



# LEED for Homes v4 Checklist

BC Housing has committed to implementing sustainability measures in all new construction. LEED for Homes is better suited to residential buildings, up to 8 storeys, than LEED BD&C, and is therefore recommended as a sustainability standard for new construction. The checklist is a list of all LEED for Homes prerequisites and credits, along with comments about each one.

Although less costly and easier to achieve than LEED BD&C, LEED for Homes ratings still achieve BC Housing's short-term sustainability goals.

## Costing for LEED for Homes vs LEED NC BD&C

LEED for Homes is significantly less administratively involved, and requires less time than LEED NC BD&C. It is also less expensive.

Ex. 8 storey 50,000 sqft building, 80 units

	LEED BD&C	LEED for Homes
<b>Registration Costs</b>	\$1,400 (\$1,225)	\$900 (\$700)
<b>Certification Costs</b>	\$9,375 (\$6,925)	\$3,400
<b>Total Costs</b>	\$10,775 (\$8,150)	\$4,300 (\$4,100)

Note: CAGBC discounted member fees are in brackets

# Checklist

This information bulletin has been developed as a resource for employees and partners by BC Housing's Energy Management department. Please visit [www.bchousing.org](http://www.bchousing.org)

## SUSTAINABLE SITES CATEGORY (7 POINTS)

### SS P1: CONSTRUCTION ACTIVITY POLLUTION PREVENTION (REQUIRED) HOMES/MIDRISE

Depending on building type, form and location, typical strategies can include temporary and permanent seeding, mulching, earth dikes, silt fences, sediment traps and sediment basins. Note that many municipalities in BC require erosion and sedimentation control measures that meet or exceed the requirements for LEED.

### SS P1: NO INVASIVE PLANTS (REQUIRED) HOMES/MIDRISE

This credit is easily achieved by ensuring that no invasive species are introduced into the landscape. Note that not all nonnative species are considered invasive.

### SS 1: HEAT ISLAND REDUCTION (1-2PT) HOMES/MIDRISE

Shading and/or high-albedo surfaces will to minimize the heat island effect. Strategies can include landscaping for shade, ENERGY STAR roof products, vegetated roofing, open pavers, etc. Points are awarded based on the percentage of the hardscape area covered by shading or high-albedo surfaces.

### SS 2: RAINWATER MANAGEMENT (1-3 PTS) HOMES/MIDRISE

The intent of these points is to reduce rainwater runoff volume. Strategies include permeable paving, swales, rain gardens, etc. These should be easy points to achieve.

### SS 3: NON-TOXIC PEST CONTROL (0.5-2 PTS) HOMES/MIDRISE

There is a picklist of options that implement in order to reduce exposure to pesticides and minimized pest problems. Each item is worth 0.5 points (unless otherwise noted), and most are simple to do.



## WATER EFFICIENCY CATEGORY (12 POINTS, MIN: 3 POINTS)

### WE P1: WATER METERING (REQUIRED) HOMES/MIDRISE

There are different requirements based on whether this is for a 1-3 storey building, or a 4-8 storey building. But in general, it is required to install a water meter (and/or submeters for each unit).

### WE 1: TOTAL WATER USE (1-12 PTS) HOMES/MIDRISE

There are 2 pathways for points in this category – this is one of them. Points are awarded based on the amount of reduction of water usage, indoor and outdoor, between 10-65% over standard practices. Following BC Housing's Design and Construction Standards will achieve at least 3 points.

### WE 2: INDOOR WATER USE (1-6 PTS) HOMES/MIDRISE

Similar to the credit above, if BC Housing's Design and Construction Standards are followed, up to 5 points should be awarded.

### WE 3: OUTDOOR WATER USE (1-4 PTS) HOMES/MIDRISE

Points are awarded for reducing turf grass and increasing native plants, or those adapted to the area. This overlaps with the SS P1, SS 1 and SS 2 credits.

## ENERGY + ATMOSPHERE CATEGORY (38 POINTS)

### EA P1: MINIMUM ENERGY PERFORMANCE (REQUIRED) HOMES/MIDRISE

Requirements are different for homes vs midrise buildings. Homes must meet ENERGY STAR requirements, and midrise buildings must be modeled and/or commissioned. If BC Housing's Design and Construction Standards are followed, it is only slightly more work to achieve this requirement.



### EA P2: ENERGY METERING (REQUIRED) HOMES/MIDRISE

Electricity and gas meters are to be installed for Homes, and submeters for each residential suite. Submeter rough-ins are already required by BC Housing's Design and Construction Standards.

### EA P3: EDUCATION OF HOMEOWNER, TENANT OR BUILDING MANAGER (REQUIRED) HOMES/MIDRISE

Developers must provide O&M manuals (electronic or paper) and a minimum 1hr walkthrough after substantial completion, for the building operators. This is a requirement in the BC Housing Design and Construction Standards, so it is easy to achieve.

**e** EASY

**m** MEDIUM

**d** DIFFICULT

IMPLEMENTATION INDICATOR

Energy + Atmosphere Category  
continued from previous page...



**EA P4: HOME SIZE (BONUS POINTS)** *HOMES*

Points are given for designing smaller homes than the ENERGY STAR for homes v3 baseline. One point per 4% decrease in conditioned floor space, for bonus points.

**m**

**EA 1: ANNUAL ENERGY USE (1-29 POINTS)** *HOMES*  
**(1-30 POINTS)** *MIDRISE*

These points require energy modeling of the proposed building vs ASHRAE 90.1-2010 baseline. Percentage reduction of the energy budget corresponds to a number of points. The types of design options that are required to reduce the energy budget range from easy to more difficult, however some should be fairly simple to achieve in municipalities (like City of Vancouver) where higher energy performance is required.

**m**

**EA 2: EFFICIENT HOT WATER DISTRIBUTION (2-5 POINTS)** *HOMES/MIDRISE*

This category has several options and paths within each option, therefore there are both easy, medium and difficult opportunities. One easy one is pipe insulation with R-4; which is awarded 2 points. A more difficult option is to collect points based on maximum pipe length requirements, or maximum pipe volume requirements.

**e**

**EA 3: ADVANCED UTILITY TRACKING (1-2 POINTS)** *HOMES/MIDRISE*

This point encourages real-time energy monitoring systems that send energy data to the occupants and/or building managers at intervals of 1hr or less.

**e**

**EA 4: HVAC STARTUP CREDENTIALING (1 POINT)** *HOMES*

This credit is only related to homes, and requires that all HVAC systems to be commissioned by a credentialed contractor.

**e**

**EA 5: ACTIVE SOLAR READY DESIGN (1 POINT)** *HOMES*

This credit is only related to homes, and requires that the home is designed with future potential for solar PV or solar hot water.

**m**

**EA 6: BUILDING ORIENTATION AND PASSIVE SOLAR DESIGN (3 POINTS)** *HOMES*

This point is related to the positioning of the building on site, with respect to glazing, shading, and orientation of east-west axis. It may be difficult to achieve these points based on the site conditions and restrictions.

**m**

**EA 7: AIR INFILTRATION (1-2 POINTS)** *HOMES*

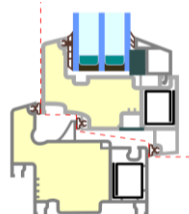
This point requires that air leakage is tested once the building envelope is complete, and must not exceed a certain level. This should be simple to achieve, with good detailing and proper air sealing around openings.

**e**

**EA 8: ENVELOPE INSULATION (1-2 POINTS)** *HOMES*

Points are awarded for exceeding the R-value for wall insulation of the International Energy Conservation Code (or local code, whichever is more stringent). This should be targeted where possible.

**e**



**EA 9: WINDOWS (1.5-3 POINTS)** *HOMES*

Points are awarded for exceeding the U-values for windows, against the ENERGY STAR for Homes baseline. These points should be targeted but may increase budgets.

**m**

**EA 10: SPACE HEATING AND COOLING (1-4 POINTS)** *HOMES*

HVAC equipment selected must have higher performance specs than the ENERGY STAR for Homes baseline.

**e**

**EA 11: HEATING AND COOLING DISTRIBUTION SYSTEMS (1-4 POINTS)** *HOMES*

Duct work and hydronic distributions systems should be designed to live completely within the conditions space, or duct leakage must be tested and not exceed a certain value. This is recommended practice and should be achieved easily.

**e**

**EA 12: EFFICIENT DOMESTIC HOT WATER EQUIPMENT (1-3 POINTS)** *HOMES*

Installation of ENERGY STAR qualified hot water heater (and/or solar hot water). This is required in the BC Housing Design and Construction Standards.

**e**

**EA 13: LIGHTING (0.5-2 POINTS)** *HOMES*

Points are awarded for indoor and outdoor lighting design, based on reduction of lighting power density against a prescribed baseline. This is recommended by BC Housing already.

**e**

**EA 14: HIGH-EFFICIENCY APPLIANCES (0.5-2 POINTS)** *HOMES*

Installation of ENERGY STAR qualified appliances are needed for these points. This is required in the BC Housing Design and Construction Standards already.

**e**

**EA 15: RENEWABLE ENERGY (1-4 POINTS)** *HOMES*

One point is awarded for each 500kWh of energy produced per year.

**d**

**MATERIALS + RESOURCES CATEGORY (10 POINTS, MIN: 2 POINTS)**

**MR P1: CERTIFIED TROPICAL WOOD (REQUIRED)** *HOMES/MIDRISE*

All wood onsite must be non-tropical, and certified by the FSC. This is already a BC Housing requirement.

**e**

Materials and Resources Category continued from previous page...

**MR P2: DURABILITY MANAGEMENT (REQUIRED)** *HOMES/MIDRISE*

Must meet the ENERGY STAR for Homes, water management system builder checklist.

e

**MR 1: DURABILITY MANAGEMENT VERIFICATION (1 POINT)** *HOMES/MIDRISE*

The verification team must verify each measure from the ENERGY STAR for Homes water management building checklist.

e

**MR 2: ENVIRONMENTALLY PREFERABLE PRODUCTS (0.5-4 POINTS)** *HOMES (0.5-5 POINTS)* *MIDRISE*

Achieve these points by choosing materials that are manufactured locally, and/or contain at least 25% recycled materials. 0.5 points per item will be awarded.

m

**MR 3: CONSTRUCTION WASTE MANAGEMENT (0.5-3 POINTS)** *HOMES/MIDRISE*

Points are awarded for reduced waste; ie the more waste that ends up being diverted from a landfill, the more points can be received. Following BC Housing's waste diversion targets will achieve an award of 3 points.

m



**MR 4: MATERIAL EFFICIENT FRAMING (0.5-2 POINTS)** *HOMES*

The use of advanced framing techniques, related to interior wall stud spacing, window and door placement within the frame, top plates, etc, will be awarded 0.5 points each.

e

## INDOOR ENVIRONMENTAL QUALITY CATEGORY (16 POINTS, MIN: 3 POINTS)

**IEQ P1: VENTILATION (REQUIRED)** *HOMES/MIDRISE*

Meet the requirements for ventilation in ASHRAE 62.2-2010 and the International Residential Code (2009).

e

**IEQ P2: COMBUSTION VENTING (REQUIRED)** *HOMES/MIDRISE*

Ensure that adequate venting is provided for all combustion appliances, and CO monitors are found on each floor.

e

**IEQ P3: GARAGE POLLUTANT PROTECTION (REQUIRED)** *HOMES/MIDRISE*

All air handling equipment and ductwork should be outside the fire-rated envelope of the garage, plus additional sealing of conditioned spaces that share a wall with a garage.

e

**IEQ P4: RADON-RESISTANT CONSTRUCTION (REQUIRED)** *HOMES/MIDRISE*

The building must be designed with radon-resistant techniques, including open air space between the building and the ground (min 2ft), capillary break, and/or rough-in for future attic fans, following prescriptive standards.

e

**IEQ P4: AIR FILTERING (REQUIRED)** *HOMES/MIDRISE*

Install air filters with a MERV of 8 or higher, as per ASHRAE 62.2-2010.

e

**IEQ P5: ENVIRONMENTAL TOBACCO SMOKE CONTROL (REQUIRED)** *HOMES/MIDRISE*

Prohibition of smoking anywhere in the building, or within 25ft of the building air intakes (including doors and windows) is required. This must be included in rental contract language and nonprofit bylaws.

e

**IEQ P6: COMPARTMENTALIZATION (REQUIRED)** *HOMES/MIDRISE*

This prerequisite requires air sealing between units to minimize leakage of indoor pollutants between units. A blower door test is required to demonstrate adequate sealing. Attention to detail during construction make this prerequisite easier to obtain.

m

**IEQ 1: ENHANCED VENTILATION (1-3 POINTS)** *HOMES/MIDRISE*

Meet the requirements in ASHRAE 62.2-2010 for ventilation, and include local enhanced control strategies like occupancy sensors.

e

**IEQ 2: CONTAMINANT CONTROL (0.5-2 POINTS)** *HOMES/MIDRISE*

There are several options in this credit that will help to reduce occupants' exposure to indoor airborne contaminants, including shoe removal stations, walk-off mats, air quality testing, etc. They are simple design inclusions that should be considered for all units.

e

**IEQ 3: BALANCING OF HEATING AND COOLING DISTRIBUTION SYSTEMS (1-3 POINTS)** *HOMES/MIDRISE*

There are various options for forced-air or radiative systems, including zoned controls and pressure balancing.

e



**IEQ 4: ENHANCED COMPARTMENTALIZATION (1 POINT)** *HOMES (3 POINTS)* *MIDRISE*

This credit requires a blower door test to higher standards than the prerequisite credit. It can be achieved with careful detailing during construction.

m

Indoor Environmental Quality Category continued from previous page...

**IEQ 5: COMBUSTION VENTING (1 -2 POINTS)** *HOMES/MIDRISE*

There are 2 points awarded for not including wood stoves or fireplaces in the design. Fireplaces are not typically installed in BC Housing developments, therefore these are simple points to achieve.

**IEQ P3: ENHANCED GARAGE POLLUTANT PROTECTION (1-2 POINTS)** *HOMES (1 POINT) MIDRISE*

Options include exhaust fans on controls, and/or detached garages. The former is highly recommended.

**IEQ P3: LOW EMITTING MATERIALS (1-3 POINTS)** *HOMES/MIDRISE*

Half a point is awarded for installed products and coatings that meet specific VOC standards, including flooring, paints, insulation and adhesives.

## LOCATION AND TRANSPORTATION CATEGORY (15 POINTS)

**LT P1: FLOODPLAIN AVOIDANCE (REQUIRED)** *HOMES/MIDRISE*

Do not build on floodplains, or design and build in accordance with flood provisions, as dictated by the local code (if available).

**LT 1: LEED FOR NEIGHBOURHOOD DEVELOPMENT (15 POINTS)** *HOMES/MIDRISE*

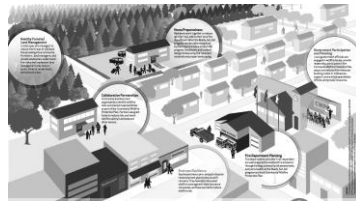
Points are awarded if the development is within the boundaries of a LEED for Neighbourhood Development-certified community.

**LT 2: SITE SELECTION (1-8 POINTS)** *HOMES/MIDRISE*

There are several options to achieve these points, including bicycle rooms, bike storage, avoiding sensitive land, infill development, and locating at high density intersections. Land location is not always a choice for BC Housing developments, however bike storage is recommended.

**LT 3: COMPACT DEVELOPMENT (1-3 POINTS)** *HOMES/MIDRISE*

Points are awarded for building more compact structures, that meet a dwelling unit per acre of buildable land value.



**LT 4: COMMUNITY RESOURCES (1-2 POINTS)** *HOMES/MIDRISE*

Locate the building within 800 meters (walking distance) of a number of uses, including supermarkets, clothing stores, pharmacies, hardware stores, banks, etc.

**LT 5: ACCESS TO TRANSIT (1-2 POINTS)** *HOMES/MIDRISE*

Locate the building within 400 meters (walking distance) of transit.

## INNOVATION CATEGORY (6 POINTS)

**IN P1: PRELIMINARY RATING (REQUIRED)** *HOMES/MIDRISE*

As early as possible in the design phase, have a meeting with the LEED team and determine the points targeted, parties accountable for each credit, and targeted award level. This is part of the integrated design process, and recommended in BC Housing's Design and Construction Standards.

**IN 1: INNOVATION (1-5 POINTS)** *HOMES/MIDRISE*

Points are awarded for innovation, pilot and exemplary performance strategies.

**IN 2: LEED ACCREDITED PROFESSIONAL (1 POINT)** *HOMES/MIDRISE*

Ensure that at least one principal on the project team must be a LEED Accredited Professional (AP).

## REGIONAL PRIORITY CATEGORY (4 POINTS)

**RP 1: REGIONAL PRIORITY (1-4 POINTS)** *HOMES/MIDRISE*

There are 6 regional priority credits that have been identified by the USGBC as having special importance for each geographical region. These credits are available to be looked at on the USGBC website.