce electricity consumption and costs, lower impact on the electrical grid, assist with ensuring that there is sufficient capacity for building electrification or EV charging, and reduce carbon emissions associated with electricity, particularly where the electrical grid has a high emission factor.

Optimization can be achieved through efficient fixtures and enhanced controls while also maintaining occupant safety.

References

None

Adapted BB 3.0 Question

Question 01.04.05 — What percentage of lighting fixtures are controlled by sensors?

E8.2b – Light Sensors

Focus Area

Energy and Carbon

Topic

Lighting

Question

E8.2b – Light Sensors

Question

Are occupancy sensors installed in tenant-controlled spaces, where appropriate?

Applicability

Multi-Unit Residential Building

Tenant occupied building

Answer & Scoring

- Yes — More than 50% of tenant residential units have occupancy sensors = 3 points
- No = 0 points

Max of 3 points

Requirements

- a) Mark up a sample floor plan or take photos to indicate extent of occupancy and/or daylight sensors installed in owner or landlord-controlled spaces
- b) Keep a record of occupancy sensor specifications

Documentation

- Sample of floor plans or photos of occupancy sensor installation

Suggested Lead

In-house

Value

- Traditionally, lighting at a building is scheduled for its operational hours. This method of lighting does not account for occupant use or natural light which often results in unnecessary artificial lighting.
- Implement lighting controls in tenant residential spaces, to turn lights on and off based on occupant needs and the weather conditions to save on energy associated with lighting.

Description

Reduction of lighting energy consumption can reduce electricity consumption and costs, lower impact on the electrical grid, assist with ensuring that there is sufficient capacity for building electrification or EV charging, and reduce carbon emissions associated with electricity, particularly where the electrical grid has a high emission factor.

Optimization can be achieved through efficient fixtures and enhanced controls while also maintaining occupant safety.

References

None

Adapted BB 3.0 Question

Question 01.04.05 — What percentage of lighting fixtures are controlled by sensors?

E8.3 – Lighting Zones

Focus Area

Energy and Carbon

Topic

Lighting

Question

E8.3 – Lighting Zones

Question

Are lighting controls installed in the building, where appropriate?

Applicability

Office, Healthcare, and Universal

Owner/landlord occupied building

Tenant occupied building – some or all systems managed by the owner/landlord

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Yes — lighting is on timers, scheduled or individually controlled = 1 point
 - Yes — spaces are zone controlled = 2 points
- No = 0 points
- Not Applicable – Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 3 points

Requirements

- a) Mark up a floor plan or take photos to indicate extent of lighting controls installed throughout the building

Documentation

- Sample of floor plans, photos or BAS screenshots of zoned controls installation

OR

- Documentation demonstrating that the owner does not manage the lighting controls (e.g. lease agreement)

Suggested Lead

In-house

Value

- Most buildings have multiple uses or tenants that have different operational periods. When all lighting is on the same schedule, it does not reflect a building's lighting needs and results in operational inefficiencies
- Implementing lighting zones at a building will reduce energy consumption associated with superfluous lighting
- Assign multiple lighting zones in a building's BAS to account for each building's use. Schedule zones independently to match each zone's operational schedule

Description

Reduction of lighting energy consumption can reduce electricity consumption and costs, lower impact on the electrical grid, assist with ensuring that there is sufficient capacity for building electrification or EV charging, and reduce carbon emissions associated with electricity, particularly where the electrical grid has a high emission factor.

Optimization can be achieved through efficient fixtures and enhanced controls while also maintaining occupant safety.

References

None

Adapted BB 3.0 Question

Question 01.04.07 — What percentage of the building's lighting is connected to an addressable lighting control system?

E9. Demand Management

E9.1 – Peak Demand

Focus Area

Energy and Carbon

Topic

Demand Management

Question #

E9.1 – Peak Demand

Question

Is the building's peak electrical demand known?

Applicability

Office, Healthcare, Enclosed Shopping Centre, Universal, Multi-Unit Residential Building, Light Industrial

Owner/landlord occupied building

Tenant occupied building – Owner/landlord has access to utility data

Answer & Scoring

- Yes = 1 point
- No = 0 points
- Not Applicable – Tenant occupied building: Owner/landlord does not have access to utility data = 0/0

Max of 1 point

Requirements

- a) Indicate the seasonal peak electrical demand values for the past year, highlighted on utility bills, monthly utility data summary or sub-metered data
- b) If electrical demand is not separately measured by the utility or the BAS, provide a monthly load profile based on electrical consumption for the past year with associated data

Documentation

- Utility data analysis identifying the seasonal peak electrical demand values over the past year

OR

- Documentation demonstrating that the owner does not have access to utility data (e.g. lease agreement)

Suggested Lead

In-house

Value

- Peak electrical demand occurs when the highest amount of electricity is drawn from the electric grid. As more buildings move towards electrification, the demand on the electrical grid increases, increasing the risk of brownouts
- Identify the building's seasonal peak electrical demand over the most recent operational year
- Understand when a building is most taxing on the grid to identify potential areas of reduction

Linked Questions:**E9.3 - Reducing Seasonal Peaks:** Identify and implement peak reduction measures**Description**

As more buildings “fuel switch” to electricity and as extreme temperatures become more frequent, additional burdens are placed on the electrical grid, particularly in peak seasons. This results in higher utility costs, less resilient infrastructure and the potential for a dirtier grid if gas-fired power plants are required to satisfy demand during times of peak usage.

Understanding peak demand patterns and schedules in buildings will allow building operators to identify opportunities to minimize the load and cost for electricity in heating and cooling seasons and other thermal heating fuel types.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E9.2 – Peak Demand

Focus Area

Energy and Carbon

Topic

Demand Management

Question

E9.2 – Peak Demand

Question

Is the month with the highest heating fuel consumption known?

Applicability

Office, Healthcare, Enclosed Shopping Centre, Universal, Multi-Unit Residential Building, Light Industrial

Owner/landlord occupied building

Tenant occupied building – Owner/landlord has access to utility data

Answer & Scoring

- Yes = 1 point
- No = 0 points
- Not Applicable – Tenant occupied building: Owner/Landlord does not have access to utility data = 0/0

Max of 1 point

Requirements

- a) Indicate highest consumption month based on the amount and type of heating fuel consumed for the past year, highlighted on utility bills or monthly utility data summary

Documentation

- Analysis of monthly utility data, identifying the highest heating consumption month and type of fuel consumed over the past year

OR

- Documentation demonstrating that the owner does not manage the lighting controls (e.g. lease agreement)

Suggested Lead

In-house

Value

- Many buildings rely on fuel (such as natural gas) for heating; this results in significant carbon emissions
- Identify the month with the highest fuel consumption at the building over the most recent operational year
- Understand peak fuel usage to identify areas of improvement to support carbon emission reduction at the building and support a transition to building decarbonization

Linked Questions:

E9.3 - Reducing Seasonal Peaks: Identify and implement peak reduction measures

Description

In colder climates buildings rely on fuel heating for space heating in many situations. However, as more buildings “fuel switch” to electricity and as extreme temperatures become more frequent, additional burdens are placed on the electrical grid, particularly in peak seasons. This results in higher utility costs, less resilient infrastructure, and the potential for a dirtier grid if gas-fired power plants are required to satisfy demand during times of peak usage.

Understanding peak demand patterns and schedules in buildings will allow building operators to identify opportunities to minimize the load and cost for electricity and gas in heating and cooling seasons and other thermal heating fuel types.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E9.3 – Reducing Seasonal Peaks

Focus Area

Energy and Carbon

Topic

Demand Management

Question

E9.3 – Reducing Seasonal Peaks

Question

Have low-carbon opportunities been identified or implemented to reduce seasonal peak heating loads and heating/cooling electrical demand?

Applicability

Office, Healthcare, Enclosed Shopping Centre, Universal, Multi-Unit Residential Building, Light Industrial

Owner/landlord occupied building

Tenant occupied building – Owner/landlord has access to utility data

Answer & Scoring

- Yes — opportunities identified = 1 point
- Yes — opportunities implemented = 2 points
- No = 0 points
- Not Applicable – Tenant occupied building: Owner/Landlord does not have access to utility data = 0/0

Max of 2 points

Requirements

- a) List energy/carbon reduction measures proposed or implemented that specifically address peak demand and high thermal loads
- b) Indicate anticipated or measured reduction in electrical demand (kW)

Proposed or implemented measures could include strategies, such as operational optimization and scheduling, system switchover, demand response programs, peak shedding programs, time-of-day usage or similar

Documentation

- Energy/carbon reduction measures proposed or implemented
- Anticipated or measured reduction in electrical demand

OR

- Documentation demonstrating that the owner does not manage the lighting controls (e.g. lease agreement)

Suggested Lead

In-house, with third-party support

Value

- Building off E9.1 - Peak Demand and E9.2 - Peak Demand Patterns, identify low carbon peak shaving opportunities
- For additional points, buildings are encouraged to implement peak shaving strategies

Description

Consider low carbon peak shaving strategies to ensure that the effect of reducing demand is not to switch to a potentially less expensive but more carbon intensive alternative.

For example: reducing fan speeds during peak times is considered a low carbon peak shaving strategy; however, increasing gas boiler capacity to reduce air-source heat pump (ASHP) peak consumption is not.

References

None

Adapted BB 3.0 Question

Question 01.05.09 — Are strategies or systems in place to allow peak shedding?

E10. HVAC Efficiency

E10.1 – HVAC Efficiency

Focus Area

Energy and Carbon

Topic

HVAC Efficiency

Question

E10.1 – HVAC Efficiency

Question

Is high efficiency, low carbon mechanical equipment installed in the building?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Yes — Connected to a low carbon District Energy System (DES) = 6 points
- Yes — Ground Source Heat Pumps = 6 points
- Yes — Heat Recovery = 3 points
- Yes — Electric Boilers = 3 points
- Yes — Heat Pumps = 2 points
- Yes — Condensing Boilers = 2 points
- Yes — AHUs and FCUs with low temperature hydronic heating coils = 1 point
- Yes — Hybrid AHUs and RTUs with air source heat pumps (ASHPs) and gas backup/peak heating = 1 point
- Yes – Other (Describe) = 1 point

- No = 0 points

Max of 6 points

Requirements

- a) List building systems where heat recovery has been implemented, such as exhaust/ventilation, chilled water or domestic hot water. Describe the type and relative scale of heat recovery for each application
- b) For owner or landlord-controlled primary equipment, provide an equipment list outlining attributes including size, systems served, type of fuel, efficiency and why it can be considered low carbon

Note that this question is pertinent to the systems installed prior to and/or during tenancy and must be answered regardless of whether the systems are managed by the tenant.

Documentation

- Equipment list with product details

Suggested Lead

In-house

Value

- Install high efficiency, low carbon HVAC equipment to reduce energy consumption and carbon emissions
- When mechanical equipment is identified as needing to be replaced, upgrade mechanical systems to high efficient, low carbon models

Linked Questions:

E10.2 - On-site Combustion: Electrify building systems

Description

Mechanical equipment and HVAC system efficiency offer the most impactful opportunity for active energy and carbon reduction across all fuel types. To achieve decarbonization goals, building management should plan to replace end-of-life, inefficient or high carbon equipment with high efficiency, low carbon options as part of asset renewals.

Heat recovery should be considered for all systems as a strategy for reducing consumption.

Electrification works toward elimination of carbon emissions related to onsite combustion and improves opportunities for reduced electricity-related emissions through energy supply from clean grids (either now or in the future) and the use of renewable energy.

Cooling systems that use high global warming potential (GWP) refrigerants can have a significant contribution to a building's carbon emissions, through fugitive emissions that occur during leaks or recharging. Low GWP systems are recommended.

References

[City of Toronto – Low Carbon Thermal Energy Ready Buildings](#)

Adapted BB 3.0 Question

Question 01.05.02 – Is 75% or more of the central heating equipment efficient?

Question 01.05.03 – Are 75% of the rooftop package units efficient?

Question 01.05.05 – Is 75% of the domestic water heating equipment efficient?

Question 01.05.06 – Does 75% of the building's exhaust air pass through a Ventilation Heat/Energy Recovery system?

E10.2 — On-site Combustion

Focus Area

Energy and Carbon

Topic

HVAC Efficiency

Question

E10.2 — On-site Combustion

Question

Has the building transitioned off all forms of on-site combustion?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes — equipment has transitioned = 3 points
- No — equipment has not transitioned = 0 points
- Not Applicable – On-site combustion was never used = 0/0

Max of 3 points

Requirements

- a) Provide a brief summary attesting that there is no onsite combustion equipment used at the property as part of regular building operations
- b) Describe the building systems present that do not utilize on-site combustion

Typical on-site combustion equipment delivers space and domestic water heating and may include equipment such as gas-fired boilers, gas-fired rooftop units, makeup air units, or gas-fired water heaters.

The following combustion equipment is excluded from this Question:

- Tenant-specific equipment used in restaurants (cooking etc.)
- Emergency generators or back-up power equipment using diesel or other fuels
- District heating systems serving the building

Points will be awarded regardless of when the transition occurred. The building team only needs to demonstrate that on-site combustion was part of the original building and has since transitioned.

Note that this question is pertinent to the systems installed prior to and/or during tenancy and must be answered regardless of whether the systems are managed by the tenant.

Documentation

- Evidence that there is no equipment in use as part of regular building operations that relies on-site combustible energy sources

Suggested Lead

In-house

Value

- On-site combustion, such as burning fuel for heating, is responsible for significant carbon emissions and can affect occupant health
- Achieve full building electrification by eliminating on-site combustion
- Building electrification is crucial for buildings pursuing decarbonization and net-zero carbon goals

Linked Questions:

E2.1a - Net Zero Transition Plan: Pursue net-zero carbon

Description

Mechanical equipment and HVAC system efficiency offer the most impactful opportunity for active energy and carbon reduction across all fuel types. To achieve decarbonization goals, building management should plan to replace end-of-life, inefficient or high carbon equipment with high efficiency, low carbon options as part of asset renewals.

Heat recovery should be considered for all systems as a strategy for reducing consumption.

Electrification works toward elimination of carbon emissions related to onsite combustion and improves opportunities for reduced electricity-related emissions through energy supply from clean grids (either now or in the future) and the use of renewable energy.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E11. Envelope

E11.1 – Envelope Improvement

Focus Area

Energy and Carbon

Topic

Envelope Performance

Question

E11.1 – Envelope Improvement

Question

Have any of the low-cost envelope improvement measures identified in assessment, condition or deep retrofit studies been implemented?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Resealing to address air leakage= 1 point
 - Applying window film = 1 point
 - Small-scale or individual window replacement = 2 points
 - Adding shading to sunny areas = 2 points
 - Improving insulation in accessible areas = 2 points
- No = 0 points
- Not applicable – Building was built within the past 3 years with 2 or more of the listed high-performance features from E1.2= 0/0

Max of 4 points

Requirements

- a) Identify the low-cost envelope improvement items from the assessment, condition or deep retrofit studies that have been implemented
- b) Document extent of implementation

For Open-Air Retail, demonstrate that the requirements have been met for 20% of the buildings on-site.

Documentation

- Describe measure(s) implemented, the benefit and potential savings impact
- Evidence of implementation through photos, as-built drawings or other proof

Suggested Lead

In-house, with third-party support

Value

- Building off E1.2 - Envelope Condition Assessment, implement low-cost envelope improvements identified in the envelope assessment
- Low-cost envelope improvements are a capital efficient way to improve envelope performance which reduces energy losses and operational costs

Description

A building envelope includes exterior components, such as the roof, walls, foundation and windows. A high-performance envelope is the most effective opportunity for achieving decarbonization of a building through passive strategies.

Optimization of the envelope can significantly reduce heating and cooling Requirements in the building, thus reducing energy consumption and electrical demand as well as decreasing the size and costs of mechanical equipment.

Lower cost measures might include resealing, replacing broken windows, adding shading to sunny areas or similar strategies. At a minimum, air leakage should be addressed.

If budgeting and renewal cycles permit, it is ideal to undertake a deep green envelope upgrade before HVAC systems are retrofitted to optimize mechanical system design.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

E11.2 – Envelope Upgrade

Focus Area

Energy and Carbon

Topic

Envelope Performance

Question

E11.2 – Envelope Upgrade

Question

Have major envelope upgrades been completed or initiated in the past ten years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes — work is underway or has been completed = 3 points
- Yes – an assessment has been completed = 1 point
- No = 0 points
- Not applicable – Building was built within the past 3 years with 2 or more of the listed high-performance features listed below = 0/0

Max of 3 points

Requirements

- a) Identify the major envelope upgrades from the assessment, condition or deep retrofit studies that have been implemented
- b) Document extent of implementation

High-performance envelope characteristics may include:

- Air sealing with whole building air leakage test completed demonstrating superior air tightness
- Interior/exterior shading, identifying whether there are automated shading controls
- Double or triple-paned glazing including high-performance window assembly or double or triple-paned windows with low-emissivity coating including high-performance window assembly
- Electrochromic glazing or other types of dynamic glazing
- Built-in photovoltaics
- Green roof covering at least 30% of the available roof space
- Reduced thermal bridging to minimize heat transfer through strategies such as continuous insulation and thermal breaks
- Foundation insulation that is 20% better than current code

- Roof insulation that is 20% better than current code
- Wall insulation that is 20% better than current code
- Natural ventilation when outdoor conditions are favorable

For Open-Air Retail, demonstrate that the requirements have been met for 20% of the buildings on-site.

Documentation

- Describe measure(s) implemented, the benefit and potential savings impact
- Evidence of implementation through photos, as-built drawings or other proof

Suggested Lead

In-house, with third-party support

Value

- Building off E1.2 - Envelope Condition Assessment, implement capital expenditure/major envelope improvements identified in the envelope assessment
- Major envelope improvements are capital intensive upgrades that can lead to significant improvements in envelope performance resulting in big cost and energy savings

Description

A high-performance building envelope aims to enhance occupant comfort, improve controllability and minimize the transfer of thermal energy between the outdoors and indoors.

Strategies, such as air tightness, shading, triple-paned glazing and increased insulation can be implemented to reduce energy consumption and GHG emissions while improving thermal comfort and reducing the mechanical system Requirements.

References

None

Adapted BB 3.0 Question

Question 01.01.03 – Does the capital plan include measures to ensure continuous improvement of the energy efficiency of the building envelope?

Question 01.05.07 – Are 75% of the building's exterior windows considered efficient?

E12. Training and Innovation

E12.1 – Training in Energy and Carbon

Focus Area

Energy and Carbon

Topic

Training

Question

E12.1 – Training in Energy and Carbon

Question

Did the building operations and management team receive energy and carbon training in the past three years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Assessment, Planning, ECMs and CRMs, Operations & Maintenance Optimization = 1 point
- Benchmarking, Tracking & Monitoring = 1 point
- Controls, Lighting, Demand Management, HVAC Efficiency, Envelope = 1 point

- No = 0 points

Max of 3 points

Requirements

- a) List the names of staff members to whom the competencies covered under these topics would apply
- b) Provide the applicable course outline or syllabus
- c) Provide evidence of competency or training received such as credentials, completion certificate, record of attendance

Training can be delivered in-house or by a third-party

Documentation

- Name of building O&M team member who received the training
- The course outline or syllabus
- Proof of training received

Suggested Lead

In-house

Value

- Train building staff on the building's energy and carbon goals and conservation strategies to give staff the confidence to play an active role in energy and carbon conservation
- Training can improve building performance and make energy and carbon conservation measures more effective

Description

For building maintenance staff to effectively manage the building's energy and carbon, training should be provided which addresses the topics of energy and carbon assessment, planning, benchmarking, O&M optimization, controls, lighting etc.

Over time, technologies and preferred practices in building operations and maintenance change. Providing regular professional development opportunities is a good way to help retain staff. Offering training and educational opportunities related to environmental/sustainable building performance not only benefits staff but improves the performance of the building when staff training is applied at the building level.

References

[SaveOnEnergy Training and Support \(Ontario\)](#)

Adapted BB 3.0 Question

Question 01.01.01 — Does building staff participate in a formalized training program focused on energy efficiency?

E12.2 – Innovation in Energy and Carbon

Focus Area

Energy and Carbon

Topic

Innovation

Question

E12.2 – Innovation in Energy and Carbon

Question

Is an innovative process or technology in place at the building that goes beyond the Requirements outlined in this section?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Renewable energy sources are installed on-site generating >1% of building energy = 1 point
 - Green or high-albedo roof covering is in place = 1 point
 - Funding / incentive received to advance net zero projects = 1 point
 - Building is connected to district or community energy system = 1 point
 - ENERGY STAR scores available representing whole-building consumption for each of the past five years = 1 point
 - Some tenants share their utility data with owner or landlord = 1 point
 - Updated tenant lease includes cost recovery of energy-efficient equipment = 1 point
 - Site staff received training in energy and carbon assessment, tips for operations and maintenance optimization, lighting and HVAC efficiency or the value of sub-metering = 1 point
 - >50% (by building area or tenant count) of tenant energy data is sub-metered = 1 point
 - Joint landlord/tenant energy or carbon initiatives implemented = 1 point
 - Other = 1 point
- Not Applicable - Not pursuing Innovation points = 0/0

Max of 4 points

Requirements

- a) Narrative of innovative technology or process and its impact. Provide details of the technology or process applied at the building
- b) Indicate when the technology or process was implemented and the steps that are in place to ensure the technology or process's ongoing success
- c) If "Other" is selected, explain how the technology or process has improved the building's energy or carbon efficiency for it to be considered innovative

Innovative processes or technologies apply to what was installed post-construction.

Funding or incentives may include strategic energy management, retrofit, Canada Infrastructure Bank etc. or other equivalent.

Innovative processes or technologies do not need to be preapproved and will be evaluated as part of the verification process.

Documentation

- Narrative of innovative technology or process and its impact

Suggested Lead

In-house, with third-party support

Value

- The Innovation in Energy and Carbon question awards buildings for going beyond requirements outlined in other Energy and Carbon questions
- Buildings are encouraged to pursue additional measures to reduce energy consumption and reduce their carbon emissions

Description

Many processes and technologies exist that go beyond the standards and requirements set out in the BOMA BEST Assessment. If building managers/owners have invested in innovative processes or technologies that go beyond these standards, innovation points can be earned under this question.

References

None

Adapted BB 3.0 Question

Question 01.05.14 — Is an innovative process or technology (approved by BOMA Canada) in place at the building that goes beyond the Requirements outlined in this section?

E13. Engagement

E13.1 – Align Engagement Initiatives with Tenants

Focus Area

Energy and Carbon

Topic

Engagement

Question

E13.1 – Align Engagement Initiatives with Tenants

Question

Do any of the tenants' energy and carbon management approaches align with the owner or landlord's?

Applicability

All asset classes

Tenant occupied building – some or all systems managed by the tenant

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Assessment, Planning, ECMs and CRMs = 1 point
 - Benchmarking, Tracking and Monitoring = 1 point
 - Operations and Maintenance Optimization, Controls = 1 point
 - Lighting, Demand Management = 1 point
 - HVAC Efficiency, Envelope = 1 point
- No = 0 points
- Not applicable – Tenant occupied building: All systems managed by the owner/landlord = 0/0

Max of 5 points

Requirements

- a) Engage with tenants to understand their energy and carbon goals, on specific topics listed, and how their goals may align with the building management's energy and carbon goals
- b) Provide a sample of feedback or communication received from tenants that demonstrate where alignment exists in specific topics covered in the Energy and Carbon Plan

In buildings where tenants manage the majority of energy and carbon-using systems, the owner or landlord can engage with the tenant(s) to collaborate and share information and lessons learned to improve whole-building performance in these areas.

Documentation

- Narrative that describes where owner or landlord and tenant's energy and carbon goals align
- Sample of relevant feedback or communication received from the tenants

Suggested Lead

In-house

Value

- Tenants are responsible for a significant portion of energy use at a building and play a crucial role in energy and carbon conservation at a building
- Engage with tenants to discuss and align energy and carbon reduction goals, conservation measures, and identify opportunities for collaboration

Description

Passive engagement through communication is an important first step. Also, the ability to collect tenant utility data is becoming increasingly important as part of reporting and disclosure. Active engagement efforts include direct outreach activities, such as working with tenants to collect tenant-controlled utility data or requiring green leases for new tenants or renewals that address sustainability initiatives.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

Water

W.0 Baseline Practices

W1.0a — Water Assessment

Focus Area

Water

Topic

Baseline Practices

Question #

W1.0a — Water Assessment

Question

Has a Walkthrough Water Assessment been conducted in the past five years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – all systems managed by the owner/landlord

Answer & Scoring

- Yes – this is a baseline requirement
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord = 0/0

Requirements

The water assessment report must contain the following elements:

- a) Analysis of water consumption through monthly utility bill analysis and benchmarking. For benchmarking purposes, utility bills must cover a minimum of 12 months of continuous data
- b) Assessment and list of current performance of water-consuming equipment.
- c) Prioritized list of proposed water conserving measures (WCMs) to enable greater water efficiency
- d) Provision of estimates of financial savings the building owner will realize as a result of investing in WCMs and the simple payback period

For buildings located in regions where monthly or annual water bills are not issued, provide calculations. All assumptions should be stated; including but not limited to: number of occupants, occupancy schedule, frequency of use, duration of time etc.

Users may wish to install whole-building meters or submeters for the future to avoid the need for recalculation at recertification.

Documentation

- Walkthrough Water Assessment Report and if applicable, calculations

OR

- [W1.0a – Water Assessment Template](#) and if applicable, calculations

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

Suggested Lead

In-house: Facility Maintenance/Project Manager/Building Manager

Third-party: Engineering consultants

Value

- Understand a building's environmental impact through water use data analysis
- Perform an entry-level walkthrough water assessment to define a building's baseline water usage through utility analysis
- Identify ways to reduce water consumption through low-cost water conservation measures (WCMS)
- This assessment can be performed in-house using the BOMA BEST Template provided in the How-to Manual or by a qualified third-party
- The question is applicable to spaces both inside and outside of the building
- Engage a qualified third-party professional to provide more detailed recommendations to improve building performance, save on operational costs, and reduce a building's overall environmental impacts

Linked Questions:

W4.1 - Water Conservation: Points are awarded for the implementation of conservation measures identified in the water assessment

Description

A water assessment refers to a simple audit of the building's configuration and water systems. It focuses on the identification of potential water conserving measures.

References

[Water Audit Guidance for Commercial Buildings](#)

[Example Commercial and Institutional Water Efficiency Assessment Report](#)

Adapted BB 3.0 Question

Best Practice 5 — Has a water assessment been conducted in the past five years?

W1.0b — Water Assessment

Focus Area

Water

Topic

Baseline Practices

Question

W1.0b — Water Assessment

Question

Has the water efficiency of systems managed by the owner or landlord been assessed in the past five years?

Applicability

All asset classes

Tenant occupied building – some systems managed by the owner/landlord

Answer & Scoring

- Yes – this is a baseline requirement. Complete [BOMA BEST Form W1.0b](#)
- Not Applicable – Owner/landlord occupied building OR Tenant occupied building: No systems managed by the owner/landlord

Requirements

For all building components managed by the owner or landlord, provide:

- a) Building and system description and review – clearly distinguish between systems that are owned vs managed vs maintained by the owner, landlord or tenant
- b) Water utility history (at least 12 months of continuous data, typically the previous 24-36 months of data) for each energy source
- c) Low- and no-cost water conservation measures, with high level costing, simple payback and anticipated savings. If no savings measures are identified, state why.

If the owner or landlord only manages for example the exterior irrigation at the building, provide the water data for these systems, as well as an assessment of the efficiency of the system. If the system was recently upgraded and no water conservation is currently feasible, state that too.

For all systems managed by the tenant, the applicant (representing the owner or landlord) is expected to outline those as well, though no water assessment is required for these systems.

Documentation

- Water End-Use Report

AND

- [W1.0b – Water Assessment Report Template](#)

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

Suggested Lead

In-house: Facility Maintenance/Project Manager/Building Manager

Third-party: Engineering consultants

Value

- Understand a building's environmental impact through water use data analysis
- Perform an entry-level walkthrough water assessment to define a building's baseline water usage and largest end-uses through utility analysis
- Identify ways to reduce water consumption through low-cost water conservation measures (WCMs)
- WCMs associated with the largest end-uses can result in the largest water savings and should be prioritized when implementing WCMs
- This assessment can be performed in-house using the BOMA BEST Template provided in the How-to Manual or by a qualified third-party
- The question is applicable to spaces both inside and outside of the building.
- Engage a qualified third-party professional to provide more detailed recommendations to improve building performance, save on operational costs, and reduce a building's overall environmental impacts

Linked Questions:

W4.1 - Water Conservation: Points are awarded for the implementation of conservation measures identified in the water assessment

Description

The most effective water reduction strategies will focus efforts on the end uses with the highest consumption. Building operations and management teams should determine the largest end uses and consider opportunities for sub-metering significant loads, such as irrigation and cooling towers.

References

[Water Audit Guidance for Commercial Buildings](#)

[Example Commercial and Institutional Water Efficiency Assessment Report](#)

Adapted BB 3.0 Question

Best Practice 5 — Has a water assessment been conducted in the past five years?

W5.0 – Mold and Water Damage Management

Focus Area

Water

Topic

Baseline Practices

Question

W5.0 – Mold and Water Damage Management

Question

Is a Mold and Water Damage Management Program in place at the building?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes – this is a baseline requirement
Select one of the following:
 - Program in place
 - Program has been shared with Tenant Representative(s)

Requirements

- a) Develop a building-specific Mold and Water Damage Management Program that covers the following:
 - Responsible parties, including the building team's training Requirements
 - Requirements and frequency for building and HVAC inspections
 - Actions required to reduce the risk of indoor mold growth
 - Procedures for mold and water damage investigations
 - Procedures for management of mold cleanup activities
- b) Demonstrate that the program was developed by a person competent in mold and water damage management practices
- c) Program must be signed by the building manager, dated within the last 12 months
- d) If there is tenant managed space in the building, the owner or landlord must provide information to the Tenant Representative(s) that manage(s) water use within the tenant space on how to implement a Mold and Water Damage Management Program

Water treatment in HVAC equipment must, at all times, meet local provincial and/or federal guidelines and regulations.

Documentation

- Building-specific Mold and Water Damage Management Program
- Evidence that Program was shared with Tenant Representative(s)

Suggested Lead

In-house: Facility Maintenance, Building Manager/Policy Makers

Third-party: Hazards/IEQ Consultant

Note: This questionnaire requires a third-party consultant. It's rare that a company will have an in-house expert on mold and water damage management practices.

Value

- Water can have a significant effect on building materials and occupant health. Water-impacted building materials can exhibit mold growth in as little as 48 hours
- Quick response to water damage is vital in preventing the deterioration of building materials and preventing adverse effects on occupant health
- Create a Mold and Water Damage Management program that defines how building management teams will prevent and respond to water damage

Linked Questions:

W5.1 - Water Damage Response: Identify qualified service providers to respond to water emergencies

Description

Water-impacted building materials can begin to exhibit mold growth in as little as 48 hours. A water damage monitoring and management program will assist in rapidly addressing bulk water damage, including detailed procedures for drying, cleaning and remediating where necessary.

Health Canada's Fungal contamination in public buildings: A guide to recognition and management, 1995 recommends "the development of programs to avoid the development of fungal amplification-sites." Further, the American Industrial Hygiene Association's 2013 "Position Statement on Mold and Dampness in the Built Environment," recommends that a "formal mold/water prevention program with clear actions and responsibilities is required for an effective response to signs of moisture".

References

[Health Canada's Fungal contamination in public buildings: A guide to recognition and management, 1995](#)

[The American Industrial Hygiene Association "Position Statement on Mold and Dampness in the Built Environment" 2013 \(reviewed 2018\)](#)

[Institute for Inspection Cleaning and Restoration Certification, Standard S-520, Standard and Reference Guide for Professional Mold Remediation, 2015](#)

[Canadian Construction Association Guide 82, Mold Guidelines for the Canadian Construction Industry, 2018](#)

[Environmental Abatement Council of Canada \(EACC\), Mold Abatement Guidelines, Edition 3 \(2015\)](#)

Adapted BB 3.0 Question

Question 02.01.01 — Is a Water Damage Monitoring and Management Program in place in the building?

W7.0 — Owner or landlord shares Water Management practices

Focus Area

Water

Topic

Baseline Practices

Question

W7.0 — Owner or landlord shares Water Management practices

Question

Has the owner or landlord shared a Water Communication Plan with the building tenants?

Applicability

All asset classes

Tenant occupied building

Answer & Scoring

- Yes – this is a baseline requirement
- Not applicable – Owner/landlord occupied building

Requirements

- a) Develop a building-specific Water Communication Plan that covers:
 - Efforts the building management team may implement to assess water efficiency and hazards. This should include tips for operations and maintenance optimization, fixture efficiency, managing water hazards and the value of sub-metering
 - Initiatives that the owner/landlord can provide to support the tenant's efforts
 - Completed water assessment and associated initiatives from W1.0b as applicable
- b) Copies of communication with the building's tenants where the content of the building's Water Communication Plan was shared, dated within the past 12 months
- c) Demonstrate that communication was distributed to at least half of the number of tenant organizations occupying the building or to a group that leases at least half of the total building area

Documentation

- Building-specific Water Communication Plan
- Proof of communication with a representative group of building tenants, covering water assessment, tips for operations and maintenance optimization, fixture efficiency, managing water hazards and the value of sub-metering
- [W7.0 – Water Communication Plan Template](#)

Suggested Lead

In-house: Facility Maintenance, Building Manager/Policy Makers

Value

- Increasing occupant awareness and engagement can positively impact the sustainability practices at building
- Tenant participation is necessary for reaching water reduction goals
- Develop a Water Management Communication Plan that defines how the building's water reduction goals will be shared with tenants
- Share water reduction tips with tenants to encourage tenants to play an active role in water reduction at the building

Description

Increasing building tenant and occupant awareness and engagement in environmental and sustainable practices can have a significant positive or negative impact on the performance of the building.

References

None

Adapted BB 3.0 Question

Best Practice 5 – Has a Water Assessment been conducted in the last five (5) years?

Best Practice 16 – Is an Occupant Environmental Communication Program in place at the building?

W1. Assessment

W1.1 – Water Efficient Features

Focus Area

Water

Topic

Water Assessment

Question #

W1.1 – Water Efficient Features

Question

Does the building incorporate any high-efficiency water fixtures?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - >50% of toilets are 4.8L/6L dual-flush or less = 4 points
 - >50% of urinals are 1.9L per flush or less = 3 points
 - >50% of lavatory faucets are 5.7L per min or less = 1 point
- No = 0 points

Max of 8 points

Requirements

- a) For each fixture type, survey how many are installed in the building and calculate the percentage that meet the specified performance criteria
- b) Provide evidence such as fixture cut sheets, flow-test results or photos showing flow-rates

Note that this question is pertinent to the systems installed prior to and/or during tenancy and must be answered regardless of whether the systems are managed by the tenant.

Documentation

- List of total fixture counts, and number that meet or exceed flowrate thresholds
- Evidence that fixtures deliver specified flowrates

Suggested Lead

In-house

Value

- Efficient water fixtures use less water while still performing the same function
- Install water efficient fixtures to reduce water consumption, operational costs, and a building's impact on natural water systems and local infrastructure

Description

A high-efficiency fixture uses less water while still performing its function.

References

[WaterSense Products](#)

Adapted BB 3.0 Question

02.04.03 – What percentage of water fixtures are efficient, based on inventory amount?

W2. Benchmarking

W2.1a – Benchmark whole-building

Focus Area

Water

Topic

Benchmarking

Question

W2.1a – Benchmark whole-building

Question

What is the calculated Water Use Intensity (WUI) for the building?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building - Owner has access to utility data

Answer & Scoring

- Yes = Points as indicated below:
Indicate which range is representative of your building's most recent Water Use Intensity (WUI):
 - 60 L/ft² and higher = 2 points
 - 40 to <60 L/ft² = 3 points
 - 28 to <40 L/ft² = 4 points
 - 20 to <28 L/ft² = 5 points
 - Lower than 20 L/ft² = 6 points
- No = 0 points
- Not Applicable – Tenant occupied building: Owner/Landlord does not have access to utility data **OR** Tenant occupied building: Pursuing W2.1b = 0/0

Max of 6 points

Requirements

To determine the whole-building water use intensity, WUI (L/ft²):

- a) Enter whole-building water-use data under the Benchmarking section of the BOMA BEST hub (bomabesthub.com) or in the ENERGY STAR Portfolio Manager portal
- b) Alternatively, calculate the WUI by entering the data in RealPac's NWUI Tool
- c) If whole-building water use is calculated by adding data from different bills or sub-meters, provide a brief narrative describing the methodology applied. Show how the 12-month total use was calculated
- d) If any spaces were excluded, provide a brief narrative describing the methodology applied

- e) For any sub-meters referenced, provide details, such as make, model, location, photo and year of installation
- f) Indicate whether any water is collected and used on-site and whether that use has been sub-metered
- g) Calculate WUI for the building based on the utility data available and floor area or consumption per occupant

Water consumption data derived from landlord-installed meters, read manually each month is acceptable.

WUI is often measured on the basis of floor area but water consumption per occupant may be more appropriate if occupancy data is available.

If W2.1b is being pursued the building is not eligible for this point.

Documentation

- Table showing the most recent 12-months of whole-building water use
- Calculation method used to determine the WUI

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

OR

- Narrative indicating that W2.1b is being pursued

Suggested Lead

In-house

Value

- Benchmarking keeps building management teams accountable for a building's annual water usage and tracks a building's progress toward water saving goals
- Upload whole-building utility data to benchmarking software (such as ENERGY STAR Portfolio or RealPac's NWUI Tool), to compare water-use data and determine the annual water use intensity (WUI)

Description

Benchmarking informs organizations about how much water they use and where they use it. It allows organizations to identify opportunities to optimize water use and reduce operating costs.

A building's annual water consumption can be normalized to a water use intensity (WUI) on the basis of floor area or occupancy to facilitate performance comparison against similar properties, similar to energy performance benchmarking using EUI.

References

[ENERGY STAR Portfolio Manager](#)

[RealPac's NWUI Methodology](#)

Adapted BB 3.0 Question

Question 02.02.01 — Do you benchmark water performance using either the BOMA BEST or ENERGY STAR Portfolio Manager portal?

W2.1b – Sub-Metered Data

Focus Area

Water

Topic

Benchmarking

Question

W2.1b – Sub-Metered Data

Question

Is any sub-metered water use available for the most recent 12 months?

Applicability

All asset classes

Tenant occupied building

Answer & Scoring

- Yes = 3 points
- No = 0 points
- Not Applicable – Owner/landlord occupied building **OR** Tenant occupied building: Pursuing W2.1a = 0/0

Max of 3 points

Requirements

For any sub-metered water data available:

- Provide monthly sub-metered water data in table format – see [BOMA BEST Form W1.0b](#)
- Provide water sub-meter details, such as make, model, location, photo and year of installation
- Indicate whether any water is collected and used on-site and whether that use has been sub-metered
- If data is not logged automatically, manual readings need to be taken at least monthly

See Question W1.0b for details of water end-use types

If W2.1a is being pursued the building is not eligible for this point.

Documentation

- Most recent 12 months of sub-metered water use (total m3)
- Narrative of data collection methodology and sub-meter data, if available

OR

- Narrative indicating that W2.1a is being pursued

Suggested Lead

In-house

Value

- Sub-metering is an effective way to track water consumption associated with individual water intensive end-uses and tenants
- Sub-metering data can help building management teams understand how water is being used at the building and identify potential opportunities for water savings
- Document the building's sub-metering practices using the BOMA BEST Form - W1.0b

Description

Sub-meters measure the water consumption of specific areas or equipment, providing property owners and managers with the ability to understand where and how the building water is used.

References

None

Adapted BB 3.0 Question

Question 02.04.02 — What percentage of the building's water consumption is sub-metered?

W3. Tracking and Monitoring

W3.1a – Tracking Whole-Building Use

Focus Area

Water

Topic

Tracking and Monitoring

Question

W3.1a – Tracking Whole-Building Use

Question

Was whole-building water-use data tracked before and during Covid?

Applicability

Office, Healthcare, Enclosed Shopping Centre, Universal, Multi-Unit Residential Building, Light Industrial

Owner/landlord occupied building

Tenant occupied building – Owner has access to utility data

Answer & Scoring

- Yes = 3 points
Enter all available information for the following:
 - Average Water Use Intensity (WUI), before Covid (2017 to 2019): _____ L/ft²
 - Average Water Use Intensity (WUI), during Covid (2020 to 2022): _____ L/ft²
- No = 0 points
- Not Applicable – Tenant occupied building: Owner/Landlord does not have access to utility data **OR** Tenant occupied building: Pursuing W3.1b **OR** Building built during or after the year 2022 = 0/0

Max of 3 points

Requirements

To generate the whole-building water use intensity, WUI (L/ft²):

- a) Enter whole-building water-use data under the Benchmarking section of the BOMA BEST portal (bomabesthub.com) or in the ENERGY STAR Portfolio Manager portal
- b) Enter any 12-month average WUI under the Answer section, over the 2017 to 2019 years before Covid
- c) Enter any 12-month average WUI under the Answer section, over the 2020 to 2022 years during Covid
- d) If whole-building water use is calculated by adding data from different bills or sub-meters, provide a brief narrative describing the methodology applied. Show how the 12-month total use was calculated

- e) For any sub-meters referenced, provide details, such as make, model, location, photo and year of installation
- f) Calculate WUI for the building based on the utility data available and floor area

Water consumption data derived from landlord-installed meters, read manually each month is acceptable.

Documentation

- Table showing past years' water data of whole-building water use
- Calculation method used to determine the 12-month average and WUI

OR

- Documentation demonstrating that the owner does not manage the utilities (e.g. lease agreement)

OR

- Narrative indicating that W3.1b is being pursued

Suggested Lead

In-house

Value

- As water use is directly correlated with occupancy, the COVID-19 Pandemic had a significant effect on building water consumption
- Analyze whole-building water use data to better understand the building's water consumption before and during the COVID-19 pandemic
- Determine how water use has changed since the pandemic to assess if the building is on track to achieve their water saving goals

Description

Tracking building performance ensures that the building operations and management team can identify issues and opportunities for improvement, track progress toward goals, implement corrective actions and inform larger water management strategies.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

W3.1b – Tracking Sub-Metered Use

Focus Area

Water

Topic

Tracking and Monitoring

Question

W3.1b – Tracking Sub-Metered Use

Question

Was any sub-metered water use data tracked before and during Covid?

Applicability

Office, Healthcare, Enclosed Shopping Centre, Universal, Multi-Unit Residential Building, Light Industrial

Tenant occupied building

Answer & Scoring

- Yes = 3 points
- No = 0 points
- Not Applicable – Tenant occupied building: Pursuing W3.1a **OR** Building built during or after the year 2022 = 0/0

Max of 3 points

Requirements

For any sub-metered water data available:

- Provide monthly sub-metered water data in table format – see [BOMA BEST Form W1.0b](#)
- Provide water sub-meter details, such as make, model, location, photo and year of installation
- Indicate whether any water is collected and used on-site and whether that use has been sub-metered

Water consumption data derived from landlord-installed meters, read manually each month is acceptable.

Applicants do not need to provide data for all five previous years. Provide the following, at a minimum:

- data from one year before Covid, i.e. any time between 2017 and 2019

AND

- data from one year during Covid, i.e. any time between 2020 and 2022

If W3.1a is being pursued the building is not eligible for this point.

Documentation

- Most sub-metered water use before Covid (2017 – 2019) and during Covid (2020 – 2022)
- Narrative of data collection methodology and sub-meter data, if available

OR

- Narrative indicating that W3.1a is being pursued

Suggested Lead

In-house

Value

- As water use is directly correlated with occupancy, the COVID-19 pandemic had a significant effect on building water consumption
- Analyze sub-metering data for individual water-intensive systems and tenants to better understand the building's water consumption before and during the COVID-19 pandemic
- Document the building's sub-metering practices using the BOMA BEST Form - W1.0b
- Determine how water use has changed since the pandemic to assess if the building is on track to achieve their water saving goals

Description

Sub-meters measure the water consumption of specific areas or equipment, providing property owners and managers with the ability to understand where and how building water is being used.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

W3.2 – Data Monitoring

Focus Area

Water

Topic

Tracking and Monitoring

Question

W3.2 – Data Monitoring

Question

How frequently are any of the water uses trended and monitored?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building - Owner has access to utility data

Answer & Scoring

- Yes = Points as indicated below
Select the most finite:
 - Annually = 2 points
 - Quarterly = 3 points
 - Monthly = 4 points
 - Daily = 5 points
 - In real-time = 6 points
- No = 0 points
- Not Applicable – Tenant occupied building: Owner/Landlord does not have access to utility data = 0/0

Max of 6 points

Requirements

- a) Demonstrate that water use data is regularly tracked and reviewed by the building operations and management team
- b) Graph or table comparing the most recent year's water use patterns with the patterns of prior years, showing daily, weekly, monthly or seasonal trends as available
- c) Brief narrative outlining building management's approach to data monitoring. Also explaining why trends occurred, such as weather, occupancy fluctuations, unexpected leaks, meter faults, conservation projects or corrective actions implemented

Documentation

- Sample set of trend reports
- Narrative outlining building management’s approach to data monitoring

OR

- Documentation demonstrating that the owner/Landlord does not have access to utility data (e.g. lease agreement)

Suggested Lead

In-house

Value

- Monitor water data more regularly to be familiar with the building's water consumption
- Regularly monitor data to more quickly identify potential issues in building systems and respond to operational inefficiencies

Description

Monitoring and tracking building water usage can highlight irregularities which, when corrected, can improve building performance. This includes a review of the water use over specific time periods, costs and consumption patterns with events highlighted. An “event” refers to a noticeable spike or dip in trend data.

This practice can help the building operations and management team identify issues and opportunities for improvement, track progress toward goals, implement corrective actions and inform larger strategies.

References

None

Adapted BB 3.0 Question

Question 02.05.02 — Have three years of water consumption been analyzed in order to establish trends?

W4. Conservation Measures

W4.1a – Water Conservation (low/no cost measures)

Focus Area

Water

Topic

Water Conservation

Question #

W4.1a – Water Conservation (low/no cost measures)

Question

Which low/no cost water conservation measures were implemented in the past five years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – some or all systems managed by the owner/landlord

Answer & Scoring

- Yes - 50% of low-and no cost measures identified in the most recent water assessment = 2 points
- No = 0 points
- Not applicable - Tenant occupied building: No systems managed by owner/landlord **OR** Assessment completed but no water conservation measures identified = 0/0

Max of 2 points

Requirements

- a) Review water reduction measures identified in past assessments or optimization studies
- b) Calculate the percentage implemented, either by count of measures, or by water reduction impact, whichever is greater
- c) Document the implementation of these measures

Recognition is given for reduction in municipal water use. Water collected and used on-site can be excluded from the total water use calculations

Documentation

- Evidence of water conservation measures implemented

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

Suggested Lead

In-house

Value

- Implementing conservation measures is beneficial in reducing operational costs, water consumption, and a building's overall environmental impact
- Implement water conservation measures (WCMs) identified in the walkthrough water assessment completed for the Baseline Practice requirement

Description

Water conservation measures (WCMs) are often categorized as no-/low-cost, medium-cost or capital projects. They can also be prioritized by urgency, complexity, environmental or financial benefits or other relevant criteria.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

W4.1b – Water Conservation (Capital Expenditure measures)

Focus Area

Water

Topic

Water Conservation

Question

W4.1b – Water Conservation (Capital Expenditure measures)

Question

Which capital expenditure water conservation measures were implemented in the past five years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – some or all systems managed by the owner/landlord

Answer & Scoring

- Yes - 5% of all the capital expenditure measures identified in previous water assessments, no older than 10 years = 3 points
- No = 0 points
- Not applicable - Tenant occupied building: No systems managed by the owner/landlord **OR** Assessment completed but no water conservation measures identified = 0/0

Max of 3 points

Requirements

- d) Review water reduction measures identified in past assessments or optimization studies
- e) Calculate the percentage implemented, either by count of measures, or by water reduction impact, whichever is greater
- f) Document the implementation of these measures

Recognition is given for reduction in municipal water use. Water collected and used on-site can be excluded from the total water use calculations

Documentation

- Evidence of water conservation measures implemented

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

Suggested Lead

In-house

Value

- Implementing conservation measures is beneficial in reducing operational costs, water consumption, and a building's overall environmental impact
- Implement water conservation measures (WCMs) identified in the walkthrough water assessment completed for the Baseline Practice requirement

Description

Water conservation measures (WCMs) are often categorized as no-/low-cost, medium-cost or capital projects. They can also be prioritized by urgency, complexity, environmental or financial benefits or other relevant criteria.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

W5. Water Hazards

W5.1 – Water Damage Response

Focus Area

Water

Topic

Water Hazards

Question #

W5.1 – Water Damage Response

Question

Is a process in place to respond to leaks or water infiltration issues?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 3 points
- No = 0 points

Max of 3 points

Requirements

- a) Provide the contact details of at least 3 pre-qualified service providers, with active accounts set up, who can be contacted in case of water damage emergency
- b) Description of their proficiency in dealing with water damage events, credentials, response time and approach to address water losses

If this service is delivered by an in-house party, describe their expertise and approach.

Water treatment in HVAC equipment must always meet local provincial and/or federal guidelines and regulations.

Documentation

- Contact details of 3 pre-qualified service providers, their proficiency, approach and response times

Suggested Lead

In-house, with third-party support

Value

- Water can have a significant effect on building materials and occupant health. Water-impacted building materials can exhibit mold growth in as little as 48 hours
- Quick response to water damage is vital in preventing the deterioration of building materials and preventing adverse effects on occupant health
- Proactively make connections with qualified service providers who can respond quickly to water emergencies to prevent negative outcomes

Description

Reduce the response time for water damage events in a building. There is a short 48-to-72-hour window following a water loss where building finishes can be dried without significant risk of indoor mold growth. Having a service contract in place with a trusted provider helps ensure cleanup work can start as quickly as possible, minimizing the risk of mold growth.

References

[Institute for Inspection Cleaning and Restoration Certification, Standard S-500, Standard and Reference Guide for Professional Water Damage Restoration, 2021](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

W5.2 – Legionella Bacteria Control Management

Focus Area

Water

Topic

Water Hazards

Question

W5.2 – Legionella Bacteria Control Management

Question

Is a Legionella Bacteria Control Management Program in place at the building?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 5 points
- No = 0 points

Max of 5 points

Requirements

- a) Develop a building-specific Legionella Bacteria Control Management compliant with ASHRAE 188 “Legionellosis: Risk Management for Building Water Systems” and Public Works and Government Services Canada’s “Control of Legionella in Mechanical Systems”
- b) The program must cover the following:
 - Responsible parties, including the building team’s training Requirements
 - Analysis of building water systems and water system flow diagrams. The following systems must be considered for Legionella susceptibility, at a minimum:
 - Cooling towers and evaporative condensers
 - Aerosol-generating misters, atomizers, humidifiers
 - Hot and cold-water systems
 - Domestic hot water storage tanks
 - Open-air systems (such as decorative fountains)
 - Whirlpool Spas
 - Building-specific water sampling protocol
 - Control measures, monitoring and corrective actions
- c) Demonstrate that the program was developed by a person competent in Legionella mitigation measures
- d) Program must be signed by the building manager, dated within the past 12 months.

- e) If there is tenant space within the building, the owner or landlord must provide information to the Tenant Representative(s) that manage(s) water use within the tenant space on how to implement a Legionella Bacteria Control Management Program

Only having a legionella management plan for a specific system (e.g. cooling towers) is not sufficient to meet Requirements. The plan should cover all applicable water-using systems in the building.

The building's water systems should be described in the form of a flow diagram to assist in analyzing the areas of risk and determining sampling locations. Where necessary, control measures, such as preventive maintenance, inspections and water treatment, should be implemented. These control measures must be monitored to ensure they are effective (for example, through routine sampling activities and checking temperatures of hot water once a month).

Risk analysis and monitoring of control measures must be documented and kept current. At a minimum, the program must be reviewed every 12 months to ensure risks associated with legionella susceptible systems are mitigated.

Water treatment in HVAC equipment must always meet local provincial and/or federal guidelines and regulations.

Documentation

- Building-Specific Legionella Bacteria Control Management Program
- Evidence that Program was shared with Tenant Representative(s)

Suggested Lead

In-house, with third-party support

Value

- Legionella is a water-borne bacteria that can cause legionnaire's disease in humans
- Managing legionella bacteria at a building is crucial for maintaining a safe and healthy environment for building occupants. Creating a Legionella Bacteria Control Management Program at the building ensures that proper legionella management procedures are followed
- Test all water-consuming equipment that contains water that will interact with occupants regularly for legionella
- Implement preventive procedures to prevent legionella favoring conditions in water systems with the highest risk of legionella growth

Description

Legionella risk management is important to provide a safe environment for employees and visitors to your facility and in preventing the bacteria that causes Legionnaires' disease.

References

[ANSI ASHRAE Standard 188 \(2018\): Legionellosis Risk Management for Building Water Systems](#)

[ASHRAE Guidance on Reducing the Risk of Legionella](#)

[Public Works and Government Services Canada's "Control of Legionella in Mechanical Systems",](#)

[MD 15161 — 2013: Control of Legionella in Mechanical Systems](#)

Adapted BB 3.0 Question

Question 05.01.01 — Is a Legionella Bacteria Control Management Program in place at the building?

W5.3 – Water Features for Laboratories

Focus Area

Water

Topic

Water Hazards

Question

W5.3 – Water Features for Laboratories

Question

Are the following strategies implemented to manage Indoor Air Quality (IAQ) in laboratories?

Applicability

Office, Healthcare, Universal

Owner/landlord occupied building

Tenant occupied building - some or all systems managed by the owner/landlord

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Water-saving sterilization processes or equipment are used (such as mechanical vacuum systems and/or water tempering devices) = 1 point
- Chemicals, chemical waste and liquid pharmaceutical waste stored in way that minimizes and contains spills = 1 point
- There is a policy in place that specifically discourages the discharge of chemicals into the sanitary sewer while also explicitly prohibiting all discharges exceeding legal limits = 1 point
- There are documented procedures to ensure that glycol discharges from the flushing of cooling coils are minimized or eliminated = 1 point
- Measures are implemented to reduce contaminated storm water run-off from outdoor hazardous or biomedical waste storage areas = 1 point
- No = 0 points
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord **OR**
The building does not have a laboratory = 0/0

Max of 4 points

Requirements

Demonstrate that the following is in place at the building:

- a) Water-saving sterilization processes or equipment are used (such as mechanical vacuum systems and/or water tempering devices)
- b) Chemicals, chemical waste and liquid pharmaceutical waste stored in way that minimizes and contains spills

- c) There is a policy in place that specifically discourages the discharge of chemicals into the sanitary sewer while also explicitly prohibiting all discharges exceeding legal limits
- d) There are documented procedures to ensure that glycol discharges from the flushing of cooling coils are minimized or eliminated
- e) Measures are implemented to reduce contaminated storm water run-off from outdoor hazardous or biomedical waste storage areas

Mechanical vacuum systems are applicable where the volume of equipment needing to be sterilized is high or where equipment needs to be sterilized quickly. A vacuum drawing on the chamber allows better contact with the steam. Water tempering reduces the amount of water needed to cool the hot condensate created during sterilization before it can be sent down the drain. A condensate tempering system monitors the temperature of the draining water and applies cold water only when needed – e.g. when the water from the sterilizer is hotter than 60°C (140°F).

At a minimum, there must be containment of chemicals and pharmaceuticals used in building operations, for example, oils, solvents, rust inhibitors, biocides, pesticides and liquid pharmaceutical waste (such as the disinfectant (HDL) glutaraldehyde). This can consist of secondary containment with plastic trays to store the materials.

This policy must explicitly identify all departments that are expected to comply (for example, pathology, research, printing, housekeeping, dentistry, etc.). Departments are expected to report their discharge activity to the staff member responsible for regulatory compliance. Used glycol and water from cooling towers should be tested to ensure that they meet local sewer-use by-laws before being discharged into the drain system. Ethylene glycol, used as an anti-corrosion agent and in freezing point depressants in air conditioning systems, is toxic to humans and animals.

Storm water may contain effluent from outdoor hazardous and biomedical waste storage areas unless appropriate measures are taken to properly contain and protect these storage areas from dripping, spilling, and overflowing in rainstorms. Best management practices can be structural or operational. Structural measures include installing a water-tight lid on the storage bin or placing a catchment container under the bin. Operational practices include regular monitoring of these storage areas to ensure they are in good condition (no holes) and placing hazardous/biomedical waste storage bins outdoors only on collection days.

ASHRAE Standard (SPC188) Prevention of Legionellosis Associated with Building Water Systems establishes absolute Requirements for the prevention of legionellosis associated with building water systems. The standard requires Hazard Analysis and Critical Control Point (HACCP) risk management to be used to reduce the potential of legionellosis associated with buildings. Having point-of-use water heaters OR by maintaining water temperatures between 50 and 55°C and avoiding stratification and dead legs in water circulation systems may be the simplest way of meeting the standard.

Documentation

- Emails, memos, service agreements, photos or any other evidence which demonstrate requirements are met

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

Suggested Lead

In-house, with third-party support

Value

- Efficient water fixtures use less water while still performing the same function as conventional fixtures
- In healthcare facilities, there are water-intensive processes and equipment that are necessary for sterilization and laboratory functions
- Install water efficient equipment to reduce water consumption, operational costs, and a building's impact on natural water systems and local infrastructure

Description

Effective water management in laboratory settings is essential for reducing water consumption while maintaining safe indoor air quality (IAQ) and minimizing environmental impact.

References

None

Adapted BB 3.0 Question

Question 2.M.8 – Are water-saving sterilization processes or equipment used such as mechanical vacuum systems and/or water tempering devices?

Question 4.3.1 – Are chemicals, chemical waste and liquid pharmaceutical waste stored in way that minimizes and contains spills?

Question 4.3.M.1 – Is there a policy in place that specifically discourages the discharge of chemicals into the sanitary sewer while also explicitly prohibiting all discharges exceeding legal limits?

Question 4.3.3.1 – Are measures implemented to reduce contaminated storm water run-off from outdoor hazardous or biomedical waste storage areas?

W6. Training and Innovation

W6.1 – Training in Water Management

Focus Area

Water

Topic

Training and Innovation

Question #

W6.1 – Training in Water Management

Question

Did the building operations and management team receive formal water efficiency training in the past three years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select the topics that are covered in the training:
 - Assessment, WCMs = 1 points
 - Benchmarking, tracking & monitoring = 1 point
 - Water hazards = 1 point
- No = 0 points

Max of 3 points

Requirements

- a) List the names of staff members to whom the competencies covered under these topics would apply
- b) Provide the applicable course outline or syllabus
- c) Provide evidence of competency or training received such as credentials, completion certificate, record of attendance

Though owner or landlord management scope is limited in Light Industrial or Open-Air Retail buildings, the operations staff's competencies need to be maintained, nonetheless.

Documentation

- Name of building O&M team member who received the training
- Course outline or syllabus
- Training Certificate or Record of Attendance

Suggested Lead

In-house, with third-party support

Value

- Train building staff on the building's water saving goals, water conservation strategies, and water hazards to give staff the confidence to play an active role in water conservation
- Training can result in improved building performance and more effective water conservation measures

Description

In order for building maintenance staff to effectively manage the building's water use, training should be provided which addresses the topics of water assessment, benchmarking, tracking and monitoring, WCMs and hazards, such as mold, leaks and Legionella.

Over time, technologies and preferred practices in building operations and maintenance change. Providing regular professional development opportunities is a good way to help retain staff. Offering training and educational opportunities related to environmental/sustainable building performance not only benefits staff but improve the performance of the building when staff training is applied at the building level.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

W6.2 – Innovation in Water Management

Focus Area

Water

Topic

Training and Innovation

Question

W6.2 – Innovation in Water Management

Question

Is an innovative process or technology in place at the building that goes beyond the requirements outlined in this section?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Whole-building water use is benchmarked in RealPac's NWUI Tool = 1 point
 - Sub-metering installed on 2 or more of the largest water end-uses = 1 point
 - Strict "No Single Use Water Bottle" policy applies to entire building management team = 1 point
 - Potable water testing program is in place = 1 point
 - Alternatively sourced water makes up at least 5% of the building's total water consumption = 1 point
 - Sub-metered water use data is available, anytime between 2017 – 2021 = 1 point
 - >50% of toilets installed in tenant-managed spaces are 4.8L/6L dual-flush or less = 1 point
 - Joint landlord/tenant water initiatives implemented = 1 point
 - Other = 1 point
- Not applicable- Not pursuing Innovation points = 0/0

Max of 4 points

Requirements

- a) Narrative of innovative technology or process and its impact. Provide details of the technology or process applied at the building
- b) Indicate when the technology or process was implemented and the steps that are in place to ensure the technology or process's ongoing success
- c) If "Other" is selected, explain how the technology or process has improved the building's water efficiency for it to be considered innovative

Innovative processes or technologies do not need to be preapproved and will be evaluated as part of the verification process.

Documentation

- Narrative of innovative technology or process and its impact

Suggested Lead

In-house, with third-party support

Value

- The Innovation in Water question awards buildings for going beyond requirements outlined in other Water questions
- Buildings are encouraged to pursue additional measures to reduce water consumption at the building

Description

Many processes and technologies exist that go beyond the standards and requirements set out in the BOMA BEST Assessment. If building managers/owners have invested in innovative processes or technologies that go beyond these standards, innovation points can be earned under this question.

References

None

Adapted BB 3.0 Question

Question 02.05.04 — Is an innovative process or technology (approved by BOMA Canada) in place at the building that goes beyond the Requirements outlined in this section?

W7. Engagement

W7.1 – Align Engagement Initiatives with Tenants

Focus Area

Water

Topic

Engagement

Question

W7.1 – Align Engagement Initiatives with Tenants

Question

Do any of the tenants' water management approaches align with the owner or landlord's?

Applicability

All asset classes

Tenant occupied building – some or all systems managed by the tenant

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Assessment, WCMs = 1 point
 - Benchmarking, tracking and monitoring = 1 point
 - Water hazards = 1 point
- No = 0 points
- Not applicable – Owner/landlord occupied building = 0/0

Max of 3 points

Requirements

- a. Engage with the tenants to understand their water efficiency goals in specific topics listed and how their goals may align with the building management's water efficiency goals
- b. Provide a sample of feedback or communication received from the tenants that demonstrate where alignment exists in specific topics covered in the Water Management Plan

In buildings where tenants manage the majority of water-using systems, the owner or landlord can engage with the tenant(s) to collaborate and share information and lessons learned to improve whole-building performance in these areas.

Documentation

- Narrative that describes where landlord and tenant's water efficiency goals align
- Sample of relevant feedback or communication received from tenants

Suggested Lead

In-house

Value

- As tenants are responsible for a significant portion of water consumption at a building, they play a crucial role in water conservation at a building
- Engage with tenants to discuss and align water reduction goals, conservation measures, and identify opportunities for collaboration

Description

Passive engagement through communication is an important first step. Also, the ability to collect tenant utility data is becoming increasingly important as part of reporting and disclosure. Active engagement efforts include direct outreach activities, such as working with tenants to collect tenant-controlled utility data or requiring green leases for new tenants or renewals that address sustainability initiatives.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

Indoor Air Quality and Hazards

10. Baseline Practices

11.0a — Owner or landlord manages whole-building IAQ

Focus Area

Indoor Air Quality and Hazards

Topic

Baseline Practices

Question #

11.0a — Owner or landlord manages whole-building IAQ

Question

Has an Indoor Air Quality (IAQ) Management Plan and Assessment been prepared for the whole-building in the past three years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – All systems managed by the owner/landlord

Answer & Scoring

- Yes – this is a baseline requirement
- Not applicable – Tenant occupied building: Some or no systems managed by the owner/landlord

Requirements

- a) The IAQ Management Plan must include the following:
 - Responsible parties, including the building team's training Requirements
 - Determine IAQ parameters for the building around carbon dioxide, carbon monoxide, temperature, relative humidity, dust, volatile organic compounds and other known contaminants of concern
 - Identify HVAC systems impacted by IAQ parameters and set a schedule for regular HVAC inspection and maintenance tasks
- b) The IAQ assessment must cover spaces within owner or landlord control and include the following:
 - Visual inspection of a representative number of HVAC systems for general cleanliness and maintenance
 - Visual inspection of occupied areas of the building for general cleanliness

- At least two rounds of spot readings with direct reading instrumentation of the temperature, relative humidity, carbon dioxide, carbon monoxide, TVOCs and particulate
- Summary of corrective actions that may be needed

The assessment must be detailed enough for management to gain a comprehensive understanding of all the factors that could influence the building's indoor air quality. It must consist of a walkthrough inspection of the building and must report on a review of the following: a list of responsible staff and/or contractors, evidence of training, and job Descriptions, HVAC design data, manuals and operating instructions including control settings and operating schedules, HVAC maintenance and calibration records, testing and balancing reports, inventory of locations where occupancy, equipment, or building use has changed, identification of areas where positive or negative pressures should be maintained, a record of locations that need monitoring or correction, and an inventory of HVAC system components needing repair, adjustment, or replacement.

Suggested performance goals for IAQ include the following for frequently occupied indoor spaces:

- Carbon dioxide not exceeding 700 ppm above ambient (ASHRAE 62.1)
- Carbon monoxide not exceeding 9 ppm (ASHRAE 62.1)
- Total volatile organic compound concentrations do not exceed 1000 µg/m³ (440 ppb) (Health Canada)
- PM10 does not exceed 50 µg/m³ (ASHRAE 62.1)
- Temperature in the range of 21 – 27 C°, considering seasonal variances, relative humidity (ASHRAE 55)
- Relative humidity in the range of 30-60% (USEPA I-BEAM) or more than 20% (CSA)
- HVAC system interiors are in good general condition, clean, free of standing water and debris, and have no visible suspect mold growth.
- If other local regulations exist for the above performance criteria, the most stringent will apply

Regarding the preventive maintenance schedule for HVAC that will impact IAQ, include language regarding how environmental quality performance will be verified. At a minimum, testing should be conducted over a typical workday, considering fluctuations in contaminant levels that may occur. Testing should be conducted, at a minimum, in the morning and afternoon.

During flu season and/or pandemic response consider the following ASHRAE HVAC operation recommendations:

- Maintain temperature and humidity design set points
- Maintain equivalent clean air supply required for design occupancy whenever anyone is present in the space served by a system
- When necessary to flush spaces between occupied periods, operate systems for a time required to achieve three air changes of equivalent clean air supply
- Limit re-entry of contaminated air from energy recovery devices, outdoor air and other sources to acceptable levels

Documentation

- IAQ Management Plan with strategies during normal operations as well as flu season, and/or pandemic response
- IAQ Assessment Report
- [I1.0a – IAQ Monitoring Plan Template](#)

Suggested Lead

In-house: Facility Maintenance, Building Manager/Policy Makers

Third-party: IEQ Consultant

Value

- Indoor air quality (IAQ) management is important for maintaining a safe and healthy environment for building occupants. Poor IAQ conditions can lead to adverse health effects in building occupants
- Engage a qualified professional to perform an IAQ assessment to confirm IAQ parameters are within recommended ranges and identify potential areas of improvement
- Develop an IAQ management plan that includes HVAC preventive maintenance and regular HVAC system inspections to maintain cleanliness and reduce air contaminants

Linked Questions:

E6.0 - Preventive Maintenance: Include HVAC inspections in preventive maintenance plan

I1.1a - IAQ Corrective Actions: Implement corrective actions

I1.2a - Owner or Landlord Frequently Assesses IAQ: Perform more frequent IAQ assessments

Description

Indoor Air Quality (IAQ) is achieved through the selection of appropriate and achievable air quality goals, regular surveillance and testing to verify HVAC performance and hygiene, efficient and effective procedures for addressing occupant IAQ concerns and adequate training for the building management team.

References

[Health Canada – Draft guidance on improving indoor air quality in office buildings](#)

[Indoor Air Quality Guideline for Non-Industrial Workplaces, EACC, 2020](#)

[IAQ Checklist \(US EPA\)](#)

[Example of IAQ Housekeeping Activities \(US EPA\)](#)

[IAQ Maintenance Inspection Form \(US EPA\)](#)

[Indoor Air Quality Guide \(US EPA\)](#)

[ASHRAE HVAC operation recommendations during flu season and/or pandemic response](#)

Adapted BB 3.0 Question

Best Practice 7 – Is an Indoor Air Quality Monitoring Plan in place at the building?

Question 03.02.01 – Does the air quality meet the goals set out in the IAQ Monitoring Plan?

I1.0b – Owner or landlord informs, tenant manages IAQ

Focus Area

Indoor Air Quality and Hazards

Topic

Baseline Practices

Question

I1.0b – Owner or landlord informs, tenant manages IAQ

Question

Does the owner or landlord conduct visual IAQ inspections of tenant-managed spaces each year?

Applicability

All asset classes

Tenant occupied building – some or all systems managed by the tenant

Answer & Scoring

- Yes – this is a baseline requirement
- Not Applicable – Owner/landlord occupied building **OR** Tenant occupied building: All systems managed by the owner/landlord **OR** Tenant occupied building: The building owner/landlord does not have access to tenant-managed spaces

Requirements

- a) Conduct a visual inspection of the tenant-managed HVAC systems that serve tenant leased spaces, covering the following as applicable:
 - Air handling units (dampers, plenum, filters, coils, humidifiers, fans, motors)
 - Air distribution and terminal systems (ductwork, plenum, diffusers, grilles, CAV/VAV boxes, fan-coils, heat pumps, exhaust)
 - Central systems (boiler, chiller, cooling tower, air compressor, pneumatics, pumps) and pipes, generators, controls)
 - Potential mold growth or water damage to base building components
 - Tenant operations that may negatively impact other tenants' air quality (for example, proper exhaust if paint booth is used)
 - No damage to asbestos containing or other hazardous base building materials
- b) Cover a group of tenants who lease at least half of the total building area
- c) Share visual inspection forms with tenants

OR

- d) Documentation demonstrating that the building owner/landlord's does not have access to the tenant managed HVAC systems (e.g. lease agreement)

OR

- e) Signed letter from owner/landlord or tenant indicating how and why the owner is restricted from the space.

Documentation

- Most recent visual inspection forms of tenant spaces
- Communication where the results of the visual inspection were shared with tenants
- Demonstrate that the inspections cover at least half of the area of the building
- [I1.0b – Visual IAQ Inspections Template](#)

OR

- Documentation demonstrating that the building owner/landlord's does not have access to the tenant managed HVAC systems (e.g. lease agreement)

OR

- Signed letter from owner/landlord or tenant indicating how and why the owner is restricted from the space.

Suggested Lead

In-house: Facility Maintenance, Building Manager/Policy Makers

Value

- Tenant-controlled HVAC systems can have a significant impact on the indoor air quality (IAQ) in a building. If systems are not properly operated or maintained, this can lead to poor IAQ and negatively affect building occupants
- Perform regular visual inspections of tenant-controlled HVAC systems to ensure systems are operating correctly and are properly maintained
- Engage with tenants during the inspection and share the results and recommendations with them

Linked Questions:

I1.1b - Tenant IAQ Corrective Actions: Implement corrective actions

Description

Indoor air quality (IAQ) is achieved through the selection of appropriate and achievable air quality goals, regular surveillance and testing to verify HVAC performance and hygiene, efficient and effective procedures for addressing occupant IAQ concerns and adequate training for the building management team.

The owner or landlord can play an important role in supporting tenants in determining appropriate and achievable air quality goals, conducting regular surveillance and testing to verify HVAC performance and hygiene, advise on efficient and effective procedures for addressing occupant IAQ concerns and encourage adequate training for the tenant space management team.

References

[Indoor Air Quality Guideline for Non-Industrial Workplaces, EACC, 2020](#)

[IAQ Checklist \(US EPA\)](#)

[Example of IAQ Housekeeping Activities \(US EPA\)](#)

[IAQ Maintenance Inspection Form \(US EPA\)](#)

[Indoor Air Quality Guide \(US EPA\)](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

I4.0 – IAQ Management in Construction

Focus Area

Indoor Air Quality and Hazards

Topic

Baseline Practices

Question

I4.0 – IAQ Management in Construction

Question

Is a plan in place to minimize indoor air quality impacts during renovation and construction?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes – this is a baseline requirement

Requirements

- a) Reference SMACNA IAQ Guidelines
- b) Develop the building-specific Construction IAQ Control Plan, covering the following:
 - Hazardous materials management
 - Dust control
 - Isolation of HVAC zones and/or enhanced ventilation
 - HVAC filter replacement
 - VOC emission/absorption and odor management
 - Noise, vibration control monitoring
 - De-pressurization of construction zones as needed (e.g., in medical offices, hospitals and long-term care facilities)

SMACNA guidelines cover the following:

- **HVAC Protection:** Protect HVAC equipment from construction debris that may enter ductwork or spaces, such as isolating the return air side of the system and installing temporary filters
- **Source Control:** Use low-emission alternatives when selecting paints, sealants, adhesives, carpeting, cleaning products etc.
- **Pathway Interruption:** Prevent airborne contaminants from construction to circulate through the rest of the building. Strategies include the installation of physical barriers between construction and occupied spaces and ventilating with 100% outside air
- **Housekeeping:** Keep the construction sites clean and promptly clean spills to prevent the potential for growth of microbial contaminants

- **Scheduling:** Consider the sequence in which materials are installed. Some materials absorb volatile organic compounds (VOCs) emitted by other materials, so those should ideally be installed after

Documentation

- Building-Specific Construction IAQ Control Plan
- [I4.0 – IAQ During Construction Management Plan Template](#)

Suggested Lead

In-house: Project Manager (oversees new builds)/Policy Makers

Third-party: Architectural or engineering consultant (needs to be familiar with construction practices)

Value

- Construction and renovation projects can introduce extra particulates and contaminants into the air. This can negatively affect indoor air quality (IAQ). Extra precautions should be taken to preserve a healthy and safe indoor environment for building occupants
- Develop a construction IAQ control plan to manage negative IAQ effects from construction activities. Include specific control measures to eliminate or reduce hazardous materials, dust, chemical emissions, noise, and vibration
- Consider isolating HVAC zones effected by construction and renovation and replacing filters after construction activities conclude to maintain the cleanliness of HVAC systems and prevent contaminants from spreading outside of the construction zone

Linked Questions:

I4.1 - IAQ Control in Construction Specifications: Include IAQ control plan in construction specifications

I4.2 - IAQ Management in Tenant Construction: Create an IAQ control plan for tenant construction

Description

During renovation or construction activities, elevated airborne particulate can be generated through the disturbance of various building materials (e.g., concrete, plaster, drywall, ductwork, flooring and insulation), dust originating from products used in the construction and by equipment that may emit combustion products. Additionally, building furnishings and finishes typically emit volatile organic compounds. Strategies to mitigate the impact of construction-generated contaminants in adjacent spaces should be developed and implemented.

Specific guidelines must be in place for base-building or tenant renovations and construction projects to ensure that contaminants are not released into the surrounding interior environment and building indoor air quality (IAQ) is maintained.

References

[SMACNA IAQ Guidelines for Occupied Buildings Under Construction, 2nd edition ANSI/SMACNA 008, 2008](#)

Adapted BB 3.0 Question

Question 03.01.03 — Is a plan in place to control construction-generated contaminants prior to base-building or tenant renovations?

18.0 – Landlord Shares IAQ and Hazards Practices

Focus Area

Indoor Air Quality and Hazards

Topic

Baseline Practices

Question

18.0 – Landlord Shares IAQ and Hazards Practices

Question

Has the owner or landlord's Indoor Air Quality & Hazards Communication Plan been shared with the building tenants?

Applicability

All asset classes

Tenant occupied building

Answer & Scoring

- Yes – this is a baseline requirement
- Not Applicable – Owner/landlord occupied building

Requirements

- a. Develop a building-specific Indoor Air Quality & Hazards Communication Plan that covers the following:
 - Efforts the building management team may implement to assess and manage IAQ and hazards. This should include tips for managing ventilation, exhaust, filtration, renovation projects, refrigeration and IAQ hazards
 - IAQ assessment from I1.0b and associated initiatives as applicable
- b. Copies of communication with the building's tenants where the content of the building Indoor Air Quality & Hazards Communication Plan was shared, dated within the last 12 months
- c. Demonstrate that communication was distributed to at least half of the number of tenant organizations occupying the building or a group who lease at least half of the total building area

Documentation

- Building-specific Indoor Air Quality & Hazards Communication Plan
- Proof of communication with representative group of building tenants, covering IAQ assessment, tips for managing ventilation, exhaust, filtration, renovation projects, refrigeration and IAQ hazards
- [18.0 – IAQ & Hazards Communication Plan Template](#)

Suggested Lead

In-house: Facility Maintenance, Building Manager/Policy Makers

Value

- Tenant engagement is important for maintaining Indoor air quality (IAQ) at a building. Engaging with tenants can help maintain and improve IAQ at the building
- Share the building's IAQ management plans with tenants and provide recommendations on how tenants can help maintain IAQ at the building

Description

Increasing building tenant and occupant awareness and engagement in environmental and sustainable practices can have a significant positive impact on the performance of the building.

Improving the environmental performance of the building can lead to many positive outcomes for building management, staff and tenants, including but not limited to lower operational costs, lower utility bills, improved indoor air quality, improved management-tenant relationships, etc.

References

None

Adapted BB 3.0 Question

Best Practice 7 – Is an Indoor Air Quality Monitoring Plan in place at the building?

Best Practice 16 – Is an Occupant Environmental Communication Program in place at the building?

I1. Assessment

I1.1a – Owner or landlord IAQ Corrective Actions

Focus Area

Indoor Air Quality and Hazards

Topic

Assessment

Question

I1.1a – Owner or landlord IAQ Corrective Actions

Question

Have base building Indoor Air Quality (IAQ) corrective actions been addressed by the owner or landlord?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building - all systems managed by the owner/landlord

Answer & Scoring

- Yes = 5 points
- No = 0 points
- Not Applicable – No corrective actions have been identified **OR** Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 5 points

Requirements

- a) Reference the IAQ Assessment Report (from Question I1.0a)
- b) If applicable, reference Occupant Service Request (from Question A4.1)
- c) If applicable, reference Occupant Satisfaction Survey (from Question A4.2)

Documentation

- Narrative with photos showing corrective actions taken
- Explain why any corrective actions were not addressed, with an implementation plan / schedule if actions were deferred due to cost constraints

Suggested Lead

In-house, with third-party support

Value

- Building off I1.0a - Owner or landlord manages whole-building IAQ, improve Indoor air quality (IAQ) at the building by implementing recommendations made during an IAQ assessment

Description

Indoor Air Quality (IAQ) is achieved through the selection of appropriate and achievable air quality goals, regular surveillance and testing to verify HVAC performance and hygiene, efficient and effective procedures for addressing occupant IAQ concerns, and adequate training for the building management team.

References

None

Adapted BB 3.0 Question

Question 03.03.02 — Has the building manager acted on recommended corrective actions identified in the IAQ audit?

I1.1b – Tenant IAQ Corrective Actions

Focus Area

Indoor Air Quality and Hazards

Topic

Assessment

Question

I1.1b – Tenant IAQ Corrective Actions

Question

Has landlord followed-up on Indoor Air Quality (IAQ) corrective actions identified in the tenant spaces?

Applicability

All asset classes

Tenant occupied building

Answer & Scoring

- Yes = 4 points
- No = 0 points
- Not Applicable – Owner/landlord occupied building **OR** Tenant occupied building: The building owner/landlord does not have access to tenant-managed spaces **OR** No corrective actions have been identified = 0/0

Max of 4 points

Requirements

- a) Demonstrate owner or landlord has followed-up with tenants regarding visual inspection findings (at least once in the last year)
- b) Reference the IAQ visual inspection forms from Question I1.0b and demonstrate any corrective actions taken

OR

- c) Documentation demonstrating that the building owner/landlord's does not have access to the tenant managed space (e.g. lease agreement)

OR

- d) Signed letter from owner/landlord or tenant indicating how and why the owner is restricted from the space.

Documentation

- Copies of follow-up communication with tenants regarding the visual inspection findings
- Narrative with photos showing corrective actions taken

OR

- Documentation demonstrating that the building owner/landlord's does not have access to the tenant managed HVAC systems (e.g. lease agreement)

OR

- Signed letter from owner/landlord or tenant indicating how and why the owner is restricted from the space.

Suggested Lead

In-house

Value

- Building off I1.0b – Owner or landlord informs, tenant manages IAQ, tenants should implement corrective actions identified in the IAQ assessment to maintain the indoor air quality at the building
- Regularly follow-up with tenants to ensure that corrective actions are implemented. Poorly maintained systems in tenant spaces can impact other building areas and negatively affect other occupants

Description

Indoor Air Quality (IAQ) is achieved through the selection of appropriate and achievable air quality goals, regular surveillance and testing to verify HVAC performance and hygiene, efficient and effective procedures for addressing occupant IAQ concerns, and adequate training for the building management team.

The owner or landlord can play an important role in supporting tenants in determining appropriate and achievable air quality goals, conducting regular surveillance and testing to verify HVAC performance and hygiene, advise on efficient and effective procedures for addressing occupant IAQ concerns, and encourage adequate training for the tenant space management team.

References

None

Adapted BB 3.0 Question

Question 03.03.02 — Has the building manager acted on recommended corrective actions identified in the IAQ audit?

I1.2 – Owner or landlord frequently assesses IAQ

Focus Area

Indoor Air Quality and Hazards

Topic

Assessment

Question #

I1.2 – Owner or landlord frequently assesses IAQ

Question

How frequently are IAQ assessments conducted at the building?

Applicability

Office, Healthcare, Enclosed Shopping Centre, Universal and Multi-Unit Residential buildings, Light Industrial

Owner/landlord occupied building

Tenant occupied building – all systems managed by the owner/landlord

Answer & Scoring

- Yes – Annually = 3 points
- Yes – Alternating seasons = 5 points
- No = 0 points
- Not applicable – Tenant occupied building: Some or no systems managed by the owner/landlord = 0/0

Max of 5 points

Requirements

Provide copies of each IAQ Assessment Report completed within the past three years.

Testing in alternating seasons means an applicant may test in the winter in one year and in the summer in the next year, and again in the winter the following year. Meaning the time that went by between audits may vary, it could be six months or 18 months. The value of conducting audits in alternating seasons means the building operations and maintenance team may gain insights on differences in IAQ in different seasons.

Documentation

- At least 3 past IAQ Assessment Reports

Suggested Lead

In-house, with third-party support

Value

- Building off the Baseline Practice I1.0a - Owner or landlord manages whole-building IAQ, engage qualified professionals to perform more frequent IAQ assessment to confirm IAQ parameters are within recommended ranges
- Performing annual assessments prevents IAQ issues from going unchecked for long periods of time. IAQ issues are resolved more quickly which prevents adverse effects on occupant health
- Different HVAC systems are typically used for heating and cooling at the building. Performing IAQ tests on alternating seasons ensures that a healthy indoor environment is maintained in all seasons

Description

Annual IAQ testing can assist in confirming if HVAC systems are operating properly and if occupants are comfortable in the working environment.

Most IAQ complaints are received during either the heating or cooling seasons, so it is best to conduct the testing during these seasons. Provide the dates of the last IAQ assessments and that they have alternated between heating and cooling seasons to achieve additional points.

References

[Indoor Air Quality Guideline for Non-Industrial Workplaces, EACC, 2020](#)

[IAQ Checklist \(US EPA\)](#)

[Example of IAQ Housekeeping Activities \(US EPA\)](#)

[IAQ Maintenance Inspection Form \(US EPA\)](#)

[Indoor Air Quality Guide \(US EPA\)](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

I1.3 – Smoking Restrictions

Focus Area

Indoor Air Quality and Hazards

Topic

Assessment

Question

I1.3 – Smoking Restrictions

Question

Is smoking restricted on the property?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 1 point
- No = 0 points

Max of 1 point

Requirements

- a) The property must prohibit indoor smoking
- b) Provide clear signage at entrances indicating smoking is only permissible at a minimum distance of nine (9) meters from building entrances, intakes and operable windows
- c) If smoking is allowed outdoors, demonstrate that there is a designated smoking area a minimum distance of nine (9) meters from building entrances, intakes and operable windows

Consideration should be given to the implementation of a property-wide smoking and e-cigarette ban.

Documentation

- Narrative describing the indoor and outdoor smoking policy
- Photos of installed signage
- If applicable, drawings demonstrating where the designated smoking area is located
- If applicable, photos of designated smoking area

Suggested Lead

In-house

Value

- Smoking is linked to severe human health effects to users and anyone who is exposed to the smoke
- To protect building occupants, define a designated exterior smoking area a minimum of nine (9) meters from building entrances and outdoor air intakes

Description

To reduce the potential for exposure, there must be restrictions placed on areas where occupants, staff or visitors are allowed to smoke (including e-cigarettes).

Such restrictions reduce the potential for harmful smoking products and odors from entering the building HVAC systems and increases occupant comfort in the building exterior space.

References

None

Adapted BB 3.0 Question

Question 03.01.02 – Is smoking restricted on the property?

I2. Ventilation and Exhaust

I2.1a – Owner or landlord maintains Outdoor Air

Focus Area

Indoor Air Quality and Hazards

Topic

Ventilation and Exhaust

Question

I2.1a – Owner or landlord maintains Outdoor Air

Question

Do measured Outdoor Air (OA) ventilation rates in owner/landlord-controlled areas meet minimum carbon dioxide (CO₂), ASHRAE 62.1 thresholds?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building - all systems managed by the owner/landlord

Answer & Scoring

- Yes — CO₂ concentrations below 800ppm = 2 points
- Yes — OA rates meet ASHRAE 62.1 Table 6.2.2.1 minimum requirements = 5 points
- No = 0 points
- Not applicable – Tenant occupied building: Some or no systems managed by the owner/landlord (must answer I2.1b) = 0/0

Max of 7 points

Requirements

a. Demonstrate CO₂ concentrations below 800ppm:

- Refer to most recent IAQ Assessment Report and highlight section showing CO₂ concentrations measured below 800ppm in owner or landlord-controlled spaces
- The assessment must have been completed within the last year

b. Demonstrate ASHRAE 62.1 Table 6.2.2.1 minimum Requirements are met:

- Determine the average ventilation rate for frequently occupied indoor spaces through on-site measurement of actual outdoor and supply air through the use of a certified air balancing contractor or equivalent
- The assessment must have been completed within the last five years, or as major renovations of the HVAC systems occur

Documentation

- Table showing CO₂ concentrations measured below 800ppm
- Table comparing calculated and measured based on ASHRAE 62.1 Table 6.2.2.1 ventilation rates

OR

- Documentation demonstrating that no systems are under the building owner/landlord's control (e.g. lease agreement)

Suggested Lead

In-house, with third-party support

Value

- Excessive carbon dioxide (CO₂) in a building can cause adverse health effects. CO₂ levels should be kept under the recommended level of 800 ppm to prevent negative impacts on building occupants
- Monitor CO₂ levels to ensure they stay below the recommended level
- Ventilate indoor spaces with an adequate amount of outdoor air to manage CO₂ levels and indoor air contaminants
- An outdoor air study can be done by qualified professionals to confirm that ventilation rates are in compliance with ASHRAE 62.1

Description

Maintaining adequate ventilation and thermal comfort within the built environment is important for occupant health and safety, comfort, and productivity.

Inadequate ventilation is one of the major sources of IAQ complaints and is also an indicator that the HVAC system may not be functioning optimally.

References

[ASHRAE 62.1 Standard](#)

Adapted BB 3.0 Question

Question 03.04.04 — Do measured outdoor air ventilation rates meet the minimum requirements of Table 6.2.2.1 of the current ASHRAE 62.1 Standard?

I2.1b – Owner or landlord informs, Tenant maintains Outdoor Air

Focus Area

Indoor Air Quality and Hazards

Topic

Ventilation and Exhaust

Question

I2.1b – Owner or landlord informs, Tenant maintains Outdoor Air

Question

Do the measured Outdoor Air (OA) ventilation rates in tenant-controlled areas meet minimum carbon dioxide (CO₂) thresholds?

Applicability

All asset classes

Tenant occupied building – some or all systems managed by the tenant

Answer & Scoring

- Yes = 3 points
- No = 0 points
- Not applicable – Owner/landlord occupied building **OR** Tenant occupied building: All systems managed by the owner/landlord **OR** Tenant occupied building: Owner does not have access to tenant-controlled areas = 0/0

Max of 3 points

Requirements

- a) Demonstrate CO₂ concentrations below 800 ppm:
 - Refer to most recent IAQ Assessment Report and highlight section showing CO₂ concentrations measured below 800 ppm in tenant-controlled spaces
 - The assessment must have been completed within the last year

Measurements taken with CO₂ handheld devices are admissible if devices meet the following criteria: Handheld non-dispersive infrared devices with a range of 0 to 5,000 ppm and resolution of 1 ppm

OR

- b) Documentation demonstrating that the building owner/landlord's does not have access to the tenant-controlled areas (e.g. lease agreement)

OR

- c) Signed letter from owner/landlord or tenant indicating how and why the owner is restricted from the space.

Documentation

- Table showing CO₂ concentrations measured below 800 ppm

OR

- Documentation demonstrating that the building owner/landlord's does not have access to the tenant managed HVAC systems (e.g. lease agreement)

OR

- Signed letter from owner/landlord or tenant indicating how and why the owner is restricted from the space.

Suggested Lead

In-house, with third-party support

Value

- Excessive carbon dioxide (CO₂) in a building can cause adverse health effects. CO₂ levels should be kept under the recommended level of 800 ppm to prevent negative impacts on building occupants
- Ventilate indoor spaces with an adequate amount of outdoor air to manage CO₂ levels and indoor air contaminants
- Engage qualified professionals to perform indoor air testing in tenant-controlled areas to confirm that CO₂ concentrations in compliance
- Alternatively, install sensors in tenant spaces to monitor CO₂ levels and confirm they are below the recommended level

Description

Where tenants manage IAQ, owner or landlords should be aware of operations and maintenance practices within tenant spaces to check that tenant practices are not negatively impacting adjacent or base building components that are the owner or landlord's responsibility.

Inadequate ventilation is one of the major sources of IAQ complaints and an indicator that the HVAC system may not be functioning optimally. Odorous or dusty operations in tenant spaces have the potential to impact adjacent tenants if the contaminants are not properly controlled. The owner or landlord should ensure any high-risk tenants are diligent with their processes so adjacent tenants are not adversely impacted.

References

[ASHRAE 62.1 Standard](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

I2.1c – Owner or landlord maintains Outdoor Air, Residential

Focus Area

Indoor Air Quality and Hazards

Topic

Ventilation and Exhaust

Question

Owner or landlord maintains Outdoor Air, Residential

Applicability

Multi-Unit Residential

Tenant occupied building

Question

Do measured Outdoor Air (OA) ventilation rates in owner or landlord-controlled areas meet minimum carbon dioxide (CO₂), ASHRAE 62.1 or ASHRAE 62.2 thresholds?

Answer & Scoring

Select all that apply:

- Yes – CO₂ concentrations below 800ppm = 1 point
- Yes – OA rates meet current ASHRAE 62.1 Table 6.2.2.1 minimum requirements (corridors and common areas) = 1 point
- Yes – OA rates meet current ASHRAE 62.2 minimum requirements (residential spaces) = 1 point
- No = 0 points

Max of 3 points

Requirements

- a) Implement a process for reviewing the efficiency of tenant HVAC equipment at lease expiry, with recommendations to address any deficiencies related to:
 - Energy efficiency
 - Carbon reduction
- b) Describe corrective actions planned and implemented, and person responsible

Documentation

- Narrative describing the process to assess and improve HVAC equipment at lease expiry

Suggested Lead

In-house

Value

- Excessive carbon dioxide (CO₂) in a building can cause adverse health effects. CO₂ levels should be kept under the recommended level of 800 ppm to prevent negative impacts on building occupants
- Ventilate indoor spaces with an adequate amount of outdoor air to manage CO₂ levels and indoor air contaminants
- Engage qualified professionals to perform indoor air testing in tenant-controlled areas to confirm that CO₂ concentrations in compliance
- Alternatively, install sensors in tenant spaces to monitor CO₂ levels and confirm they are below the recommended level

Description

Where tenants manage HVAC equipment, owner or landlords should be aware of operations and maintenance practices within tenant spaces to check that tenant practices are not negatively impacting adjacent or base building components that are the owner or landlord's responsibility.

At lease expiry the owner or landlord has the opportunity to replace inefficient equipment and implement strategies that could advance the organization's energy efficiency and net zero goals.

References

[ASHRAE 62.1 Standard](#)

[ASHRAE 62.2 Standard](#)

[ASHRAE 180 "Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems"](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

I2.2 – IAQ in New Tenancies

Focus Area

Indoor Air Quality and Hazards

Topic

Ventilation and Exhaust

Question

I2.2 – IAQ in New Tenancies

Question

Is there a procedure in place for reviewing the tenant-controlled HVAC equipment at lease expiry?

Applicability

All asset classes

Tenant occupied building

Answer & Scoring

- Yes = 3 points
- No = 0 points
- Not applicable – Owner/landlord occupied building = 0/0

Max of 3 points

Requirements

- a) Implement a process for reviewing the condition and efficiency of tenant HVAC equipment at lease expiry, with recommendations to address any deficiencies related to:
 - Mold or water damage
 - Air quality and ventilation effectiveness
 - Filtration media
- b) Describe corrective actions planned and implemented, and person responsible

Documentation

- Narrative describing process to maintain HVAC equipment at lease expiry

Suggested Lead

In-house

Value

- Tenant-controlled HVAC systems can have a significant impact on the indoor air quality (IAQ) in a building. If systems are not properly operated or maintained, this can lead to poor IAQ and negatively affect building occupants
- During tenancy change-overs or at lease ends, review the condition and efficiency of tenant HVAC systems to ensure they have been operated and maintained correctly

- Implement corrective actions to ensure HVAC systems continue to be properly maintained to preserve IAQ at the building

Description

Where tenants manage IAQ, owner or landlords should be aware of operations and maintenance practices within tenant spaces to check that tenant practices are not negatively impacting adjacent or base building components that are the owner or landlord's responsibility.

Inadequate ventilation is one of the major sources of IAQ complaints and is also an indicator that the HVAC system may not be functioning optimally. Odorous or dusty operations in tenant spaces have the potential to impact adjacent tenants if the contaminants are not properly controlled. The owner or landlord should ensure any high-risk tenants are diligent with their processes so adjacent tenants are not adversely impacted.

References

[ASHRAE 180 "Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems"](#)

Applicability

All buildings

Adapted BB 3.0 Question

New in BOMA BEST 4.0

I2.3 – Air Quality Sensors

Focus Area

Indoor Air Quality and Hazards

Topic

Ventilation and Exhaust

Question

I2.3 – Air Quality Sensors

Question

Are air quality sensors (CO₂, Temperature, Relative Humidity) present within the HVAC system and do they monitor real-time indoor air quality metrics on the Building Automation System (BAS)?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - PM2.5 = 1 point
 - PM10 = 1 point
 - CO = 1 point
 - Ozone = 1 point
 - NO₂ (nitrogen dioxide) = 1 point
 - Total VOCs = 1 point
 - Formaldehyde = 1 point
- No = 0 points

Max of 3 points

Requirements

- a) At least one sensor must be installed within a regularly occupied space in the building
- b) Demonstrate air quality sensors are present within the HVAC system, as follows:
 - The BAS system must be equipped with sensors to measure CO₂ concentrations, temperature, and relative humidity in the air supply serving at least 75% of the occupied spaces in the building
 - Sensors must be non-dispersive infrared and provided by a reputable manufacturer
 - Sensors should be either self-calibrating or regularly calibrated as per manufacturer's direction
 - Sensors must provide real-time monitoring with a data output interval of at least once every 10 minutes
- c) Provide BAS readouts that demonstrate how IAQ is monitored on the BAS

- d) Provide brief narrative explaining how BAS readings are used to inform building operations & maintenance procedures

Note that this question is pertinent to the sensors installed prior to and/or during tenancy and must be answered regardless of whether the systems are managed by the tenant.

Documentation

- Purchase orders, installation records, maintenance work orders or photos of sensors installed
- Screenshots of BAS readings
- Narrative of IAQ monitoring activities

Suggested Lead

In-house, with third-party support

Value

- Monitor IAQ parameters (temperature, relative humidity, and indoor air contaminants) through real-time air quality sensors
- HVAC systems can be adjusted to respond to IAQ issues in real-time to maintain a healthy indoor environment and occupant comfort

Description

Maintaining adequate ventilation and thermal comfort within the built environment is important for occupant health and safety, comfort, and productivity.

Having sensors measure CO₂ concentrations, temperature and relative humidity within the building HVAC system can provide useful information to help manage indoor air quality.

References

None

Adapted BB 3.0 Question

Question 11.04.01 – Have real-time air quality sensors been installed since the start of the COVID-19 pandemic?

I2.4 – CO Monitoring in Parking Areas

Focus Area

Indoor Air Quality and Hazards

Topic

Ventilation and Exhaust

Question

I2.4 – CO Monitoring in Parking Areas

Question

Do carbon monoxide (CO) concentrations in enclosed parking garages and loading docks meet minimum thresholds?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes – CO is tested = 1 point
- Yes – CO sensors installed = 2 points
- No = 0 point
- Not Applicable – There are no enclosed parking garages or loading docks = 0/0

Max of 2 points

Requirements

- a) If IAQ testing data is available, provide representative sampling that:
 - Demonstrates that CO levels are below 25 ppm
 - Is conducted at least annually and captures high traffic periods
- b) If sensors are installed:
 - Demonstrate that concentrations of carbon monoxide are monitored continuously
 - Provide sensor details (electrochemical or metal oxide semi-conductor with a resolution of 1 ppm)
 - Show that sensors are calibrated in accordance with manufacturer's specifications
 - Confirm that CO levels are below 25 ppm. Provide sensor logs and/or IAQ testing data for these locations

Note that this question is pertinent to the systems installed prior to and/or during tenancy and must be answered regardless of whether the systems are managed by the tenant.

Documentation

- IAQ testing results

OR

- IAQ sensor data

Suggested Lead

In-house, with third-party support

Value

- Carbon monoxide (CO) is a gas emitted from internal combustion vehicles that can present serious health risks to humans
- Monitor CO levels in enclosed parking areas to ensure levels stay within a safe range by either testing CO levels annually or installing real-time CO sensors
- HVAC systems can be adjusted to respond to high CO levels in real-time to maintain a healthy indoor environment

Description

Carbon monoxide emissions from internal combustion vehicles can present a serious health and safety risk. Monitoring carbon monoxide within enclosed parking areas and loading docks can help identify exposures before they exceed current occupational exposure limits.

The current ACGIH Threshold Limit Values for carbon monoxide exposure is 25 ppm.

References

[ACGIH Threshold Limit Values \(TLV\) – Chemical Substances](#)

Adapted BB 3.0 Question

Question 03.04.06 – Is the enclosed parking garage and/or gas/fuel-fired equipment room ventilated?

I2.5 – CO Monitoring in Occupied Spaces

Focus Area

Indoor Air Quality and Hazards

Topic

Ventilation and Exhaust

Question

I2.5 – CO Monitoring in Occupied Spaces

Question

Do carbon monoxide (CO) concentrations in occupied spaces adjacent to parking garages, loading docks, and mechanical rooms meet minimum thresholds?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes — CO is tested = 1 point
- Yes — CO sensors installed = 2 points
- No = 0 points
- Not Applicable – There are no occupied spaces adjacent to parking garages, loading docks, and mechanical rooms = 0/0

Max of 2 points

Requirements

- a) Identify occupied spaces that are located adjacent to parking garages, loading docks and mechanical rooms
- b) If IAQ testing data is available, provide representative sampling that:
 - Demonstrates that CO levels are below 5 ppm
 - Is conducted at least annually and captures high traffic periods
- c) If sensors are installed:
 - Demonstrate that concentrations of carbon monoxide are monitored continuously
 - Provide sensor details (electrochemical or metal oxide semi-conductor with a resolution of 1 ppm)
 - Show that sensors are calibrated in accordance with manufacturer's specifications
 - Confirm that CO levels are below 5 ppm

Note that this question is pertinent to the systems installed prior to and/or during tenancy and must be answered regardless of whether the systems are managed by the tenant.

Documentation

- Identify occupied spaces potentially exposed to CO

AND

- IAQ testing results

OR

- IAQ sensor data

Suggested Lead

In-house, with third-party support

Value

- Carbon monoxide (CO) is a gas emitted from internal combustion vehicles and fuel-burning mechanical equipment that can present serious health risks to humans
- CO from parking areas and mechanical rooms can leak into surrounding occupied spaces putting occupants at risk
- Monitor CO levels in occupied spaces to ensure CO levels stay within a safe range by either testing CO levels annually or installing real-time CO sensors
- HVAC systems can be adjusted to respond to high CO levels in real-time to maintain a healthy indoor environment

Description

Carbon monoxide emissions from vehicles and improperly vented combustion equipment like boilers and hot water tanks can present a serious health and safety risk. Monitoring carbon monoxide concentrations in occupied spaces adjacent to indoor parking areas and mechanical rooms can help identify exposures before they become a health hazard.

Health Canada has indicated that carbon monoxide concentrations above 5 ppm are indication of possible emissions and warrant further investigation.

References

[Health Canada: Indoor Air Quality in Office Buildings, A Technical Guide, 1995](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

I3. Filtration

I3.1 – Filter Inspection

Focus Area

Indoor Air Quality and Hazards

Topic

Filtration

Question #

I3.1 – Filter Inspection

Question

Are filters in air handling systems inspected/replaced at regular intervals and corrective actions taken when required?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – systems managed by the owner/landlord

Answer & Scoring

- Yes = 3 points
- No = 0 points
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 3 points

Requirements

- a) All filters to be rated as per ASHRAE 52.2 (latest version)
- b) Confirmation of MERV-A ratings or equivalent must be in writing
- c) Filters in constant velocity systems can be replaced at the manufacturer's maximum rated pressure drop providing there is no detrimental effect on air flow. Air filters in Variable Frequency Drive (VFD) systems to be replaced at approximately twice the initial pressure drop to achieve maximum energy savings
- d) Provide filter inspection records and maintenance log showing frequency of inspection and replacements
- e) Outline corrective actions taken or plan to address issues identified

Documentation

- Filter rating (ASHRAE test reports including Appendix “J” testing or written confirmation from supplier that filters do not decrease in efficiency through their life)
- Filter replacement schedule
- Filter inspection records and maintenance log
- Evidence that corrective actions have been completed

Suggested Lead

In-house

Value

- Filters are used in HVAC systems to trap air contaminants such as dust, pollen, and mold spores to ensure that clean air is provided to indoor spaces
- Filters have a MERV rating that reflects the filter's efficacy. The higher the MERV rating, the smaller particulates the filter can capture
- Filters can become clogged quickly with particulates. Frequently inspect filters to determine when filters need to be replaced
- Replace filters are found in poor condition as soon as possible to prevent poor air quality

Description

Use of ASHRAE Minimum Efficiency Reporting Value MERV 8/8-A or greater filtration shall be utilized in intermittently occupied areas and used primarily in the protection of HVAC equipment and components only. In regularly occupied areas, a minimum MERV 13/13-A filter shall be utilized. Pressure gauges shall be used wherever possible to determine the correct change-out interval of the filters. Filtration of return-air (from systems, such as compartment units, fan-coil units, heat pumps) prevents recirculation of occupant-generated contaminants.

Filtration systems need to be properly maintained in accordance with manufacturers' recommendations. Filters should be inspected at least quarterly.

References

[ASHRAE 52.2-2017 Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size](#)

Adapted BB 3.0 Question

Question 03.04.01 – What MERV filters are in use for all outdoor air and return air (i.e. circulating air) systems?

Question 03.04.03 – Are measures in place to alert building operators that HVAC filtration systems need replacement?

13.2 – MERV Filter Rating

Focus Area

Indoor Air Quality and Hazards

Topic

Filtration

Question

13.2 – MERV Filter Rating

Question

Are filters with a MERV 13 rating or higher installed on Air-Handling Units (AHUs)?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – systems managed by the owner/landlord

Answer & Scoring

- Yes = 4 points
- No = 0 points
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 4 points

Requirements

- a) Provide evidence of the MERV filter rating or equivalent. All filters must be rated as per ASHRAE 52.2
- b) Filters must be replaced at or before the pre-determined pressure drop or timeframe, not exceeding the manufacturer's specifications and ASHRAE Standard 180 (Maintenance Standard)

Documentation

- Filter rating (MERV 13 to 16) or equivalent, such as via inventory list, product box, photos
- Filter replacement schedule

Suggested Lead

In-house

Value

- Filters are used in air handling systems to trap air contaminants such as dust, pollen, and mold spores. Filters ensure that clean air is provided to indoor spaces
- Filters have a MERV rating that reflects the filter's efficacy. The higher the MERV rating the smaller particulates the filter can capture.
- MERV 13 - 16 filters prevent up to 90% of outdoor air contaminants from entering the HVAC system
- Install higher rated filters in HVAC systems to improve indoor air quality at their building
- Before installation ensure the building's HVAC systems can support higher rated filters

Description

Installation of filtration systems that meet ASHRAE Minimum Efficiency Reporting Value (MERV) 13 or equivalent prevent larger outdoor air contaminants, such as mold spores, pollen, some dusts, and aerosols from entering the HVAC system. Installation of filtration systems that meet ASHRAE MERV 13 to 16 prevent up to 90% of fine outdoor air contaminants, such as mold spores, pollen, dust, and aerosols from entering the HVAC system.

References

[ASHRAE 52.2-2017 Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size](#)

Adapted BB 3.0 Question

Question 03.04.01 – What MERV filters are in use for all outdoor air and return air (i.e. circulating air) systems?

I4. Renovation and Construction

I4.1 – IAQ Control in Construction Specifications

Focus Area

Indoor Air Quality and Hazards

Topic

Renovations and Maintenance

Question #

I4.1 – IAQ Control in Construction Specifications

Question

Are the construction IAQ controls included in specifications for owner or landlord renovation or construction projects?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Yes — included in specifications = 1 point
 - Yes — evidence of implementation exists = 2 points
- No = 0 points

Max of 3 points

Requirements

Before construction:

- a) Incorporate the Construction IAQ Control Plan into design and construction specifications for all owner or landlord-led renovation or construction projects being planned in the building
- b) Identify construction projects where the implementation of the Construction IAQ Control Plan would apply
- c) Prepare the specifications for those projects and highlight the sections detailing the construction IAQ control measures to follow

During and after construction:

- d) Conduct regular inspections and document where and how the construction IAQ control measures are followed
- e) Keep a record of the inspections and track implementation of controls for the duration of the construction project

These specifications are required regardless of whether the owner/landlord has control over the tenant space as the specifications should be utilized if the owner/landlord needs to renovate the space during tenant change-over.

Documentation

- Section of construction specifications detailing IAQ control measures
- Photos or inspection reports demonstrating implementation of the Construction IAQ Plan

Suggested Lead

In-house, with third-party support

Value

- Construction and renovation projects can cause extra particulates and contaminants to enter the air. This can negatively affect indoor air quality (IAQ). Extra precautions should be taken to preserve a healthy and safe indoor environment for building occupants
- Building off I4.0 - IAQ Management in Construction, include the building's construction IAQ control plan in construction specifications to manage negative IAQ effects from construction activities
- Additional points will be awarded to buildings that provide proof of implementation of IAQ control strategies during construction

Description

Specific guidelines must be in place for base-building or tenant renovations and construction projects to ensure that contaminants are not released into the surrounding interior environment and building indoor air quality (IAQ) is maintained.

Contractors or sub-contractors performing renovation or construction work in a building may be required to follow SMACNA IAQ guidelines as directed by the owner or landlord.

References

[SMACNA IAQ Guidelines for Occupied Buildings Under Construction, 2nd edition ANSI/SMACNA 008, 2008](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

I4.2 – IAQ Management in Tenant Construction

Focus Area

Indoor Air Quality and Hazards

Topic

Renovations and Construction

Question #

I4.2 – IAQ Management in Tenant Construction

Question

Are the construction IAQ controls included in specifications for tenant renovation or construction projects?

Applicability

All asset classes

Tenant occupied building

Answer & Scoring

- Yes = 2 points
- No = 0 points
- Not applicable – Owner/landlord occupied building = 0/0

Max of 2 points

Requirements

- a) Develop tenant construction manuals for all tenant-led renovations or construction projects being planned in the building
- b) Share the building-specific Construction IAQ Control Plan with tenants to include in their design and construction specifications

Documentation

- Section of tenant construction manual detailing IAQ control measures

Suggested Lead

In-house

Value

- Construction and renovation projects can cause extra particulates and contaminants to enter the air. This can negatively affect indoor air quality (IAQ). Extra precautions should be taken to preserve a healthy and safe indoor environment for building occupants
- Building off I4.0 - IAQ Management in Construction, create a tenant construction manual detailing control measures to manage negative IAQ effects from tenant construction activities
- This prevents tenant renovation and construction activities from affecting the IAQ of tenant areas and surrounding spaces

Description

Specific guidelines must be in place for base-building or tenant renovations and construction projects to ensure that contaminants are not released into the surrounding interior environment and building indoor air quality (IAQ) is maintained.

Tenants, their contractors or sub-contractors performing renovation or construction work in a building may be required to follow SMACNA IAQ guidelines as directed by the owner or landlord.

References

[SMACNA IAQ Guidelines for Occupied Buildings Under Construction, 2nd edition ANSI/SMACNA 008, 2008](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

I5. Refrigerants

I5.1 – Refrigerant Safety Program

Focus Area

Indoor Air Quality and Hazards

Topic

Refrigerants

Question #

I5.1 – Refrigerant Safety Program

Question

Is a Refrigerant Safety Program in place?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 2 points

Select all that apply, whether owner/landlord- or tenant-managed:

- R12
 - R22
 - R410a
 - R407c
 - R134a
 - R32
 - R513a
 - R1234ze
 - R1234yf
 - R514a
 - R1233zd
 - Ammonia (R717)
 - Propane (R290)
 - CO₂ (R744)
 - Water (R718)
 - Halon or Halocarbon Fire Suppressants greater than 10 kg
 - Other (include refrigerant name and GWP)
- No = 0 points
 - Not applicable – Demonstrate that no systems in the building require refrigerants = 0/0

Max of 2 points

Requirements

- a) Develop a building-specific Refrigerant Safety Program, compliant with ASHRAE Standard 15 “Safety Standard for Refrigeration Systems,” CSA Mechanical Refrigeration Code B52-13 and the Federal Halocarbon Regulation
- b) The program must:
 - Cover responsible parties, including the building team’s training Requirements
 - List refrigerants in use at the building
 - List actions required to reduce and managed refrigerant leaks
 - Describe procedures for refrigerant investigations and corrective action
- c) Demonstrate that the program was developed by a person competent in refrigerant safety practices
- d) Be signed by the building manager, dated within the past 12 months.

OR

- e) Where refrigeration systems are owned and managed by the tenants, the owner or landlord must provide information to tenants on how to implement a Refrigerant Safety Program. Tenants must be encouraged to disclose any halocarbon fire suppressant systems within their space

OR

- f) If no refrigerants are present in the building, provide a list of equipment in the building demonstrating that no refrigerants are required

Documentation

- Building-specific Refrigerant Safety Program
- Proof that program was shared with tenants

OR

- Provide documentation demonstrating that the building systems do not require refrigerants

Suggested Lead

In-house, with third-party support

Value

- Refrigerants are fluids used by heating and cooling equipment (i.e. air conditioning, chillers, coolers, refrigerators) to transfer heat
- Refrigerants can pose significant risks to occupants and the environment when improperly managed
- Establish a refrigerant safety program that outlines safety procedures to reduce hazards associated with refrigerants
- Implement measures to reduce occupant exposure and prevent refrigerant leaks

Linked Questions:

- 15.2 - Refrigerant Inspections
- 15.3 Phase-out High GWP Refrigerants

Description

Refrigerants are fluids used by heating and cooling equipment (e.g., air conditioners, heat pumps, commercial chillers, and variable-refrigerant-flow (VRF) systems, vending machines, cooled water-fountains, kitchen/catering/freezers etc.) to transfer heat. Some refrigerants present both a health and environmental hazard. Safety measures should be employed to reduce the potential for releases.

Halon is an ozone depleting substance as well as an indoor atmospheric hazard (oxygen displacing). Use of halon in fire-suppression systems has been banned in many jurisdictions.

A Refrigerant Safety Program can help prevent leaks or occupant exposure to refrigerants and halocarbons.

References

[ASHRAE Standard 15, 2022 – “Safety Standard for Refrigeration Systems” CSA Mechanical Refrigeration Code B52-13](#)

[CSA Mechanical Refrigeration Code B52-13](#)

[Federal Halocarbon Regulation](#)

Adapted BB 3.0 Question

Question 05.01.02 – Is a Refrigerant Safety Program in place at the building?

15.2 – Refrigerant Inspections

Focus Area

Indoor Air Quality and Hazards

Topic

Refrigerants

Question

15.2 – Refrigerant Inspections

Question

Have leak checks and inspections been conducted on refrigerant systems?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – systems managed by the owner/landlord

Answer & Scoring

- Yes = 2 points
- No = 0 points
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord **OR**
No systems in the building require refrigerants = 0/0

Max of 2 points

Requirements

- a) Identify the third-party consultant or service contractor responsible for conducting the required refrigeration leak tests. The service contractor should have an ozone depleting substance (ODS) certification card or equivalent
- b) Conduct inspections and tests at regular intervals as outlined in the respective refrigeration standards and detail:
 - The date of service and time since previous service
 - The nature of the service
 - Whether a leak was discovered
 - Corrective action taken, such as the amount of refrigerant lost or added to the system

Inspections are required annually in Federal sites in Canada. For provincially regulated sites the leak check inspection is required when equipment needs to be charged or topped up.

Documentation

- Credentials of third-party delivering the refrigerant management service
- Record of most recent refrigeration inspections and leak tests conducted

Suggested Lead

This question requires a third-party

Value

- Refrigerant leaks can pose significant risks to occupants and can emit harmful gases into the environment. These gases can negatively contribute to ozone depletion and global warming
- Building off I5.1 - Refrigerant Safety program, perform regular inspections of refrigerant using equipment looking for leaks to manage potential risks

Description

Refrigerants are fluids used by heating and cooling equipment (e.g., air conditioners, heat pumps, commercial chillers, and variable-refrigerant-flow (VRF) systems) to transfer heat. Some refrigerants present both a health and environmental hazard. Safety measures should be employed to reduce the potential for releases. A Refrigerant Safety Program can help prevent leaks or occupant exposure to refrigerants and halocarbons. Regular leak checks and inspections safeguard occupants from potential risks.

References

[ASHRAE Standard 15, 2022 — “Safety Standard for Refrigeration Systems”](#)

[CSA Mechanical Refrigeration Code B52-13](#)

[Federal Halocarbon Regulation](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

I5.3 – Phase-Out High GWP Refrigerants

Focus Area

Indoor Air Quality and Hazards

Topic

Refrigerants

Question

I5.3 – Phase-Out High GWP Refrigerants

Question

Is there a plan to phase out any of the high global warming potential (GWP) refrigerants in use at the building or have any already been phased out?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – systems managed by the owner/landlord

Answer & Scoring

- Yes = 3 points
 - Select which of the following high GWP refrigerants are planned for phase-out:
 - R12
 - R22
 - R410a
 - R407c
 - R134a
 - Halon or Halocarbon Fire Suppressants greater than 10 kg
 - Other (include refrigerant name and GWP)
- No = 0 points
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord **OR**
No systems in the building require refrigerants = 0/0

Max of 3 points

Requirements

- a) Indicate which type of refrigerants have already been phased out
- b) Indicate which type of refrigerants are currently being used in the building
- c) Where high GWP refrigerants are being used please describe the transition plan

The following refrigerants are considered to have medium to low GWP compared to those with high GWP listed above:

- R32 (medium GWP)
- R513a (medium GWP)
- R1234ze (low GWP)

- R1234yf (low GWP)
- R514a (low GWP)
- R1233zd (low GWP)
- Ammonia (R717) (low GWP)
- Propane (R290) (low GWP)
- CO₂(R744) (low GWP)
- Water (R718) (low GWP)

Low emissions refrigerants have a GWP under 600 kg CO₂e/m².

Documentation

- Evidence of refrigerants already phased out
- Refrigerant Phase-out Plan

Suggested Lead

In-house, with third-party support

Value

- Some refrigerants pose an even more significant risk to the environment as they have a high global warming potential (GWP). High GWP gases when released into the environment, significantly contribute to global warming and climate change
- Building off I5.1 - Refrigerant Safety program, phase-out of refrigerants with a high GWP to reduce the building's contribution to global warming
- When replacing equipment, building management teams purchase new equipment that uses refrigerants with low GWP

Description

Refrigerants contribute to climate change by trapping heat in the atmosphere similar to CO₂. The global warming impact of a refrigerant is referred to as Global Warming Potential (GWP), a metric that measures a substance's impact relative to CO₂. When a refrigerant is released to the atmosphere it contributes to a building's emissions. This often occurs when leaks develop, equipment is damaged, and during decommissioning. As refrigerants are phased out equipment will require decommissioning and replacement with new equipment.

For comparison, the common refrigerant R410A has a GWP 2,088, meaning the warming effect it has when released to the atmosphere is 2,088x more than that of CO₂.

References

[Regulations Amending the Ozone-depleting Substances and Halocarbon Alternatives: SOR/2020-177](#)

[Greenhouse Gas Protocol — Global Warming Potential Values](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

I6. IAQ Hazards

I6.1 – Hazardous Materials Management

Focus Area

Indoor Air Quality and Hazards

Topic

IAQ Hazards

Question

I6.1 – Hazardous Materials Management

Question

Is a Hazardous Materials Management Program implemented at the building?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – systems managed by the owner/landlord

Answer & Scoring

- Yes = 3 points
Select all hazardous materials known or suspected to be present, handled or stored at the building, managed by the owner or landlord and tenants:
 - Asbestos
 - PCBs
 - Silica
 - Suggested Lead
 - Mercury
 - Urea Formaldehyde Foam Insulation
 - Chrysotile
 - Other
- No = 0 points
- Not Applicable – Provide evidence that no hazardous materials are in the building **OR**
Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 3 points

Requirements

- a) Develop and implement a Hazardous Materials Management Program
 - Responsible parties, including the building team's training requirements
 - Inventory of all building materials known or presumed to contain asbestos, lead, PCBs, silica, and mercury etc.
 - Outline requirements and frequency for hazardous materials surveys and/or inspections
 - Describe how to safely store chemical products in accordance with product Safety Data Sheets and remove asbestos or PCB-containing materials from the building
- b) Engage a third-party expert to survey and inspect hazardous materials present, handled and stored at the building
- c) Conduct a hazardous materials survey that covers the following:
 - Type, location, approximate quantity in each area and overall extent of hazardous materials present or stored in the building
 - Description of sampling methodology applied and locations where samples were taken
 - Findings and recommendations that provide site specific handling, abatement and disposal guidelines
 - Appendices that include relevant laboratory testing results of samples taken
- d) Inspect hazardous materials to ensure these are managed in accordance with the building's Hazardous Materials Management Program

Consult with the building's third-party hazardous materials expert to determine how frequently surveys need to be conducted. If operations or renovation and construction activities are not affecting the location of these materials, then consider whether survey frequency can be adjusted

Inspections of known or presumed asbestos-containing materials, where present, are required every year. The condition or state of the asbestos-containing materials (e.g., poor, fair, good) must be reviewed. Inspection of materials known or presumed to contain lead, mercury, PCBs or other hazardous building materials or equipment, where present, are required every three years.

The laboratory performing the sample testing should be accredited by one of the following organizations:

- National Voluntary Laboratory Accreditation Program (NVLAP)
- American Industrial Hygiene Association (AIHA)
- The Canadian Association for Laboratory Accreditation (CALA)
- The Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST), or equivalent

Documentation

- Hazardous Materials Management Program
- Credentials of third-party delivering the hazardous materials assessment service
- Outline of construction, renovation, or operations activities that may have come in contact with these hazardous materials in the last three years
- Inspection records demonstrating that materials are safely handled
- Corrective actions identified and completed
- If applicable, evidence that no hazardous materials are in the building

Suggested Lead

In-house

This question requires a third-party to meet a portion of the requirements

Value

- Hazardous building materials can pose a significant health risk to building occupants if improperly managed
- Engage a qualified professional to identify and assess hazardous materials at the building and make recommendations for on-going management of these materials
- Establish a hazardous material management program to ensure hazardous materials are properly managed
- When possible, remove or abate hazardous materials from the building to maintain a safe indoor environment for occupants

Description

To mitigate the risk of exposure to hazardous materials associated with building materials, equipment and finishes, the building owner/manager must develop a program to periodically inspect the condition of these materials, conduct safe repair, assess disturbance or complete removal of these materials, and to adequately train personnel in contact with hazardous materials.

The presence and condition of hazardous materials must be identified and managed for the safety of building occupants.

References

[ASTM E2356 – 14 “Standard Practice for Comprehensive Building Asbestos Surveys”](#)

Adapted BB 3.0 Question

Best Practice 9: Is a Hazardous Building Materials Management Program in place at the building?

I6.2 – Hazardous Chemicals Management

Focus Area

Indoor Air Quality and Hazards

Topic

IAQ Hazards

Question

I6.2 – Hazardous Chemicals Management

Question

Is a Hazardous Chemical Product Management Program implemented at the building?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – systems managed by the owner/landlord

Answer & Scoring

- Yes = 2 points
- No = 0 points
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord = 0/0

Max of 2 points

Requirements

The Hazardous Chemical Products Management Program must include all following components:

- Responsible parties
- The building team's training requirements (including safe handling and use of chemicals pertaining to their work, symbol recognition, safety data sheets, first aid and spill response, storage, and disposal)
- Inventory of all hazardous chemical products
- Outline requirements for periodic inventory of in-use, base-building hazardous chemical products (at least annually, or as procurement is revised)
- Describe how to safely store chemical products in accordance with product Safety Data Sheets
- Outline requirements for a continuous and proactive review process to ensure up-to-date Safety Data Sheets for all hazardous chemical products are always available to employees, must be performed within the last three (3) years
- Describe how chemical products are to be labeled in accordance with WHMIS/GHS/HAZCOM
- Requirements for the review and update of the Program (as products are changed and at least annually)

Documentation

- Hazardous Chemical Management Program

Suggested Lead

In-house

Value

- Chemicals that are potentially hazardous to human health are often necessary for building maintenance
- Proper management of hazardous chemicals in the building is important in maintaining a safe indoor environment
- Establish a hazardous chemical product management program to ensure proper chemical management protocols are used by all staff
- Follow proper storage procedures, product labelling techniques, and train relevant building staff
- Update the Hazardous chemical management program regularly to ensure it includes all hazardous chemicals at the building

Description

Identification and management of chemical products in use or storage at the building is essential to manage health hazards and safety risks, as well as potential environmental impacts.

Internationally, a Globally Harmonized System (GHS) for safety related to the use of hazardous chemical products has been developed by the United Nations. Similar systems such as the Workplace Hazardous Materials Information System (WHMIS) in Canada and HAZCOM in the US are regulated approaches to the management of hazardous chemical or use-related products.

A use-related product is defined as anything that is brought into the building and can include a hazardous chemical. A hazardous chemical is defined as a dangerous good which could be a solid, liquid, or gas that can harm people, other living organisms, property, or the environment.

References

None

Adapted BB 3.0 Question

Best Practice 10 – Is a Hazardous Chemical Products Management Program in place at the building?

I6.3 – Radon Risk Assessment

Focus Area

Indoor Air Quality and Hazards

Topic

IAQ Hazards

Question

I6.3 – Radon Risk Assessment

Question

Has a Radon Risk Assessment been performed?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 3 points
- No – Information must still be provided, see Requirements = 1 point

Max of 3 points

Requirements

- Conduct testing in the following locations:
 - Radon testing must occur in all occupied areas where the floors or walls are in direct contact with the ground or is over crawlspaces, utility tunnels or parking garages. Health Canada defines an occupied area as one that is occupied by an individual for four hours per day
 - Unoccupied rooms should also be tested at the same time as occupied rooms if there are plans for them to become occupied in the near future
 - If none of the ground contact floors are occupied, test all occupied rooms on the first occupied floor level above
- Measurement of occupied areas within a building is required for a minimum duration of 91 days. The testing period will occur entirely during the heating season.
- Use only measurement devices approved by C-NRPP
- Final analysis must be completed by a laboratory certified by the C-NRPP or similar. Not all measurement protocols require laboratory analyses (e.g., E-PERM Electrets) so long as the analyst is accredited to conduct that analysis through C-NRPP
- The radon risk assessment report must be signed by an individual certified by the C-NRPP or similar certification body

OR

- f) If selecting no, for properties located in Canada, go to [link](#), find the region where this building is located and enter the % of homes in that region with high radon levels: ____ %

High radon levels can potentially exist on upper floors due to the upward movement of air from stack effect or if radon is suspected to be emanating from building materials. However, Health Canada has conducted large-scale testing of federal buildings, and these factors are not considered to be significant. If elevated radon levels are identified on the lower floors, the C-NRPP mitigation professional could potentially conduct diagnostic testing on the upper floors while the mitigation strategy is being developed, to confirm the full scope of mitigation required.

Documentation

- Radon Risk Assessment Report

OR

- If located in Canada, enter the % of homes in that region with high radon levels

Suggested Lead

In-house

This question requires a third-party to meet a portion of the requirements

Value

- Radon is a colorless, odorless radioactive gas present in soil, rock, and water
- At low concentrations, such as in outdoor environments, radon poses a very low risk to human health. However, radon gas can enter a building through contact with sub-surface soil and rock, and can reach concentrations that pose a higher health risk to occupants
- Perform radon testing to confirm the building's radon levels are within a safe range
- Some areas in Canada have been found to have higher radon levels than other areas. If radon testing has not been done at the building, identify the percentage of homes in the building's geographical location that have tested positive for high radon levels

Description

Radon is a colorless, odorless, naturally occurring radioactive gas present in soil, rock and water.

In outdoor environments the concentration of radon is low, and the associated health risk is negligible. However, radon can enter buildings through any openings that are in contact with the sub-surface soil and rock and can accumulate to higher concentrations which results in a higher health risk for the occupants within.

Health Canada has identified elevated radon concentrations in every public health unit across Canada and as such, it is recommended that every building be tested to confirm if radon levels within are acceptable. The only way to know the radon concentrations that are present within a building is to test for it.

References

[What is radon and where can I find it?](#)

[Canadian National Radon Proficiency Program](#)

[Guide for Radon Measurements in Public Buildings](#)

[General Information about Radon in Canada](#)

[About Radon Testing](#)

[Find a certified radon measurement professional](#)

Adapted BB 3.0 Question

Question 05.02.01 – Has a radon risk assessment been completed for the building?

17. Training and Innovation

17.1 – Training in IAQ and Hazards

Focus Area

Indoor Air Quality and Hazards

Topic

Training and Innovation

Question #

17.1 – Training in IAQ and Hazards

Question

Did the building operations and management team receive Indoor Air Quality & Hazards training in the past three years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - IAQ Assessment, Ventilation, Exhaust & Filtration = 1 point
 - Renovation & Maintenance = 1 point
 - Refrigeration & IAQ Hazards = 1 point
- No = 0 points

Max of 3 points

Requirements

- a) List the names of staff members to whom the competencies covered under these topics would apply
 - Training must be provided on the equipment and systems for which the owner or landlord is responsible, covering content such as:
 - A review of maintenance practices, such as filter changes, coil cleaning, drain pans, humidifiers, fan operation, cooling tower maintenance, etc.
 - A review of applicable IAQ standards and guidelines as well as building performance goals
 - Typical causes of IAQ complaints and suggested remedies
 - What is radon, health effects of radon exposure, how does radon enter buildings? Applicable guidance and legislation, testing for radon, mitigation of radon, radon and new construction
- b) Provide the applicable course outline or syllabus

- c) Provide evidence of competency or training received such as credentials, completion certificate, record of attendance

Documentation

- Name of building O&M team member who received the training
- Course outline or syllabus
- Training Certificate or Record of Attendance

Suggested Lead

In-house, with third-party support

Value

- Train building staff on the indoor air quality (IAQ) management, maintaining IAQ during construction and renovation, and IAQ Hazards to give staff the confidence to play an active role in IAQ management
- Training can result in improved IAQ and more effective IAQ management

Description

For building maintenance staff to effectively manage the building's Indoor Air Quality & Hazards, training should be provided which addresses the topics of IAQ assessment, ventilation and exhaust, filtration, renovation & maintenance, refrigeration or IAQ hazards.

Over time, technologies and preferred practices in building operations and maintenance change. Providing regular professional development opportunities is a good way to help retain staff. Offering training and educational opportunities related to environmental/sustainable building performance not only benefits staff but improves the performance of the building when staff training is applied at the building level.

References

[ASHRAE 180 "Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems"](#)

[ASHRAE Indoor Air Quality Guide](#)

Adapted BB 3.0 Question

Question 03.01.01 — Is a training program on indoor air quality (IAQ) in place for Property Managers and Building Maintenance staff?

17.2 – Innovation in Indoor Air Quality and Hazards

Focus Area

Indoor Air Quality and Hazards

Topic

Training and Innovation

Question

17.2 – Innovation in Indoor Air Quality and Hazards

Question

Is an innovative process or technology in place at the building that goes beyond the requirements outlined in this section?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Permanent IAQ sensors installed = 1 point
 - Corrective actions taken to address any of the hazardous materials risks identified (including, but not limited to radon) = 1 point
 - Joint landlord/tenant IAQ initiatives implemented = 1 point
 - Other = 1 point
- Not Applicable - Not pursuing Innovation points = 0/0

Max of 3 points

Requirements

- a) Provide details of the technology or process applied at the building
- b) Indicate when the technology or process was implemented and the steps that are in place to ensure the technology or process's ongoing success
- c) If "Other" is selected, explain how the technology or process has improved the building's IAQ or hazards management practices for it to be considered innovative

Innovative processes or technologies do not need to be preapproved and will be evaluated as part of the verification process.

Documentation

- Narrative of innovative technology or process and its impact

Suggested Lead

In-house, with third-party support

Value

- The Innovation in IAQ question awards buildings for going beyond requirements outlined in other IAQ questions
- Buildings are encouraged to pursue additional measures to improve indoor air quality at the building

Description

Many processes and technologies exist that go beyond the standards and requirements set out in the BOMA BEST Assessment. If building managers/owners have invested in innovative processes or technologies that go beyond these standards, innovation points can be earned under this question.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

18.1 – Align Engagement Initiatives with Tenants

Focus Area

Indoor Air Quality and Hazards

Topic

Engagement

Question

18.1 – Align Engagement Initiatives with Tenants

Question

Do any of the tenants' indoor air quality & hazards management approaches align with the owner or landlord's?

Applicability

All asset classes

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - IAQ Assessment = 1 point
 - Ventilation, Exhaust and Filtration = 1 point
 - Renovation and Maintenance = 1 point
 - Refrigeration and IAQ Hazards = 1 point
- No = 0 points
- Not applicable – Owner/landlord occupied building = 0/0

Max of 4 points

Requirements

- a) Engage with tenants to understand their Indoor Air Quality and Hazards goals, in specific topics listed, and how their goals may align with the building management's Indoor Air Quality and Hazards goals
- b) Provide a sample of feedback or communication received from the tenants that demonstrate where alignment exists in specific topics covered in the Indoor Air Quality and Hazards Plan

In buildings where tenants manage the majority of the IAQ-delivering systems, the owner or landlord can engage with the tenant(s) to collaborate and share information and lessons learned to improve whole-building performance in these areas.

Documentation

- Narrative that describes where landlord and tenant's Indoor Air Quality and Hazards goals align
- Sample of relevant feedback or communication received from the tenants

Suggested Lead

In-house

Value

- The Innovation in IAQ question awards buildings for going beyond requirements outlined in other IAQ questions
- Buildings are encouraged to pursue additional measures to improve indoor air quality at the building

Description

Passive engagement through communication is an important first step. Also, the ability to collect tenant utility data is becoming increasingly important as part of reporting and disclosure. Active engagement efforts include direct outreach activities, such as working with tenants to collect tenant-controlled utility data or requiring green leases for new tenants or renewals that address sustainability initiatives.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

Accessibility and Wellness

A0. Baseline Practices

A1.0 – Accessibility Awareness

Focus Area

Accessibility and Wellness

Topic

Baseline Practices

Question #

A1.0 – Accessibility Awareness

Question

Has the property management team considered the following accessibility questions in relation to this building?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes – this is a baseline requirement

Requirements

- a) Review the BOMA Accessibility Guide and Rick Hansen Foundation materials linked under References
- b) Review the features on-site and complete [BOMA BEST Form A1.0](#) by checking off which accessibility features are installed on-site

Applicants will not be penalized if the building lacks accessibility features. Achieving this baseline requirement will be accomplished by completing the form to the best of the building management team's abilities.

Documentation

- Completed [BOMA BEST Form A1.0](#)
- Photos of each question marked "Yes"

Suggested Lead

In-house: Building Manager

Value

- Environmental sustainability cannot be achieved without social sustainability being achieved first
- Accessible building features create spaces that work for all kinds of people and abilities
- Perform an in-house review of accessible features at their building to better understand what accessible features are currently at the building and opportunities for improvement

Linked Questions:

A1.1 - RHFAC Survey: Engage a RHFAC professional to perform an accessibility site review

Description

The intent behind this Question is to raise awareness about the different building elements that impact accessibility.

The BOMA Accessibility Guide is a resource to help building owners and managers understand how to be more inclusive of people with varying temporary and permanent disabilities. It was developed in partnership with the Rick Hansen Foundation.

The Rick Hansen Foundation Accessibility Certification™ (RHFAC) provides a holistic and consistent approach to measuring access through a rating survey.

References

[BOMA Accessibility Guide](#)

[RHFAC Program](#)

[RHFAC Rating Survey](#)

Adapted BB 3.0 Question

Question 04.02.02 — Is the building designed such that potential accessibility barriers are addressed?

A4.0 – Occupant Engagement

Focus Area

Accessibility and Wellness

Topic

Baseline Practices

Question

A4.0 – Occupant Engagement

Question

Is an Occupant Environmental Communication Program in place at the building?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

Yes – this is a baseline requirement

Requirements

- a) The Occupant Environmental Communication Program must address the following:
 - Include communications on the various strategies being pursued through the BOMA BEST Sustainable program:
 - Baseline practices
 - Any additional environmental strategies
 - The communication strategies that will be used
 - The activities that will be encouraged
 - Identify responsible individuals among management for moving each aspect of the plan forward
 - Include a timeline for implementation

- b) Demonstrate that at least four communication strategies have been implemented in the past 12 months:
 - Communication strategies include newsletters, tenant manual, posters, etc.
 - The key aspects of effective communication are frequency, accuracy, comprehensiveness and inclusiveness
 - To ensure that building occupants work together with building management to achieve environmental goals, regular communication must be executed. As such, the Program must clearly outline communication strategies, activities, responsibilities and timelines for implementation. The following communication framework must be evident:

- Communication strategies: clearly describe the communication strategies that will be used with tenants/occupants
- Activities: clearly describe the activities/events that will be communicated to occupants (e.g., Earth Day event or energy awareness campaigns with “turn off your monitor” stickers)
- Responsibilities: clearly describe who will be responsible for each aspect of the Occupant Sustainability Communications Program
- Timeline for implementation: clearly describe the timeline for implementation of all activities, events, and strategies put in place in the context of the Occupant Sustainability Communications Program
- Occupants are the permanent/regular occupants of the building, such as tenants and staff. If the building is owner-occupied, surveys should be directed to staff. Visitors to the building are not considered occupants

Documentation

- Occupant Environmental Communication Program
- Evidence of programs implemented
- [A4.0 – Occupant Environmental Communication Program Template](#)

Suggested Lead

In-house: Facility Maintenance, Building Manager/Policy Makers

Value

- Occupant experience is an important part of sustainability
- Occupant wellness is important for boosting productivity, profitability of businesses, and the overall mood of users
- Comfortable occupants are more likely to engage with the building which can also lead to improved building operations
- Increase occupant engagement by establishing several channels of communication with occupants

Linked Questions:

A4.1 - Occupant service request: Implement an occupant service request program

A4.2 - Occupant satisfaction survey: Conduct an occupant satisfaction survey

Description

Increasing building occupant awareness and engagement in environmental and sustainable practices can have a significant positive or negative impact on the performance of the building. Improving the environmental performance of the building can lead to many positive outcomes for building management, staff and tenants, including but not limited to lower operational costs, lower utility bills, improved indoor air quality, improved management-tenant relationships, etc.

References

None

Adapted BB 3.0 Question

Best Practice 16 – Is an Occupant Environmental Communication Program in place at the building?

A1. Accessibility

A1.1 – RHFAC Survey or Equivalent

Focus Area

Accessibility and Wellness

Topic

Accessibility

Question #

A1.1 – RHFAC Survey or equivalent

Question

Has a Rick Hansen Foundation Accessibility Certification™ (RHFAC) Professional (or equivalent for countries outside of Canada) conducted an on-site visit of the building to identify barriers faced by people with disabilities?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 2 points
- No = 0 points
- Not Applicable – Only available to buildings outside of Canada: No equivalent exists = 0/0

Max of 2 points

Requirements

- a) Engage a RHRAC Professional to conduct an on-site visit as part of the systematic review of the building's elements and features using the RHFAC methodology

OR

For countries outside of Canada:

- b) Have an on-site survey conducted by a similar organization and/or professional.
- c) Demonstrate how the organization and/or professional is equivalent to a Rick Hansen Foundation Accessibility Certification™ (RHFAC) Professional

OR

- d) If an equivalent does not exist, provide a narrative outlining the efforts made to find an equivalent

Documentation

- Documentation demonstrating that on-site visit was conducted by RHFAC Professional or equivalent

OR

- Narrative outlining efforts made to find equivalent

Suggested Lead

This question requires a third-party

Value

- The Rick Hansen Foundation promotes accessibility through the removal of barriers in buildings
- Rick Hansen Foundation Accessibility Certification (RHFAC) professionals are trained to assess accessibility features at a building
- Engage a RHFAC professional to perform an on-site review to identify accessibility barriers at their building

*Note that by completing the requirements of this question, the requirements of the Baseline Practice A1.0 will also be met.

Linked Questions:

A1.2 - RHFAC Plan or Action: Implement recommendations made by RHFAC professional

A1.3 - RHFAC Certification: Become RHFAC certified

Description

RHFAC Professionals are designated individuals who can conduct RHFAC ratings. They are trained with specific knowledge and skills to conduct a systematic review of the building's elements and features using the RHFAC methodology, based on the holistic user experience of people with varying disabilities affecting their mobility, vision, and hearing.

References

[RHFAC Rating Survey](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

A1.2 — RHFAC Plan or Action

Focus Area

Accessibility and Wellness

Topic

Accessibility

Question

A1.2 — RHFAC Plan or Action

Question

Have steps been taken to address any shortcomings identified in the Rick Hansen Foundation Accessibility Certification™ (RHFAC) Professional's (or equivalent) on-site visit?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes – Plan = 1 point
- Yes – Corrective actions implemented = 2 points
- No = 0 points
- Not Applicable – No recommendations made = 0/0
- Not Applicable – Only available to buildings outside of Canada: No equivalent exists = 0/0

Max of 2 points

Requirements

- a) Following the on-site visit create and document a plan outlining how and when accessibility shortcomings identified are to be addressed.
- b) Implement corrective actions

OR

- c) Documentation from the certification or equivalent that demonstrates no recommendations were made

OR

For countries outside of Canada:

- d) Have an on-site survey conducted by a similar organization and/or professional.
- e) Demonstrate how the organization and/or professional is equivalent to a Rick Hansen Foundation Accessibility Certification™ (RHFAC) Professional

OR

- f) If an equivalent does not exist, provide a narrative outlining the efforts made to find an equivalent

Documentation

- Plan of actions and timeline
- Photos of corrective actions taken (if any)
- If applicable, narrative demonstrating equivalency to RHFAC Professional

OR

- Narrative outlining efforts made to find equivalent from A1.1

Suggested Lead

In-house, with third-party support as required

Value

- Building off A1.1 - RHFAC Survey, building management teams are encouraged to create a plan to implement recommendations made by RHFAC professionals during the on-site review
- Additional points will be awarded to buildings who implement corrective actions

Description

The Rick Hansen Foundation Accessibility Certification™ (RHFAC) provides a holistic and consistent approach to measuring access through a rating survey. Reviewing the building's elements and features using the RHFAC methodology, based on the holistic user experience of people with varying disabilities affecting their mobility, vision, and hearing identifies shortcomings. Implementing corrective actions ensures a more accessible and inclusive building for the public.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

A1.3 – RHFAC Certification or Equivalent

Focus Area

Accessibility and Wellness

Topic

Accessibility

Question

A1.3 – RHFAC Certification or Equivalent

Question

What level of Rick Hansen Foundation Accessibility Certification™ (RHFAC) has the building achieved?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- RHFAC Certified = 2 points
- RHFAC Gold = 3 points
- Other equivalent accessibility certification achieved = 2 points
- No = 0 points
- Not Applicable – Only available to buildings outside of Canada: No equivalent exists = 0/0

Max of 3 points

Requirements

- a) Buildings can achieve RHF Accessibility Certified level by meeting certification prerequisites and achieving a score of at least 60% on the RHFAC Rating Survey
- b) Buildings can achieve RHF Accessibility Gold level by meeting gold certification prerequisites and achieving a score of at least 80% on the RHFAC Rating Survey
- c) Buildings can achieve any level of equivalent accessibility certification achieved

The Rick Hansen Foundation Accessibility Certification™ (RHFAC) or equivalent must be active.

For countries outside of Canada:

- a) Have an on-site survey conducted by a similar organization and/or professional
- b) Demonstrate how the organization and/or professional is equivalent to a Rick Hansen Foundation Accessibility Certification™ (RHFAC)

OR

- c) If an equivalent does not exist, provide a narrative outlining the efforts made to find an equivalent

Documentation

- RHFAC Registry issued Letter of Certification and Scorecard
- Certificate and scorecard of equivalent accessibility certification achieved
- If applicable, narrative demonstrating equivalency to RHFAC

OR

- Narrative outlining efforts made to find equivalent from A1.1

Suggested Lead

In-house or third-party

Value

- Third-party recognition is a way for a building to demonstrate their excellence in accessibility
- Third-party recognition adds validity to a building's accessibility claims and adds an element of transparency in the public eye
- A building with certification from a well-respected third party such as the Rick Hansen Foundation, is more attractive to potential tenants and stands out from other buildings
- Buildings that remove accessibility barriers from their building may be eligible to become RHFAC Certified
- Buildings with outstanding accessibility design can achieve a higher level of certification - RHFAC Gold

Description

The Rick Hansen Foundation Accessibility Certification™ (RHFAC) is a rating system developed to help property owners and managers measure the accessibility of their sites and promote increased access through the adoption of Universal Design principles. The program measures a site's level of meaningful access based upon CSA B651 standards that consider the holistic user experience of people of all abilities, including those with mobility, vision, and hearing disabilities.

References

[RHFAC Guide to Certification](#)

Adapted BB 3.0 Question

Question 04.05.03 — Is the building currently certified with the Rick Hansen Foundation Accessibility Certification™?

Comfort, Views, and Acoustics

A2.1 – Humidification

Focus Area

Accessibility and Wellness

Topic

Comfort, Views, and Acoustics

Question

A2.1 – Humidification

Question

Are humidification systems present and properly maintained?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – systems managed by the owner/landlord

Answer & Scoring

- Yes – humidification systems are present and properly maintained = 2 points
- No = 0 points
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord **OR** Humidification systems were considered but deemed not necessary = 0/0

Max of 2 points

Requirements

- a) Describe the type of humidification system present at the building
- b) Maintain the humidification system in accordance with manufacturer's recommendations

OR

- c) Describe the steps taken to understand the building's humidification needs (e.g. not needed in humid climate)
- d) Explain why humidification systems are not used at the building

Requirements apply to humidification delivered to occupied spaces.

Water treatment in HVAC equipment must, at all times, meet local provincial and/or federal guidelines and regulations.

Documentation

- Humidification System Maintenance Program and Maintenance records
- Annual cleaning and inspection logs

Suggested Lead

In-house

Value

- Humidification at a building is important to maintain occupant comfort
- When the relative humidity at a building is too low, occupants will become uncomfortable
This is often the case in cold climates during winter months when the air becomes dry
- If a building is located in a climate that experiences cold, dry winters, install humidification systems to maintain a comfortable RH level at their building
- Properly maintain humidification systems to ensure optimal indoor conditions are maintained

Linked Questions:

E6.0 - Preventive Maintenance: Include humidifier maintenance in plan

Description

Low indoor relative humidity is a common problem in cold climate buildings during winter months and a common source of indoor air quality complaints. The addition of a carefully maintained whole-building humidification system, that is focused on human comfort, can help maintain a more comfortable work environment.

Humidification systems should be cleaned and inspected annually. ASHRAE 180-2018 recommends annual inspection and cleaning of strainers, drain pans, distributors and semi-annual cleaning of steam traps, pumps and controls

References

[ASHRAE 180-2018 Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems, Table 5-11](#)

For more guidance on creating this risk management plan, please review the Hazard Analysis and Critical Control Point (HACCP) risk management plan in ASHRAE Standard 188, Prevention of Legionellosis Associated with Building Water Systems.

Adapted BB 3.0 Question

New in BOMA BEST 4.0

A2.2 – Relative Humidity

Focus Area

Accessibility and Wellness

Topic

Comfort, Views and Acoustics

Question

A2.2 – Relative Humidity

Question

Is Relative Humidity (RH) maintained according to ASHRAE 55?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – systems managed by the owner/landlord

Answer & Scoring

- Yes = 2 points
- No = 0 points
- Not applicable – Tenant occupied building: No systems managed by the owner/landlord **OR** Humidification systems were considered but deemed not necessary = 0/0

Max of 2 points

Requirements

- a) Demonstrate ASHRAE 55 is maintained at the building

Documentation

- BAS logs or equivalent Documentation showing humidity set point

Suggested Lead

In-house

Value

- Keep relative humidity (RH) at a building within the recommended range to maintain occupant comfort
- If the relative humidity is too high, occupants may feel uncomfortable, and the building may suffer with condensation issues which can lead to mold developing in building materials
- If the relative humidity is too low, the air will feel dry leading to general occupant discomfort and an increased risk of viral transmission

Description

Maintaining relative humidity in the proper range can prevent occupant complaints and condensation issues on building finishes. High relative humidity can cause discomfort and can also Suggested Lead to condensation and mold growth within buildings. Low relative humidity causes dryness and is a common indoor air quality complaint during winter months.

As per ASHRAE's Epidemic Task Force, Building Readiness Guide, maintaining the space relative humidity between 40% and 60% decreases the bioburden of infectious particles in the space and decreases the infectivity of many viruses in the air. Some regions recommend humidity levels are maintained between 30% to 50%.

References

[ASHRAE 55-2020 Thermal Environmental Conditions for Human Occupancy](#)

[ASHRAE Building Readiness Guide, 2022](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

A2.3 – Visual Elements

Focus Area

Accessibility and Wellness

Topic

Comfort, Views, and Acoustics

Question

A2.3 – Visual Elements

Question

Have the visual elements in the building been reviewed to identify and recognize improvement opportunities within the past five years?

Applicability

Office, Healthcare, Universal

Owner/landlord occupied building

Tenant occupied building – areas managed by the owner/landlord

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Review conducted of access to views and natural light = 1 point
- Review conducted of quality of electric light = 1 point
- Review conducted on glare control devices = 1 point
- Low and no-cost corrective actions addressed = 1 point
- Plan in place to address higher cost corrective actions (such as natural features in building e.g. living wall, plants etc.) = 1 point
- No recommendations made – Demonstrate how the building has the best visual elements possible = 2 points

- Not Applicable – Tenant occupied building: No areas managed by the owner/landlord = 0/0

Max of 3 points

Requirements

List the visual environment elements that have been reviewed within owner/landlord-controlled areas and summarize qualitative observations as applicable:

- Access to views and natural light, including views, lines of sight to natural landscapes, daylight, interior or exterior natural features (e.g., biophilia)
- Quality of electric light, including visible light transmittance of glazing, intensity and spectrum of electric light, lighting controls, lighting zones, lighting schedule- glare control devices, including manual or automated shading, luminaire shields to prevent glare, and any other visual elements not listed

- Provide the date of review, the name and role of the reviewer (may be internal), the reason for the review (tenant request, tenant complaint, landlord initiative, existing feature, or other) and a summary of findings

Documentation

- List with descriptions and observations of visual elements reviewed
- Explanation why any areas were excluded

Suggested Lead

In-house to review, third-party support

Value

- Visual elements in a space can play a significant role in occupant well-being. Good quality artificial lighting, access to views and daylight, natural landscapes, and biophilic interior design can all improve occupant comfort
- Perform an in-house assessment of the quality of visual elements at their building
- Third-party professionals can be engaged if building management teams do not have the resources to complete the review
- Based on the results of the review, implement corrective actions to improve occupant well-being

Description

A property's visual environment includes factors, such as the quality of light, daylighting, access to views, natural landscapes, or biophilic interior design elements.

A healthy visual environment is vital for many physiological processes including performance and alertness, sleep-wake cycles, hormone regulation, and immune system function.

It is suggested that owner or landlords collaborate with tenants to assess opportunities for addressing visual environment.

Building management can implement measures to promote balanced and comfortable access to natural light and views and reduced glare, supplemented by high quality electric light to positively impact occupants' experience. Enhancements may be a co-benefit of other building improvements, such as lighting upgrades.

References

None

Adapted BB 3.0 Question

Question 05.05.01 – Are features that attempt to simulate the natural environment installed in commonly occupied base-building areas?

A2.4 – Acoustic Elements

Focus Area

Accessibility and Wellness

Topic

Comfort, Views, and Acoustics

Question

A2.4 – Acoustic Elements

Question

Have the acoustic elements in the building been reviewed to identify and recognize improvement opportunities within the past five years?

Applicability

Office, Healthcare, Universal

Owner/landlord occupied building

Tenant occupied building – areas managed by the owner/landlord

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Review conducted = 1 point
- Low and no-cost corrective actions addressed = 1 point
- Plan in place to address higher cost corrective actions = 1 point
- No recommendations made – Demonstrate how the building has the best acoustic environment possible = 2 points

- No = 0 points

Max of 3 points

Requirements

- a) List the acoustic environment elements that have been reviewed within landlord-controlled areas and summarize qualitative observations as applicable:
 - Common area space use by noise level (quiet, medium, loud activities)
 - External noise intrusion (traffic, maintenance, construction)
 - Internal building system and operational noise intrusion (HVAC, elevators, maintenance, food service areas)
 - Internal occupant noise (foot traffic, conversations)
 - Whether space use activities and current conditions match or conflict acoustically
 - Other considerations not listed above
- b) Provide the date of review, the name and role of the reviewer (may be internal), the reason for the review (tenant request, tenant complaint, landlord initiative, existing feature, or other) and a summary of findings

Assess the background sound levels generated from exterior and base-building sources in a representative sample of spaces including open plan workspaces, private offices and meeting rooms. Background Noise Criteria (NC) levels must be compared to those stated in the ASHRAE “HVAC Applications” handbook and USGSA Centre for Workplace Strategy “Sound Matters” guidelines: maximum of 40 NC for open plan workspaces, 35 NC for private offices, and 25 NC for meeting rooms.

The scope of this question is limited to the aspects that the owner or landlord can control.

Examples of improvements could include building policies regarding noise levels, establishment of quiet, medium, and loud zones, or installing acoustic panels.

Documentation

- List with descriptions and observations of acoustic elements reviewed
- Explanation why any areas were excluded

Suggested Lead

In-house, with third-party support

Value

- Acoustic elements in a space can play a significant role in occupant comfort. Managing noise levels in a space from tenant activities, external noises, and internal building systems creates a good quality acoustical environment
- Perform an in-house assessment of the quality of acoustic elements at their building. Third-party professionals can be engaged if building management teams do not have the resources to complete the review
- Based on the results of the review, implement corrective actions to improve acoustic conditions at the building

Description

Much of the acoustic conditions within an office building are affected by the levels of background noise generated from building equipment and road noise.

References

[ASHRAE “HVAC Applications” handbook](#)

[USGSA Centre for Workplace Strategy, Whole-building Design Guide – Sound Matters: How to Achieve Acoustic Comfort in the Contemporary Office](#)

Adapted BB 3.0 Question

Question 04.02.01 — Has an assessment been performed of background sound levels generated from exterior and base-building sources?

A3. Equity and Inclusivity

A3.1 – DEI Assessment

Focus Area

Accessibility and Wellness

Topic

Equity and Inclusivity

Question #

A3.1 – DEI Assessment

Question

Have the building features been evaluated against diversity, equity and inclusion (DEI) aspects to inform an implementation plan?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - In-house assessment conducted = 1 point
 - Third-party DEI expert engaged = 2 points
 - Implementation plan developed = 3 points
- No = 0 points

Max of 3 points

Requirements

- a) Conduct an assessment that considers a variety of DEI strategies, and the feasibility of implementing them
- b) Engage a third-party DEI expert to consider in-house assessment and help in the development of a building-specific DEI strategy
- c) Develop a long-term DEI implementation plan based on the building-specific DEI strategies identified in the in-house assessment and through consultation with DEI expert

Strategies to consider include:

Amenities:

- Universal washrooms
- Baby feeding room
- Infant change tables in washrooms for all genders
- Family washrooms

- Gender neutral washrooms
- Provision of free female hygiene products
- On-site childcare
- Prayer/meditation/restorative room
- Spaces provided for community events/meetings
- Outdoor place of respite
- Safety and security measures (e.g., lighting, areas of refuge, safe walk programs, visible entries and exits)
- Training for tenants or employees (e.g., anti-racism, LGBTQIA+)
- Other

Sense of Place:

- Ancestral land acknowledgement
- Historical community acknowledgement (e.g. slavery, ethno-cultural)
- Hosting events to celebrate location and connection to the community
- Public art or interior/exterior design elements, such as murals to reflect and celebrate ancestral land use and community
- Art by local Indigenous artists
- Conservation of heritage features
- Outdoor publicly accessible and safe amenities
- Installations or permanent displays recognizing the local geography or environment
- Other structural or social strategies to enhance sense of place

Documentation

- In-house assessment of DEI strategies
- Letter confirming engagement of third-party DEI expert, with their credentials
- Long-term DEI implementation plan

Suggested Lead

In-house

Value

- Diversity, equity, and inclusivity (DEI) elements are building features that allow different groups of people to harmoniously use the building
- DEI elements allow more people to access the building and makes building occupants feel more welcome
- Perform an in-house assessment of the DEI elements at the project
- A third-party DEI expert can be engaged to provide a more detailed review of DEI elements or if building management teams do not have the resources to complete the review
- Based on the results of the review, implement corrective actions to improve DEI features at the building

Description

Inclusivity addresses equity of building use by different groups of occupants, providing a spectrum of amenities to support varying needs. This can include welcoming other users through building elements, such as universal washrooms and family washrooms, or providing signage in different languages.

Promoting inclusiveness within buildings can ensure that efforts to improve building wellness impact all building users equally. It is an opportunity to consider diversity and equity in planning and programming, to include components that support underrepresented, minority, and less visible user groups.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

A3.2 – Inclusive Amenities

Focus Area

Accessibility and Wellness

Topic

Equity and Inclusivity

Question

A3.2 – Inclusive Amenities

Question

Have steps been taken to enhance inclusive amenities at the building?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Universal washrooms = 1 point
 - Baby feeding room = 1 point
 - Infant change tables in washrooms for all genders = 1 point
 - Family washrooms = 1 point
 - Gender neutral washrooms = 1 point
 - Provision of free female hygiene products = 1 point
 - On-site childcare = 1 point
 - Prayer/meditation/restorative room = 1 point
 - Spaces provided for community events/meetings = 1 point
 - Outdoor place of respite = 1 point
 - Safety and security measures (e.g., lighting, areas of refuge, safe walk programs, visible entries and exits) = 1 point
 - Training for tenants or employees (e.g., anti-racism, LGBTQIA+) = 1 point
 - Other = 1 point
- No = 0 points
 - Not Applicable – No common areas/spaces on-site. Please provide documentation demonstrating spaces in landlord or owner’s control do not apply to these requirements = 0/0

Max of 5 points

Requirements

- a) For owner or landlord-controlled areas, indicate the inclusive amenity features that are implemented to make building users feel welcome

The strategies covered under this question are meant to go above and beyond common tenant / occupant engagement initiatives. Applicants are required to demonstrate the effort taken to understand building specific DEI challenges and opportunities.

By implementing strategies to create a sense of place that celebrates both relevant historic and contemporary cultures, owners or landlords can foster community-building opportunities beyond the site boundaries.

Inclusivity efforts will enhance safety, security and comfort while promoting a sense of belonging for all building users and the broader community.

Documentation

- Description of strategies implemented with accompanying photos

Suggested Lead

In-house, with third-party support

Value

- Inclusive amenities are building features that allow people of all abilities, ages, cultures, economic situations, educations, genders, languages, and races to collectively use a building
- Implement inclusive amenities to improve the project's inclusivity

Description

The strategies covered under this question are meant to go above and beyond common tenant / occupant engagement initiatives. Applicants are required to demonstrate the effort taken to understand building specific DEI challenges and opportunities.

By implementing strategies to create a sense of place that celebrates both relevant historic and contemporary cultures, owner or landlords can foster community-building opportunities beyond the site boundaries.

Inclusivity efforts will enhance safety, security and comfort while promoting a sense of belonging for all building users and the broader community.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

A3.3 – Sense of Place

Focus Area

Accessibility and Wellness

Topic

Equity and Inclusivity

Question

A3.3 – Sense of Place

Question

Have measures been implemented to enhance occupant and visitor inclusivity through creating a sense of place in the broader community?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Ancestral land acknowledgement = 1 point
- Historical community acknowledgement (e.g. slavery, ethno-cultural) = 1 point
- Hosting events to celebrate location and connection to the community = 1 point
- Public art or interior/exterior design elements, such as murals to reflect and celebrate ancestral land use and community = 1 point
- Art by local Indigenous artists = 1 point
- Conservation of heritage features = 1 point
- Outdoor publicly accessible and safe amenities = 1 point
- Installations or permanent displays recognizing the local geography or environment = 1 point
- Other structural or social strategies to enhance sense of place = 1 point
- No = 0 points
- Not Applicable – No common areas/spaces on-site. Please provide documentation demonstrating spaces in landlord or owner’s control do not apply to these requirements = 0/0

Max of 4 points

Requirements

- a) Describe the measures implemented to enhance the property's sense of place

The strategies covered under this question are meant to go above and beyond common tenant / occupant engagement initiatives. Applicants are required to demonstrate the effort taken to understand building specific DEI challenges and opportunities.

Documentation

- Description of strategies implemented with accompanying photos

Suggested Lead

In-house, with third-party support

Value

- Creating a sense of place at a building improves diversity, equity, and inclusivity at a building
- Occupants who feel a sense of place are more comfortable, more productive, more willing to engage with their building, and have a higher sense of belonging
- Implement inclusive amenities to improve the building's accessibility and improve occupant wellness
- When implementing sense of place measures, it is important to consider the different groups using the space and the geographical location of the building

Description

For owner or landlord-controlled areas, indicate the inclusive amenity features that are either planned or already implemented to make building users feel welcome

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

A4. Occupant Experience

A4.1 – Occupant Service Requests

Focus Area

Accessibility and Wellness

Topic

Occupant Experience

Question

A4.1 – Occupant Service Requests

Question

Is an Occupant Service Request Program in place?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Yes — Occupant Service Request Program in place = 1 point
- Yes — Evidence of requests resolved within 1 — 2 weeks = 2 points
- No = 0 points

Max of 3 points

Requirements

- a) Describe the process used in the building to receive, document and respond to complaints (such as IAQ, temperature, smell, dust, dryness etc.)
- b) The Occupant Service Request Program must include the following components:
 - A mechanism to ensure that all service requests are reviewed and acted upon within 1-2 weeks, unless otherwise specified (e.g., critical area or critical equipment) – see Other Notes
 - Information on the origins of the service request
 - Information on the status of the service request (e.g., in progress, resolved, etc.)
 - Information on the corrective action taken.
- c) Service requests must be reviewed and acted upon within 1-2 weeks, unless otherwise specified (e.g., critical area or critical equipment).
- d) Ensure there are considerations and directions provided for when a complaint can be handled by on-site maintenance staff and where the complaint requires escalation to bring in a third-party

- e) Describe procedures to follow if issues require more time to resolve

The Occupant Service Request Program must have a mechanism in place for recording the following information:

- Incident log number
- Occupant name, company and department, location in building.
- Date complaint was received
- Description of complaint
- Suggested cause
- Summary of problem
- Actions completed
- Date of occupant interview (if applicable)
- Remedial action report
- Date of when occupant was advised about actions taken
- Additional details (as required)

Documentation

- Occupant Service Request Program
- Sample service requests received and resolved, such as closed work orders
- Demonstrate service requests are addressed within 1-2 weeks
- Provide communication with occupants as proof that matters were resolved

Suggested Lead

In-house

Value

- Resolving occupant complaints is important in maintaining occupant comfort and satisfaction
- Occupants are the people who engage with the building the most and will often be the first to notice issues at a building
- Implement a service request program at the building so occupants effectively and openly communicate building issues
- When a service request is received, resolve service requests within 1-2 weeks and maintain records of the implemented measures

Description

Service requests for maintenance are used to identify issues pertaining to the building. Having a formal process in place allows tracking of various Key Performance Indicators (KPIs) such as critical equipment maintenance and critical building maintenance.

Building occupants (tenants and building staff) are important stakeholders in IAQ management. Promoting a better understanding of IAQ in the building will encourage feedback and demonstrate active management of IAQ concerns.

Building management must have in place a documented means for addressing occupant (tenant and building staff) concerns regarding maintenance service requests. Visitors to the building may also log service requests. Such service request logs can provide evidence of occupant dissatisfaction and its causes. Trends in complaint rates over time may indicate occupant reactions to changes in building operation.

References

None

Adapted BB 3.0 Question

Best Practice 8 – Is an Occupant Service Request Program in place?

A4.2 – Occupant Satisfaction Survey

Focus Area

Accessibility and Wellness

Topic

Occupant Experience

Question

A4.2 – Occupant Satisfaction Survey

Question

Was an occupant satisfaction survey conducted in the last two years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below

Select all components covered in the survey:

- Quality and effectiveness of building management and services = 1 point
 - Air quality = 1 point
 - Thermal comfort = 1 point
 - Lighting = 1 point
 - Acoustics, and/or noise = 1 point
 - Frequency and timeliness of communication and response times = 1 point
 - Inclusivity = 1 point
 - Other = 1 point
- No = 0 points

Max of 4 points

Requirements

- Conduct an occupant satisfaction survey every two years, at a minimum
- The survey must be provided to at least 50% of building occupants
- Record the date the survey was distributed and survey recipients
- Advertise the survey in different media channels, as appropriate, to encourage occupant participation
- Compile survey results, detail corrective actions planned and implemented

Although there is no minimum rate of response required, a rate of 30% is encouraged for results to be considered informative

Documentation

- Survey questions
- Sample of occupant responses received
- Summary report, corrective actions planned and implemented

Suggested Lead

In-house

Value

- Receiving occupant feedback is important to ensure a building is operating in a way that benefits building occupants
- Conduct an occupant satisfaction survey that covers a wide range of occupant comfort topics at least once every two years
- Based on the results of these surveys, implement corrective actions to improve occupant comfort

Description

Conducting regular occupant satisfaction surveys can help management better understand the issues/priorities that matter most to occupants. Surveys can also help improve management-tenant relationships and inform management priorities.

References

None

Adapted BB 3.0 Question

Question 10.02.01 – Does building management regularly conduct an occupant satisfaction survey that includes the following components?

A5. Training and Innovation

A5.1 – Training in Accessibility and Wellness

Focus Area

Accessibility and Wellness

Topic

Training

Question #

A5.1 – Training in Accessibility and Wellness

Question

Did the building operations and management team receive Accessibility & Wellness training in the past three years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Indicate which topics are covered in the training:
 - Accessibility, Equity = 1 point
 - Comfort, Views and Acoustics = 1 point
 - Occupant Experience = 1 point
- No = 0 points

Max of 3 points

Requirements

- a) List the names of staff members to whom the competencies covered under these topics would apply
- b) Provide the applicable course outline or syllabus
- c) Provide evidence of competency or training received such as credentials, completion certificate, record of attendance

Documentation

- Name of building O&M team member who received the training
- Course outline or syllabus
- Training Certificate or Record of Attendance

Suggested Lead

In-house, with third-party support

Value

- Train building staff on the accessibility, equity, visual elements, acoustics, and occupant experience to give staff the confidence to play an active role in improving occupant wellness and accessibility

Description

For building maintenance staff to effectively manage the building's Accessibility & Wellness, training should be provided which addresses the topics of accessibility, comfort, views, acoustics, occupant experience and equity.

Over time, technologies and preferred practices in building operations and maintenance change. Providing regular professional development opportunities is a good way to help retain staff. Offering training and educational opportunities related to environmental/sustainable building performance not only benefits staff but improves the performance of the building when staff training is applied at the building level.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

A5.2 – Innovation in Accessibility and Wellness

Focus Area

Accessibility and Wellness

Topic

Training and Innovation

Question

A5.2 – Innovation in Accessibility and Wellness

Question

Is an innovative process or technology in place at the building that goes beyond the requirements outlined in this section?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - High-cost corrective actions implemented for visual elements = 1 point
 - High-cost corrective actions implemented for acoustic elements = 1 point
 - Occupant survey response rate >50% - Demonstrate how the response rate was determined = 1 point
 - Other = 1 point
- Not Applicable – Not pursuing Innovation points = 0/0

Max of 1 point

Requirements

- a) Provide details of the technology or process applied at the building
- b) Indicate when the technology or process was implemented and the steps that are in place to ensure the technology or process' ongoing success
- c) If "Other" is selected, explain how the technology or process has improved the building's accessibility and wellness practices for it to be considered innovative

Documentation

- Narrative of innovative technology or process and its impact

Suggested Lead

In-house, with third-party support

Value

- The Innovation in Accessibility & Wellness question awards buildings for going beyond requirements outlined in other Accessibility & Wellness questions.
- Buildings are encouraged to pursue additional measures to improve Accessibility & Wellness at their building

Description

Many processes and technologies exist that go beyond the standards and requirements set out in the BOMA BEST Assessment. If building managers/owners have invested in innovative processes or technologies that go beyond these standards, innovation points can be earned under this question.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

Custodial and Waste

P0. Baseline Practices

P2.0 – Green Cleaning Program

Focus Area

Custodial and Waste

Topic

Baseline Practices

Question #

P2.0 – Green Cleaning Program

Question

Is a Green Cleaning Program in place at the building?

Applicability

Office, Healthcare, Enclosed Shopping Centre, Universal, Multi-Unit Residential Building

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

Yes – this is a baseline requirement

Requirements

- a) Develop a building-specific Green Cleaning Program that covers the following:
 - Responsible parties, including the building team and cleaning staff's training requirements
 - Standard Operating Procedures (SOP) for cleaning activities and waste collection
 - Specify cleaning products and supplies to be used, requiring that at least half (by total volume) meets third-party recognized green cleaning standards
- b) Specify cleaning equipment to be used, requiring that >75% vacuums use HEPA filtration or is a chemical-free cleaning system or is a mobile UV cleaning device
- c) Program must be signed by the building manager, dated within the past 12 months.

Where custodial services are managed and delivered by the tenants and their service providers, the owner or landlord must provide information to the tenants on how to implement a Green Cleaning Program

The Green Cleaning Program can be integrated into the Janitorial / Custodial service provider's contract. Where custodial services are contracted, communicate custodial goals and green cleaning initiatives to the contracted company. The contracted company must provide the building manager with documentation showing the same information outlined above.

Third-party recognized green cleaning standards include: EcoLogo, Green Seal, US EPA Safer Choice, GREENGUARD, Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI), Sustainable Forest Management Standard (SFMI) or equivalent.

Documentation

- Building-specific Green Cleaning Program
- Proof that program was shared with tenants
- [P2.0 – Green Cleaning Program Template](#)

Suggested Lead

In-house: Facility Maintenance, Building Manager/Policy Makers

Value

- Many common cleaning products contain chemicals that are harmful to the environment, custodial staff, and occupants
- Single use products typically associated with cleaning, such as paper products and plastic bags, are resource intensive and environmentally impactful to produce
- Use environmentally conscious cleaning products to reduce the impact on the environment and occupants
- Establish a Green Cleaning Program that prioritizes the use of environmentally preferred products, the maintenance of cleaning equipment, and the implementation of effective cleaning practices. Contracted service providers are required to follow this program (if applicable)

Linked Questions:

P3.1 - Cleaning Products & Equipment Use: Use cleaning products and equipment that meet the Green Cleaning Program

Description

A Green Cleaning Program emphasizes the use of environmentally preferred products, maintenance of cleaning equipment and effective cleaning practices.

References

[EcoLogo](#)

[Green Seal](#)

[US EPA Safer Choice](#)

[GREENGUARD](#)

[Forest Stewardship Council \(FSC\)](#)

[Sustainable Forestry Initiative \(SFI\)](#)

[Sustainable Forest Management Standard \(SFMI\)](#)

Adapted BB 3.0 Question

Best Practice 11 – Is a Green Cleaning Program in place at the building?

Question 07.04.01 – Is high-efficiency cleaning equipment used in the building?

P4.0a – Waste Audit

Focus Area

Custodial and Waste

Topic

Baseline Practices

Question

P4.0a – Waste Audit

Question

Has a Waste Audit been completed for the building in the past three years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – waste managed by the owner/landlord

Answer & Scoring

- Yes – this is a baseline requirement
- Not applicable – Tenant occupied building: Waste managed by the tenant

Requirements

- a) The audit must be conducted every three years, and waste sampling should take place over one day at a minimum
- b) The Waste Audit must address:
 - The time period and duration of waste sampling
 - The sample size representing a minimum of 10% of the building's waste and recycling materials and reasons why the sample is representative
 - Details specific to each stream and if each stream has an available program locally for collection for recycling or reuse
 - How the waste data was categorized, evaluated and analyzed based on its composition (the site must be equipped with a minimum number of worktables, precise scales, and mobile containers for weighing the waste)
- c) The Waste Audit Report must include:
 - Summary of the sampling protocol and methodology used
 - Total of each waste stream and overall total waste
 - Audit diversion rate
 - Audit capture rate
 - If data is extrapolated to represent annual waste weights or volumes, describe the calculation methodology used

- Summary of recommendations for improving waste diversion
- Suggested implementation plan for recommendations
- Credentials of third-party who conducted the audit

Waste audits conducted with the exclusive use of cameras in bins are not admissible. At a minimum, a waste audit should be carried out every three years. Annual audits are recommended. Auditing is a scientific approach aimed at collecting precise data about the characteristics of waste, including its mass, composition, waste stream and methods of disposal. To be credible, auditing should be conducted using a trustworthy methodology. In addition, it should clearly establish the different criteria and methods of evaluation, as outlined in an initial protocol.

Documentation

- Custodial Effectiveness Assessment Report
- Credentials of person(s) conducting the assessments
- Photos, etc. demonstrating corrective actions addressed
- [P4.0a – Waste Audit Template](#)

Suggested Lead

Third-party: Waste Consultant

Value

- Worldwide, humans produce more garbage than we have the ability to process and manage. Reducing the amount of waste that enters landfills is an important component sustainability
- Engage a qualified professional to perform a waste audit to understand current waste management practices, benchmark the building's waste production, and make recommendations to improve waste management practices

Linked Questions:

- P4.1 - More Frequent or detailed waste audit
- P4.2 - Corrective Actions: Implement recommendations defined in waste audit
- P4.3 - Diversion Rate: Diversion rate identified in waste audit

Description

Improving waste management practices requires knowledge regarding the nature and mass of waste collected on-site. Often data provided by waste haulers is not always based on weighted data, making a reliable analysis of a building's performance impossible. Regular auditing of the waste generated on a site is therefore recommended to gain a more accurate understanding of the volume of waste generated, size of different waste streams and where waste is taken once it leaves the building site.

References

[BOMA BEST Waste Audit Guiding Principles](#)

[BOMA BEST Waste Auditing Requirements](#)

Adapted BB 3.0 Question

Best Practice 13 – Has a Waste Audit been completed for the building in the past three years?

P4.0b – Waste Reduction and Diversion Policy

Focus Area

Custodial and Waste

Topic

Baseline Practices

Question

P4.0b – Waste Reduction and Diversion Policy

Question

Is a Waste Reduction and Diversion Policy in place at the building?

Applicability

All asset classes

Tenant occupied building – waste managed by the tenant

Answer & Scoring

- Yes – this is a baseline requirement
- Not applicable – Owner/landlord occupied building **OR** Tenant occupied building: Waste managed by the owner/landlord = 0/0

Requirements

- a) The Policy must include a statement committing the organization or building to continuous improvement in the reduction and diversion of waste. Address the prevention, diversion, and management of solid waste generated as a result of the following:
 - Day-to-day activities from all waste producing areas, including food service and retail; and
 - Periodic events such as conferences, catered meetings and functions, training, tenant relocation activities, construction, renovation and demolition projects, fit ups, etc.
- b) The policy must be signed by the building manager, dated within the last 12 months.

Demonstration of implementation is not required, nor is building-specific information.

The contamination of recyclable material does not disqualify this requirement, though continued contamination should be addressed in the Waste Reduction Work Plan.

Off-site sorting such as at a transfer station from a single common receptacle does not qualify as source-separation in the context of the BOMA BEST application.

Documentation

- Waste Reduction and Diversion Policy
- [P4.0b – Waste Reduction and Diversion Policy Template](#)

Suggested Lead

In-house: Facility Maintenance, Building Manager/Policy Makers

Value

- Worldwide, humans produce more garbage than we have the ability to process and manage. Reducing the amount of waste that enters landfills is an important component sustainability
- Develop and implement a Waste Reduction and Diversion policy to reduce the amount of the waste that is sent to landfill
- Prioritize waste prevention to reduce the overall amount of waste produced at the building

Description

The Waste Reduction and Diversion Policy represents a commitment from the organization or building management to continuously improve performance regarding the reduction and diversion of solid waste.

References

None

Adapted BB 3.0 Question

Question BEST Practice 12(B) – Is a Waste Reduction and Diversion Policy in place at the building?

P8.0 – Landlord Shares Custodial and Waste Management Practices

Focus Area

Custodial and Waste

Topic

Baseline Practices

Question

P8.0 – Landlord Shares Custodial and Waste Management Practices

Question

Has the owner or landlord's Custodial & Waste Communication Plan been shared with the tenants?

Applicability

All asset classes

Tenant occupied building

Answer & Scoring

- Yes – this is a baseline requirement
- Not Applicable – Owner/landlord occupied building = 0/0

Requirements

- a) Develop a building-specific Custodial and Waste Plan that covers:
 - The building management team's efforts to manage custodial and waste
 - Custodial and waste assessments as well as tips for managing waste, in day-to-day operations and during renovations
- b) Copies of communication with the building's tenants where the content of the building Custodial & Waste Communication Plan was shared and dated within the past 12 months
- c) Demonstrate that communication was distributed to at least half of the number of tenant organizations occupying the building or a group who lease at least half of the total building area

Documentation

- Building-specific Custodial and Waste Plan
- Proof of communication with representative group of building tenants, covering custodial and waste assessments as well as tips for managing waste, in day-to-day operations and during renovations
- [P8.0 – Custodial and Waste Communication Plan Template](#)

Suggested Lead

In-house: Facility Maintenance, Building Manager/Policy Makers

Value

- Increasing tenant awareness and engagement can positively impact the custodial and waste management at a building
- Develop a Custodial & Waste Communication Plan that defines how the building's custodial & waste management practices will be shared tenants
- Share custodial & waste management tips with tenants to encourage tenants to play an active role in improving custodial operations and waste reduction at the building

Description

Increasing building tenant and occupant awareness and engagement in environmental and sustainable practices can have a significant positive or negative impact on the performance of the building.

Improving the environmental performance of the building can Suggested Lead to many positive outcomes for building management, staff and tenants, including but not limited to lower operational costs, lower utility bills, improved indoor air quality, improved management-tenant relationships, etc.

References

None

Adapted BB 3.0 Question

Best Practice 7 – Is an Indoor Air Quality Monitoring Plan in place at the building?

Best Practice 16 – Is an Occupant Environmental Communication Program in place at the building?

P1. Procurement

P1.1 Circular Economy Procurement Strategy

Focus Area

Custodial and Waste

Topic

Procurement

Question

P1.1 Circular Economy Procurement Strategy

Question

Are circular economy procurement strategies implemented and maintained in building management activities?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes — circular economy strategies are implemented = 2 points
- No = 0 points

Max of 2 points

Requirements

- a) How equipment is selected to reduce the environmental impact over its life cycle
- b) How resources use is optimized to reduce consumption, or generate energy/collect water on-site
- c) Source food products from local suppliers, select durable or refurbished products
- d) Inform procurement decisions by considering waste creation and vendor take-back programs

Documentation

- Procurement policy highlighting any of the aspects listed above
- Documentation showing an example of each strategy implemented

Suggested Lead

In-house

Value

- Traditionally, when a product is created, the resources are extracted and refined, the product is made and sold, and at the end of the product's useful life it is disposed of (typically sent to a landfill). This is called a "linear economy"
- Conventional operations and maintenance products are designed for single use. A more sustainable model considers the entire life-cycle of a product and promotes the re-use of resources at the end of its useful life. This is called a circular economy. This process preserves natural resources and eliminates waste
- Purchase products that support a circular economy. This can include buying reusable products, products with recycled content, purchasing refurbished furniture and appliances, or purchasing products from manufacturers that have end-of-life recycling or "buy-back" programs

Description

Green or sustainable procurement typically concentrates on how to improve sustainable practices within a linear economic model and as a result, focus can be narrowly applied to individual components, such as what materials are used in the product.

On the other hand, circular procurement focuses on the value of a product, considers needs, best use, and end of life management. Within this system, it is possible to leverage the full value of a product or material while minimizing environmental and social impacts.

While waste diversion may be a critical piece of the company's sustainability objectives, its interrelationship with procurement is rarely recognized. When end-of-life considerations are included in procurement decisions less waste is generated, and diversion and capture rates increase.

References

[BOMA Canada — Circular Economy in Commercial Real Estate Focus: Circular Procurement](#)
[Circular Innovation Council](#)

Adapted BB 3.0 Question

Question 06.01.01 – Is an environmental procurement program in place at the building that includes the following components?

P1.2 Social Procurement Strategy

Focus Area

Custodial and Waste

Topic

Procurement

Question

P1.2 Social Procurement Strategy

Question

Are social procurement strategies implemented and maintained in building management activities?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes — social procurement strategies are implemented = 2 points
- No = 0 points

Max of 2 points

Requirements

- a) Award contracts to local, independent and/or socially responsible businesses
- b) Partner with equity-seeking groups to fill staffing positions and apprentice opportunities

Social Procurement is defined as the achievement of strategic social, economic and workforce development goals using an organization's process of purchasing goods and services.

Documentation

- Procurement policy highlighting any of the aspects listed above
- Documentation showing an example of each strategy implemented

Suggested Lead

In-house

Value

- Social economy focuses on "how" a product is made and prioritizes sustainable and ethical production channels
- This differs from a "circular economy" (see P1.1) which focuses on "what" materials are used in a product
- Social procurement supports minority groups, strengthens community bonds, and enhances local economies
- Purchase products from local, independent, and socially responsible businesses

Description

Social procurement is an approach to purchasing that extends beyond cost and quality considerations to prioritize social and environmental benefits. By integrating sustainability principles into procurement, organizations support responsible sourcing that fosters economic inclusion, promotes fair labor practices, reduces environmental impact, and strengthens local communities.

Through partnerships with diverse suppliers—such as small businesses, minority-owned enterprises, and environmentally conscious vendors—social procurement enables organizations to align spending with values. This approach not only helps to meet sustainability goals but also boosts social equity, drives innovation, and enhances brand reputation, creating value for both society and the environment.

References

[City of Toronto's Social Procurement Program](#)

Adapted BB 3.0 Question

Question 06.01.01 – Is an environmental procurement program in place at the building that includes the following components?

Custodial Maintenance and Operations

P2.1 – Pest Management

Focus Area

Custodial and Waste

Topic

Custodial Maintenance and Operations

Question

P2.1 – Pest Management

Question

Is an Integrated Pest Management Program in place?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 2 points
- No = 0 points

Max of 2 points

Requirements

- a) Develop a building-specific Integrated Pest Management Program that covers:
 - Responsible parties, including the building team's training Requirements
 - Standard operating procedures (SOP) for pest management
 - Interior and exterior pest management products and supplies to be used
 - Guidance about the use of environmentally preferable or low-risk pesticides and circumstances when the use of conventional products is appropriate
 - Strategies for storing food in sealed containers with daily disposal
 - Proactive inspection for evidence of pests, at least monthly
 - How to manage communications with tenants when pesticide applications are needed
- b) Program must be signed by the building manager, dated within the past 12 months
- c) Where pest management services are managed and delivered by the tenants and their service providers, the owner or landlord must provide information to the tenants on how to implement a Pest Management Program

Documentation

- Building-specific Integrated Pest Management Program
- Proof that the Program was shared with Tenants

Suggested Lead

In-house

Value

- Pests at a building can cause unhygienic conditions for occupants and deteriorate building materials
- Implement a pest management program to prevent pests from affecting the building. Contracted service providers are required to follow this program (if applicable)
- Pest management should be preventive not reactive
- Complete monthly inspections to check for evidence of pest presence
- If pests are found at the building, take corrective actions to remediate the issue

Description

Unhygienic conditions can result in the presence and proliferation of organisms that produce harmful or irritating by-products.

References

[Integrated Pest Management](#)

Adapted BB 3.0 Question

Question 07.03.02 – Are pest reduction strategies in place at the building?

P2.2 – Enhanced Cleaning Protocols

Focus Area

Custodial and Waste

Topic

Custodial Maintenance and Operations

Question

P2.2 – Enhanced Cleaning Protocols

Question

Is there an Enhanced Cleaning Protocol in place during flu season or for pandemic response?

Applicability

Office, Healthcare, Enclosed Shopping Centre, Universal, Multi-Unit Residential Building

Owner/landlord occupied building

Tenant occupied building – areas managed by the owner/landlord

Answer & Scoring

- Yes = 2 points
- No = 0 points

Max of 2 points

Requirements

- a) Develop Enhanced Cleaning Protocols as follows:
 - Frequently touched surfaces should be easily cleanable and sanitized with a disinfectant at least twice daily during flu season, a pandemic response, or similar circumstances
 - Use acceptable disinfection products registered with Health Canada (DIN), products certified by EcoLogo or equivalent
 - Hand sanitizers should contain at least 60% alcohol content for effective virus control, approved for use by your local health authority and be placed in central locations for easy access
 - Signage: raise awareness, reminders of handwashing, safe distancing etc.
 - Scheduling: increase cleaning frequency to at least twice daily to disinfect high contact and commonly shared areas
 - Maintenance: increase the supply and upkeep of soap, toilet paper, and paper towels
 - Training: ensure building and custodial staff are appropriately trained in proper cleaning and safety techniques
- b) Provide evidence that the enhanced cleaning protocol was implemented (e.g. hi-touch cleaning)

- c) Where custodial services are managed and delivered by the tenants and their service providers, the owner or landlord must provide information to the tenants on how to implement enhanced cleaning protocols

Documentation

- Building-specific Enhanced Cleaning Protocol
- Proof that Program was shared with Tenants

Suggested Lead

Third-party

Value

- During flu seasons and pandemics, standard cleaning protocols at a building may not be sufficient in preventing disease transmission
- Implement enhanced cleaning protocols during flu seasons and pandemics to additionally combat unhygienic conditions. Contracted service providers are required to follow these protocols (if applicable)
- Increase the frequency of cleaning, raise awareness of hygienic practices and how it prevents the spread of disease, train custodial staff, and track protocol implementation

Description

During flu season and pandemic response there is an elevated risk for frequently touched surfaces to harbor bacteria and viruses.

Frequently touched surfaces, such as door handles and elevator buttons and shared common areas, such as kitchens and washrooms can harbor bacteria and viruses for extended periods.

An enhanced sanitation schedule must be developed which identifies frequently touched surfaces (e.g., door handles/knobs, elevator call buttons, handrails, light switches, faucets, drinking water stations, kitchen equipment, countertops, shared Office equipment, etc.) and commonly shared areas (e.g., fitness rooms, boardrooms, break areas, shared kitchens, shared washrooms, shared Office equipment, lobbies, hallways, elevators, stairs, etc.)

References

[Health Canada — Hard-surface disinfectants and hand sanitizers \(COVID-19\)](#)

[BOMA Canada's Pandemic Guide](#)

[Hand Washing, Cleaning, Disinfection and Sterilization in Health Care](#)

[Centres for Disease Control and Prevention](#)

Adapted BB 3.0 Question

Question 07.03.01 – Does the building management maintain an inventory and sanitation schedule for frequently touched surfaces?

Custodial Assessment

P3.1 – Cleaning Products and Equipment in Use

Focus Area

Custodial and Waste

Topic

Custodial Assessment

Question

P3.1 – Cleaning Products and Equipment in Use

Question

Do the cleaning products and equipment used in the building meet the Green Cleaning Program Requirements?

Applicability

Office, Healthcare, Enclosed Shopping Centre, Universal, Multi-Unit Residential Building
Owner/landlord occupied building
Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - More than half of the total volume of cleaning products meet third-party green cleaning standards = 1 point
 - More than half of the vacuums use HEPA filtration = 1 point
 - Some of the cleaning equipment is a chemical-free cleaning system = 1 point
 - Some of the cleaning equipment is a mobile UV cleaning device = 1 point
 - None of the cleaning equipment is compliant = 1 point
- No = 0 points

Max of 3 points

Requirements

- a. Develop an inventory of all cleaning products and equipment used in the building
- b. Conduct a survey annually of the products and equipment in use to determine the extent to which green cleaning Requirements are being met
- c. Identify corrective actions addressed and planned (if it is not possible to remedy immediately)

A chemical-free cleaning system includes devices that use ionized, ozonated, or electrolyzed water as a substitute for cleaning chemicals.

Documentation

- Inspection records, dated within the last year
- Photos, receipts, etc. of the cleaning products and equipment that meet Green Cleaning requirements

Suggested Lead

In-house

Value

- Cleaning products that meet third-party green cleaning standards pose less of an impact to the environment and building occupants
- Properly maintained, high-performing cleaning equipment reduces water usage associated with cleaning, extends equipment lifespan, and reduces a building's use of disposable cleaning products
- Regularly clean with high-performing cleaning equipment and green cleaning products to maintain a hygienic environment and improve indoor air quality

Description

Well-maintained, high-performing cleaning equipment reduces the required amount of water, disposable cleaning products and frequency of cleaning as well as reducing the spread of indoor air contaminants.

References

None

Adapted BB 3.0 Question

Question 07.04.01 – Is high efficiency cleaning equipment used in the building?

P3.2 – Custodial and Pest Management Assessment

Focus Area

Custodial and Waste

Topic

Custodial Assessment

Question

P3.2 – Custodial and Pest Management Assessment

Question

Has an assessment of the building's custodial practices been conducted in the last two years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – some or all custodial practices managed by the owner/landlord

Answer & Scoring

- Yes = 2 points
- No = 0 points
- Not applicable – Tenant occupied building: All custodial practices managed by the tenant = 0/0

Max of 2 points

Requirements

- a) Engage someone who is not affiliated with the custodial management staff to assess whether the building's green cleaning program requirements are being met to complete the following:
 - Review the custodial and pest management service providers' Standard Operating Procedures and evaluate to what extent these are implemented at the building
 - Check cleaning products and equipment specified and evaluate to what extent these are used in the building
 - Check pesticides applied over the last two years, the extent of low risk vs. conventional pesticides applied and determine if changes are needed
 - Create an inventory of the different space use types, visit a representative sample of these spaces and determine the level of cleanliness and pest management in each
 - Summarize findings, indicating what areas need improvement
- b) Guidelines on how the areas can be improved
- c) Identify corrective actions addressed and planned (if it is not possible to remedy)

In the scenario where the tenant manages either the custodial or the pest management, answer the question for the component that is managed by the owner/landlord.

Documentation

- Custodial Effectiveness Assessment Report
- Credentials of person(s) conducting the assessments
- Photos, etc. demonstrating corrective actions addressed

Suggested Lead

In-house (someone not directly involved with cleaning services)

Value

- Perform a third-party assessment of custodial and pest management practices at a building to ensure current maintenance protocols are effective
- Use recommendations by qualified professionals to improve custodial and pest management at the building and improve building cleanliness

Description

Independent assessment of custodial and pest management practices ensure that the building's cleanliness and pest management goals are being met.

References

None

Adapted BB 3.0 Question

Question 07.02.01 – Is a green cleaning audit conducted annually at the building?

P4. Waste Management

P4.1 – More frequent or detailed Waste Audit

Focus Area

Custodial and Waste

Topic

Baseline Practices

Question

P4.1 – More frequent or detailed Waste Audit

Question

Has a Waste Audit been completed for the building in the past year or sampling for more than 24 hours?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – waste managed by the owner/landlord

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Yes – audit conducted every year = 3 points
 - Yes – waste sampling took place over two or three days = 1 point
 - Yes – waste sampling took place over more than three days = 2 points
- No = 0 points
- Not applicable – Tenant occupied building: Waste managed by the tenant = 0/0

Max of 5 points

Requirements

- a) Waste Audit needs to meet Requirements laid out in Question P4.0a
- b) Highlight section that provides audit date and sampling duration

At a minimum, a waste audit should be carried out every three years. Annual audits are recommended. Auditing is a scientific approach aimed at collecting precise data about the characteristics of waste, including its mass, composition, waste stream and methods of disposal. To be credible, auditing should be conducted using a trustworthy methodology. In addition, it should clearly establish the different criteria and methods of evaluation, as outlined in an initial protocol.

Documentation

- Waste Audit Report

Suggested Lead

Third-party

Value

- Building off P4.0a - Waste Audit, perform waste audits annually or over a longer sample period to complete a detailed analysis of a building's waste production and management

Description

Improving waste management practices requires knowledge regarding the nature and mass of waste collected on-site. Often data provided by waste haulers is not always based on weighted data, making a reliable analysis of a building's performance impossible. Regular auditing of the waste generated on a site is therefore recommended to gain a more accurate understanding of the volume of waste generated, size of different waste streams and where waste is taken once it leaves the building site.

References

[BOMA BEST Waste Audit Guiding Principles](#)

[BOMA BEST Waste Auditing Requirements](#)

Adapted BB 3.0 Question

Best Practice 13 – Has a Waste Audit been completed for the building in the past three years?

P4.2 – Corrective Action

Focus Area

Custodial and Waste

Topic

Waste Audit & Measurement

Question

P4.2 – Corrective Action

Question

Is there evidence of Waste Audit corrective actions implemented in the last five years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – waste managed by the owner/landlord

Answer & Scoring

- Yes = 3 points
- No = 0 points
- Not applicable – Tenant occupied building: Waste managed by the tenant = 0/0

Max of 3 points

Requirements

- a) Reference the Waste Audit Report and demonstrate any corrective actions taken
- b) Explain why recommended actions were not addressed, with implementation plan/schedule if actions were deferred due to cost constraints

Documentation

- Narrative with photos or correspondence showing corrective actions taken

Suggested Lead

In-house

Value

- Building off P4.0a - Waste Audit, improve a building's waste management by implementing corrective actions recommended in the waste audit
- Improved waste management can lead to an overall reduction of waste generated, an increase in waste being diverted from landfills, and additional waste streams being established at the building

Description

Improving waste management practices requires knowledge regarding the nature and mass of waste collected on-site. Regular auditing of the waste generated on a site is therefore recommended to gain a more accurate understanding of the volume of waste generated, size of different waste streams and where waste is taken once it leaves the building site.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

P4.3 – Diversion Rate

Focus Area

Custodial and Waste

Topic

Waste Audit & Measurement

Question

P4.3 – Diversion Rate

Question

What is the building's most recent diversion rate?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – waste managed by the owner/landlord

Answer & Scoring

- Yes = Points dependent on range
Indicate which range is representative of your building's waste diversion rate:
 - 90% and higher = 4 points
 - 75 to <90% = 3 points
 - 60 to <75% = 2 points
 - 40 to <60% = 1 point
 - Lower than 40% = 0 points
- No = 0 points
- Not applicable – Tenant occupied building: Waste managed by the tenant = 0/0

Max of 4 points

Requirements

- a) Provide yearly data on the weights of all waste streams collected. Some streams will have weights provided from haulers, while others will need to be approximated using number of pick-ups (schedules), the volume of the bins (cubic yards) and fill-level data if available
- b) The diversion rate must be based on 12 months of data. Data cannot be older than the past three (3) years.
- c) If available, include weights of tenant-managed bins. Indicate if weights are approximated or actual
- d) Calculate waste diversion as follows: $[A / (A+B)] \times 100$
 - A = Annual weight of all materials currently diverted from disposal
 - B = Annual weight of all materials currently sent for disposal (includes landfill, incineration and EFW)
- e) Express the annual weight in metric tonnes or kilograms.

If waste audits were not conducted during Covid, reference the last Waste Audit that was completed before Covid.

Calculating a yearly diversion number from yearly pick-up data is considered the preferred method over the Waste Audit diversion number. Where weights are provided by haulers, these can be submitted and indicated as real weights. Where the number of hauls and bin sizes per stream are available only, these will be converted to weights using EPA densities and assuming full bins (unless reliable fill-level data can be provided).

For density of material, the EPA provides standard densities for each material type which is the current highest standard in the industry: <https://www.epa.gov/smm/volume-weight-conversion-factors-solid-waste> to convert volume to weight

Documentation

If information is not contained in Waste Audit, then provide:

- Table showing (at least) the last 2 years of whole-building waste data
- Calculation method used to determine the 12-month average
- Narrative of approach, waste weight vs volume, conversion factors applied, etc.

Suggested Lead

In-house

Value

- A diversion rate is the percentage of total waste produced at a building that is diverted from landfills through recycling, composting, and reuse. The higher the diversion rate, the less waste that is sent to landfills
- Diversion rates can be improved by establishing additional waste streams for collection at the building, implementing corrective actions, and improving recycling practices

Description

Improving waste management practices requires knowledge regarding the nature and mass of waste collected on-site. Often data provided by waste haulers is not always based on weighted data, making a reliable analysis of a building's performance impossible. Regular auditing of the waste generated on a site is therefore recommended to gain a more accurate understanding of the volume of waste generated, size of different waste streams and where waste is taken once it leaves the building site.

References

[GRESB: See Appendix 7 on estimation methodology](#)

Also see [recent GRESB update to Appendix 7](#) that states that sensor fill-levels can be used, or bin can be assumed at 100% if fill-levels are not known (page 21)

Adapted BB 3.0 Question

Question 08.02.01 – What is the building's Reduce, Reuse, Recycle (3Rs) diversion rate?

Question 08.02.02 – What is the building's capture rate?

P5. Waste Audit and Measurement

P5.1a – Workplan

Focus Area

Custodial and Waste

Topic

Waste Audit and Measurement

Question

P5.1a – Workplan

Question

Is a Waste Reduction Work Plan in place at the building?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – waste managed by the owner/landlord

Answer & Scoring

- Yes = 2 points
- No = 0 points
- Not applicable – Tenant occupied building: Waste managed by the tenant = 0/0

Max of 2 points

Requirements

Reference the Waste Audit and develop the following:

- a) A building-specific Waste Reduction Work Plan that covers the following:
 - Responsible parties, including the building team's training Requirements
 - Standard operating procedures (SOP) for waste collection
 - Identify the waste streams generated at the building, covering the following:
 - Recyclables, such as paper (general, mixed and confidential shredded paper), metal cans, glass, plastics (rigid or soft), cardboard etc.
 - Food and organics, such as food waste, coffee pods, grease/cooking oil, containers, cutlery, etc.
 - Electronic waste (e-waste), batteries, printer cartridges etc.
 - Waste (or garbage)
 - Construction and renovation (skids, light bulbs, etc.)
 - Furniture, equipment
 - Miscellaneous
 - Treatment of contaminated waste
 - Hazardous

- Tenant-managed waste
- b) Describe each stream's waste removal strategy, such as:
 - Identify the different waste streams collected at the building (at least two streams (garbage, mixed or paper recycling))
 - How waste is collected within the building and site (describe the on-site source separation strategies)
 - Who collects each of the current waste streams from the building and site
 - [Optional] Determine if there any waste streams that represent >15% of the total waste stream (as measured in the waste audit sample) and separate collection is not yet set up at the building
 - Waste hauling destination
 - Frequency of collection
 - Outcomes and recommendations from the most recent waste assessment
 - Clear outline of the waste reduction plan for the next 12-24 months
 - Program must be signed by the building manager, dated within the past 12 months

This work plan incorporates many other areas of the BOMA waste section into a unified plan and will be used to verify and cross-reference other claims.

Documentation

- Waste Reduction Workplan
- Proof that program was shared with tenants

Suggested Lead

In-house, with third-party support

Value

- Establish a waste reduction workplan to establish waste reduction goals, implement waste management strategies, and reduce waste production at a building
- Include current standard operating procedures for waste collection and the waste streams collected at the building in the waste reduction work plan
- Implement additional waste streams and waste reduction strategies to reduce the amount of waste at their building sent to a landfill

Linked Questions:

W5.2 - Waste management strategies: Implement waste management strategies

Description

Source separation strategy facilitates the separation of waste at the point of generation for recycling and waste destined for disposal.

References

[3R Certified](#)

Adapted BB 3.0 Question

Best Practice 12 – Is a Source Separation Program in place at the building?

Best Practice 14 – Is a Waste Reduction Work Plan in place at the building?

P5.1b – Waste Diversion Strategies

Focus Area

Custodial and Waste

Topic

Waste Management

Question

P5.1b – Waste Diversion Strategies

Question

Are any of the following waste diversion initiatives in place at the building?

Applicability

Office, Healthcare, Enclosed Shopping Centre, Universal, Light Industrial, Open Air Retail
Tenant occupied building – waste managed by the tenant

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Electronic communication = 1 point
 - Food waste diversion = 1 point
 - Other
- No = 0 points
- Not applicable – Owner/landlord occupied building **OR** Tenant occupied building: Waste managed by the owner/landlord = 0/0

Max of 2 points

Requirements

- a) Demonstrate that waste diversion initiatives have been implemented in the building.
Reduction initiatives can include but are not limited to:
 - Electronic communication initiatives that result in a reduction of paper use.
 - Food waste reduction or diversion programs with on-site cafeterias, restaurants or coffee shops.

Documentation

- Photos or evidence of program implementation

Suggested Lead

In-house

Value

- Implementing waste management strategies can improve a building's diversion rates and improve waste collection procedures
- Improve the waste management at the building by implementing waste management strategies that focus on diverting waste away from landfills

Description

Reduction initiatives encourage staff/tenant participation in waste diversion activities.

References

None

Adapted BB 3.0 Question

Question 08.03.01 – Are any of the following waste diversion initiatives in place at the building?

P5.2a – Waste Management Strategies

Focus Area

Custodial and Waste

Topic

Waste Audit and Measurement

Question

P5.2a – Waste Management Strategies

Question

Is a program in place at the building for recycling, waste avoidance, reuse or donation?

Applicability

Office, Healthcare, Enclosed Shopping Centre, Universal, Light Industrial. Open-Air Retail

Owner/landlord occupied building

Tenant occupied building – waste managed by the owner/landlord

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- (If applicable) New waste stream collection set up (i.e. >15% identified in Question P4.1) = 1 point
- Paperless initiatives = 1 point
- E-waste and batteries = 1 point
- Bulk dispensers = 1 point
- Water refill stations (in owner or landlord-managed spaces) = 1 point
- Food waste donation (in owner or landlord-managed spaces) = 1 point
- Community reuse partnerships with charities for products, such as furniture and computers = 1 point
- No= 0 points
- Not applicable – Tenant occupied building: Waste managed by the tenant = 0/0

Max of 4 points

Requirements

- a) Indicate all reduction, reuse, and donation programs implemented at the building
- b) (If applicable) Set up separate collection of waste streams that represent more than 15% of the total waste stream (as measured in the waste audit sample), where separate collection was not previously set up

- c) Collect Documentation to demonstrate these initiatives are in place, such as
- Donation program partnerships
 - Confirmed pick-ups from charities or organizations
 - Launch of reduction/avoidance campaigns (e.g., paperless)
 - Sourcing of items that promote bulk use (e.g., soap dispensers)

Reduction can be hard to measure. Evaluate if the waste would have been produced at the building had the initiative not been put in place.

Check whether the service schedule is appropriate given the proportion of the stream. For example: a building with food service establishments would need an organics program that is picked up more than every other week.

Ensure that streams are set up in locations that will maximize the success of the program.

Initiatives not covered here can be included under Innovation.

Documentation

- Emails, memos, service agreements, photos or any other evidence which demonstrate requirements are met

Suggested Lead

In-house

Value

- Implementing waste management strategies can reduce a building's overall waste production, improve a building's diversion rates and improve waste collection procedures
- Improve the waste management at the building by implementing waste management strategies that focus elimination or reduction of waste

Description

Programs that reduce waste and recycling generation and reuse products instead of putting them into the waste stream is an important piece of a waste reduction strategy. A transition to a circular economy must go beyond recycling, and promote the reuse of existing materials, or the elimination of their production in the first place. Making a new product emits greenhouse gases that contribute to climate change and requires a lot of materials and energy – raw materials must be extracted from the earth, and the product must be fabricated then transported to wherever it will be sold. As a result, reduction and reuse are the most effective ways you can save natural resources, protect the environment and save money.” (Source: <https://www.epa.gov/recycle/reducing-and-reusing-basics>)

References

[Circular Economy](#)

[The Waste Hierarchy](#)

Adapted BB 3.0 Question

Questions 08.03.01 – Are any of the following waste diversion initiatives in place at the building?

Question 08.03.02 – Has the recycling program been expanded to include any of the following waste materials?

Question 08.03.03 – Are reuse initiatives in place at the building that have the potential to result in less waste disposed?

P5.2b – Additional Waste Management Strategies

Focus Area

Custodial and Waste

Topic

Custodial and Waste

Question

P5.2b – Additional Waste Management Strategies

Question

Is a program in place at the building for recycling, waste avoidance, reuse or donation of the following waste streams?

Applicability

Office, Healthcare, Enclosed Shopping Centre, Universal, Light Industrial. Open-Air Retail
Owner/landlord occupied building

Tenant occupied building – waste managed by the owner/landlord

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Ballasts, fluorescent tubes, CFL and lamps containing mercury = 1 point
- Organic food material for composting = 1 point
- Grease/cooking oil = 1 point
- Other waste material = 1 point
- No = 0 points
- Not applicable – Tenant occupied building: Waste managed by the tenant = 0/0

Max of 4 points

Requirements

- a) Indicate all reduction, reuse and donation programs implemented at the building
- b) Collect Documentation to demonstrate these initiatives are in place, such as:
 - Donation program partnerships
 - Confirmed pick-ups from charities or organizations
 - Launch of reduction/avoidance campaigns

Documentation

- Emails, memo, service agreements, photos or any other evidence which demonstrate requirements are met

Suggested Lead

In-house

Value

- Implementing waste management strategies can reduce a building's overall waste production, improve a building's diversion rates and improve waste collection procedures
- Improve the waste management at the building by implementing waste management strategies that focus on waste avoidance and diverting waste through recycling, reuse, and donation

Description

In addition to the typical list of designated materials for source separation that most regions accept to be recycled (paper, containers, cardboard) or composting (food waste), many organizations expand their collection programs to include other reusable/recyclable materials (where a demonstrated end-market exists).

Programs that reduce waste and recycling generation and reuse products instead of putting them into the waste stream is an important piece of a waste reduction strategy. A transition to a circular economy must go beyond recycling, and promote the reuse of existing materials, or the elimination of their production in the first place. Making a new product emits greenhouse gases that contribute to climate change and requires a lot of materials and energy – raw materials must be extracted from the earth, and the product must be fabricated then transported to wherever it will be sold. As a result, reduction and reuse are the most effective ways you can save natural resources, protect the environment and save money. (Source: <https://www.epa.gov/recycle/reducing-and-reusing-basics>)

References

None

Adapted BB 3.0 Question

Question 08.03.02 – Has the recycling program been expanded to include any of the following waste materials?

P5.2c – Additional Waste Management Strategies (MURBs)

Focus Area

Custodial and Waste

Topic

Waste Management

Question

P5.2c – Waste Management Strategies

Applicability

Multi-Unit Residential Building

Tenant occupied building – waste managed by the owner/landlord

Question

Is a program in place at the building for recycling, waste avoidance, reuse or donation of the following waste streams?

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- (If applicable) New waste stream collection set up (i.e. >15% identified in Question P4.1) = 1 point
 - Food waste donation = 1 point
 - Community reuse partnerships with charities for products, such as furniture and computers = 1 point
 - Clothing drive for textile donation = 1 point
- No = 0 points

Max of 4 points

Requirements

- Indicate all reduction, reuse and donation programs implemented at the building
- (If applicable) Set up separate collection of waste streams that represent more than 15% of the total waste stream (as measured in the waste audit sample), where separate collection was not previously set up
- Collect Documentation to demonstrate these initiatives are in place, such as
 - Donation program partnerships
 - Confirmed pick-ups from charities or organizations
 - Launch of reduction/avoidance campaigns (e.g., paperless)
 - Sourcing of items that promote bulk use (e.g., soap dispensers)

- Reduction can be hard to measure. Evaluate if the waste would have been produced at the building had the initiative not put in place
- Check whether the service schedule is appropriate given the proportion of the stream. For example: a building with food service establishments would need an organics program that is picked up more than every other week
- Ensure that streams are set up in locations that will maximize the success of the program
- Initiatives not covered here can be included under Innovation

Documentation

- Emails, memo, service agreements, photos or any other evidence which demonstrate requirements are met

Suggested Lead

In-house

Value

- Implementing waste management strategies can reduce a building's overall waste production, improve a building's diversion rates and improve waste collection procedures
- Improve the waste management at the project by implementing waste management strategies that focus on waste avoidance, establishing new waste streams, and diverting waste through recycling, reuse, and donation

Description

Programs that reduce waste and recycling generation and reuse products instead of putting them into the waste stream are an important piece of a waste reduction strategy. A transition to a circular economy must go beyond recycling, and promote the reuse of existing materials, or the elimination of their production in the first place. Making a new product emits greenhouse gases that contribute to climate change and requires a lot of materials and energy – raw materials must be extracted from the earth, and the product must be fabricated then transported to wherever it will be sold. As a result, reduction and reuse are the most effective ways you can save natural resources, protect the environment and save money. (Source: <https://www.epa.gov/recycle/reducing-and-reusing-basics>)

References

[Circular Economy](#)
[The Waste Hierarchy](#)

Adapted BB 3.0 Question

Questions 08.03.01 – Are any of the following waste diversion initiatives in place at the building?

Question 08.03.02 – Has the recycling program been expanded to include any of the following waste materials?

Question 08.03.03 – Are reuse initiatives in place at the building that have the potential to result in less waste disposed?

P5.3 – Bin-sizing

Focus Area

Custodial and Waste

Topic

Waste Audit and Measurement

Question

P5.3 – Bin-sizing

Question

Is there evidence of bin right-sizing as recycling and reuse programs are established and efficiencies are required with changing volumes across waste streams?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – waste managed by the owner/landlord

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Regular visual assessments = 1 point
 - Sensors installed = 2 points
 - Corrective actions implemented = 2 points
- No = 0 points
- Not applicable – Tenant occupied building: Waste managed by the tenant = 0/0

Max of 5 points

Requirements

- a) Evidence of a monitoring system for fullness levels, either through regular visual inspections or sensor technology
- b) Demonstrate corrective action taken to adjust schedules and/or bin sizes

IoT technology is more accurate and offers more benefits (such as the identification of contamination in bins and data trend lines) but could be considered proprietary. On-site visual assessments to ensure bin right sizing will also be awarded points.

Documentation

- Photos of bin fullness levels from visual assessment or sensors
- Correspondence regarding bin schedule or bin size adjustments

Suggested Lead

In-house, with third-party support

Value

- For effective waste collection, bins should be sized appropriately to reflect the production of each waste stream at the building
- If bins are too small, more frequent waste pickups will be needed, leading to unnecessary operational costs and Greenhouse Gas emissions. If bins are too large, they take up more space in the building than is required
- Regularly inspect bin fullness or implement sensors in bins to monitor fullness to ensure that bins are appropriately sized
- Take corrective actions if bins are found to be too large or too small to improve waste collection practices

Description

Optimization of service schedules can occur with the assistance of bin sensors (IoT Technology), or by on-site monitoring of fullness levels on the days prior to pick-up and adjusting based on these visual assessments.

Carbon dioxide (CO₂) reductions result when eliminating unnecessary truck trips to sites, and programs are better utilized when schedules reflect correct projected volumes. The goal is to reduce waste and reduce the number of waste pick-ups needed.

References

[Smart waste management solutions deliver reduction in CO₂ emissions caused by the waste collection process](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

P6. Renovations and Construction

P6.1 – Waste Management in Construction

Focus Area

Custodial and Waste

Topic

Renovations and Construction

Question

P6.1 – Waste Management in Construction

Question

Is a Construction Waste Management Program in place to minimize waste impacts during renovation and construction?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 2 points
- No = 0 points

Max of 2 points

Requirements

- a) Develop and implement a Construction Waste Management Program that covers:
 - Responsible parties, including the building team's training requirements
 - Plan to sort discarded materials into corresponding waste bins for separation, reuse/recycling and haul off-site by a verified hauler
 - Details on how construction waste materials are handled, how waste is tracked, and diverted/garbage volumes reported
- b) Program must be signed by the building manager, dated within the past 12 months
- c) Where construction services are managed and delivered by the tenants and their service providers, the owner or landlord must provide information to the tenants on how to implement a Construction Waste Management Program

This Construction Waste Management Program is required regardless of whether the owner/landlord has control over the tenant space as the program should be utilized if the owner/landlord needs to renovate the space during tenant change-over.

Documentation

- Building-specific Construction Waste Management Program

Suggested Lead

In-house, with third-party support

Value

- Construction, demolition, and renovation activities can produce large amounts of waste. Some waste cannot be properly collected and managed with operational waste at the building
- Develop a Construction Waste Management Program to be shared with contractors to ensure proper waste management strategies are followed at the building during construction and renovation activities
- Implement construction specific waste management strategies, to reduce the overall generation of construction waste at the project and divert waste from landfills to suitable end-facilities

Linked Questions:

P6.2 - Waste Control in Construction Specifications: Include Waste Management plan in construction specifications

P6.3 - Waste Management in Tenant Construction: Create a Waste Management plan for tenant construction

Description

Renovation, construction, and demolition projects create a lot of waste materials (about 30% of Canada's disposal) and need to be effectively managed to minimize the adverse impact on the environment.

These materials are largely inert, very heavy and can pose unique challenges in source separation because most materials are combined and difficult to recycle. This is further complicated because the Project Managers for C&D projects work in a separate department and interdepartmental collaboration is minimal.

Without effective communication and planning from the initial project design stages, waste minimization and diversion are nearly impossible.

References

None

Adapted BB 3.0 Question

Question 08.01.02 – Is a program in place at the building to minimize construction, renovation and/or demolition waste being sent to landfill?

P6.2 – Waste Control in Construction Specifications

Focus Area

Custodial and Waste

Topic

Renovations and Construction

Question

P6.2 – Waste Control in Construction Specifications

Question

Are the construction waste controls included in specifications for owner or landlord renovation or construction projects?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building - some or all waste managed by the owner/landlord

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Included in specifications = 1 point
 - Evidence of implementation exists = 1 point
- No = 0 points
- Not applicable - Tenant occupied building: Waste managed by the tenant = 0/0

Max of 2 points

Requirements

Before construction:

- a) Develop design and construction specifications for all owner or landlord-led renovation or construction projects being planned in the building
- b) Ensure all items covered in the building-specific Construction Waste Management Program are covered in the design and construction specifications
- c) Include directive in the specifications that binds the contractor to follow the Construction Waste Management Program during construction

During and after construction:

- a) Identify construction projects to implement the Construction Waste Management Program
- b) Gather the specifications for those projects and highlight the sections detailing the construction waste control measures to follow
- c) Conduct regular inspections and document where and how the construction waste management are followed
- d) Keep a record of the inspections and track implementation of waste sorting activities for the duration of the construction project

Documentation

- Section of construction specifications detailing waste control measures
- Section of construction specifications detailing contractor commitment
- Photos, waybills or inspection reports demonstrating implementation of the program

Suggested Lead

In-house, with third-party support

Value

- Construction, demolition, and renovation activities can produce large amounts of waste. Some waste cannot be properly collected and managed with operational waste at the building
- Building off P6.1 - Waste Management in Construction, include the building's construction Waste Management Program in construction specifications to manage negative IAQ effects from construction activities
- Additional points will be awarded to buildings that provide proof of implementing of IAQ control strategies during construction

Description

Renovation, construction, and demolition projects create a lot of waste materials (about 30% of Canada's disposal) and need to be effectively managed to minimize the adverse impact on the environment.

These materials are largely inert, very heavy and can pose unique challenges in source separation because most materials are combined and difficult to recycle. This is further complicated because the Project Managers for C&D projects work in a separate department and interdepartmental collaboration is minimal.

Without effective communication and planning from the initial project design stages, waste minimization and diversion are nearly impossible.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

P6.3 – Waste Management in Tenant Construction

Focus Area

Custodial and Waste

Topic

Renovations and Construction

Question

P6.3 – Waste Management in Tenant Construction

Question

Are the construction waste controls included in specifications for tenant renovation or construction projects?

Applicability

All asset classes

Tenant occupied building – waste managed by the tenant

Answer & Scoring

- Yes = 1 point
- No = 0 points
- Not Applicable – Owner/landlord occupied building **OR** Tenant occupied building: Waste managed by the owner/landlord = 0/0

Max of 1 point

Requirements

- a) Develop tenant construction manuals for all tenant-led renovation or construction projects being planned in the building
- b) Share the building-specific Construction Waste Management Program with tenants to include in their design and construction specifications

Documentation

- Section of tenant construction manual detailing construction waste management measures

Suggested Lead

In-house

Value

- Construction, demolition, and renovation activities can produce large amounts of waste. Some waste cannot be properly collected and managed with operational waste at the building
- When tenants complete construction and renovation activities, landlords and building managers may have limited control of the renovation or construction project. It is important for building management teams to share their Construction Waste Management Program so tenants also follow proper waste management procedures
- Building off P6.1 - Waste Management in Construction, develop a tenant construction manual to give tenants guidelines for managing construction waste to ensure tenants' activities do not impact the rest of the building

Description

Renovation, construction, and demolition projects create a lot of waste materials (about 30% of Canada's disposal) and need to be effectively managed to minimize the adverse impact on the environment.

These materials are largely inert, very heavy and can pose unique challenges in source separation because most materials are combined and difficult to recycle. This is further complicated because the Project Managers for C&D projects work in a separate department and interdepartmental collaboration is minimal.

Without effective communication and planning from the initial project design stages, waste minimization and diversion are nearly impossible.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

Training and Innovation

P7.1 – Training in Custodial and Waste

Focus Area

Custodial and Waste

Topic

Training and Innovation

Question

P7.1 – Training in Custodial and Waste

Question

Did the building operations and management team receive Custodial & Waste training in the past three years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Procurement = 1 point
 - Custodial O&M and Assessment = 1 point
 - Waste Management, Audit and Measurement = 1 point
 - Waste in Renovations and Construction = 1 point
- No = 0 points

Max of 4 points

Requirements

- a) List the names of staff members to whom the competencies covered under these topics would apply
- b) Provide the applicable course outline or syllabus
- c) Provide evidence of competency or training received such as credentials, completion certificate, record of attendance

Documentation

- Name of building O&M team member who received the training
- Course outline or syllabus
- Training Certificate or Record of Attendance

Suggested Lead

In-house, with third-party support

Value

- Train operations and management staff on procurement, custodial and maintenance assessment, waste management, and waste assessment so staff are more effective when managing custodial and waste operations at the building

Description

For building maintenance staff to effectively manage the building's Custodial & Waste, training should be provided which addresses the topics of custodial maintenance & operations, custodial assessment, waste management, waste audit and measurement and renovations and construction.

Over time, technologies and preferred practices in building operations and maintenance change. Providing regular professional development opportunities is a good way to help retain staff. Offering training and educational opportunities related to environmental/sustainable building performance not only benefits staff but improves the performance of the building when staff training is applied at the building level.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

P7.2 – Innovation in Custodial and Waste

Focus Area

Custodial and Waste

Topic

Training and Innovation

Question

P7.2 – Innovation in Custodial and Waste

Question

Is an innovative process or technology in place at the building that goes beyond the requirements outlined in this section?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Evidence of procurement practices implemented (e.g. fair-trade, social or circular economy principles applied) = 1 point
 - Evidence of waste reduction (not due to Covid-related reduced occupancy) = 1 point
 - Evidence of waste avoidance (e.g. single-use plastics, zero-waste event hosted, embodied energy considerations applied) = 1 point
 - Food procurement initiative in place that specifies the purchase of sustainable foods for food prepared on-site (e.g. cafeteria, patient meal catering etc.) = 1 point
 - Joint landlord/tenant custodial or waste initiatives implemented = 1 point
 - Other (e.g. TRUE or equivalent certification achieved) = 1 point
- Not Applicable - Not pursuing Innovation points = 0/0

Max of 5 points

Requirements

- Provide details of the technology or process applied at the building
- Indicate when the technology or process was implemented and the steps that are in place to ensure the technology or process' ongoing success
- If "Other" is selected, explain how the technology or process has improved the building's procurement, custodial and waste management practices for it to be considered innovative

Innovative processes or technologies do not need to be preapproved and will be evaluated as part of the verification process.

Documentation

- Narrative of innovative technology or process and its impact

Suggested Lead

In-house, with third-party support

Value

- The Innovation in Custodial & Waste question awards buildings for going beyond requirements outlined in other Custodial & Waste questions
- Buildings are encouraged to pursue additional measures to improve Custodial & Waste at their building

Description

Many processes and technologies exist that go beyond the standards and requirements set out in the BOMA BEST Assessment. If building managers/owners have invested in innovative processes or technologies that go beyond these standards, innovation points can be earned under this question.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

P8. Engagement

P8.1 – Align Engagement Initiatives with Tenants

Focus Area

Custodial and Waste

Topic

Engagement

Question #

P8.1 – Align Engagement Initiatives with Tenants

Question

Do any of the tenants' Custodial & Waste management approaches align with the owner or landlord's?

Applicability

Office, Enclosed Shopping Centre, Universal, Light Industrial, Open-Air Retail
Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all topics that are aligned:
 - Custodial Maintenance & Operations = 1 point
 - Custodial Assessment = 1 point
 - Waste Management = 1 point
 - Waste Audit & Measurement = 1 point
 - Waste in Renovations & Construction = 1 point
- No = 0 points
- Not applicable – Owner/landlord occupied building = 0/0

Max of 5 points

Requirements

- a) Engage with the tenants to understand their custodial & waste goals, in specific topics listed, and how their goals may align with the building management's custodial & waste goals
- b) Provide a sample of feedback or communication received from the tenants that demonstrate where alignment exists in specific topics covered in the Custodial & Waste Plan

In buildings where tenants manage the majority of custodial and waste services, the owner or landlord can engage with the tenant(s) to collaborate and share information and lessons learned to improve whole-building performance in these areas.

Documentation

- Narrative that describes where owner or landlord and tenant's custodial & waste goals align
- Sample of relevant feedback or communication received from the tenants

Suggested Lead

In-house

Value

- As tenants are often responsible for maintaining custodial & waste practices in their spaces, they play a crucial role in improving custodial & waste management at a building
- Engage with tenants to discuss and align waste reduction goals, custodial & waste management practices, and identify opportunities for collaboration

Description

Passive engagement through communication is an important first step. Also, the ability to collect tenant utility data is becoming increasingly important as part of reporting and disclosure. Active engagement efforts include direct outreach activities, such as working with tenants to collect tenant-controlled utility data or requiring green leases for new tenants or renewals that address sustainability initiatives.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

Resilience and Site

R0. Baseline Practices

R2.0 – Past Climate Hazards

Focus Area

Resilience and Site

Topic

Baseline Practices

Question #

R2.0 – Past Climate Hazards

Question

What climate hazards and extreme weather events has the site experienced in the past 10 years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

Yes – this is a baseline requirement

Requirements

- a) Complete the [BOMA BEST Form R2.0](#) that covers:
- b) High-impact climate hazards and events that have been experienced or considered as posing a risk at the property and/or within the region in the past ten years by completing the provided template
 - o Provide detail on how relevant hazards affected occupants, key building systems and components
 - o If information is not available for ten (10) years or for the hazard, explain why

OR

- c) Conduct a building-specific Climate Change Risk or Resilience Report

According to the Intergovernmental Panel on Climate Change (IPCC), climate risk results from the interaction of hazard, exposure and vulnerability.

Hazard: the potential occurrence of climate-related physical events or trends that may cause damage and loss.

Exposure: indicates the presence of assets, services, resources and infrastructure that could be adversely affected.

Vulnerability: the propensity or predisposition to be adversely affected.

Documentation

- Completed Form R2.0

OR

- Building-Specific Climate Change Risk or Resilience Report

Suggested Lead

In-house: Building Manager

Third-party: Architectural/Engineering Consultant

Note: This questionnaire requires a third-party consultant.

Value

- Climate change and global warming causes hazards and extreme weather events to a severity or frequency that building locations may have not previously experienced
- To prepare for future extreme weather events, it is important to identify which climate-related hazards that are present at a building's location and the likeliness of occurrence
- Perform a review of the climate-related hazards that have affected the building over the past 10 years using the BOMA BEST Form R2.0
- This assessment can be performed in-house or through a third-party. The question is applicable to spaces both inside and outside of the building

Description

To enable preparation and planning, relevant climate-related hazards specific to a property's location should be identified. This requires consideration of past events that have caused damage and/or disruption and projected future events including their likelihood of occurring and potential consequences at the property level if they do.

Consider both climate hazards that are experienced as trends, such as rising annual temperatures, and climate hazards that are experienced as events, such as severe storms.

Climate risk analysis is complex, and this question is intended to be an initial step rather than a comprehensive assessment.

References

[Resilience in the CRE Industry](#)

[Ahead of the Storm](#)

[Ahead of the Storm \(full\)](#)

[BOMA Canada — Resilience Brief](#)

[Intergovernmental Panel on Climate Change \(IPCC\)](#)

Adapted BB 3.0 Question

New in BOMA BEST 4.0

R1. Site

R1.1 – Site Irrigation

Focus Area

Resilience and Site

Topic

Site

Question

R1.1 – Site Irrigation

Question

Which type of water efficient controls are used to irrigate the site's landscaped areas?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Drip or root-fed irrigation = 1 point
 - Rain and/or soil moisture sensors = 1 point
 - Weather-based controllers = 1 point
 - Pressure regulated head = 1 point
 - Smart scheduling = 1 point
 - Stormwater capture = 1 point
 - Landscaping does not require irrigation = 5 points
- No = 0 points
- Not Applicable – No exterior landscapes areas on site = 0/0

Max of 5 points

Requirements

Indicate which type of irrigation control is in place at the building and used to irrigate 80% or more of the landscape.

- Drip irrigation: Water lines with low flow, dripping applicators spread throughout the irrigated area to more conservatively distribute water.
- Root-fed irrigation: Applicators are below ground and close to the roots zone of plants.
- Soil moisture sensors: Moisture sensors are placed in the soil of the irrigated area and communicate with an automatic scheduling system to adjust scheduling based on the real-time moisture levels of the irrigated area.

- Rain sensors: Precipitation sensors placed in the irrigated area communicate with an automatic scheduling system to adjust scheduling based on previous rainfall on the irrigated area.
- Weather-based controllers: Can be either a Smart or Central Controller. Must be WaterSense approved
- Smart scheduling: Manual scheduling based on an interaction of factors to maximize the efficiency of water use in irrigating plants. Considers the following: timing (to reduce evapotranspiration, best at night or away from peak sun and heat loads); flow rate and distribution of irrigation system; slope; soil type and infiltration rate of area being irrigated; plant type (watering needs and root depth); seasonal changes in watering needs; and predicted and actual rainfall.

Documentation

- Photos, specifications, excerpts from landscaping contract etc. showing example of specific strategy implemented

Suggested Lead

In-house, with third-party support

Value

- Water use associated with landscaping can significantly impact the overall water consumption at a building
- Reduce water use associated with landscaping by implementing landscaping designs that do not require irrigation or using water efficient irrigation systems

Description

Water-efficient irrigation controls reduce water consumption.

References

None

Adapted BB 3.0 Question

Question 02.04.01 – Which type of water efficient controls are used for irrigation?

R1.2 – Sensitive Site Management

Focus Area

Resilience and Site

Topic

Site

Question

R1.2 – Sensitive Site Management

Question

Are environmentally sensitive site management strategies implemented and maintained on the site?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below
Select all that apply:
 - Native plant species = 1 point
 - Native pollinator-friendly flowering plants = 1 point
 - Edible garden = 1 point
 - Bee hives or hotels = 1 point
 - Bird-safe = 1 point
- No = 0 points

Max of 5 points

Requirements

Strategies include:

- a) >80% of landscaping contains native and drought resistant plant species
- b) >80% of landscaping contains native and drought resistant flowering plants that encourage pollinators
- c) Removal of invasive/non-native plant species
- d) Environmentally preferable pesticides, fertilizers and herbicides
- e) Bee hives or bee hotels
- f) Bird-safe strategies include grey or black deterrent markers installed on reflective or clear glass surfaces

If there is no landscaping on site then there is still the possibility of implementing the proposed strategies in other areas of the building, such as bee hives on the roof, bird-friendly films on glazing etc.

Measures should be in place for at least a year, or one prior summer season.

Documentation

- Photos, specifications, excerpts from landscaping contract etc. showing example of specific strategy implemented

Suggested Lead

In-house, with third-party support

Value

- How the landscaped areas at a building are managed can significantly impact the surrounding environment
- Chemical run-off in fertilizers and pesticides, invasive plant species, and non-native plant species all negatively impact on the local fauna and flora
- Implement environmentally sensitive site management strategies to reduce the building's impact on the local environment, such as using environmentally preferred products. Contracted service providers are required to implement these strategies (if applicable)
- Create spaces that enhance the local environment by reintroducing native species to their site and incorporating strategies to help local fauna such as bee hives and bird-safe designs

Description

How a building manages its landscaped areas through mowing and fertilization practices can have an impact on the surrounding environment (e.g., the persistence of invasive species; the release of harmful chemicals and toxins into the environment such as pesticides, fertilizers and herbicides; and on resource use like water).

Broad-spectrum application of pesticides, fertilizers, and herbicides has significant impacts on the health of the landscape and the runoff of harmful chemicals into the environment. Building managers can reduce non-point source pollution by focusing on using non-chemical control methods. When chemical options are used, these should be low in toxicity and persistence. Their use should be part of an overall landscape management plan.

References

[CSA Bird-safe Design Guide](#)

[Bird-friendly Certification](#)

[Pollinator Partnership Canada](#)

Adapted BB 3.0 Question

Question 09.01.01 – Is a landscape management program in place for the building that includes the following considerations?

R1.3 – Hardscape Management Program

Focus Area

Resilience and Site

Topic

Site

Question

R1.3 – Hardscape Management Program

Question

Is there a hardscape management program in place for the building that includes the following considerations?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – some or all systems managed by the owner

Answer & Scoring

- Yes = 3 points
- No = 0 points
- Not applicable – Tenant occupied building: All systems managed by the tenant = 0/0

Max of 3 points

Requirements

- a) Create a Hardscape Management Program. The program must be reviewed every 12 months and be available to all relevant building staff, contractors, or service providers.

The hardscape management plan should include:

- Cleaning of the hardscape (building's façade, sidewalks, pavement, parking garages, parking lots, etc.)
 - Environmentally preferable cleaning chemicals
 - Use of environmentally preferable maintenance equipment
 - Use of environmentally preferred snow and ice melting products, if applicable. For regions where this is not applicable, provide evidence of the climate conditions in which the building is located to demonstrate that there would be no snow and ice requiring removal, e.g., regional weather maps/reports.
 - Appropriate application of products
- b) Demonstration of implementation is required. The program can be common to a portfolio or campus of buildings however implementation must be building-specific.

Documentation

- Hardscape management plan
- Proof of implementation including but not limited to: cleaning logs for hardscape, list of exterior cleaning products, list of maintenance equipment, proof of purchase of snow and ice melting products

Suggested Lead

In-house

Value

- How the hardscaped areas at a building are managed can significantly impact the surrounding environments
- Runoff from chemicals used to clean hardscapes or snow and ice melting products can have a negative impact on local fauna and flora
- Poorly maintained hardscapes can pose a safety risk to occupants and affect the overall aesthetic and street appeal of the building
- Implement a Hardscape Management Program that includes proper maintenance practices and environmentally preferred products. Contracted service providers are required to follow this program (if applicable)

Description

Building managers must have a clear plan in place to address the regular cleaning and maintenance of the building's facade and hardscape areas. Proper hardscape management can have a tremendous impact on the surrounding environment (e.g., release of chemicals and toxins into the environment), safety (e.g., slips due to ice build-up), and the building's overall aesthetic/street appeal.

References

Definitions:

Environmentally Preferable Cleaning Chemicals: Obtained a third-party certification from EcoLogo or Green Seal.

Environmentally Preferable Equipment: These must be energy and water efficient. If powered equipment is necessary, it must operate with a sound level of less than 70 dBA and be compliant with ENERGY STAR (where possible). Propane-powered equipment must have high-efficiency, low emission engines. Battery-powered equipment must be equipped with environmentally preferable gel batteries. Powered equipment must be ergonomically designed to minimize vibration, noise and user fatigue.

Equipment dependent on water must use water efficiently or use non-potable water where possible. Carefully monitor the landscape to avoid excessive water runoff.

Environmentally preferred snow and ice melting products:

Specify the use of environmentally preferable de-icing agents for hardscape (parking, walkways, etc.). De-icing agents must have a working temperature of -7°C/19.4°F or below and contain no chloride (such as sodium chloride, magnesium chloride or calcium chloride). Organic products (e.g., beet juice, Organic Melt or equivalent), 100% calcium magnesium acetate or products that meet the U.S EPA Safer Choice standard are recommended. Materials may be brines or solid deicers that are pre-treated or pre-wetted. Products containing sodium chloride or calcium chloride may only be used during snow events when the temperature reaches -12°C/10.4°F or below.

Adapted BB 3.0 Question

Question 09.01.06 - Is there a hardscape management program in place for the building that includes the following considerations?

Question 09.01.07 - Regular cleaning of hardscape areas such as sidewalks, pavement, parking garages, parking lots

Question 09.01.08 - Regular cleaning of the building's exterior facade

Question 09.01.09 - Use of environmentally preferable cleaning chemicals

Question 09.01.10 - Use of environmentally preferable maintenance equipment

Question 09.01.11 - Use of environmentally preferred snow and ice melting products

R2. Climate Hazards and Risks

R2.1 – Future Climate Hazards

Focus Area

Resilience and Site

Topic

Climate Hazards and Risks

Question

R2.1 – Future Climate Hazards

Question

Have the site-specific risks associated with potential future climate hazards and related events been identified?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 5 points
- No = 0 points

Max of 5 points

Requirements

- a) Determine the relevant climate hazards on the site, using climate projection data. Outline methodology and data sources.
- b) Identify exposure of the site to high-impact climate-related hazards in the future, as it is relevant to the site and considering that every situation is different.
- c) Establish the timeframe based on the organization's planning horizons but extend to at least 2040.

For example: A property that is located far from any forests or grassland would likely have a low exposure to wildfires impacting the site now and through 2050. However, a property that is located near a forest in a region that regularly experiences wildfires now and is projected to experience more frequent droughts by 2050 could be considered to have a high exposure to wildfires now and through 2050.

If the hazards were identified through high-level portfolio-wide review, outline the methodology or framework (e.g. GRESB), tools used, level of accuracy and other pertinent information.

For individual building assessments, review regional climate projections where available to determine potential future climate hazards through 2040, 2050 or beyond. Indicate the future emissions/temperature scenario considered and the rationale for the chosen scenario.

Documentation

- Narrative or in-house climate risk and adaptation survey or exposure assessment

OR

- Building-Specific Climate Change Risk or Resilience Report

Suggested Lead

In-house, with third-party support

Value

- As more extreme weather events and other climate-related hazards are expected due to global warming and climate change, it is important to understand what future climate hazards might impact the building
- Building on the Baseline practice, R2.0 - Past Climate Hazards, identify future climate-related hazards that may impact the building
- This assessment can be performed in-house or through a qualified third-party. The question is applicable to spaces both inside and outside of the building

Description

To enable preparation and planning, relevant climate-related hazards specific to a property's location should be identified. This requires consideration of past events that have caused damage and/or disruption and projected future events including their likelihood of occurring and potential consequences at the property level if they do.

Consider both climate hazards that are experienced as trends, such as rising annual temperatures, and climate hazards that are experienced as events, such as severe storms.

The time horizon under consideration should extend into the future, through at least 2050 or further, using climate projections from national and international climate data sources. From climate data projections and the team's input, the most relevant hazards for the property based on potential level of impact can be identified for assessment of climate risk.

Climate risk analysis is complex, and this Question is intended to be an initial step rather than a comprehensive assessment.

References

Climate projection data is often available through regional or federal governments or related organizations, such as [Climate Data Canada](#), [Climate Risk Institute](#), [FloodSmart Canada](#) or [ClimateAtlasCanada](#).

[Pacific Climate Impacts Consortium](#) or [Preliminary strategic climate risk assessment](#) (for BC) [California's Fourth Climate Change Assessment](#) (for California)

[City Resilience Index](#)

[Climate Risk Institute \(Municipal\)](#)

and [regional floodplain maps](#)

Municipal zoning/DPAs (e.g., hazard lands, steep slopes, floodplains)

Regional/provincial climate risk assessments

Regional wildland urban interface fire risk class maps and landslide susceptibility maps, Scientific papers and Portfolio wide risk assessments.

Adapted BB 3.0 Question

Question 09.01.13 – Has a resilience or business continuity plan been prepared for the building that includes the following components?

Question 09.01.14 – A long-term climate change risk assessment

R2.2 – Rank Climate Risks

Focus Area

Resilience and Site

Topic

Climate Hazards and Risks

Question

R2.2 – Rank Climate Risks

Question

Have the climate risks been ranked and assessed for the building and site?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 4 points
- No = 0 points

Max of 4 points

Requirements

- a) Conduct a Climate Risk Assessment. Include information on the relative likelihood of occurrence for each hazard identified and the potential impacts.
- b) For each high-risk hazard identified, determine the likelihood of occurrence through 2040. Rate and describe potential consequences on the building components identified as vulnerable to that hazard.

For example: major floods occur annually and are projected to increase in frequency by 2050, so the likelihood could be rated as ‘high.’ If the mechanical systems are vulnerable to flooding and located in the basement, the consequences of a flood event impacting the mechanical equipment could be total loss of HVAC systems and requirement for replacement, so the consequence could be rated as ‘high.’ However, if the mechanical room is on an upper floor, the consequence of a flood to that system could be ‘low.’

- c) From this review, identify the highest risks based on the most significant consequences for the most likely, high-impact relevant hazards, where Risk = Likelihood x Consequences).

For example: provision of equipment and supplies, infrastructure upgrades, or retrofits to improve resiliency.

- d) Provide an explanation/Description of the data sources, methodologies and Representative Concentration Pathway (RCP) scenario(s) used to determine the highest or most important risks facing the building and site

Climate projection data referenced as part of hazard identification will typically include likelihood or increases in occurrence.

Identification of level of risk will vary for each organization, and criteria for determining high, medium, and low consequence and risk should be established internally.

A recommended scenario is Representative Concentration Pathway 8.5 (RCP8.5) from the Intergovernmental Panel on Climate Change (IPCC).

Documentation

- Building-Specific Climate Change Risk or Resilience Report

Suggested Lead

Third-party

Value

- Building on R2.1 – Future Climate Hazards, rank future climate hazards by likeliness of occurrence and the consequence the hazard has on the building
- By better understanding the impacts climate-related hazards have on a building, building management teams can better plan for these hazards
- A third-party professional should be engaged to assess climate hazards at the building location

Description

Commercial real estate leaders are increasingly recognizing the risks posed by extreme weather events that will continue to occur more frequently than in the past. Design and operations need to focus on business continuity, safety, and wellbeing to reduce risks to assets, occupant health and safety, and services.

Climate risks can be assessed based on the likelihood of a high impact climate hazard occurring and the severity of the consequences to property components, people and systems that may occur. Consequences can include health and safety, displacement, asset damage, inaccessible and unusable space, legal liability, increased insurance premiums, supply chain and service interruptions, reputational impact, increased operations and maintenance costs, environmental effects, and other considerations.

The inclusion of climate resilience in planning, preparation, and implementation projects will reduce risks to ensure that people and property are protected, costs are minimized, reputation is maintained, environmental effects are reduced, and asset value is enhanced.

References

[IPCC](#), [Climate Data Canada](#), [CCME Assessment Guidance](#), [ICLEI Canada](#) Also refer to the BOMA website under '[climate resilience](#).'

ISO 31000:2018

Ontario Climate Change and Health Toolkit

PIEVC Engineering Protocol

BARC Milestone 2

Acceptable asset-level risk assessment frameworks include: [CRREM](#) [PIEVC](#) [ISO 31000](#) [GRESB](#) BOMA Canada will accept other frameworks if equivalency is proven.

Adapted BB 3.0 Question

New in BOMA BEST 4.0

R2.3 – Resilience Strategies

Focus Area

Resilience and Site

Topic

Climate Hazards and Risks

Question

R2.3 – Resilience Strategies

Question

Have resilience strategies been identified to address the most significant climate risks at the building and site level?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 3 points
- No = 0 points

Max of 3 points

Requirements

- a) Conduct a Climate Risk Assessment and highlight the framework used to undertake the assessment, as well as the Representative Concentration Pathway (RCP) scenario(s) evaluated
- b) Acceptable asset-level risk assessment frameworks include CRREM, PIEVC, ISO 31000, GRESB or similar, but must focus on the individual property.
- c) If not identified in the report, for each of the highest risks, indicate any measures that have been implemented to address identified risks. Examples include equipment and supplies, infrastructure upgrades, retrofits or other tangible actions

IPCC's recommended Representative Concentration Pathway (RCP) scenario(s) is RCP8.5.

See: [The Intergovernmental Panel on Climate Change](#) and [Representative Concentration Pathways \(Government of Canada\)](#)

Documentation

- Climate Risk Assessment, referencing industry-accepted framework used

Suggested Lead

Third-party

Value

- Building on R2.2 - Rank Climate Hazards, once climate-related hazards that impact a building are assessed and ranked, identify resilience strategies to respond to these hazards
- Resilience strategies minimize the impact of climate-related hazards on the building and its occupants, protects assets, and reduces costs.
- Engage a qualified professional to recommend resilience strategies to prepare and respond to the most significant climate-related hazards

Linked Questions:

R3.1 - Emergency Preparedness: Into resilience strategies in emergency preparedness and response plans

R3.3 - Capital Planning: Include resilience strategies in future capital planning

Description

Commercial real estate leaders are increasingly recognizing the risks posed by extreme weather events that will continue to occur more frequently than in the past. Design and operations need to focus on business continuity, safety, and wellbeing to reduce risks to assets, occupant health and safety, and services.

The inclusion of climate resilience in planning, preparation, and implementation projects will reduce risks to ensure that people and property are protected, costs are minimized, reputation is maintained, environmental effects are reduced, and asset value is enhanced.

While the previous Question provides guidance on conducting a high-level assessment of risks to your facility, having a comprehensive assessment done that follows one of the acceptable climate risk assessment frameworks will provide greater depth and detail, and can provide a stronger foundation for planning and decision-making, particularly if completed by a climate

References

Acceptable asset-level risk assessment frameworks include:

- [CRREM](#)
- [PIEVC](#)
- [ISO 31000](#)
- [GRESB](#)
- BOMA Canada will accept other frameworks if equivalency is proven

Adapted BB 3.0 Question

New in BOMA BEST 4.0

R3. Climate Planning and Vulnerabilities

R3.1 – Emergency Preparedness

Focus Area

Resilience and Site

Topic

Climate Planning and Vulnerabilities

Question #

R3.1 – Emergency Preparedness

Question

Do emergency preparedness and response plans include climate hazards and related extreme events?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 5 points
- No = 0 points

Max of 5 points

Requirements

Demonstrate the extent to which climate change and related hazards have been incorporated into the building-specific emergency preparedness and response plans.

Documentation

- Highlight relevant sections in Emergency Preparedness and Response Plans

Suggested Lead

In-house, with third-party support

Value

- As more extreme weather events and other climate-related hazards are expected due to global warming and climate change, building management teams are encouraged to include climate-related hazards in their emergency planning
- Building off R2.3 - Resilience Strategies, include protocols to respond to climate-related emergencies in the building's emergency preparedness and response plans
- Incorporate resilience strategies into official building management documents and communicate appropriate protocols to the building occupants

Description

Commercial real estate leaders are increasingly recognizing the risks posed by extreme weather events that will continue to occur more frequently than in the past. Design and operations need to focus on emergency preparedness, safety, and wellbeing to reduce risks to assets, occupant health and safety, and services.

The inclusion of climate resilience in planning, preparation, and implementation projects will reduce risks to ensure that people and property are protected, costs are minimized, reputation is maintained, environmental effects are reduced, and asset value is enhanced.

Planning activities to respond to high priority climate risks will increase resilience. Risks must be addressed in operations, including emergency response plans and business continuity plans.

References

[Resilience in the CRE Industry](#)

[Ahead of the Storm](#)

[Ahead of the Storm \(full\)](#)

[BOMA Canada — Resilience Brief](#)

[Intergovernmental Panel on Climate Change \(IPCC\)](#)

Adapted BB 3.0 Question

Question 09.01.13 – Has a resilience or business continuity plan been prepared for the building that includes the following components?

Question 09.01.14 – A long-term climate change risk assessment

R3.2 – Maintain Critical Systems

Focus Area

Resilience and Site

Topic

Climate Planning and Vulnerabilities

Question

R3.2 – Maintain Critical Systems

Question

Have the building's critical systems been identified that must be maintained in an extreme climate-related hazard event?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 4 points
- No = 0 points

Max of 4 points

Requirements

- a) List or describe the critical systems that must be maintained in an emergency and the building function that requires these systems
- b) For each of the relevant hazards identified, indicate which of the systems could be affected
- c) Provide an explanation of the measures necessary to maintain the critical systems, including critical spare equipment components

Example for a power outage due to an extreme storm:

- Electricity: Is adequate backup/emergency power in place? Note, backup power should be provided with 72 hours of fuel for critical systems/spaces at a minimum
- Heating, cooling and ventilation: What provisions are in place for maintaining safe conditions in case of a power outage?
- Security and communications: What provisions are in place for maintaining security and communications in case of a power outage?
- Accessibility: How will individuals with disabilities fare during power outages and what supports might they need?
- Other: e.g. water, sanitary plumbing, natural gas, stormwater drainage

Documentation

- Highlight relevant sections in Emergency Preparedness and Response Plans and associated policies
- Documentation must be building-specific

Suggested Lead

Third-party

Value

- More frequent extreme weather events and other climate-related hazards are expected due to global warming and climate change which can significantly impact building systems
- Engage a qualified professional to identify critical systems that need to be maintained during climate-related events to sustain for building functions
- Include protocols to preserve these systems in the project's Emergency Preparedness and Response Plans

Description

The focus of this Question is to guide owners and landlords to think about how future climate events may impact critical building systems, and to plan accordingly. It is meant to go beyond day-to-day emergency preparedness practices.

Resilient buildings reduce vulnerability to climate-related hazards; maintain and enhance healthy, livable spaces for occupants; and mitigate carbon emissions. Investments in building infrastructure protect against damage and losses and reduce insurance premiums. The owner or landlord should determine which elements are important to review, since every building and situation is different.

Components and systems could include elements related to buildings, site, infrastructure, programs and services, operations, health and safety, or other categories that the owner or landlord deems important for the property. Each element may be reviewed to determine its relative level of exposure and sensitivity to relevant hazards, as well as current ability to adapt to them. In combination, these criteria can be used to assess a building element's vulnerability to climate hazards.

References

[BOMA Canada](#)

[GRESB](#)

[RDH's report "Climate Change Resilience for Buildings Primer"](#)

[Resilience in Hospitals](#)

Adapted BB 3.0 Question

Question 09.01.13 – Has a resilience or business continuity plan been prepared for the building that includes the following components?

Question 09.01.14 – A long-term climate change risk assessment

R3.3 – Capital Planning

Focus Area

Resilience and Site

Topic

Climate Planning and Vulnerabilities

Question

R3.3 – Capital Planning

Question

Are capital upgrade and renewal planning processes informed by climate-related risks?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building – owner/landlord responsible for capital expenditures

Answer & Scoring

- Yes = 3 points
- No = 0 points
- Not applicable – Tenant occupied building: Tenant responsible for capital expenditures = 0/0

Max of 3 points

Requirements

- a) Provide an explanation of how climate risks are incorporated into planning and budgeting
- b) Show the inclusion of climate risk mitigation projects that have been incorporated into the 10-year plan
- c) List completed, initiated or budgeted climate risk mitigation capital projects, identifying the risks addressed
- d) Indicate the extent of the improvements and the implementation stage

Documentation

- Explanation of how climate risks have been incorporated into planning and budgeting.
- List of climate mitigation capital projects and identify the risks addressed

Suggested Lead

Third-party

Value

Coming Soon

Description

Planning activities to respond to high priority climate risks will increase resilience. Risks must be addressed in operations, including emergency response plans and business continuity plan.

Capital project investments will be required to ensure that assets can respond to and recover from extreme weather events. Projects addressing climate risks should be incorporated into capital projects.

References

- To recover from the impacts of climate hazards and implement resilience strategies, capital investments are required
- Building off R2.3 - Resilience Strategies, include the costs associated with implementing resilience strategies and responding to the effects of climate hazards in the building's capital planning

Adapted BB 3.0 Question

Question 09.01.13 – Has a resilience or business continuity plan been prepared for the building that includes the following components?

Question 09.01.15 – An adaptation plan based on assessed long-term climate risks

R4. Training and Innovation

R4.1 – Training in Resilience

Focus Area

Resilience and Site

Topic

Training and Innovation

Question #

R4.1 – Training in Resilience

Question

Did the building operations and management team receive resilience training in the past three years?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = 2 points
- No = 0 points

Max of 2 points

Requirements

- a) List the names of staff members to whom the competencies covered under these topics would apply
- b) Provide the applicable course outline or syllabus
- c) Provide evidence of competency or training received such as credentials, completion certificate, record of attendance

Documentation

- Name of building O&M team member who received the training
- Course outline or syllabus
- Training Certificate or Record of Attendance

Suggested Lead

In-house, with third-party support

Value

- Train building staff in resilience to inform staff of the climate hazards that affect the building, the importance of resilience strategies, and what protocols are in place at the building to respond to climate-related hazards
- Training allows building staff to be more effective in implementing resilience strategies and be better prepared for climate-related emergencies

Description

Over time, technologies and preferred practices in building operations and maintenance change. Providing regular professional development opportunities is a good way to help retain staff. Offering training and educational opportunities related to environmental/sustainable building performance not only benefits staff but improves the performance of the building when staff training is applied at the building level.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0

R4.2 – Innovation in Resilience & Site

Focus Area

Resilience and Site

Topic

Training and Innovation

Question

R4.2 – Innovation in Resilience & Site

Question

Is an innovative process or technology in place at the building that goes beyond the requirements outlined in this section?

Applicability

All asset classes

Owner/landlord occupied building

Tenant occupied building

Answer & Scoring

- Yes = Points as indicated below

Select all that apply:

- Non-potable sources of water are used for irrigation = 1 point
- Actions are being taken to address climate risk hazards identified = 1 point
- Electric Vehicle (EV) charging stations installed for >2% of parking stalls (Office, Healthcare, ESC, Universal, Light Industrial, OAR)= 1 point
- Electric Vehicle (EV) charging stations installed for >2% of resident suites (MURB) = 1 point
- Other = 1 point
- Not Applicable - Not pursuing Innovation points = 0/0

Max of 4 points

Requirements

- a) Provide details of the technology or process applied at the building
- b) Indicate when the technology or process was implemented and the steps that are in place to ensure the technology or process' ongoing success
- c) If "Other" is selected, explain how the technology or process has improved the building's resilience and site management practices for it to be considered innovative

Innovative processes or technologies do not need to be preapproved and will be evaluated as part of the verification process.

Documentation

- Narrative of innovative technology or process and its impact

Suggested Lead

In-house, with third-party support

Value

- The Innovation in Resilience & Site question awards buildings for going beyond requirements outlined in other Resilience & Site questions
- Projects are encouraged to pursue additional measures to improve resilience and site management at their building

Description

Many processes and technologies exist that go beyond the standards and requirements set out in the BOMA BEST Assessment. If building managers/owners have invested in innovative processes or technologies that go beyond these standards, innovation points can be earned under this question.

References

None

Adapted BB 3.0 Question

New in BOMA BEST 4.0