# UBC REAP 4.0 - Scorecard

LEGEND

major change | minor change | housekeeping update

red text = revised

black text =orginal (REAP 3.3)

| 22 | Energy & Emissions (E&E) | | 22 |
|---|---|---|---|
| precondition | P1 | Energy Step Code Compliance (Step 3) | - |
| precondition | P2 | Zero Carbon Step Code Compliance (EL-4) | - |
| precondition | P3 (new) | Eliminate Combustion-Based Supplemental Heating | - |
| precondition | P4 | Energy Star Appliances | - |
| precondition | P5 | Programmable Thermostats | - |
| precondition | P6 | Energy Commissioning | - |
| precondition | P7 | Energy System Maintenace Contract | - |
| precondition | P8 | Building Level Energy Metering and Reporting | - |
| precondition | P9 | Domestic Hot Water Energy Use Sub-metering and Reporting | - |
| precondition | P10 | Refrigerant Emission Reporting | - |
| precondition | P11 | Electric Vehicle Charging Infrastructure | - |
| 10 | 1.1 | Optimized Energy Performance (Step Code 4/PH) | 10 |
| 4 | 2.1 | Renewable Energy | 4 |
| 4 | 3.1 | Enhanced Energy Submetering and Reporting | 4 |
| 1 | 4.1 | Smart Thermostat | 1 |
| 3 | 5.1 | Electric Vehicle Charging Infrastructure | 3 |

| 15 | Climate Adaptation (CA) | | 15 |
|---|---|---|---|
| precondition | P1 | 2050 Climate Thermal Comfort Modelling and Design | - |
| precondition | P2 (new) | 2050 Climate Ready Energy Efficient Design | - |
| precondition | P3(new) | Design for Wildfire Risk Reduction | |
| 5 | 1.1 | 2050 Climate Ready Energy Efficient Design | 5 |
| 3 | 2.1 | Enhanced Design for Wildfire Risk Reduction | 3 |
| 3 | 3.1 | Refuge Area & Back-up Power | 3 |
| 2 | 4.1 (new) | Design for Social Connection | 2 |
| 2 | 5.1 (new) | Urban Heat Island Mitigation | 2 |

| 17 | Materials & Resources (M&R) | | 17 |
|---|---|---|---|
| precondition | P1 | Zero Waste Ready | - |
| precondition | P2 (new) | 10% Embodied Carbon Reduction | - |
| precondition | P3 | Construction and Demolition Waste Reduction | - |
| 4 | 1.1 | Responsible Materials | 4 |
| 10 | 2.1 | Embodied Carbon Reduction | 10 |
| 2 | 3.1 | Mass Timber/Hybrid Superstructure | 2 |
| 1 | 4.1 | Healthy Building Materials | 1 |

| 15 | Water (W) | | 15 |
|---|---|---|---|
| precondition | P1 | Low-Flow Plumbing Fixtures | - |
| precondition | P2 | Outdoor Water Use Reduction | - |
| precondition | P3 | Water Efficient Appliances | - |
| precondition | P4 | Rainwater Management | - |
| 9 | 1.1 | Total Water Use Reduction | 9 |
| 6 | 2.1 | On-Site Rainwater Management | 6 |

| 8 | Biodiversity (B) | | 8 |
|---|---|---|---|
| precondition | P1 | Ecological Planting | - |
| precondition | P2 | Light Pollution Reduction | - |
| precondition | P3 | Bird Friendly Design - Basic | - |
| 3 | 1.1 | Planting for Biodiversity and Ecosystem Health | 3 |
| 1 | 2.1 | Site Green Space | 1 |
| 3 | 3.1 | Bird Friendly Design - Enhanced | 3 |
| 1 | 4.1 | Food Growing Opportunity | 1 |

| 5 | Place & Experience (P&E) | | 5 |
|---|---|---|---|
| precondition | P1 | Project Community Amenity Spaces | - |
| 5 | 1.1 | Project Exemplary Community Amenity Spaces | 5 |

| 11 | Health & Wellbeing (H&W) | | 11 |
|---|---|---|---|
| precondition | P1 | Bicycle Parking | - |
| precondition | P2 | Low-Emitting Products | - |
| precondition | P3 | Construction Indoor Air Quality Management | - |
| precondition | P4 | Air Filtration Requirement | - |
| 1 | 1.1 | IAQ Assessment | 1 |
| 2 | 2.1 | Additional Bicycle Facilities | 2 |
| 2 | 3.1 | Low-Emitting Products | 2 |
| 2 | 4.1 | Connection to Nature | 2 |
| 2 | 5.1 | Daylight Access | 2 |
| 2 | 6.1 | Active Living | 2 |

| 7 | Quality (Q) | | 7 |
|---|---|---|---|
| precondition | P1 | Sustainability Commitment | - |
| precondition | P2 | Educate the Homeowner | - |
| precondition | P3 | Educate the Sales & Leasing Staff | - |
| precondition | P4 | Green Building Specialist | - |
| precondition | P5 | Design for Security and Crime Prevention | - |
| precondition | P6 | Integrated Design Workshop | - |
| 4 | 1.1 | Durable Building | 4 |
| 3 | 2.1 | Education and Awareness | 3 |

| 10 | Innovation & Research (I&R) | | 10 |
|---|---|---|---|
| precondition | P1 | Contribution to Low Carbon Mobility and Research | - |
| 2 | 1.1 | Exemplary Performance | 2 |
| 3 | 1.2 | Innovation | 3 |
| 5 | 2.1 | Research | 5 |

| TOTAL | | |
|---|---|---|
| 110 | Total Credits | 110 / 110 |
| 50 | Gold | |
| 60 | Gold Plus | |
| 70 | Platinum | |
| 80 | Platinum Plus | |

# ENERGY & EMISSIONS

**Green Building Action Plan Goals**

UBC buildings will advance the campus towards net-positive energy use and greenhouse gas neutrality by reducing energy demand and focusing on site-specific passive design approaches.

UBC buildings will have indoor thermal environments that are comfortable and enhance health and wellbeing.

UBC will integrate lessons learned to improve building energy performance.

| E&E | Precondition | |
|---|---|---|
| P1 | **Energy Step Code Compliance (Step 3)** | |
| | Design and construct buildings to comply with Section 10.2 Energy Efficiency of the BC Building Code and:<br>.1 Conform to the following BC Energy Step Code energy performance requirements:<br>.Residential Buildings, Step 3: BC Building Code (Division B, Table 10.2.3.3.-H).<br>.Offices and Other Businesses, Step 2 as specified by the Energy Step Code Regulation (Table 10.2.3.3.-I and Table 10.2.3.3.-J)<br>.2 Use an infiltration rate of 0.20 L/s/m2 for energy modelling OR contact UBC Sustainability and Engineering to receive approval to use a lower infiltration rate for modelling<br>.3 Provide an airtightness plan that includes mid-construction testing and reporting<br>.4 Hold a mid-construction meeting with UBC Sustainability and Engineering to review the airtightness plan and mid-construction testing results. | |
| P2 | **Zero Carbon Step Code Compliance (EL4)** | |
| | Design and construct buildings to comply with Section 10.3 Greenhouse Gas (GHG) Emissions of the BC Building Code and conform to the GHG Emission Level (EL) target EL4 for Residential, Business and Personal Services and Mercantile Major Occupancies found in Table 10.3.1.3. | |
| P3 | **Eliminate Combustion-Based Supplemental Heating** | |
| | Design and construct building without any supplemental or redundant, combustion-based heating systems that provide primary domestic hot water or indoor space heating (e.g. natural gas fireplaces). | |
| P4 | **Energy Star Appliances** | |
| | Specify and install Energy Star-labelled, or equivalent performance, driers and refrigerators in each unit. | |
| P5 | **Programmable Thermostats** | |
| | Specify and install programmable thermostats for at least the largest heating zone in each unit. | |

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| | ~~**Energy Modeling Workshop** **(precondition deleted)**~~ | |
| | ~~Model the energy performance of the building and hold a workshop with the design team, a representative from UBC Sustainability and Engineering, and contractor to evaluate the results and optimize the design of the building AND~~<br>~~Provide a draft energy modelling report to the UBC Sustainability and Engineering representative at least one week prior to the workshop.~~ | |
| **P6** | **Energy Commissioning** | |
| | Contract a third party Commissioning Authority to develop and implement a commissioning plan for all major building energy systems, in accordance with CSA Z5000-18 or ASHRAE Guideline 0-2005 and 1.1-2007, and verify that they are installed, calibrated, and perform according to design intent. | |
| **P7** | **Energy System Maintenance Contract** | |
| | For buildings with in-building heating systems, establish a comprehensive and preventative maintenance contract on behalf of the building owner covering heat pump based heating and cooling systems and all related building energy, HVAC and plumbing systems, established to cover a period of no less than 5 years after occupancy of the building. This precondition applies in cases where the building is not served by a utility-owned, professionally maintained and operated energy system (e.g. buildings not subject to a Community Energy Covenant as defined in the NDES Infrastructure Agreement between UBC and Corix). | |

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| P8 | **Building Level Energy Metering and Reporting** | |
| | Support UBC in establishing an ENERGY STAR Portfolio Manager (ESPM) account and reporting building utility consumption by:<br>• Providing completed auto upload permission forms where required; or<br>• Sharing ESPM account(s) with UBC Sustainability and Engineering that have been established by a qualified service provider. For mixed-use developments, establish utility metering for each major use class (e.g., residential, commercial or retail) and building typology (e.g., high rise or townhouse). | |
| P9 | **Domestic Hot Water Energy Use Sub-metering and Reporting** | |
| | Install energy metering for domestic hot water energy use for each major use class (e.g., residential, commercial or retail) and building typology (e.g., high rise or townhouse) and report energy use to UBC Sustainability and Engineering. | |
| P10 | **Refrigerant Emission Reporting** | |
| | Determine and report the life cycle equivalent annual carbon dioxide emissions of refrigerants in buildings in kgCO2. | |

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| P11 | **Electric Vehicle Charging Infrastructure**<br>Provide energized level 2 outlets as follows:<br>.1 Each residential parking stall, including accessible parking stalls.<br>.2 Each assigned parking stall for car share.<br>.3 10% of commercial parking stalls.<br>.4 50% of commercial accessible parking stalls, at a minimum of one stall per parking area.<br><br>All Level 2 charging must provide a minimum of 40A service and a minimum performance level of 12 kWh per stall, over an eight (8) hour. Load sharing (up to four-way) and load management systems may be utilized except for short term commercial stalls which require a minimum performance of 48 kWh per stall. Exceptions may be granted in cases where utility mandated transformer upgrades are required. | | |
| **E&E** | **Optimization Credits** | **Attempted Points** | **Total Points** |
| 1.1 | **Optimized Energy Performance (Step Code 4/PH)**<br>Design and construct buildings to comply with Section 10.2 Energy Efficiency of the BC Building Code and:<br>.1 Confirm to the following Energy Step Code Regulation performance requirements:<br>Residential, Step 4 as specified by the Energy Step Code Regulation (Table 10.2.3.3.-H).<br>Offices and Other Businesses, Step 3 as specified by the Energy Step Code Regulation (Table 10.2.3.3.-I and Table 10.2.3.3.-J)<br>.2 Use an infiltration rate of 0.20 L/s/m2 for energy modelling OR contact UBC Sustainability Engineering to receive approval to use a lower infiltration rate for modelling<br>.3 Provide an airtightness plan that includes mid-construction testing and reporting<br>.4 Hold a mid-construction meeting with UBC Sustainability and Engineering to review mid-construction testing results and the airtightness plan – **7 points** OR<br><br>Passive House Performance: Design and construct the building to conform to the Passive House Planning Package, version 9 or newer, meeting the requirements of Section 10.2.3.3 (3) of the Energy Step Code Regulation. **10 points** | **10** | 10 |
| 2.1 | **Renewable Energy**<br>Use on site renewable energy systems to offset all or a portion of the building's annual electricity consumption as follows:<br>• 4% **– 2 points**<br>• 8% **– 4 points** | **4** | 4 |

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| 3.1 | **Enhanced Energy Submetering and Reporting**<br>Install energy metering as follows:<br>▪ Sub-metering for major energy end uses (representing 10% or more of total energy consumption) for each major use class (e.g., residential, commercial or retail) and building typology (e.g., high rise or townhouse). 1 point AND/OR<br>▪ Suite level thermal energy sub-metering for<br>o domestic hot water – 1 point<br>o space heating – 1 point<br>o space cooling – 1 point<br>▪ Report energy use to Sustainability and Engineering | **4** | 4 |
| 4.1 | **Smart Thermostat**<br>Install a smart thermostat to control heating and cooling that has wi-fi functionality, can detect absence through geofencing or occupancy sensors and allows users to track energy use. | **1** | 1 |
| 5.1 | **Electric Vehicle Charging Stations**<br>Install Level 2 charging stations for visitor or shared use and/or the following percentage of owners'/residents' parking.<br>• 1 visitor and/or shared station per 100 units. **– 1 point** AND / OR<br>• 5% of owners'/residents' parking. **– 1 point** OR<br>• 10% of owners'/residents' parking. **2 points** | **3** | 3 |
| | **Total Optimization Points** | **22** | **22** |

# CLIMATE ADAPTATION

**Green Building Action Plan Goals**

UBC buildings and landscapes will have the resilience to respond to both anticipated and unpredictable changes in climate.
UBC will engage with researchers in a meaningful and ongoing way to inform building policy and guidelines around climate adaptability.

| CA | Precondition | |
|---|---|---|
| P1 | **2050 Climate Thermal Comfort Modelling and Design** | |
| | The building design must meet thermal comfort requirements for 2050s. Buildings with mechanical cooling systems must use the 2050's summer design temperature specified in Article 2.4.2 of the Section 20 00 30 UBC Indoor Thermal Environment Technical Guidelines (Vancouver November 2023) and report maximum hours exceeding acceptability limits using a 2050's weather file with the mechanical cooling disabled. OR Passively cooled buildings must meet City of Vancouver Energy Modelling Guideline requirements for passively cooled buildings using 2050's weather files and not exceed temperature acceptability limits by more than 20 hours. Perform thermal comfort modelling for buildings using future climate weather files for the 2050's (RCP 8.5 scenario). | |
| P2 | **2050 Climate Ready Energy Efficient Design** | |
| | Meet a Cooling Energy Demand Intensity (CEDI) target of 25 kWh/m2-yr using 2050 future climate weather files (RCP 8.5 Scenario) and following Energy Step Code energy modelling requirements. | |

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| P3 | **Design for Wildfire Risk Reduction** | |
| | Implement the following design, construction and operation measures to reduce risk from wildfire events:<br>1. Design building entry and exits that can be operated manually<br>2. Roof materials should satisfy Class A of CAN/ULC-S107, standard test methods for Fire Tests of Roof coverings<br>3. Cladding materials must be ignition-resistant, with a flame spread rating of less than 25, and all penetrations in the exterior wall cladding should be sealed with no gaps greater than 3 mm<br>4. Glazing must have minimum one pane of tempered or heat-strengthened glass<br>5. Exterior doors must be made of non-combustible assemblies<br>6. Finishes for eaves, soffits and roof projections must be non-combustible materials<br>7. Vents must resist the intrusion of flames and embers and should be screened with non-combustible wire mesh (openings no larger than 3 mm)<br>8. Decks, balconies and other building attachments must be constructed from materials that are non-combustible (or combustible materials, such that construction is solid and continuous without slots or other openings larger than 3 mm)<br>9. Screens, rails and shelters within 10 m of the building should be constructed using non-combustible materials<br>10. Landscaping within 1.5 m from the building face should include plants selected from FireSmart BC's fire-resistant plant list wherever possible<br>11. Irrigation systems should be in good working order and operational beyond the plant establishment period<br>12. Landscape maintenance must include the removal of all combustible debris from planting beds as part of regular landscape maintenance. | |

| CA | Optimization Credits | Attempted Points | Total Points |
|---|---|---|---|
| 1.1 | **2050 Climate Ready Energy Efficient Design** | **5** | 5 |
| | Meet a Cooling Energy Demand Intensity (CEDI) target using 2050 future climate weather files (RCP 8.5 ), and following Energy Step Code energy modelling requirements as follows:<br>•20 kWh/m2-yr – **2 points OR**<br>•15 kWh/m2-yr – **5 points** | | |
| 2.1 | **Enhanced Design for Wildfire Risk Reduction ~~Resiliency Measures~~** | **3** | 3 |
| | Comply with NRC's "National Guide for Wildland-Urban Interface Fires" Chapter 3 3.1-3.4 by using consultation from a qualified professional and implementing recommended strategies. | | |
| 3.1 | **Refuge Area & Back-up Power ~~On Site Backup Power -~~** | **3** | 3 |
| | Ensure the multi-purpose indoor space required as part of REAP P&E P1 (Project Community Amenity Spaces) is equipped to serve as a refuge space. The space should be a separate room that includes operable windows, access to electrical outlets, and basic kitchen amenities including refrigeration and cooking appliances. AND Provide a minimum of 72 hours of back-up power to the refuge area ensuring access to electricity as well as heating, cooling, and potable water. Design for protection from power outages from the grid, through strategies including switching gear and/or power hook-ups. Back-up power provision should be provided by either:<br>•Infrastructure for temporary generators – 2 points; OR<br>•Installed, on-site generator or combined supply from on-site generator and on-site renewable energy and storage system (on-site renewable energy limited to maximum 50% of supply) - 3 points | | |
| 4.1 | **Design for Social Connection** | **2** | 2 |
| | Implement at least four design strategies to promote social design outcomes from the "Building Social Connections Toolkit" in the categories of "Social Building Edges" and "Social Circulation" (Parts 4 and Part 5) | | |

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| 5.1 | **Urban Heat Island Mitigation**<br>Nonroof and Roof Measures – **1 point**<br>Employ a combination of strategies for both nonroof and roof areas that meet the following criteria:<br>Area of Nonroof Measures/0.5 + Area of High-Reflectance Roof/0.75+ Area of Vegetated Roof/0.75 ≥Total Site Paving Area+Total Roof Area<br>*Options for Nonroof Measures:*<br>• Use existing plant material, and/or install plants or vegetated structures that provide shade over paved areas. Plants must be in place at the time of occupancy permit. Vegetated planters may be included; artificial turf is not permitted.<br>• Install architectural structures that provide shade. If the structure is a roof, an aged Solar Reflectance (SR) >= 0.28 is required. For non-roof structures, an initial SR >= 0.33 is required. Shade structures which incorporate energy generation systems (e.g., photovoltaics) are exempt from SR requirements. SR values must be measured in accordance with ANSI/CRRC S100.<br>• Use paving materials with an initial SR value of at least 0.33.<br>*Options for Roof Measures:*<br>Apply roofing materials with the following Solar Reflectance Index (SRI) values:<br>Low-sloped roof (≤ 2:12 slope): Initial SRI of 82 OR aged SRI of 64.<br>Steep-sloped roof (>2:12 slope): Initial SRI of 39 OR aged SRI of 32.<br>Vegetated (Green) Roof: Install a vegetated roof using native or adapted plant species.<br>AND / OR<br>Wall Measures – **1 point**<br>Surface at least 60% of the building's gross exterior wall area (including vertical fenestration) with a 'cool-wall material'. The 'cool-wall material' must meet the following criteria:<br>• Initial SR of at least 0.60.<br>• Initial thermal emittance of at least 0.75.<br>• Must be opaque to sunlight.<br>• No more than 25% of the cool-wall area may be placed on the north-facing wall. | **2** | 2 |
| | **Total Optimization Points** | **15** | **15** |

# MATERIAL AND RESOURCES

**Green Building Action Plan Goals**

UBC will prioritize the use of building materials that have net positive environmental impacts.
UBC will support marketplace transformation by designing buildings with materials that are not harmful to human and ecological health.
UBC will support the development of the circular economy by promoting the adaptation, reuse and recycling of materials and products during a building's lifetime.

| M&R | Precondition | |
|---|---|---|
| P1 | **Zero Waste Ready** | |
| | 1.Design buildings to be zero waste ready by providing dedicated *resident recycling areas* for the collection and storage of waste, recyclable materials and organics as follows:<br>▪ Design the areas in accordance with the Metro Vancouver Technical Specifications (see link in Resources section). Include a hand sanitizer station in each recycling and garbage area.<br>▪ Design and locate areas to be convenient, accessible and pleasant for all residents including those with restricted mobility, identifying specific strategies to minimize barriers and increase convenience, this may include dedicated in-unit storage and/or multiple collection points within the building.<br>▪ Minimize the total one-way horizontal distance residents need to travel, limiting it to 50 m or less. Minimize the number of doors that need to be opened on the travel route to recycling areas.<br>▪ Centralized areas should be located at grade, or if not feasible no more than one level down from grade.<br>▪ Co-locate organics, recycling and garbage at recycling areas to provide equal convenience for each waste material.<br>▪ Provide clear visual cues and signage in appropriate languages to support residents in correct sorting of waste materials.<br>2. Waste collection areas must be provided that are accessible to waste haulers. These may be the same or separate from the resident recycling areas; in the latter case, provision must be made to ensure transfer of waste from resident recycling areas to collection areas. Ensure bins are returned to recycling areas in a timely manner.<br>3. Provide a recycling and organics collection guide in the homeowner's guide and in the resident recycling areas in appropriate languages.<br>AND<br>4. Provide for the adequate collection of the following by contracting with a waste management services provider, ensuring adequate servicing frequency to prevent bin overflows, and maintain cleanliness of recycling areas:<br>▪ Mixed paper, cardboard, mixed containers and glass.<br>▪ Food scraps and accepted organic materials.<br>▪ Optional collection: soft plastics, styrofoam, dog waste and other specialty items. | |
| P2 | **10% Embodied Carbon ~~Reporting~~ Reduction** | |
| | Perform a Whole Building Life Cycle Assessment (wbLCA) to demonstrate a reduction of at least 10% in global Warming Potential (embodied carbon).The wbLCA shall be completed in accordance with UBC's Embodied Carbon Guidelines v2.0. | |
| P3 | **Construction and Demolition Waste Reduction** | |
| | Prepare and implement a Waste Management Plan that diverts 85% (by weight) of construction and demolition waste from landfill. | |

| M&R | Optimization Credits | Attempted Points | Total Points |
|---|---|---|---|
| | **Responsible Materials** | **4** | 4 |
| **1.1** | Meet one or more of the following selection criteria:<br>Product transparency- 1 point<br>Use at least 20 different, permanently installed products sourced from at least five manufacturers that have published Environmental Product Declarations (EPD's) conforming to ISO 14025, ISO 21930, or EN 15804. EPD's must report LCA Modules A1-A3 (Cradle-to-Gate) at a minimum. EPD's shall be non-expired, or can be shown to have been valid at the time of relevant material procurement.<br>AND/OR<br>Responsibly sourced wood- 1 point<br>50% of wood products must be FSC, CSA Z809, or salvaged.<br>AND/OR<br>Local Materials –2 points<br>20% or more of the materials must be local, based on cost of the total materials value. | | |

| 2.1 | **Embodied Carbon Optimization** | **10** | 10 |
|---|---|---|---|
| | Perform a Whole Building Life Cycle Assessment (wbLCA) in accordance with UBC's Embodied Carbon Guidelines v2.0 and demonstrate a reduction in Global Warming Potential (Embodied carbon) of at least:<br>**20% -42 points; 25% - 4 points; 30% - 6 points; 35% - 8 points; 40% - 10 points**<br>AND/OR<br>**Modules A1-A3 Materials Actuals (EPD's) - 1 Point**<br>For the 10 materials with the highest LCA Module A1-A3 impacts within the wbLCA, compile EPD's (as defined in M&R 1.1) for the specific products being installed and update wbLCA accordingly.<br>AND/OR<br>**Modules A1-A3 Materials Actuals (Quantities) – 2 Points**<br>For the 5 materials with the highest LCA Module A1-A3 impacts within the wbLCA, compile actual quantities of the specific products delivered to site and update wbLCA accordingly.<br>AND/OR<br>**Module A4 Transportation Actuals - 1 Point**<br>For the 5 materials with the highest LCA Module A4 impacts within the wbLCA, document actual primary shipping routes, distances, and mode(s) of transportation, and update wbLCA accordingly.<br>AND/OR<br>**Module A5.2 Construction Activities Actuals- 1 Point**<br>Document actual energy (electricity & fuel) usage required for key on-site Construction activities (Excavators, Crane(s), Temporary Heating, & Temporary Power) that are under the direct control of the primary Contractor and/or a single major subcontractor and update wbLCA accordingly.<br>AND/OR<br>**Module A5.3 Construction Waste Actuals - 1 Point**<br>Utilizing the waste data gathered for M&R P3 Construction and Demolition Waste Reduction, update wbLCA accordingly.<br>AND/OR<br>**Inclusion of Non-Required Elements within wbLCA – up to 5 Points from below;**<br>Expand the scope of the wbLCA to include:<br>Interiors (Interior Construction, Interior Finishes, & Millwork) – 2 Points<br>Services (Conveying, Plumbing, HVAC [Including Refrigerants], Fire Protection, & Electrical) - 4 Points<br>Sitework (Site Preparation & Site Improvements) – 1 Point<br>A maximum of 10 points are available for this credit using a combination of approaches. | | |

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| **3.1** | **Mass Timber/ Hybrid Superstructure** | **2** | 2 |
| | Specify and install a building superstructure consisting of at least 50% mass timber by mass or value of the total superstructure. | | |
| | **Healthy Building Materials** | **1** | 1 |
| **4.1** | Install ten different building products from at least three different manufacturers which meet the ingredient transparency criteria of a program specified below. The chemical inventory of the products must be disclosed to an accuracy of 0.1% (1000 ppm).<br>• Declare Label (International Living Future Institute): Red List Free, Declared; or LBC Compliant if at least 99.9% of the ingredients are disclosed; **or**<br>• Health Product Declaration (HPD); **or**<br>• Manufacturers Inventory of all ingredients by Chemical Abstract Service Registry Number (CASRN). | | |
| | **Total optimization points** | **17** | **17** |

# WATER

**Green Building Action Plan Goals**

UBC will practice responsible water management and use at the building and site scale by: advancing water conservation and efficiency, exploring alternative water supply and treatment solutions, and building water supply resiliency.

UBC will use a low-impact development approach to rainwater management at the site scale to mitigate risk and respect the natural hydrology of the campus.

| W | Precondition | |
|---|---|---|
| P1 | **Low-flow Plumbing Fixtures** | |
| | Specify and install:<br>• Water-saving showerheads with a maximum flow rate of 5.7 L per minute in each shower.<br>• Low flow faucets with aerators in all bathroom sinks with a maximum flow of 3.8 L per minute.<br>• Low flow faucets with aerators in all kitchen sinks with a maximum flow of 6.8 L per minute. | |
| P2 | **Outdoor Water Use Reduction** | |
| | **Option 1:**<br>Design and install a water-efficient irrigation system that includes an automated controller, rain or soil sensors and pressure regulator; for non-grass areas, use a micro- or drip-feed irrigation.<br>Reduce the project's landscape water use by at least 30% from the site's calculated baseline of the peak watering month through plant selection and irrigation efficiency using the WaterSense Water Budget Tool spreadsheet.<br>**Option 2:**<br>Install a temporary irrigation system | |
| P3 | **Water Efficient Appliances** | |
| | Specify and install:<br>• Energy Star labelled, or equivalent performance, clothes washers; if washers are available only as an option, specify and offer only models complying to this standard.<br>• Energy Star labelled dishwashers,or equivalent performance; if dishwashers are available only as an option, specify and offer only models complying with this credit. | |
| P4 | **Rainwater Management** | |
| | In alignment with UBC's Integrated Rainwater Management Plan, detain the future 1:10 year condition and discharge at the lesser of 50% of the current 1:10 year peak flow or 100% of the current 1:5 year peak flow occurring during a 24-hour storm duration either on site or at a designated central facility, using low-impact development and green infrastructure as far as possible;<br>AND<br>Permeable surfaces should constitute at least 10% of the site area. The following surfaces are eligible: grass with 12" topsoil, planting areas with 24" topsoil, rain gardens, extensive vegetated roofs, swale, and pervious paving. | |

| W | Optimization Credits | Attempted Points | Total Points |
|---|---|---|---|
| 1.1 | **Total Water Use Reduction**<br>Reduce the total indoor and outdoor potable water use from the calculated code baseline using efficient fixtures, efficient landscaping practices and/or alternative water sources.<br>• 35% reduction from baseline. **–2 points**<br>• 40% reduction from baseline. **– 3 points**<br>• 45% reduction from baseline. **– 4 points**<br>• 50% reduction from baseline. **– 6 points**<br>• 55% reduction from baseline. **–9 points** | **9** | 9 |
| 2.1 | **On-Site Rainwater Management**<br>Provide permeable surfaces for low impact rainwater management for a percentage of areas of the site. The following surfaces are eligible: grass with 12" topsoil, planting areas with 24" topsoil, rain gardens, extensive vegetated roofs, swale, and pervious paving.<br>.Permeable surfaces on 30% of the site. – **3 points**<br>.Permeable surfaces on 50% of the site. – **6 points** | **6** | 6 |
| 3.1 | ~~Domestic Hot Water Metering~~ (credit deleted)<br>~~In units with central domestic hot water consumption, provide building level and/or individual suite hot water submetering.~~<br>~~• Provide submetering of hot water consumption at the building level. – **1 point**~~<br>~~• Provide submetering of hot water consumption at the suite level. – **3 points**~~ | **0** | 0 |
| | **Total Optimization Points** | **15** | **15** |

# BIODIVERSITY

**Green Building Action Plan Goals**

UBC will develop highly functioning landscapes at the building and site scale to contribute to biodiversity and natural ecosystem processes.
UBC will engage campus teaching and research opportunities to enhance biodiversity management capacity.

| B | Precondition | |
|---|---|---|
| P1 | **Ecological Planting** | |
| | 1. Plant selection:<br>• Select native or resilient plant species that are appropriate for the ecoregion, suitable for the site conditions and climate (including changing conditions); and fulfill the design intent. Mature plant height, spread and form must be considered in plant selection as a means to reduce maintenance and establish healthy landscapes.<br>• Select plants that are suited to the microclimate, including sun and shade conditions of the site and are drought tolerant. Consider wildfire resilience in plant choices.<br>• Include plants that are pollinators and provide a food source for birds.<br>2. Soil and topsoil:<br>• Ensure minimum soil volume requirements are met as outlined in Table 1: Soil Volume Requirement from the UBC Campus Plan to support long-term plant health.<br>• Select suitable topsoil that offers sufficient organic matter, drainage, and nutrient retention. | |
| P2 | **Light Pollution Reduction** | |
| | Do not exceed the current Illuminating Engineering Society (IES) illuminance requirements as stated in Lighting for Exterior Environments. | |
| P3 | **Bird Friendly Design - Basic** | |
| | Meet Tier 4 requirements of the Bird Friendly Building Design Requirements (see *Table 1* below). | |

| B | Optimization Credits | Attempted Points | Total Points |
|---|---|---|---|
| 1.1 | **Planting for Biodiversity and Ecosystem Health**<br>Enhance biodiversity and ecosystem health by achieving the following:<br>**Develop ~~a~~ Landscape Establishment and Maintenance Plans — 1 point**<br>• Develop a landscape establishment plan that ensures successful initial planting and establishment, prioritizing plant health and appropriate placement; and<br>• Develop a landscape maintenance plan that instructs maintenance contractors on the sustainable care of plants over the lifetime of the building and landscape. AND/OR<br>**Maximize Resilient Plantings — 1 point**<br>• Provide a plant list that demonstrates that 50% of the plantings (by number of plants) are native and of that of that list 50% of the native plantings support pollinators such as hummingbirds, native bees, butterflies, moths, and bats. AND/OR<br>**Increase Tree Canopy through Appropriate Planting — 1 point**<br>Plant native deciduous trees with a caliper of 8 to 10 cm and wide, spreading canopies, and/or native coniferous trees at a minimum height of 1.5 m at the time of planting. These trees should provide tree canopy which covers 10% of the site area at maturity, approximately 7 to 10 years after planting. | **3** | 3 |
| 2.1 | **Site Green Space**<br>Dedicate 30% of the total site area (including the building footprint) to green space, with 10% of the green space area designated for trees. Eligible spaces include: grass, areas with plants and trees, vegetated roofs, living walls, balcony greenery, areas dedicated to food production (excluding paving). | **1** | 1 |
| 3.1 | **Bird Friendly Design - Enhanced**<br>Part 1 – **2 points**<br>Meet Tier 3 requirements of the Bird Friendly Building Design Requirements.<br>or<br>Part 2 – **3 points**<br>Meet Tier 2 requirements of the Bird Friendly Building Design Requirements. | **3** | 3 |
| 4.1 | **Food Growing Opportunity**<br>Provide food gardening spaces of at least 1.3 m2 for 10% of residential units which do not have access to a private outdoor space of more than 9.3 m2. Food gardens can be provided in raised common area garden plots on grade and/or on rooftops in planters or communal gardens appropriate for food growing. | **1** | 1 |
| | **Total Optimization Points** | **8** | **8** |

# PLACE AND EXPERIENCE

**Green Building Action Plan Goals**

UBC buildings and landscapes will provide opportunities for collaboration, innovation and community development to reflect the social and environmental sustainability aspirations of the University.

| P&E | Precondition | |
|---|---|---|
| P1 | **Project Community Amenity Spaces** | |
| | Provide community amenity spaces for residents including:<br>• Outdoor spaces for residents which allow for opportunities for both quiet and social gathering activities, minimum one area for each activity; **AND**<br>.Added features in outdoor spaces to increase recreational choices and activities (such as a BBQ area, comfortable seating or picnic tables etc.) in at least two locations. **AND**<br>• A multi-purpose indoor space designed to support community activities and meeting the following requirements: located on the ground floor with direct access to the outdoors; includes an accessible washroom; floor area of 0.3% x the gross floor area, minimum 37.16 m² (400 sq ft)) **AND**<br>.A community space for package delivery (in response to online shopping and food delivery services).<br><br>For multi-building projects, the community amenity spaces are not required to be in every building, as long as all occupants of each building are provided access to the required amenities. For multi-phase projects, it is acceptable to guarantee future access to community amenity spaces as long as their completion is targeted within one year of occupancy. | |

| P&E | Optimization Credits | Attempted Points | Total Points |
|---|---|---|---|
| | **Project Exemplary Community Amenity Spaces** | **5** | 5 |
| | Install indoor and outdoor community amenities from the list below. Each listed amenity is awarded 1 or 2 points, for up to 5 points in total.<br>.If more than 2 points are targeted, a minimum of one indoor amenity and one outdoor amenity is required.<br>.For multi-building projects, the community amenity spaces are not required to be in every building, as long as all occupants of each building are provided access to the amenities. For multi-phase projects, it is acceptable to guarantee future access to community amenity spaces as long as their completion is targeted within one year of occupancy. | | |
| | **Indoor Amenities** | | |
| | Family friendly community spaces (additional to PE P1) within or adjacent to enhanced lobbies or multi-purpose rooms such as a community play area or youth friendly space. The total area should be minimum 91.44 m² (300 sq ft). | | 2 |
| **1.1** | Small-scale gathering spaces within circulation routes or the end of corridors on different floors to increase opportunities for relaxing, studying, and meetings or social activities. The total area should be 0.3% x the gross floor area. | | 2 |
| | A designated-bookable guest suite within the building near the lobby. | | 2 |
| | Pet friendly washable flooring finishes installed for 50% of indoor common spaces. | | 1 |
| | **Outdoor amenities** | | |
| | An accessible outdoor wash station for bikes and pets with a concrete pad, water source and good drainage. | | 1 |
| | Roof top social spaces outfitted with comfortable seating and planters. The space would be able to comfortably accommodate a minimum of 10 people. | | 2 |
| | A small child friendly play area with complementary seating for adults. | | 1 |
| | An innovative community outdoor amenity that supports a range of intergenerational social and recreational opportunities. | | 1 |
| | **Total Optimization Points** | **5** | **5** |

# HEALTH & WELLBEING

**Green Building Action Plan Goals**

UBC will enhance the mental, physical and social dimensions of wellbeing by making them integral to building and landscape design decisions.

UBC researchers, community stakeholders and building occupants will be engaged in a meaningful and ongoing way to inform building design decisions around health and wellbeing.

UBC will become a leader in enhancing wellbeing through the built environment within the context of higher education in Canada.

| H&W | Precondition | |
|---|---|---|
| P1 | **Bicycle Parking** | |
| | Provide bicycle parking according to the following :<br>• -Class1 bicycle parking at a rate of: 1.5 spaces per studio or one bedroom unit; 2.5 spaces per two bedroom unit; and 3 spaces per three or four bedroom units.<br>•(10% of spaces to be oversize spaces to accommodate cargo bikes of other;<br>• One electrical outlet per 0.05 spaces with a minimum of two electrical outlets per room~~)~~;<br>• At least one bicycle repair station in one of the Class I parking rooms;<br>• Class II bicycle parking spaces at a rate of 0.2 spaces per dwelling unit;<br>• A concrete pad outside the building, close to the building entrance, with a power supply ~~-~~for electrified bike share.<br><br>.All bike racks to be installed in accordance with details provided in UBC Campus Design Guidelines. | |
| P2 | **Low-Emitting Products** | |
| | On the inside of the building, inside the air barrier, specify and use:<br>• Adhesives, sealants and sealant primers that are EcoLogo certified or do not exceed the current VOC limits in the South Coast Air Quality Management District (SCAQMD) Rule #1168 on the interior of the building."<br>• Paints and coatings rated at a minimum GPS-2 by the Master Painter's Institute. If no VOC limit is indicated for the product under GPS-2, show compliance with GPS-1.<br>For GPS-1 and GPS-2 ratings, if the paint or coating is not on the MPI approved products list, compliance to VOC content and chemical component restrictions must be shown by submitting product information sheets. | |
| P3 | **Construction Indoor Air Quality Management** | |
| | Prepare and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building. During construction, meet or exceed all applicable recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd edition, 2007, ANSI/SMACNA 008–2008, Chapter 3. | |

| | | | |
|---|---|---|---|
| **P4** | **Air Filtration** | | |
| | Ventilation systems will be designed to include filtration devices with a Minimum Efficiency Reporting Value (MERV) rating of 13, as defined by ANSI/ASHRAE 52.2 to protect against wildfire smoke, traffic-related air pollution, and airborne pathogens.<br>Filter depth should be sufficient to enable building operators to switch to filters with a MERV 16 rating during wildfire smoke events. | | |
| **H&W** | **Optimization Credits** | **Attempted Points** | **Total Points** |
| **1.1** | **IAQ Assessment** | **1** | 1 |
| | After construction has ended and the building has been completely cleaned, prior to occupancy, complete one of the following:<br>▪ Before occupancy: Install new filtration media and flush-out the building by supplying an outside air volume of 4,267,140 litres per square metre of gross floor area; OR<br>▪During occupancy: If occupancy is desired before the flush-out is completed, the space may be occupied only after delivery of a minimum of 1,066,260 liters of outdoor air per square meter of gross floor area. Once the space is occupied, it must be ventilated at a minimum rate of 1.5 liters per second per square meter of outdoor air. During each day of the flush-out period, ventilation must begin at least three hours before occupancy and continue during occupancy. These conditions must be maintained until a total of 4 267 140 liters of outdoor air per square meter has been delivered to the space OR<br>▪ Conduct a Baseline Indoor Air Quality Test. | | |
| **2.1** | **Additional Bicycle Facilities** | **2** | 2 |
| | In addition to the requirements for bicycle parking in HW P1, provide one of the following:<br>• Provide an additional Class I bicycle parking at a rate of 0.25 spaces per bedroom; **or**<br>• Provide an at grade, Class I bicycle parking room for at least 50% of the Class I spaces with a bike specific entrance; **or**<br>• Provide points for giving each unit an on-campus bike share membership for the duration of their stay in the building. | | |
| **3.1** | **Low-Emitting Products** | **2** | 2 |
| | Specify and install products that meet the following requirements:<br>• Carpets and carpet cushions: Carpet and Rug Institute Green Label Plus or has been tested according to California Department of Public Health (CDPH) Standard Method v1.2–2017 and can demonstrate compliance with the VOC limits in Table 4-1 of the method. **— 1 point**<br>• Interior composite wood products, such as cabinetry doors and boxes, flooring, doors, trim, etc.: CARB ultra low emitting or have no added urea formaldehyde. **— 1 point** | | |

| | | | |
|---|---|---|---|
| 4.1 | **Connection to Nature** | **2** | 2 |
| | Demonstrate connections to nature through direct visual connections (for example, glazing) to plants, sunlight, and views of nature and/or, indirect connections to nature through the use of natural materials, patterns, colours, or images. Ensure connections to nature in:<br>• 95% of units, with direct visual connections to nature visible from the living room and at least one bedroom.<br>• All amenity spaces, lobbies and 90% of building corridors above parkade level, with direct and/or indirect connections to nature.<br>• Long corridors over 10m in length with direct visual connections to allow sunlight access and views of nature. | | |
| 5.1 | **Daylight Access** | **2** | 2 |
| | Ensure adequate levels of daylight within each unit by achieving the following requirements:<br>• Transparent envelope glazing area is a minimum of 7% of the unit floor area.<br>• Visible light transmittance (VLT) of envelope glazing is greater than 40%.<br>• 30% of the area is within 6 m (20 ft) of transparent envelope glazing. | | |
| 6.1 | **Active Living** | **2** | 2 |
| | Design a staircase that is safe, visually appealing, and invites regular use through the following strategies:<br>• Ensure the staircase services all floors of the project, excluding the parking garage, and can be accessed by all regular building occupants.<br>• Install transparent fire-rated glazing to each floor level of the staircase. The area of glazing must span at least 0.93 square meters (10 square feet) in order to increase visibility of the staircase and provide views to the interior, from inside the staircase.<br>• Use appealing materials and finishes.<br>• Install visible signage at elevators and the entrance to the staircase to encourage stair use. | | |
| | **Total Optimization Points** | **11** | **11** |

# QUALITY

**Green Building Action Plan Goals**

UBC buildings and landscapes will be durable, reliable and resilient.

| Q | Precondition | |
|---|---|---|
| P1 | **Sustainability Commitment** | |
| | Submit a "Sustainability Statement" that describes how the development will be designed to achieve high environmental standards related to UBC's Green building Action Plan and the university's sustainability policies in the eight component areas AND<br>Provide a list of professionals or responsible parties who will sign declaration letters for meeting requirements of UBC REAP preconditions and credits. | |
| P2 | **Educate the Homeowner** | |
| | Provide a homeowners' manual to educate homeowners on the features of the building as well as the proper use and maintenance of facilities and equipment. Include the following details in the homeowners' manual:<br>• A completed checklist of UBC REAP credits, including product manufacturers' manuals for all equipment, fixtures, and appliances with Energy Star details; **and**<br>• Guidance on how to minimize energy, water, and resource use in everyday activities and choices throughout the home to promote sustainable behavior; **and**<br>• Information on sorting and recycling in the building; **and**<br>•Information on building resilience features and emergency information, such as refuge areas, evacuation measures, and exit locations;<br>**And**<br>• Ensure the manual is incorporated into record drawings or some form that will be accessible beyond the first generation of owners/residents; **and**<br>• Conduct a one-hour walkthrough with the occupants and building manager(s) to educate them on all sustainable equipment and features. | |
| P3 | **Educate the Sales & Leasing Staff** | |
| | Develop marketing materials based on the environmental performance of the project and ensure the sales or leasing staff is knowledgeable about the green building features. | |
| P4 | **Green Building Specialist** | |
| | Engage a Green Building Specialist who is an expert in green buildings and sustainable construction practices to provide advice on effective green building strategies to the design team. | |
| P5 | **Design for Security and Crime Prevention** | |
| | Demonstrate that the design has been reviewed by an expert in Crime Prevention Through Environmental Design (CPTED) and that recommendations have been followed. | |

| | | |
|---|---|---|
| **P6** | **Integrated Design Workshop** | |
| | Beginning in pre-design and continuing throughout the design phases,<br>Identify and use opportunities to achieve synergies across disciplines and building systems; AND<br><br>Hold a preliminary workshop during schematic design which meets the following requirements:<br>•Workshops should be facilitated, and use REAP as a basis, to focus on: site conditions, building massing & orientation, building materials, embodied carbon, envelope attributes, sustainable energy and water systems, operational parameters, and climate resiliency.<br>•Explore ideas for the project based on REAP credits as well as UBC's GBAP goals, targets and vision.<br>•Investigate design strategy synergies that will meet project goals.<br>•Present preliminary energy/carbon analysis and water budget analysis to verify targets, performance benchmarks, and potential strategies to achieve project goals.<br>•Explore synergies among systems and components.<br>.•Invitees to the workshop should include, appropriate members of the design team, a representative from UBC Sustainably & Engineering and the project manager. | |

| Q | Optimization Credits | Attempted Points | Total Points |
|---|---|---|---|
| **1.1** | **Durable Building** | **4** | 4 |
| | Develop and implement a Building Durability Plan in accordance with the principles in CSA S478:19 - Durability in Buildings. Include: Structure, building cladding assemblies, glazing assemblies and roofing assemblies.<br>• Design service life is 60 years.<br>• Where component and assembly design service lives are shorter than the design service life, design so they can be readily replaced.<br>• Develop and manage a quality management program in accordance with CSA S478.<br>• Categories of failure are 6,7, or in table 3 use a design service life equal to the design service life.<br>• Categories of failure 4 or 5 in table 3 use a design service life quality to at least half of the design service life of the building.<br>• Qualified building science professional to develop and deliver the Building Durability Plan. | | |
| **2.1** | **Education and Awareness** | **3** | 3 |
| | Develop the following programs to educate occupants and visitors about the benefits of the green building and the sustainable features of the project:<br>• A script for a guided tour of the building describing the sustainable features of the project; **and**<br>• A case-study highlighting the sustainable features of the project to inform the UBC community and future buildings of the successes of the project. | | |
| | **Total Optimization Points** | **7** | **7** |

# INNOVATION & RESEARCH

**GREEN BUILDING ACTION PLAN GOALS**

UBC buildings and landscapes will be durable, reliable and resilient.

| I&R | Precondition | | |
|---|---|---|---|
| P1 | **Contribution to Low Carbon Mobility and Research**<br>Contribute to a Low Carbon Development Fund which will help resource low carbon community mobility initiatives and support REAP research projects. | | |
| **I&R** | **Optimization Credits** | **Attempted Points** | **Total Points** |
| 1.1 | **Exemplary Performance**<br>Demonstrate exceptional performance above the requirements set by an existing credit, to reach the next performance level. | **2** | 2 |
| 1.2 | **Innovation**<br>Achieve significant, measurable sustainable building performance using a strategy not addressed in REAP;<br>**or**<br>Pilot a significant, measurable strategy or strategies from UBC's Green Building Action Plan, the LEED Innovation catalog or the LEED BD&C Pilot Credit catalog. | **3** | 3 |
| 2.1 | **Research**<br>Developer to collaborate in a research project related to UBC neighbourhood residential building and landscape design and which has a likelihood of providing information relevant to policy outcomes for UBC and/or the broader community. The research project is to be conducted in coordination with UBC SEEDS Sustainability Program with a project proposal preapproved by C&CP.<br>Project topic must be related to the: goals, targets, indicators and actions in UBC's Green Building Action Plan: residential section (starts page 66) and the UBC Neighbourhood Climate Action Plan. | **5** | 5 |
| | **Total Optimization Points** | **10** | **10** |