



- First, the policy now clarifies that the building permit information requirements are voluntary, and suggests a support and recognition program for building permit applicants who identify and implement specific green building innovations.
- Second, the performance goals have been revised to emphasize energy performance, and extended to 2020 and 2030, by which time the Municipality would aim to meet ambitious targets for carbon neutral buildings<sup>1</sup>.

The Green Building Policy refers to LEED standards, the Built Green program, and the Whistler Green checklist, each of which forms a schedule to the policy. The Whistler Green checklist has been slightly updated and revised since the version that Council endorsed in April. All three programs are used for reference only; applicants are free to choose their preferred approach in communicating how their project meets the six objectives of the policy (Site and Landscape, Energy, Water, Materials, Waste, Indoor Environment).

As discussed in the Green Building Policy and the April 7<sup>th</sup>, 2008 staff report, the Municipality's role in the field of green buildings presents challenges. Local governments have clear authority to regulate land use and development density, both of which can influence building efficiency and more importantly, can create compact, pedestrian-friendly, transit-oriented communities. At the scale of individual buildings and their sites; however, the regulatory terrain is complex. Development Permit guidelines can now be established for energy and water conservation objectives, along with building form and character, but such guidelines apply only to external features and appearance. They can not, for example, be invoked to require or even encourage better roof insulation or efficient mechanical systems.

Those items, like many others that form the bulk of most green building checklists, are regulated only by the provincial building code (BCBC). The BCBC is evolving to incorporate energy and water efficiency measures, but none would be sufficient to match the performance goals outlined in the proposed RMOW Green Building Policy. Indeed, the rationale for adopting the policy is to accelerate a transition toward buildings that perform better than code requirements. This context suggests three broad strategies to meet the Municipality's green building goals:

- Use municipal planning, zoning and development permit authority to create compact, efficient development whenever possible.
- Continue to support provincial efforts to incorporate proven green building requirements within the BCBC.
- Work with individual landowners and developers to set higher standards for building performance on a site-specific basis.

## SUMMARY

The RMOW is working toward a more efficient, flexible, and healthy built environment. This report presents a Green Building Policy for Council's consideration.

Respectfully submitted,

*(Signed original on file)*

Guy Patterson  
HOUSING PLANNER  
for

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<sup>1</sup> The goal of achieving carbon neutral buildings by 2030 is proposed by the *Architecture 2030* challenge. In a related initiative, a nascent group of local governments known as Living Communities Cascadia proposes to achieve carbon neutral buildings by 2025. If this initiative proceeds, the RMOW could consider accelerating its targets, but in the interim the proposed targets are considered ambitious, but not unrealistic.

Green Building Policy

Page 3 ...

October 20<sup>th</sup>, 2008

Bob MacPherson

GENERAL MANAGER, COMMUNITY LIFE

(filename)

## COUNCIL POLICY

POLICY NUMBER:	DATE OF RESOLUTION:
<b>GREEN BUILDING POLICY</b>	

### I. SCOPE OF POLICY

The built environment is an enduring legacy for any community, and plays a key role in Whistler's vision for the future. *Whistler2020* proposes flexible, durable buildings designed to use energy, water and materials efficiently. Community task forces emphasize the role of these "green" buildings in a successful, sustainable community. The benefits of buildings that achieve better performance and reduced environmental impacts include lower operating costs, increased occupant health, and a smaller ecological footprint. The British Columbia Building Code (BCBC) establishes requirements for safe and functional structures, and is evolving to incorporate measures for more efficient energy and water use. The vision described in *Whistler2020* implies higher performance whenever possible.

To lead a transition towards Whistler's Description of Success for the Built Environment, this policy provides guidance for the design, construction and operation of buildings and their surrounding landscapes within the Resort Municipality of Whistler. It sets performance goals that are progressively more ambitious over time, for the following building types:

#### I.1 Commercial

Hotel, office, retail, restaurant, warehouse, commercial recreation and industrial facilities.

#### I.2 Institutional

Hospitals, clinics, schools, churches, government facilities and other public buildings.

#### I.3 High Rise Residential

Apartment and condominium dwellings that fall under Part 3 of the provincial building code, typically 5 or more storeys.

#### I.4 Multi-Unit Residential

Buildings that contain 5 or more dwellings, but are less than 5 storeys.

#### I.5 Low-density Residential

Buildings with less than 5 dwelling units (includes detached and duplex dwellings).

#### I.6 Municipal Buildings

All municipally owned and/or operated facilities.

This policy does not contemplate every initiative that the Municipality might pursue to achieve its green building goals. For example: following certain guidelines associated with Whistler's Protected Areas Network would be consistent with the site and landscape goals of most green building programs; water pricing might be very effective in reducing the volume of municipal potable water used in buildings throughout the community; providing community composting and construction waste recycling facilities will help to reduce the amount of solid waste sent to landfills; establishing a district energy system for Whistler Village could significantly reduce the greenhouse gas emissions

associated with heating and cooling commercial buildings. None of these measures, however, would be required or directly motivated per se by the green building goals in this policy. This policy's scope is limited to practices implemented at the scale of individual buildings and their sites.

This policy also recognizes that while local governments help to shape the built environment through their authority to govern land use and their responsibility for administering the BCBC, in most cases they are explicitly barred from imposing building standards that differ from those set out in the Code. Recognizing the extent and limitations of its authority, the RMOW will pursue three broad avenues toward green buildings in the community:

- Use municipal planning, zoning and development permit authority to create compact, efficient development whenever possible.
- Continue to support provincial efforts to incorporate proven green building requirements within the BCBC.
- Work with individual landowners and developers to set higher standards for building performance on a site-specific basis.

## 2. OBJECTIVES

This policy establishes six broad objectives for the design, construction and operation of buildings and their sites in Whistler.

### 2.1 Site / Landscape

Minimize disturbance to soils, vegetation and hydrology through careful location, design, construction practices and site rehabilitation.

### 2.2 Energy

Decrease energy requirements and associated greenhouse gas emissions; lower the share of energy supplied by non-renewable sources. Target net zero energy consumption.

### 2.3 Water

Reduce the total volume of water used for buildings and associated landscaping; lower the share of water needs met through the municipal potable system.

### 2.4 Materials

Use less new material through efficient design and engineering, and material reuse; increase the application of renewable, recycled and locally-sourced materials.

### 2.5 Waste

Lower the total volume of waste sent to landfills during construction and occupancy; work toward the community's goal of generating no landfill waste.

### 2.6 Indoor Environment

Minimize chemical emissions from materials used in buildings; provide excellent ventilation and air exchange equipment.

## 3. BEST PRACTICES

Public, private and non-profit agencies worldwide have developed programs to improve building performance and reduce environmental impacts. Details such as specific criteria, measurement of performance and certification requirements of these “green building” programs vary, but most are broadly structured according to some or all of the categories noted in Section 2 of this policy.

The LEED (Leadership in Energy in Environmental Design) system widely recognized in North America and globally; it is the basis for the RMOW’s performance goals respecting Commercial, Institutional, Municipal and High-Rise Residential building. A new LEED rating system applies to Low-Rise Residential. Prior to the introduction of a LEED for Homes, the Canadian Home Builder’s Association created the Built Green program. To incorporate the relevant elements of these systems in a local program for housing construction, the RMOW developed Whistler Green. Along with LEED for Homes, Whistler Green and Built Green form the basis for the RMOW’s performance goals respecting low- and medium density residential construction.

### 3.1 Performance Goals

In its capacity as a policy maker, regulator and in some cases a building owner/operator, the RMOW will lead Whistler to meet the green building performance goals set out in Table 3.1, below. The goals are based on existing, voluntary rating systems, which are used for reference only. Regardless of the chosen measures, format or rating scheme invoked, all construction and renovation projects should meet the Site and Landscape, Energy, Water, Waste, Materials and Indoor Environment objectives described in Section 2, above.

Table 3.1, Summary of RMOW Green Building Performance Goals

Building Type	Rating System	Performance Goals			
		2009	2012	2020	2030
Municipal Buildings	LEED	Gold, 35% better than MNECB <sup>1</sup>	Gold, 60% better than MNECB	Platinum, carbon neutral	“Living Building” <sup>2</sup>
Commercial, Institutional, High-Rise Residential	LEED <sup>3</sup>	Silver, 25% better than MNECB	Gold, 50% better than MNECB	Gold, 75% better than MNECB	Platinum, carbon neutral
Multi-Unit & Low-Density Residential	Built Green	Gold, Energuide 80	Gold, Energuide 83	Platinum, Energuide 87	Platinum, carbon neutral
	LEED for Homes	Silver, Energuide 80	Gold, Energuide 83	Gold, Energuide 87	Platinum, Carbon Neutral
	Whistler Green	Adopter (20 points)	Achiever (30 points)	Innovator (40 points)	
Renovations: Multi-Unit & Low-Density Residential	Residential renovation projects follow the same procedures as new construction, but will only be evaluated for their incorporation of green building practices in categories applicable to the renovations.				

<sup>1</sup> MNECB: Model National Energy Code for Buildings

<sup>2</sup> The Living Building concept was developed by the Cascadia Green Building and includes, among other prerequisites, net zero energy and water consumption.

<sup>3</sup> Use LEED-NC for new construction, or renovation projects that affect the building envelope and have a budget exceeding 50% of total building. Use LEED-EB for renovations with a budget that is less than 50% of total building value.

## 4. PROCEDURES

To meet its green building performance goals the Municipality will encourage, and in some cases require, the submission of green building information prior to processing applications and/or issuing approvals for development. This procedures section describes the information to be provided (Section 4.1), and then clarifies the requirements in different applications (Section 4.2).

### 4.1 Application Information

#### 4.1.1 Application Checklist

An Application Checklist, or narrative, summarizes how proposed site works, construction or renovation projects respond to each of the green building objectives outlined in Section 2 of this policy.<sup>4</sup> Municipal staff will review the Application Checklist and may work with applicants to identify appropriate green building choices for the project. Based on this review, and as planning and design work progress, applicants should update their green building choices and document any changes or new information in the checklist.

#### 4.1.2 Project Checklist

Following review and design development, applicants re-submit their green building checklist to reflect the most current strategies, practices or targets. For instance, the Project Checklist might indicate additional storm water management details, updated energy performance targets, or material reclamation opportunities that have been identified during the design process. The Project Checklist should be accompanied by a covering letter signed by the project architect, builder or another coordinating professional, confirming that plans, drawings and specifications reflect the identified green building practices.

#### 4.1.3 Green Building Commitment

Prior to adopting a Zoning Amendment Bylaw, the RMOW will require provisions that can be enforced to ensure future development is consistent with the Project Checklist and with the objectives and goals of this Green Building Policy. These provisions should be in the form of a covenant pursuant to Section 219 of the *Land Title Act*.

#### 4.1.4 Project Completion Report

A Project Completion Report details the implementation of green building practices proposed in the Project Checklist. For each item in the checklist, the report states whether or not the item was incorporated, and describes the manner and extent of its application.

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<sup>4</sup> If applicants do not refer to the existing rating systems or checklists noted in Section 3.1 of this policy, they should nevertheless demonstrate clearly and specifically how their project meets the objectives in Section 2.

## 4.2 Application Types

### 4.2.1 Zoning Amendment

The RMOW's most significant opportunity to require specific commitments in respect of green building features is through its discretionary authority to enact and amend zoning bylaws. Zoning regulations govern land use and development density; the rezoning application and approval process is a function and responsibility of local government. To support its green building goals the RMOW will require the following information for processing and approval of zoning amendments:

- a) Application Checklist
- b) Revised Checklist
- c) Green Building Commitment

### 4.2.2 Development Permit

With the exception of detached dwellings, Development Permits (DPs) are required for nearly all construction projects within the RMOW. Buildings and associated landscaping must conform to the applicable development permit area guidelines. New construction and renovation projects in DP areas are also encouraged to meet the RMOW's green building goals. To this end, the following items will be required in conjunction with DP applications (the requirement will be waived, or simply updated, if it has been completed through a zoning amendment process):

- a) Application Checklist
- b) Revised Checklist

### 4.2.3 Building Permit

Unlike Zoning Amendments and Development Permits, the Municipality does not exercise discretionary authority in the issuance of Building Permits. Rather, the Municipality ensures that permits are issued in conformance with the BCBC. Consequently, applicants are not bound to meet standards other than those in the Code (except as might be required in a development permit or covenant). A proposed RMOW green building permitting program will encourage architects, builders and homeowners to implement, and document, appropriate innovations. The program will include consultation with Municipal staff, assistance in accessing government incentives, and eligibility for local green building awards. Participation will entail submission of the following information:

- a) Application Checklist
- b) Revised Checklist
- c) Project Completion Report

The application procedures and associated green building information requirements are summarized in Table 4.1, below:

**Table 4.1 Summary of Green Building Information Requirements**

Application Information	Zoning Amendment	Development Permit	Building Permit
<b>Application Checklist</b> <i>Submit a completed green building checklist or narrative for the project; review and refine with RMOW staff and/or consultants.</i>	Required		Optional; required for participation in proposed green building permits program.
<b>Project Checklist</b> <i>Signed by the property owner, project architect, builder, or other coordinating professional.</i>			
<b>Project Completion Report</b> <i>Summarize implementation of items in checklist.</i>	Required	n/a	
<b>Green Building Commitment</b> <i>S.219 covenant or equivalent instrument requiring development consistent with the green building objectives of this policy.</i>	Required	n/a	n/a

**5. SCHEDULES AND FORMS**

Schedule A: Summary of Recommended Green Building Practices

Schedule B: Acronyms and Definitions

Schedule C: Whistler Green Checklist

Schedule D: Built Green Checklist

Schedule E: LEED for Homes Checklist

Schedule F: LEED – NC Checklist

Certified Correct:

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Shannon Story, Manager of Legislative Services

**SCHEDULE A**  
**Summary of Recommended Green Building Practices**

Objective	Practices
Site & Landscape	Select a previously developed site that is close to transit, pedestrian/cycling routes, amenities, and municipal infrastructure. Protect existing trees, vegetation and soil during construction; minimize erosion. Absorb and detain storm water on the development site. Minimize lawn area; choose landscape plants suited to local climate conditions.
Energy	Target Energuide 78, or 25% better than Model National Energy Code performance. Design for natural heating, lighting, and ventilation, and for solar thermal devices. Avoid the use of electric resistance heating (e.g. baseboards).
Water	Minimize or eliminate the use of potable water for irrigation using landscape design, efficient irrigation, and rainwater/snowmelt collection. Install only water-efficient toilets and urinals, fixtures, and appliances.
Materials	Design compact, flexible and adaptable buildings. Use recycled or engineered structural materials and efficient framing techniques. Use reclaimed, durable, renewable and locally-sourced materials, and certified wood.
Waste	Minimize construction waste; recycle at least 50% of waste generated in construction. Provide convenient recycling and organic waste diversion.
Indoor Environment	Install a Heat Recovery Ventilator with improved air filters. Specify low-emission materials (e.g. paints, adhesives, cabinets, panels and flooring). Use hard-surface flooring rather than carpet.

## SCHEDULE B Acronyms and Definitions

<b>Built Green</b>	A green building rating system for residential construction, developed and administered by the Canadian Home Builders Association
<b>CHBA</b>	Canadian Home Builders Association
<b>CaGBC</b>	Canada Green Building Council
<b>Energiguide</b>	An energy rating system for detached dwellings and low-rise multi-unit residential buildings, developed by Natural Resources Canada. Models and measures energy performance and reports results on non-linear scale of 1 – 100.
<b>LEED</b>	Leadership in Energy and Environmental Design. A green building rating system originally developed by the United States Green Building Council (USGBC), and now maintained and administered by both the USGBC and the Canada Green Building Councils.
<b>LEED – NC</b>	LEED for New Construction and Major Renovations. The original and most widely implemented version of the LEED program. LEED - NC is normally used to evaluate large commercial, industrial, office, high-rise residential and other similar building types.
<b>LEED – EB</b>	LEED for Existing Buildings. An adaptation of the LEED – NC program to be used for projects that do not affect the building envelope and are projected to cost less than 50% of the total building value.
<b>LEED for Homes</b>	A new LEED standard for low-rise and detached residential dwellings. Still in the pilot phase in Canada in 2009.
<b>Living Building</b>	A green building standard that seeks to “define the highest measure of sustainability possible in the built environment based on the best current thinking” <sup>5</sup> .
<b>MNECB</b>	Model National Energy Code for Buildings. A comprehensive standard for building energy performance released in 1997 by the National Research Council of Canada. Similar to the standard known as ASHRAE-90.1.
<b>RMOW</b>	Resort Municipality of Whistler
<b>USGBC</b>	United States Green Building Council
<b>Whistler Green</b>	A green building rating system for residential construction, developed and maintained by the RMOW.

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<sup>5</sup>Cascadia Green Building Council *Living Building Challenge (version 1.3)* <http://www.cascadiagbc.org/lbc/lbc-v1.3.pdf>

## Schedule C - Whistler Green Checklist



# Whistler Green: Project Checklist

(Detached and duplex dwellings)

Whistler Green is our community standard for healthy homes that use energy and resources efficiently in a mountain setting. Considered early in the home planning and design process, many of the measures in this checklist are easily incorporated and cost no more than conventional practices. Benefits include reduced energy and maintenance costs, and a more comfortable home.

If you require more information to determine whether your plans meet the standard, or how many points would be awarded for credit, refer to the Whistler Green Program Guide, speak with an RMOW Community Planning staff member, or consult an architect or builder.

Tag	Title	Definition and Target	Max pts	Points
<b>Site and Landscape (SL)</b>				
SL1	Trees	Protect all mature and unique trees and shrubs not immediately affected by the building footprint or to be removed for solar access or safety reasons.		
SL2	Soils	Protect, save and reuse existing topsoils. Follow Metro Vancouver or equivalent guidelines for erosion and sediment control.		
SL3	Stormwater	Mimic natural or pre-development hydrology by absorbing stormwater on the site. Target 90% effective impermeability and/or no new flow to storm drains.		<b>Required</b>
SL4	Landscape Plants	Use only regionally appropriate trees, plants and shrubs for landscaping; refer to "Plant Materials Suitable for the Whistler Climate".		
SL5	Outdoor Lighting	Minimize light pollution by using only full cut-off fixtures for outdoor lights (no more than 10% of lamp lumens between 80 - 90 degrees of nadir).		
SL6	Site Selection	Build on a previously disturbed site (1 point); no utility or road extensions required (1 point); 30-minute year round bus service and neighbourhood retail within 500m of site centre (1 point).	3	
SL7	Compact Footprint	The footprint of all buildings, deck and porches is less than 150 m <sup>2</sup> (1 point); less than 100 m <sup>2</sup> (2 points).	2	
SL8	Solar Access	Sunlight strikes one or more walls of principal rooms at window sill height for 3 hours (1 point); or 5 hours (2 points). Measured on November 7th.	2	
SL9	Habitat	Protect natural habitat beyond the building footprint. Restore disturbed areas to provide food, water and shelter suitable for desirable local fauna.	1	
SL10	Restoration	Restore to native habitat value a previously disturbed site that is equal in area to the footprint of all buildings and hard surfaces.	1	
SL11	Fill	The total volume of soils exported and imported during excavation and grading is less than the building foundation area multiplied by 1 cubic metre.	1	
SL12	Green Roof	60% or more of roof area is vegetated (2 points), or structure, membrane and drainage are designed to accommodate future planting (1 point).	2	
<b>SL Total</b>			<b>8</b>	<b>0</b>

## Schedule C - Whistler Green Checklist

Energy (E)			
E1	<b>Energuide</b>	The home is certified Energuide 78.	
E2	<b>Fuel Heaters</b>	Gas fireplaces have electronic ignition (no pilot flame) and solid fuel devices comply with applicable CSA or EPA standards.	
E3	<b>Furnace and Boiler</b>	Use Energy Star certified products for fuel fired space heating and hot water.	
E4	<b>Hot Tub</b>	Hot tubs incorporate at least heater and pumping efficiency measures, or advanced features such as indoor water storage.	<b>Required</b>
E5	<b>Air Conditioning</b>	Any independent air conditioning system is high-efficiency (COP >3).	
E6	<b>Lighting</b>	Use lighting fixtures with energy efficient lamps for at least 40% of permanent lighting (nominal rating > 35 lumens/watt).	
E7	<b>Space Heating</b>	Primary space heating uses forced air or low temperature liquid (<55 C). Electric resistance heating is no more than 700W for the home.	
E9	<b>Enhanced Performance</b>	Energuide Rating: 79 (1 point); 80 (2 pts); 81 (3 pts); 82 (4 pts); 83 (5 pts)	5
E10	<b>Passive Solar Heating</b>	Use building orientation, window design and thermal mass to achieve passive solar heating. Calculate usable solar gains fraction: >15% (1 point); >25% (2 points); >35% (3 points); >45% (4 points).	4
E11	<b>Passive Cooling</b>	Occupied rooms with one outside wall have operable windows equal to at least 4% of floor area; occupied rooms with two or more outside walls have operable windows equal to at least 2.5% of floor area.	1
E12	<b>Solar Thermal</b>	Designate south-facing roof and wall areas for solar devices and install conduit and pipe connections (1 point); solar devices provide >20% of space heating (1 point), >40% of water heating (1 point).	3
E13	<b>Heat Pump Performance</b>	Verify heat pump efficiency for space and water heating: COP > 2.8 (1 point); COP > 3.0 (2 points); COP > 3.4 (3 points); COP > 3.8 (4 points).	4
E15	<b>Greywater Heat</b>	Install an approved greywater heat recovery unit.	1
E16	<b>Outdoor Lighting</b>	Except as required for safety and security, control all outdoor lights with motion detectors.	1
E17	<b>Renewable Electricity</b>	Install systems that produce electricity from renewable sources (3 points per KWh of installed capacity).	6
	<b>Subtotal</b>		0
E19	<b>Home Size</b>	Enter a home size multiplier from the table in Appendix A.	
<b>E Total</b>			<b>15 0</b>

## Schedule C - Whistler Green Checklist

Water (Wa)			
Wa 1	<b>Water Appliances</b>	Provide only Energy Star certified products for water-consuming appliances.	
Wa 2	<b>Irrigation</b>	Design any installed irrigation system to reduce potable water use by 50% compared to conventional systems.	<b>Required</b>
Wa 3	<b>Landscape Mulch</b>	Cover soil in all landscape planting areas with a mulch layer.	
Wa 4	<b>Advanced Irrigation</b>	Install rainwater/snowmelt collection equipment (1 point); no irrigation system, or irrigation system requires no potable water (1 point).	2
Wa 5	<b>Water Fixtures</b>	All water fixtures meet the following flow rates: faucets < 6.5 L/minute at 415 kPa (1 point); showerheads < 7.5L/minute at 550kPa (1 point)	2
Wa 6	<b>Greywater Reuse</b>	Separate toilet and kitchen sink drains from all other drains to point of exit (1 point); install an approved greywater reuse system (2 points).	3
Wa 7	<b>Dual Flush Toilets</b>	At least 2 toilets are dual flush, maximum 6L per flush (1 point); all toilets are dual flush, maximum 6L per flush (2 points).	2
<b>Wa Total</b>			<b>6 0</b>

Indoor Environment (IE)			
Ie 1	<b>Safe Liquid Materials</b>	Paints and coatings meet GreenSeal VOC requirements; adhesives and sealants meet South Coast Air Quality Management District standards.	
Ie 2	<b>Safe Solid Materials</b>	Floor coverings meet CRI Green Label standards; interior panel products contain no added urea formaldehyde.	<b>Required</b>
Ie 3	<b>Air Filters</b>	All furnace and ventilation air filters are rated minimum MERV 4.	
Ie 4	<b>Flush Out</b>	Maximum ventilation operates for 7 days after final painting and finishing, prior to occupancy.	
Ie 5	<b>Ventilation</b>	Install an HRV/ERV with supply ducted to all occupied rooms and exhaust from all wet rooms.	2
Ie 6	<b>Isolate Garage</b>	Fit attached garages with a carbon monoxide alarm, and an exhaust fan capable of maintaining a 10 Pa pressure difference from the home with doors closed.	1
Ie 7	<b>Advanced Air Filtration</b>	All furnace and ventilation air filters are rated minimum MERV 6.	1
Ie 8	<b>Healthy Flooring</b>	Hard surface or resilient flooring covers 50% (1 point) or 75% (2 points) of the livable net floor area (does not include unfinished basements and garages).	2
<b>Ie Total</b>			<b>5 0</b>

## Schedule C - Whistler Green Checklist

<b>Materials (Ma)</b>			
Ma 1	<b>Resource Efficient</b>	Use engineered structural materials for two major applications (each application covers >10% of floor area, or >3% of total material costs).	
Ma 2	<b>Recycled Content</b>	Two materials (each covers a main surface, >10% of floor area, or >3% of material costs excluding plumbing and wiring) are certified for recycled content.	<b>Required</b>
Ma 3	<b>Framing</b>	Employ at least 3 advanced framing methods described in the CHBA builders manual, to reduce unnecessary lumber and sheathing.	
Ma 4	<b>Reused Materials</b>	1 point for each major building element made from >50% salvaged material, or for each 3% of new material costs substituted by salvaged materials.	3
Ma 5	<b>Reuse Building</b>	Use foundation, floor and >50% of walls from existing buildings for >20% (1 point), >40% (2 points), or >60% (3 points) of the new project's floor area.	3
Ma 6	<b>Building Disassembly</b>	Deconstruct >50% (1 point) or >75% (2 points) of existing buildings for material salvage.	2
Ma 7	<b>Advanced Recycled</b>	Four materials (each covers a main surface, >10% of floor area, or >3% of material costs excluding plumbing and wiring) are certified for recycled content.	1
Ma 8	<b>Durable Materials</b>	1 point for each of the following warranty requirements: roofing >35 years; majority of cladding >40 years; >30% of floor area material >10 years.	3
Ma 9	<b>Renewable Content</b>	Use one major material made from plant fibre with less than 10 year rotation (e.g. straw, bamboo, cotton).	1
Ma 10	<b>Locally Sourced</b>	Use 5 major materials (e.g. exterior walls or floors, windows, doors) and/or systems (e.g. insulated panels, lighting, heating) produced in BC.	1
Ma 11	<b>Fire Resistant</b>	Roofing is Class A, non-combustible (1 point); cladding is BC Fire smart rated not greater than +1 (1 point).	2
Ma 12	<b>FlexHousing</b>	Incorporate specific features to create adaptable, expandable and accessible homes. 3 features (1 point); 5 features (2 points).	2
Ma 13	<b>Certified Wood</b>	Use certified sustainably harvested wood for one major structural or finishing application (e.g framing, plywood, floors).	1
	<i>Subtotal</i>		0
Ma 15	<b>Home Size</b>	Enter a home size multiplier from the table in Appendix A.	
<b>Ma Total</b>			<b>10      0</b>

## Schedule C - Whistler Green Checklist

Waste (Ws)			
Ws 1	<b>Recyclables Collection</b>	Provide a recycling area no less than 0.3 m <sup>2</sup> located in or adjacent to the kitchen and equipped with at least 3 collection bins.	<b>Required</b>
Ws 2	<b>Ozone Protection</b>	Where a cooling system or heat pump is used, refrigerants must be chlorine free, with zero ozone depletion potential (R410 or R407 refrigerants comply).	
Ws 4	<b>Hazardous Spills</b>	Adopt a hazardous spills cleanup plan to BC MWLAP standards, or follow an environmental management system that complies with ISO 14000.	1
Ws 5	<b>Construction Waste</b>	Submit receipts indicating recycling of construction waste by volume: >50% (1 point); >65% (2 points); >80% (3 points).	3
Ws 6	<b>Organics</b>	Provide bear-proof household composting (2 points), or an in-sink disposal system (garburetor) (1 point) for organic waste.	2
<b>Ws Total</b>			<b>4      0</b>

Owner and Public Education (OE)			
OE 1	<b>Owner's Manual</b>	Provide a comprehensive owner's manual including: a product list, maintenance and warranty information, Whistler It's Our Nature household toolkit, and waterwise gardening information.	<b>Required</b>
OE 2	<b>Open House</b>	Offer and advertise an open house with educational tours and literature on green features, for at least 2 weekend days and 3 evenings.	1
OE 3	<b>Controls and Monitoring</b>	Install a system of home controls and monitoring that, at minimum, manages energy use and provides feedback to occupants.	2
<b>OE Total</b>			<b>2      0</b>

Innovation (In)			
In 1	<b>Innovation</b>	Any innovative feature(s) or system(s) to reduce the environmental impact of site works, construction and operation of the home.	5

<b>WHISTLER GREEN TOTAL</b>	<b>50</b>	<b>0</b>
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Whistler Green ADOPTER	20 points
Whistler Green ACHIEVER	30 points
Whistler Green INNOVATOR	40 points

Whistler Green is a new initiative. If you have suggestions to improve its content, format or application, please contact the RMOW Community Planning Department on 604 935 8170.

*Thank you for completing the checklist.*

## Schedule C - Whistler Green Checklist

### Appendix A - Home Size Multiplier

Calculate gross inhabited floor area from building permit drawings, not including self-contained suites with full kitchen and private entrance. Apply a multiplier to the point subtotals for Energy, and for Materials, as follows:

Unit Type	Base Size
Studio	600
1 bedroom	750
2 bedroom	1100
3 bedroom	1500
4+ bedroom	2000

% of base size	Multiplier
<70	1.4
<80	1.25
<90	1.1
<100	1
<125	0.9
<150	0.8
<175	0.7
<200	0.6
<250	0.5
>250	0.3



# Schedule D - Built Green Checklist

## Built Green™ Multi Checklist

Items selected must be applied to every unit, except where noted otherwise (i.e.: central systems).  
 Version 6 -August 14, 2007 - ONLY FOR USE BY BUILDERS PARTICIPATING IN PILOT  
 \*\*\*NOTE: THIS IS NOT A FINAL DRAFT AND IS LIKELY TO CHANGE\*\*\*

**BuiltGreen™**

Section 1: 0 Section 2: 0 Section 3: 0 Section 4: 0 Section 5: 0 Section 6: 0 Section 7: 0 TOTAL POINTS: 0

Builder Name:

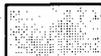
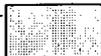
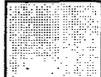
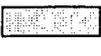
House Address:

### I OPERATIONAL SYSTEMS

This section awards points for construction methods and types of products that contribute toward lower energy consumption as well as alternative heating and electrical systems.

Minimum 32 (UNDER REVIEW)

- |      |  |                          |        |
|------|--|--------------------------|--------|
| 1-1  | <p><b>All ductwork joints and penetrations sealed with low toxic mastic or aerosolized sealant system.</b><br/>         Duct mastic is a preferred flexible sealant that can move with the expansion, contraction, and vibration of the duct system components. A high quality duct system greatly minimizes energy loss from ductwork. The additions to the system should be sized and designed to deliver the correct airflow to each room.</p>  | <input type="checkbox"/> | 3      |
| 1-2  | <p><b>Install individual unit programmable ENERGY STAR thermostat (2 pts. total for all units).</b><br/>         A set back thermostat regulates the heating/cooling system to provide optimum comfort when the unit is occupied and to conserve energy when it is not. Builders are encouraged to install an override system to ensure adequate temperatures for building durability.</p>   | <input type="checkbox"/> | 2      |
| 1-3  | <p><b>Install high efficiency, sealed combustion heating systems, all units or common system (min. 92% AFUE).</b><br/>         High efficiency furnaces or boilers such as condensing systems, reduce energy consumption and consequently fossil fuel reliance.</p>  | <input type="checkbox"/> | 3      |
| 1-4  | <p><b>Calculate design heat loss and properly size HVAC equipment and/or implement a boiler management system to match the system operation to building loads and optimize controls for maximum energy savings.</b><br/>         A properly sized heating and cooling system can reduce costs as well as conserve energy. When properly sized, HVAC equipment will run for longer periods which increases the efficiency and durability of the equipment due to less cycling on and off.</p>   | <input type="checkbox"/> | 2      |
| 1-5  | <p><b>Centrally locate HVAC systems inside the building's heated envelope and reduce duct length.</b><br/>         Roof top units are poorly insulated and waste heat is lost to the environment rather than added to the building. High efficiency heating systems with shorter distribution distances require less energy.</p>   | <input type="checkbox"/> | 1      |
| 1-6  | <p><b>Install HVAC systems with variable speed motors (ECM).</b><br/>         A variable speed fan motor is designed to vary its speed based on the buildings heating and air conditioning requirements. Working in conjunction with the thermostat, it keeps the appropriate air temperature circulating through the home, reducing temperature variances in the home. It also provides greater air circulation and filtration, better temperature distribution, humidity control, higher efficiency and quiet performance.</p>   | <input type="checkbox"/> | 3      |
| 1-7  | <p><b>Units contain multiple heating/cooling zones, thermostatically controlled zones (2 zones = 2pts., 3 zones = 3pts., 4 zones = 4pts.).</b><br/>         Efficiency can be significantly improved by only heating or cooling when occupants are present and by only heating/cooling to the exact desired temperature. Different desired temperatures can be set in each room or space and an individual zone can be turned off when not occupied. This type of system results in a dramatic reduction of energy consumption and operating costs.</p>  | <input type="checkbox"/> | 2 to 4 |
| 1-8  | <p><b>Install ground/ air/water/solar source heat pump system, either radiant or forced air to supply majority of space heating and cooling loads.</b><br/>         Heat pumps can significantly reduce primary energy use for building heating and cooling. The renewable component displaces the need for primary fuels, which, when burned, produce greenhouse gases and contribute to global warming.<br/>         Please Note: Effectiveness of heat pumps is related to climate zone and energy costs. Please consult with specialist or engineer to confirm effectiveness.</p>  | <input type="checkbox"/> | 10     |
| 1-9  | <p><b>Provide electricity (1 pt.) and/or natural gas (1 pt.) direct metering for each unit.</b><br/>         Direct metering in a Multi Context may require significant additional expenses above and beyond prorated condominium energy fees and holds individuals responsible for energy use.</p>  | <input type="checkbox"/> | 1 to 2 |
| 1-10 | <p><b>Install and balance an individually controlled active Heat Recovery Ventilator (HRV) and/or solar/geo fresh air pre-heating for each unit (4 pts.) and/or common area (2 pts.) and/or buildings exhaust air (3 pts.)</b><br/>         HRVs exhaust return air out of the home while bringing in fresh air for ventilation. The process used to do this takes advantage of the heat in the exhaust air to preheat the incoming air, saving energy.</p>  | <input type="checkbox"/> | 2 to 9 |
| 1-11 | <p><b>Install and balance an active Heat Recovery Ventilator (HRV) and/or solar/geo fresh air pre-heating for building common area.</b><br/>         HRV exhaust returns air out of the home while bringing in fresh air for ventilation. The process used to do this takes advantage of the heat in the exhaust air to preheat the incoming air, thereby saving energy.</p>   | <input type="checkbox"/> | 2      |
| 1-12 | <p><b>Install and balance an active Heat Recovery Ventilator (HRV) and/or solar/geo fresh air pre-heating for the building's exhaust air.</b><br/>         This would apply when a building has a large amount of exhaust air (ie. from a restaurant or health club). A HRV would help to recapture much of the heat in the air being exhausted.</p>   | <input type="checkbox"/> | 3      |
| 1-13 | <p><b>Install district high efficiency domestic hot water heating system (3 pts.) or an instantaneous "tankless" domestic hot water system in each unit (3 pts.).</b><br/>         Hot water heater is direct vented with a closed combustion system. All air for combustion is taken directly from the outside. A direct system utilizes a co-axial vent pipe (pipe inside a pipe) draws combustion air in through the outer pipe, and exhausts the products of combustion through the inner pipe. A power vented heater exhausts air out of the building via a positive exhaust during main burner operation. Both systems eliminate the need for conventional chimneys or flue systems. A tankless water heater does not have a storage tank to keep heated all day, or a pilot light; it burns gas only when you need hot water. This eliminates standby heat loss and its higher efficiency will save on utility costs.</p> | <input type="checkbox"/> | 3      |
| 1-14 | <p><b>Hot water storage tanks insulated by manufacturer to a minimum R-15.</b><br/>         An insulation blanket will reduce the standby heat loss of the hot water in the tank.</p>  | <input type="checkbox"/> | 2      |

1-15	<p><b>Install solar/air/water/geo (solar fraction &gt;50%) DHW Heating System to supply a minimum of 25% of the peak DHW heating load and 70% of the total DHW energy load.</b></p> <p>A substantial amount of energy is wasted heating water in a traditional gas system. Using renewable sources will reduce the consumption of non-renewable energy and also reduce green house gas emissions.</p>		2
1-16	<p><b>Provide roof area (min. 10% area of total) designed for future solar collector (Make solar ready; with solar or PV conduit installed).</b></p> <p>A roof area with an appropriate slope allows for the effective addition of future solar air, water heating or photovoltaics.</p>		1
1-17	<p><b>Install urban wind/photovoltaic electrical generation system which supplies (10%-2 pts., 20%-4 pts., 50%-8 pts., 100%-10 pts.) of design electrical load for the private area(s) of the building. This does not include electric heat.</b></p> <p>Urban wind and photovoltaics use renewable energy to generate electricity for the home, greatly reducing reliance on non-renewable energy sources and also reducing green house gas emissions.</p>		2 to 10
1-18	<p><b>Install photovoltaic electrical generation system which supplies 50% (1 pt.) or 100% (2 pts.) of electrical needs for the common areas. This does not include electric heat.</b></p> <p>Photovoltaics use the sun's energy to generate electricity for the home, greatly reducing reliance on non-renewable energy sources and also reducing green house gas emissions.</p>		1 or 2
1-19	<p><b>50% (2 pts.) or 100% (4 pts.) of electricity used during construction of the project is generated by wind power or equivalent green power certificate.</b></p> <p>This practice encourages and promotes the use of renewable, sustainable energy resources as well as reducing green house gas emissions.</p>		2 or 4
1-20	<p><b>50% (2 pts.) or 100% (4 pts.) of electricity used by homeowner during first year of occupancy is generated by wind power or equivalent green power certificate (prepaid by builder).</b></p> <p>This practice encourages and promotes the use of renewable, sustainable energy resources as well as reducing green house gas emissions.</p>		2 or 4
1-21	<p><b>Install a central drainwater heat recovery system (1 pt.) or individual units at each shower (1 pt. per shower max 3 pts.).</b></p> <p>Drainwater heat recovery units enable an exchange of heat from greywater to the incoming water. This pre-heating reduces the amount of energy required for the hot water tank.</p>		1 to 3
1-22	<p><b>Sealed combustion gas fireplace with electronic ignition or electric fireplace for all fireplaces.</b></p> <p>Sealed combustion fireplaces involve a double-walled special vent supplied by the manufacturer that normally vents through a sidewall in a horizontal position. The inner surface removes the flue gases and the outer container provides for passage of combustion air.</p>		2
1-23	<p><b>Install fireplace fan kit to circulate warm air into room on all fireplaces.</b></p> <p>A fan kit allows the heat generated by a fireplace to be transferred into the home more effectively.</p>		2
1-24	<p><b>All windows in the project are ENERGY STAR labeled.</b></p> <p>ENERGY STAR labelled windows save energy by insulating better than standard windows, making the home more comfortable all year round, reducing outside noise and can result in less condensation forming on the window in cold weather.</p>		2
1-25	<p><b>All Electric ranges use below 480 kwh/yr. based-on-EnerGuide rating system.</b></p> <p>EnerGuide label often reduces fuel consumption by approximately 20%.</p>		1
1-26	<p><b>Refrigerators( 1 pt.), Dishwashers (1 pt.), clothes washers (1 pt.) and/or combo washer dryer (2 pts.) are all ENERGY STAR labeled products.</b></p> <p>An ENERGY STAR label for refrigerator indicates the product has met strict requirements to reduce energy consumption.</p>		1 to 4
1-27	<p><b>All Clothes dryers have an energy performance auto sense dry setting which utilizes a humidity sensor for energy efficiency.</b></p> <p>Sensor saves energy by shutting dryer off when clothes are dry rather than leaving it on for a specified time.</p>		1
1-28	<p><b>Other building appliances (ie. TV, LCDs, security systems) are energy efficient/Energy Star rated.</b></p> <p>An ENERGY STAR label indicates the product has met strict requirements to reduce energy consumption.</p>		1
1-29	<p><b>Exposed Exterior Accessibility Ramps heated with renewable energy or waste heat.</b></p> <p>This practice encourages and promotes the use of renewable, sustainable energy resources as well as reducing green house gas emissions.</p>		2
1-30	<p><b>Install properly supported ceiling fan wired rough-in for each unit.</b></p> <p>Intended to allow for future temperature equalization.</p>		1
1-31	<p><b>Install interior motion sensor light switches. 1 point for every 10 switches for a maximum of 3 points.</b></p> <p>Motion sensor switches prevent lights from staying on in rooms that are unoccupied. This helps reduce electricity consumption.</p>		1 to 3
1-32	<p><b>Install lighting with an automation control system capable of unified automation control of lighting loads for all common areas</b></p> <p>Lighting and automation control systems prevent lights from staying on in rooms without occupants, thereby reducing electricity consumption.</p>		2
1-33	<p><b>Install automatic lighting system (2 pts.) and/or ventilation system (2 pts.), which are triggered by movement or CO levels, for garages/ parkade.</b></p> <p>Automating will allow better control and energy efficiency.</p>		2 to 4
1-34	<p><b>Exterior Lighting follows IESNA illuminance requirements for recommended practice manual: Lighting for Exterior Environments.</b></p> <p>This addresses light pollution issues. The Illuminating Engineering Society of North America can be found online at: iesna.org and the "Lighting for Exterior Environments" guide (IESNA RP-33-99) can be purchased there.</p>		2
1-35	<p><b>Common Area lit with high efficiency lamps.</b></p> <p>Incandescent lights lose much of their energy as heat rather than light and therefore are not as energy efficient as many of the other options available.</p>		1

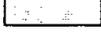
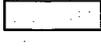
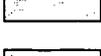
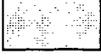
1-36	Minimum 25% (1 pt.), 50% (2 pts.) or 100% (4 pts.) of light fixtures are L.E.D., fluorescent or have compact fluorescent light bulbs installed in each unit. Fluorescent, compact fluorescent and L.E.D bulbs use 50% less energy than standard bulbs and last up to ten times longer.	<input type="checkbox"/>	1, 2 or 4
1-37	Minimum 50% of recessed lights in the entire building use halogen bulbs. Halogen bulbs are slightly more energy efficient, last longer and provide a more effective task light than conventional bulbs.	<input type="checkbox"/>	1
1-38	All EXIT signs are photoluminescent or LED. Photoluminescent exit signs use no power as the light is supplied by a phosphorous chemical that absorbs light until needed and then emits it.	<input type="checkbox"/>	2
1-39	Air tight, insulation contact-rated recessed lights are used in all insulated ceilings, or insulated ceilings have no recessed lights. Prevent heated air from exhausting through ceiling. Air tight light fixtures lead to a more airtight, energy efficient home.	<input type="checkbox"/>	1
TOTAL SECTION POINTS			<input type="text" value="0"/>

## II. BUILDING MATERIALS

This section deals with building components that make up the structure of the home. Items involve alternatives to using large dimensional lumber, products with a recycled component, utilizing wood products that come from sustainable managed forests and reducing the overall amount of lumber used.

### Minimum 10 (UNDER REVIEW)

2-1	Insulated Concrete Forming system (ICF's) used below grade (2 pts.) and/or above grade (2 pts.). Insulating Concrete Forms (ICFs) are hollow building elements made of plastic foam that are assembled, often like building blocks, into the shape of a building's exterior walls. The ICFs are filled with reinforced concrete to create structural walls. Unlike traditional forms, the ICFs are left in place to provide insulation and a surface for finishes.	<input type="checkbox"/>	2 to 4
2-2	Minimum of R-7.5 insulation installed under entire basement/foundation slab under conditioned space. Insulation installed under the basement slab will reduce the downward heat transfer into the ground below the slab, especially when hydronic in-slab heating is installed. Insulation under the slab can reduce temperature swings in the heated space and respond quicker to new changes in thermostat settings.	<input type="checkbox"/>	2
2-3	Attached garage, parking and/or loading dock overhead doors are insulated with R8 to R12 (1 pt.) or greater than R12 (2 pts.). An insulated overhead garage door will reduce heat loss.	<input type="checkbox"/>	1 or 2
2-4	Attached garage/parking walls and ceiling are insulated to NBC minimum (R12 for walls, R34 for ceilings). A fully insulated garage acts as a buffer zone, reducing heat loss.	<input type="checkbox"/>	1
2-5	Non-solvent based damp proofing (seasonal application). Water based damp proofing products use water as a thinner. Oil based damp proofing give off a number of volatile organic compounds (VOCs) as the solvent evaporates after application. These VOCs can be a strong irritant and can add to air pollution.	<input type="checkbox"/>	1
2-6	Paint Parkade semi gloss white to reduce number of required lighting fixtures. Using high reflectance white paint allows for fewer lights to be used in the parkade area.	<input type="checkbox"/>	1
2-7	Steel studs made from a recycled steel (min. 75%) is used to replace wood studs (min. 15%). Recycling steel reduces landfill waste and saves on wood consumption.	<input type="checkbox"/>	1
2-8	Use Optimum Value Engineering (OVE) to reduce wood use in framing: - Exterior and interior wall stud spacing at 24" on-center (2 points) or 19.2" on-center (1 pt.) - Elimination of headers at non-bearing interior and exterior walls. (1 pt.) - Use of header hangers instead of jack studs. (1 pt.) - Elimination of cripples on hung windows. (1 pt.) - Elimination of double plates, use single plates with connectors by lining up roof framing with wall & floor framing (1 pt.) - Use of two stud corner framing with drywall clips or scrap lumber for drywall backing instead of studs. (1 pt.) For more details on Optimum Value Engineering (OVE) framing principles see <a href="http://www.buildingscience.com">www.buildingscience.com</a> .	<input type="checkbox"/>	1 to 7
2-9	Walls and roof designed as 24" module to reduce waste. A 24" module takes into account the size of sheets of OSB or plywood, stud spacing, carpet size etc.	<input type="checkbox"/>	2
2-10	Use of insulated headers (either manufactured or site built open insulated single headers) with minimum insulation value of R10. Headers can either be insulated on site or can be a pre-manufactured product (often insulated with a foamed plastic).	<input type="checkbox"/>	1
2-11	Install manufactured insulated rim/band joist or build on site by setting back joists to allow rigid insulation filler of a minimum R10. Rim and band joists can either be insulated on site or can be pre-manufactured (often insulated with a foamed plastic).	<input type="checkbox"/>	2
2-12	Structural insulated panel system (SIPS) used for walls (3 pts.) and/or for roofs (2 pts.). Reduces thermal migration and controls air leakage - Keeps heating and cooling costs to a minimum compared to a conventionally framed wall.	<input type="checkbox"/>	2 to 5
2-13	All insulation used in the project is certified by a third party to contain a minimum recycled content: 40% (1 pt.) or 50% (2 pts.). Recycled content means less landfill waste and raw material use. Also, according to the the North American Insulation Manufacturer's Association, insulation with recycled content takes less energy to produce than using all raw materials.	<input type="checkbox"/>	1 or 2
2-14	Insulation levels meet or exceed the MNECB (may include Roof-R28, Walls R14, Floor R14). Model New Energy Code minimums will help to keep heating and cooling costs to a minimum compared to a conventionally framed wall.	<input type="checkbox"/>	1
2-15	Replace exterior wood sheathing with installed insulating sheathing.	<input type="checkbox"/>	2

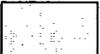
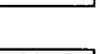
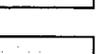
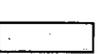
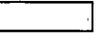
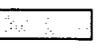
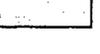
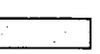
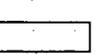
	Using less materials when not required saves the forest reserves, reduces thermal migration and controls air leakage; it also keeps heating and cooling costs to a minimum compared to a conventional wall.		
2-16	<b>Deck (1pt.), balcony surfaces (1pt.), and/or veranda structure (1 pt.) made from a third-party certified sustainable harvested wood source or third-party certified sustainable concrete.</b> The issue of sustainable forest management (SFM) is considered to be of such importance by the Canadian forest industry that, in 1993, a group of 22 organizations representing virtually all of the industry came together to form the Canadian Sustainable Forestry Certification Coalition. The coalition regroups several different certification standards that each have their strengths and weaknesses. For more information, see <a href="http://www.sfms.com">www.sfms.com</a> . Concrete produced from aggregates derived from a pit or quarry with a valid reclamation plan approved by Materials and Resources Canada or the governing provincial body.		1 to 3
2-17	<b>Dimensional lumber from a third-party certified sustainable harvested source used for floor framing (1 pt.), wall framing (2 pts.), and/or roof framing (1 pt.).</b> Saves old growth forests by using trees from a second generation forest.		1 to 4
2-18	<b>Environmentally engineered flooring system (ie. Uses reclaimed/recycled/rapidly renewable wood waste, flyash concrete (1pt-30%), recycled steel (1pt-90%).</b> Use of Engineered floor system saves old growth forest by using components from second generation forests and the use of recycled materials.		1
2-19	<b>Environmentally engineered products for all load bearing beams (ie. Uses reclaimed/recycled/rapidly renewable wood waste, flyash concrete, recycled steel).</b> Engineered products include wood products, concrete and recycled steel.		2
2-20	<b>Environmentally engineered products for all exterior window and door headers.</b> Engineered products include wood products, concrete and recycled steel.		1
2-21	<b>Engineered stud material for 10% of stud wall framing.</b> Use of Engineered lumber products saves old growth forest by using components from second generation forests and recycled materials.		1
2-22	<b>Engineered plate material and/or finger-jointed plate material.</b> Use of recycled materials saves old growth forest.		1
2-23	<b>Finger-jointed studs for 90% of non-structural stud wall framing.</b> Use of recycled materials saves old growth forest.		2
2-24	<b>Recycled and/or recovered content gypsum wallboard, recycled content (min. 15%).</b> Recycled content reduces landfill waste and the use of new materials.		1
2-25	<b>Recycled content exterior wall sheathing (min. 50% pre or post consumer).</b> Recycled content reduces landfill waste and the use of new materials.		2
2-26	<b>Replace exterior wood sheathing (if applicable) and use external rigid insulation as sheathing or installed insulating sheathing (2pts.)</b> Using this system replaces the need for use of additional OSB product, saving the forest reserves, reduces thermal migration and controls air leakage; it also keeps heating and cooling costs to a minimum compared to a conventional wall.		2
2-27	<b>100% Recycled content rainscreen attachment system.</b> Use of recycled content polypropylene, steel or aluminium rainscreen strapping may replace the traditional use of treated wood strapping on rainscreen systems.		2
2-28	<b>Advanced sealing package, non-HCFC expanding foam around window, door openings and all exterior wall penetrations (2 pts). All sill plates sealed with foam gaskets or a continuous bead of acoustical sealant (1 pt.).</b> Controls air leakage and keeps heating and cooling costs to a minimum.		1 to 3
2-29	<b>Builder has installed a green roof over 50% (3 pts.), 75% (5 pts.) or 100% of total roof area (7 pts.).</b> Green roofs are defined as a system of plants, growing medium and roof/waterproof membrane that acts as a whole to maximize the available environmental benefits of improving air temperature (reduced heat island effect), air pollution, storm water management and green space. Extensive or 2-6" Thickness typically requires 30-40 lbs/sqft structural support, while intensive roofs (8"-4") require significant structural support.		3, 5 or 7
2-30	<b>Builder has incorporated exterior horizontal and/or vertical shading devices for glazing (2 pts.), or exterior operational shading devices (4 pts.).</b> Shading windows from solar heat gain is a key design strategy for passive cooling and to reduce cooling loads on active HVAC systems in multi buildings. Light shelves and/or louvres can be optimized to allow for winter solar gain, while reducing overheating during the summer.		2 or 4
2-31	<b>All decks or balconys are thermally broken from the envelope by R10 (1 pt.), or fully separated (3 pts.).</b>		1 or 3
<b>TOTAL SECTION POINTS</b>			<b>0</b>

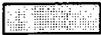
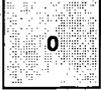
### III. EXTERIOR and INTERIOR FINISHES

This section focuses on the finish materials used both inside and outside of the project. The items listed include using longer lasting products, products with recycled content and products that are harvested from third party certified managed forests.

Minimum 10. (UNDER REVIEW)

3-1	<b>Exterior doors with a minimum of 15% recycled and/or recovered content.</b> Recycled or recovered content ensures we keep our landfill use to a minimum.		1
3-2	<b>All exterior doors manufactured from fiberglass.</b> Fiberglass doors insulate better than steel skinned or wood doors, have a longer lifespan, do not warp, twist or crack, and therefore reduce landfill use.		1
3-3	<b>Exterior window frames contain a minimum of 10% recycled content.</b> Reusing materials such as plastics reduces landfill usage, which may not be biodegradable.		1
3-4	<b>Exterior window frames are made from third-party certified sustainable harvested wood.</b> Uses trees from a forest managed system that prevents clear cutting trees, and replants trees to replace from which they've been harvested.		2

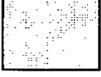
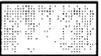
3-5	<p>Concrete used in home has a minimum supplementary cementing material of 25% (1 pt.) and/or 40% (2 pts.) is within the scope of proper engineering practices.</p> <p>For every one tonne of Portland cement generated, eighth tenths of a ton of carbon dioxide is produced. Supplementary cementitious products include fly ash, blast furnace slag as well as metakaolin.</p>		1 to 2
3-6	<p>Natural cementitious stone/stucco/brick or fiber cement siding – complete or combination thereof for 100% of exterior cladding.</p> <p>Battens are included in cladding. Strong, long lasting, fireproof material.</p>		4
3-7	<p>Exterior trim and finish is made of recycled content (50% min., pre or post consumer) material, durable and fire rated; trim (1 pt.) and/or wall finish (4 pts.).</p> <p>Fiber cement fascia and soffit, made with recycled content from sawmill waste and Portland cement, is a strong, long lasting and fireproof material.</p>		1 to 5
3-8	<p>Exterior trim (3 pts.) and /or siding materials (4 pts.) have recycled and/or recovered-content (min. 50% pre- or post-consumer).</p> <p>Recycled and/or recovered-content trim materials reduce the amount of new material used in production by gluing up miss scraps into large pieces, which conserves natural resources and reduces landfill usage.</p>		3 to 4
3-9	<p>Exterior trim materials are manufactured from OSB .</p> <p>Trim materials manufactured from OSB uses a laminating process to make larger pieces from smaller pieces or strands of wood. The process saves old growth forests by using trees from forest managed systems that prevents clear cutting trees, and replants trees in areas from which they have been harvested.</p>		1
3-10	<p>All exterior trim is clad with pre-finished metal (1 pt. over top wood backings, 2 pts. without wood backings).</p> <p>Trim clad with pre-finished metal is a durable long lasting product that requires no maintenance, reduces waste in landfills due to long life of product.</p>		1 to 2
3-11	<p>Deck or balcony surfaces made from recycled materials: 50% (1 pt.), 75% (2 pts.), 100% (3 pts.), and/or from low maintenance materials (2 pts.) (Deck surfaces should not need maintenance of any kind, including painting, for a minimum of 5 years).</p> <p>Substituting recycled material outdoors avoids the use of pressure treated and high mildew resistant wood that may otherwise be harvested from disappearing old growth or rain forests. Material which lasts longer and reduces landfill usage tends to require little to no maintenance, saving replacement costs and reducing energy spent.</p>		1,2,3 or 5
3-12	<p>Install 25-year (2 pts.), 30-year (3 pts.), 35-year (4 pts.), 40-year (5 pts.), or 50-year (6 pts.) roofing material -- with manufacturer's warranty.</p> <p>A longer warranted roof system saves money in replacement costs, and reduces the use of landfills due to the longevity of the product.</p>		2, 3, 4, 5 or 6
3-13	<p>Minimum 25% recycled-content roofing material.</p> <p>Recycled content roof material reduces the use of new resources, and waste in landfills.</p>		3
3-14	<p>Interior doors made with recycled and/or recovered content (min. 15%-1 pt.) and/or from third-party certified sustainable harvested sources (2 pts.).</p> <p>Recycled or recovered content ensures we keep our landfill use to a minimum.</p>		1 to 3
3-15	<p>Interior doors made from third-party certified sustainable harvested sources.</p> <p>Uses trees from a forest managed system that prevents clear cutting trees, and replants trees to replace from which they have been harvested.</p>		2
3-16	<p>Domestic wood from reused/recovered or remilled sources – 500 square foot minimum for flooring or all cabinets or all millwork.</p> <p>Reused, recovered or re-milled sources eliminate the need for new resources, saves energy, transportation costs, and forestry from depletion.</p>		6
3-17	<p>All carpet padding made from natural or recycled textile, carpet cushion or tire waste.</p> <p>Natural or recycled-content carpet padding is a good use of reuseable resources. Rebond still qualifies.</p>		2
3-18	<p>Install carpet that has a minimum of 50% recycled content.</p> <p>Recycled-content carpet is a good use of renewable resources, lessens off gases, and improves air quality.</p>		2
3-19	<p>100% recycled or recovered content underlayment or use of concrete finishes to enable the flooring to remain concrete.</p> <p>Concrete finishes such as stamped or stained concrete etc.</p>		1
3-20	<p>Install a minimum of 300 square feet per unit of laminate flooring.</p> <p>Laminate flooring is made up of sustainable raw materials.</p>		2
3-21	<p>Bamboo, cork or hardwood flooring used in home (min. 300 square feet installed). Products must be third-party certified to be from managed forests or from certified sustainable sources.</p> <p>Cork flooring comes from stripping the bark off cork oak, which regenerates itself. The cork tiles are moisture, rot and mold resistant, providing a floor that can last over 30 years. Bamboo flooring is a good use of natural resources because it is fast growing, durable and flexible.</p>		3
3-22	<p>All ceramic tile installed in the project has a minimum of 25% recycled-content.</p> <p>Reduces landfill usage.</p>		2
3-23	<p>MDF casing and baseboard used throughout the project.</p> <p>MDF casing is created from sawdust and glues, utilizing all wood waste to create usable product.</p>		1
3-24	<p>Finger-jointed casings, baseboards and jambs used throughout the project.</p> <p>Finger-jointed casing and baseboards maximize wood usage, buy using small pieces of wood glued together to create longer pieces. The process saves old growth forests by using trees from forest managed systems that prevents clear cutting trees, and replants trees in areas from which they have been harvested.</p>		1
3-25	<p>Solid hardwood trim from third party certified sustainable harvested sources approved for millwork (2 pts.) and/or cabinets (2 pts.).</p> <p>This process saves old growth forests by using trees from forest managed systems that prevents clear cutting trees, and replants trees in areas from which they have been harvested.</p>		2 to 4
3-26	<p>Paints or finishes with minimum of 20% recycled content.</p> <p>Paints or finishes made from recycled content are environmentally friendly because recycling paint reduces the hazardous waste in landfills.</p>		1

3-27	Natural granite, concrete, recycled glass or stone countertops in 100% of the kitchen (2 pts.) and all other countertop areas (1 pt.). Natural product is more durable; easy to clean and maintain and is resistant to heat and scoring.		1 to 3
3-28	100% agricultural waste or 100% recycled wood particle board used for shelving. Products such as wheat board are made from agricultural waste.		2
3-29	PVD finish on all door hardware (1 pt.) PVD finish on all faucets (1 pt.). Physical Vapor Disposition (PVD) provides a more durable product; no toxic wastes are produced making it.		1 to 2
<b>TOTAL SECTION POINTS</b>			
			 0

#### IV. INDOOR AIR QUALITY

This section focuses on the quality of the air within the finished project. Products listed here include materials that are low in VOC's; products made from all natural materials as well as various air cleaning and ventilation systems.

**Minimum 15 (UNDER REVIEW)**

4-1	Install pleated media filter (1 pt.) or an electrostatic air cleaner (2 pts.) or an electronic air cleaner (3 pts.) or a HEPA filtration system ( 6 pts.) or an ultraviolet air purifier (2 pts.) in conjunction with the HVAC system.  <i>Pleated air filters</i> are made with material that has been pleated or folded to provide more surface area. These pleated air filters are often the most efficient of all the media air filter types and are a whole house air filter. By increasing the surface area for collecting dust, airflow through the pleated air filter is less restricted. The <i>electrostatic air cleaner</i> is a permanent washable air filter that traps and removes airborne particles from the air before being circulated through the furnace and into the home. An <i>Electronic Air Cleaner</i> offers a superior level of filtration by using advanced, 3-stage filtration technology to trap and filter airborne particles like dust, cat dander and smoke. It works by placing an electric charge on airborne particles, and then collecting the charged pollutants like a magnet. The air cleaner cells can be washed in your dishwasher or sink. <i>HEPA</i> stands for High-Efficiency Particle Arresting. HEPA filtration offers the highest particulate removal available - 99.97% of particles that pass through the system including dust, cat dander, certain bacteria, pollens and more. The system is		1,2, 3 or 6
4-2	Install power drum humidifier (1 pt.) or a drip type humidifier (2 pts.) in conjunction with the HVAC system.  Proper humidity provides a more comfortable living environment at a lower temperature, so you can turn down your thermostat for energy savings. Controlling humidity also means moisturizing dry air to prevent damage to hardwood floors and woodwork. Power drum humidifiers direct the heated air through a water-laden evaporator sleeve which absorbs moisture and then returns to the heating system for distribution throughout the home.		1
4-3	Install drip type humidifier on HVAC system.  Proper humidity provides a more comfortable living environment at a lower temperature, so you can turn down your thermostat for energy savings. Controlling humidity also means moisturizing dry air to prevent damage to hardwood floors and woodwork. Flow-through humidifiers direct the airflow from your heating and cooling system to pass through a moisture filled pad, so the airstream picks up moisture evenly and distributes it throughout the home.		2
4-4	Install in-line ventilation fan with programmable timer (separate switch from lighting) in each unit.  A programmable timer ensures necessary, regular, automatic mechanical ventilation of the housing units.		1
4-5	Install passive Heat Recovery Ventilator (HRV-2 pts.) or and active Heat Recovery Ventilator/ Energy Recovery Ventilator (HRV or ERV- 4pts.) in each unit .  A Heat Recovery Ventilator (HRV) is an air exchanger that exhausts humid, stale, polluted air out of the housing unit and draws in fresh, clean outdoor air. Invisible pollutants produced by common household substances, plus dust and excess humidity that get trapped in today's houses, can increase your risk of chronic respiratory illness and your home's risk of serious structural damage. A passive HRV unit does not have its own internal fan and is 100% furnace assisted. It works by tying the exhaust side of the unit to the supply air plenum which forces air to exhaust from the housing unit and at the same time fresh air enters from outside through the unit and into the cold air return duct work. Much like the HRV the ERV recovers heat, it also recuperates the energy trapped in moisture; this greatly improves the overall recovery efficiency. In dry climates and humidified homes the ERV limits the amount of moisture expelled from the home. In humid climates and air conditioned homes, when it is more humid outside than inside, the ERV limits the amount of moisture coming into the housing unit.		2 to 6
4-6	Install thermostat that indicates the need for the air filter to be changed or cleaned.  This feature displays filter maintenance reminders on the thermostat. Regular furnace maintenance is required to keep your mechanical equipment running efficiently and problem free as well as ensuring a healthy indoor air environment.		1
4-7	All combustion appliances are sealed with no possibility of backdraft (if units are individually heated).  Sealed-combustion appliances draw all their combustion air from the outdoors, which eliminates any chance of back drafting. This feature is especially helpful in well sealed housing units. These types of appliances do not negatively affect indoor air quality.		3
4-8	Install hardwired carbon monoxide detector outside main sleeping areas, if combustion spillage susceptible appliances are used in the unit.  Carbon monoxide detectors warn against high levels of toxic carbon monoxide.		1
4-9	Power vacuum all HVAC ducting prior to occupancy by homeowner.  This process helps eliminate pollutants that drop into the HVAC ducting during the construction process from being circulated into the housing unit.		2
4-10	Central vacuum system vented to exterior has Carpet and Rug Institute (CRI) IAQ approval.  A central vacuum system collects dust centrally, while exhausting to the exterior so that dust mites and bacteria do not have the opportunity to re-circulate. The result is cleaner, healthier air.		1
4-11	All insulation in the project is third-party certified or certified with low or zero formaldehyde.  Formaldehyde may cause eye, nose, and throat irritation, headaches, loss of coordination, nausea, damage to liver, kidney, and central nervous system .		2
4-12	Low formaldehyde sub floor sheathing.  Formaldehyde is colorless gaseous organic compound, water soluble, with a characteristic pungent and stinging smell. Building materials low in or free of formaldehyde glues are used in the floor underlayment, cabinetry and elsewhere to protect the indoor air quality.		3
4-13	Low formaldehyde underlayment is used in the project. (ANSI A208.1 – 1993 concentration 0.3 ppm).		1

Low formaldehyde (phenol) and formaldehyde-free binders (PMDI) are available and becoming more common. FSC certified OSB is becoming more common, reducing environmental impacts on air, water, social quality.

4-14	<p><b>Low formaldehyde particle board/MDF used for cabinets (ANSI A208.2 – 1994 concentration 0.3 ppm).</b></p> <p>Urea formaldehyde-free fibreboard can be used in the same way as conventional fibreboard, but with the added caution of greater potential for water damage.</p>		1
4-15	<p><b>Low formaldehyde particle board/MDF used for shelving (ANSI A208.2 – 1994 concentration 0.3 ppm).</b></p>		1
4-16	<p><b>Zero formaldehyde particle board/MDF used for cabinets (2 pts.) and/or for shelving (2 pts.).</b></p> <p>Cabinets made from formaldehyde free particleboard or MDF eliminate the Volatile Organic Compounds (VOC) that offgas into the home, resulting in healthier indoor air quality.</p>		2 to 4
4-17	<p><b>All interior wire shelving is factory powder coated.</b></p> <p>Vinyl coating on conventional shelving units offgas VOC toxins.</p>		2
4-18	<p><b>Water-based urethane finishes used on all site-finished wood floors.</b></p> <p>Water-Based Epoxy: Generally referred to as "epoxy-modified finish," water-based epoxy finish differs from its solvent-based counterpart in that the epoxy resin is itself the catalyst for an acrylic or urethane resin.</p>		2
4-19	<p><b>All wood or laminate flooring in the project is factory finished.</b></p> <p>Installing a pre-finished floor eliminates the time, the dust and the odors associated with the on-site sanding and finishing of an unfinished product.</p>		2
4-20	<p><b>Water-based Lacquer or paints are used on all site built and installed millwork, including doors, casing and baseboards.</b></p> <p>Water based interior finish products reduces VOC off-gassing which improves indoor air quality.</p>		3
4-21	<p><b>Interior paints are used that have low VOC content (2 pts.--Standards are less than 250 grams/liter of VOCs) and/or interior paint is used that has no VOC's in base paint--prior to tint (3 pts.).</b></p> <p>Volatile Organic Compounds (VOC) are a class of chemical compounds that can cause short or long-term health problems. A high level of VOCs in paints/finishes off gas and can have detrimental effects to a building's indoor air quality and occupant health. Any paint with VOC's in the range of 5 grams/litre or less can be called "Zero VOC", according to an EPA standard. Some manufacturers may claim "Zero-VOC's", but these paints may still use colorants, biocides and fungicides with some VOC's. Adding a color tint usually brings the VOC level up to 10 grams/liter, which is still quite low.</p>		2 to 5
4-22	<p><b>Carpet and Rug Institute (CRI) IAQ label on all carpet used in unit (2 pts.) and/or on all underlay used in unit (1 pt.).</b></p> <p>To identify carpet products that are truly low-VOC, CRI has established a labeling program. The green and white logo displayed on carpet samples, of the CRI Indoor Air Quality Carpet Testing Program, in showrooms informs the consumer that the product type has been tested by an independent laboratory and has met the criteria for very low emissions. The adhesives used to install carpets and the latex rubber by some manufacturers to adhere face fibers to backing materials generate volatile organic compounds (VOCs). Carpets also cover large surfaces within an interior environment and can provide "sinks" for the absorption of VOCs from other sources.</p>		1 to 3
4-23	<p><b>Natural wool carpet in all living areas.</b></p> <p>Natural wool carpets are durable and use less secondary backing materials and chemicals. Offgassing is typically caused by the secondary backings and chemical additives in synthetic carpets, for controlling mildew, fungus, fire and rot.</p>		2
4-24	<p><b>All vinyl or linoleum sheet flooring is installed with low VOC adhesives (1 pt.--Low VOC = standard is less than 150 grams per litre) and/or are replaced by hard surface flooring (2pts.) and/or natural linoleum replaces vinyl (1pt.).</b></p> <p>Low VOC adhesive or backing minimizes the amount of VOC off-gassing, therefore improving IAQ.</p>		1 to 4
4-25	<p><b>Natural linoleum in place of any vinyl sheet flooring. Linoleum installed with low VOC adhesives. (Low VOC = standard is less than 150 grams per litre).</b></p> <p>Natural linoleum is made from natural linseed and other abundant renewable materials.</p>		2
4-26	<p><b>All ceramic tiles are installed with low VOC adhesives and plasticizer-free grout. (Low VOC = standard is less than 150 grams per litre).</b></p> <p>Most adhesives are still based on SB latex, which releases large quantities of volatile organic compounds (VOCs). The volatile solvents are used to emulsify (or liquefy) the resin that acts as the bonding agent. However, water-based adhesives emit far less VOCs than their conventional solvent based counterparts. There are three types of low-VOC formulas: water-based (latex and acrylics); reactive (silicone and polyurethane); and exempt solvent-based (VOC-compliant solvents). While all three technologies yield low- or zero-VOC caulks, sealants, and adhesives, their performance is slightly different.</p>		1
4-27	<p><b>All vinyl flooring in units are replaced by hard surface flooring.</b></p> <p>See detail below.</p>		2
4-28	<p><b>All carpet in units are replaced by hard surface flooring.</b></p> <p>Hard surface flooring is generally more durable and improves the IAQ within a building. Carpets collect dust, dust mites and other allergens which when disturbed become airborne particulates, directly affecting the health of the occupants.</p>		4
<b>TOTAL SECTION POINTS</b>			<b>0</b>

## V. WASTE MANAGEMENT

This section deals with the handling of waste materials on the construction site and encourages recycling.

### Minimum 7 (UNDER REVIEW)

5-1	<p><b>Comprehensive recycling program for building site including education, site signage and bins.</b></p> <p>A comprehensive recycling program that is strictly followed significantly reduces the amount of waste ending up in landfills. Currently it is estimated that up to 50% of landfill waste is construction related.</p>		2
5-2	<p><b>Collection of waste materials from site by a waste management company that is a current member of a provincial recycling council or equivalent association and verifies that a minimum of 10% of the materials collected from the construction site have been recycled.</b></p>		4

Not only does this reduce overall waste of product, it ensures that as much product as possible is being utilized for the production of future resources.

5-3	<b>Suppliers and Trades recycle their own waste. (1 pt. per trade, max. 4 pts.).</b> Trades being responsible for recycling and removal of waste not only reduces landfill waste, but also promotes a cleaner and safer working environment.		1 to 4
5-4	<b>Minimum 25% (2 pts.) or 50% (4 pts.) by weight of waste materials collected from construction site is diverted from waste stream.</b> Trades being responsible for recycling and removal of waste not only reduces landfill waste, but also promotes a cleaner and safer working environment.		2 or 4
5-5	<b>Use of recycled materials derived from local construction sites (1 pt. for each different product used, max of 3 pts.).</b> Products recycled from the construction site, such as mulched wood cut offs or mulched gypsum are often useable as either clay/ soil water retention additives or for organic burning.		1 to 3
5-6	<b>Trees and natural features on site protected during construction.</b> The protection of existing trees and other natural features such as streams, ponds and other vegetation reduces environmental impact, and ecosystem impact. Many of these features can be protected simply by following good waste management procedures.		1
5-7	<b>Shared transportation benefits: provide one parking stall for a car-sharing vehicle (1 pt.), and/or a car sharing vehicle as one component of condominium association (3 pts.) and/or bicycle storage on site (1 pt.).</b> Providing a vehicle to share allows occupants to live without their own vehicle and using the shared vehicle when needed. Provision of covered storage facilities for securing bicycles on site encourages the use of alternative transportation.		1 to 5
5-8	<b>Metal or engineered durable form systems used for concrete foundation walls.</b> The use of metal forming systems reduces the requirement of lumber, a limited resource.		1
5-9	<b>Reusable bracing is used for framing.</b> The use of reusable bracing for framing reduces the requirement of lumber, a limited resource.		1
5-10	<b>Install built-in recycling center in with two or more bins in each unit (2 pts.) and/or provide composter to each homeowner (1 additional pt.).</b> By installing built in recycling centers, which can be as simple as labeled containers (paper, cardboard, cans, plastics, etc), homeowners are more likely to utilize the pre-existing facilities and thus contribute to the reduction in landfill waste. Providing a composter promotes a reduction in wastes heading to the landfill by giving homeowners an option for organic waste such as food leftovers.		2 to 3
5-11	<b>Provide a central recycling center for the housing project (1 pt.--min. of paper, glass and tin recycling) and/or install trash compactor for unit or building (1 pt.).</b> Providing a recycling center will promote recycling among the homeowners/occupants. Installing a trash compactor, while not actually reducing the mass of waste, does help by reducing it's volume, which over time can make a significant difference to landfill levels.		1 to 2
<b>TOTAL SECTION POINTS</b>			<b>0</b>

## VI. WATER CONSERVATION

This section encourages a reduction in the amount of water used in the home or in individual units within multi story buildings.

Minimum 7 (UNDER REVIEW)

6-1	<b>CSA approved single flush toilet averaging 1.6 GPF or less installed in all bathrooms.</b> Lower flow toilets can save a substantial amount of water over time.		2
6-2	<b>Install a dual flush or 1.2 GPF toilet in one or more bathrooms in each unit (2 pts. for one bathroom, 3 pts. for all).</b> These toilets offer a choice between two water levels for every flush; 1.6 GPF (6 LPF) or 0.8 GPF (3 LPF).		2 or 3
6-3	<b>Install waterless urinals in men's public facilities.</b> The Average public urinal uses approximately 400 litres of water/day or 3.8- 10 litres per flush. Waterless urinals are more sanitary, reduce maintenance, installation costs and are only marginally more expensive to purchase.		1
6-4	<b>Insulate the first three feet of the water lines on the hot water tank with flexible pipe insulation where units contain independent DHW system (1 pt.) and/or insulate all hot water lines to all locations (2 pts.).</b> Minimizing the heat loss in the water line will decrease the initial water wasted by delivering hot water faster. Minimizing the heat loss in the water line will decrease the initial water wasted by delivering hot water faster.		1
6-5	<b>Install hot water recirculation line.</b> Having the hot water re-circulated from the hot water source to the fixture points will decrease the initial water wasted by delivery the hot water faster.		3
6-6	<b>Install low flow faucet aerators on all bathroom and kitchen sinks (1 pt.) and/or install hands free lavatory or kitchen faucets in each unit (4 pts.).</b> Low flow faucets may be included if flow rate is a maximum of 3.8 L/ minute on bathroom sinks and/or 6.8 L/minute on kitchen sinks. Battery powered electronic sensor minimizes the spread of germs and saves water.		1 to 5
6-7	<b>Supply front loading clothes washer in each unit.</b> Front loading clothes washers conserve water by design, as they are only required to fill up the washing compartment 1/3 full to effectively wash clothing. Additionally they use up to 75% less environmentally damaging laundry detergent, AND they also conserve electrical or gas energy by significantly reducing drying time for clothes with a more thorough spin cycle.		3
6-8	<b>Install water saving dishwasher that uses less than 26.0 L/water per load in each unit.</b> Water saving dishwasher uses technology to reduce both the amount of water required as well as electrical energy requirements. The EnerGuide appliance directory put out by Natural Resources Canada has a comprehensive listing of all manufacturers and models of dishwashers and other appliances with water usage and energy efficiency ratings.		1
6-9	<b>Install permeable paving materials for driveways and walkways.</b> Permeable paving materials allow rainwater to flow back into the ground instead of into storm sewers.		2

6-10	<b>Install a water meter in every unit.</b> Installing a water meter in each unit makes the occupants more aware of and responsible for water use.	<input type="checkbox"/>	3
6-11	<b>Install Efficient Irrigation Technology (1 pt.) in conjunction with a collection system (1 pt.)-- 50% of irrigation needs; 3 pts. for all).</b> Show Storm Water Management plan & design; water efficient irrigation systems, sensors, regulators, micro drip feed systems etc. Plan for neighbourhood storm water management principles and strategies including run-off and controlling rates.	<input type="checkbox"/>	1 to 3
6-12	<b>Provide a list of drought tolerant plants and a copy of the local municipality water usage guide to homebuyers with closing package.</b> Most municipalities provide a guide that gives the water requirements of various plants and grasses. When properly designed, landscaping choices can significantly contribute to water conservation.	<input type="checkbox"/>	1
6-13	<b>Reduce lawn/turf to 50% of landscaped area.</b> Lawns require a large amount of water to maintain. By reducing the amount of lawn, water use can also be reduced.	<input type="checkbox"/>	1
6-14	<b>Builder captures rainwater for use in atrium, patio garden feature and/or landscaping.</b>	<input type="checkbox"/>	1
6-15	<b>Greywater is collected, treated and reused throughout the project</b>	<input type="checkbox"/>	5
<b>TOTAL SECTION POINTS</b>			<b>0</b>

## VII. BUSINESS PRACTICE

This section deals more with manufacturers and builders office and business practices  
Minimum 9 (UNDER REVIEW)

7-1	<b>Products used for the project are manufactured within 800 km. (1 pt. for each product to a max. of 5 products).</b> Products made closer to the location of use will have less embodied energy. Basically this means that the shorter the transportation distance the less energy used in moving the product. Less energy used means fewer emissions.	<input type="checkbox"/>	1 to 5
7-2	<b>Builder provides Built Green homeowner manual and/or educational walkthrough and/or Green systems manual for building managers.</b> Homeowner education is an important component to any high performance building. If the technology is not used correctly, it will diminish the efficiency.	<input type="checkbox"/>	2
7-3	<b>Builders office and show homes purchase a minimum of 50% (1 pt.) up to 100% (2 pts.) solar, wind or renewable energy.</b> Wind Energy is a cleaner way to provide energy. Lower emissions benefit the environment.	<input type="checkbox"/>	1 to 2
7-4	<b>Manufacturers and/or suppliers purchase 50% or more solar, wind or renewable electricity.</b> Wind Energy is a cleaner way to provide energy. Lower emissions benefit the environment.	<input type="checkbox"/>	1
7-5	<b>Builder supplies a minimum of 8" of topsoil as finish grading throughout site.</b> Compared to subsoil materials, topsoils usually have higher aggregate stability, lower bulk density, and more favourable pore size distributions which leads to higher hydraulic conductivity, waterholding capacity, and aeration porosity.	<input type="checkbox"/>	2
7-6	<b>Development site provides community amenity space for not for profit community services.</b> Floor area made available to the City for not-for-profit community use. (ie. Assemblies, offices, educational facilities etc).	<input type="checkbox"/>	2
7-7	<b>Development site provides for Publically Accessible Private Space .</b> ie. Atriums, open courtyards etc. which are part of the residential project but have links to/for public access.	<input type="checkbox"/>	1
7-8	<b>Development includes a diversity of housing types including 20% live/work units (2pts.), 25% mixed use (2 pts.) facilities and/or 20% with separate basement suite units (2pts.)</b> This type of development encourages neighborhoods where people can live, work, shop etc. without having to drive.	<input type="checkbox"/>	2 to 6
7-9	<b>Builder has written environmental policy which defines their commitment (which must include an office recycling program and energy efficient lighting).</b> A statement of commitment helps to emphasize priority and ultimately define a corporate culture.	<input type="checkbox"/>	1
7-10	<b>Manufacturer and/or supplier has a written environmental policy which defines their commitment (this must include an office recycling program and energy efficient lighting). (1 pt. per supplier/manufacturer, max. of 2 pts.).</b> Doing business with others committed to the environment helps to promote the ideals of being earth friendly.	<input type="checkbox"/>	1 to 2
7-11	<b>Builder has written an environmental policy which prioritizes milestones for future net zero housing developments.</b> The next step toward easing our reliance on non-renewable energy is net zero housing. Net zero houses produce as much energy as they consume using renewable sources such as solar, thermal, wind, geoechange etc.	<input type="checkbox"/>	1
7-12	<b>Make provision Truck Management Plan, to avoid high congestion areas during construction.</b> A truck management plan would minimize the impact of trucks in the construction neighborhood. Features include scheduled arrivals/departures, reuse of materials to reduce truck traffic, communication with community and specific hours of work designated.	<input type="checkbox"/>	1
7-13	<b>Delivery Area wheel washed/ treated during construction.</b> Wheel wash area will cut down on dust pollution in the neighborhoods where construction is taking place.	<input type="checkbox"/>	1
7-14	<b>Builder's company vehicles are hybrid or bio-diesel vehicles (1 pt. per vehicle to max. of 3 pts.).</b> A commitment to the environment shouldn't stop at construction. Using a hybrid vehicle produces lower harmful emissions. Diesel construction vehicles converted to bio-diesel reduce fuel consumption by up to 75%.	<input type="checkbox"/>	1
7-15	<b>Builder uses radiantly supplied cold weather construction practice.</b> Propane heaters under tarps are often inefficient; this results in a great deal of wasted energy while reducing the quality of workmanship. Alternatives may include manufacturing components indoors.	<input type="checkbox"/>	1
7-16	<b>Environmental certification for builder's place of business (building, office etc).</b>	<input type="checkbox"/>	3

Many commercial buildings have been rated with various energy efficiency standards. Does your company work within an ENERGY STAR or LEED certified office building?

7-17

**Builder agrees to construct and label a min. of 50% of all projects to the Built Green™ standard per calendar year. (3 pts. for 50% or 5 pts. for 100%).**

--

3 or 5

A commitment to the environment from the builder can expand energy efficiency exposure to a large number of home owners and other home builders. Every Built Green project that is built is a reduction in material use, a reduction of green house gas emissions, less waste and better efficiency.

7-18

**Contracted trades and/or suppliers have successfully taken Built Green™ Builder Training. (1 pt. per company, max 3 pts.).**

--

1 to 3

Using trades or suppliers who have successfully taken Built Green Builder Training means that there is common understanding about what needs to be done and how it will be accomplished, streamlining the process.

TOTAL SECTION POINTS

0
---

TOTAL CHECKLIST POINTS

0
---

# Schedule D - LEED for Homes Checklist

## LEED for Homes Simplified Project Checklist



for Homes

Builder Name:
Project Team Leader (if different):
Home Address (Street/City/State):

**Project Description:**

**Adjusted Certification Thresholds**

Building type: *Single detached*  
 # of bedrooms: 0

Project type: *Custom*  
 Floor area: 0

Certified: 45.0 Gold: 75.0  
 Silver: 60.0 Platinum: 90.0

<b>Project Point Total</b>	<b>Final Credit Category Total Points</b>				
Prelim: 0 + 0 maybe pts	Final: 0	ID: 0	SS: 0	EA: 0	EQ: 0
<b>Certification Level</b>	Min. Point Thresholds Not Met for Prelim. OR Final Rating				
Prelim: Not Certified	Final: Not Certified	LL: 0	WE: 0	MR: 0	AE: 0

date last updated :  
 last updated by :

		Max Points	Project Points		
			Preliminary	Final	
<b>Innovation and Design Process (ID)</b> (No Minimum Points Required)		Max	Y/Pts	Maybe	No
					Y/Pts
<b>1. Integrated Project Planning</b>	1.1 Preliminary Rating	Prereq			
	1.2 Integrated Project Team	1	0	0	0
	1.3 Professional Credentialed with Respect to LEED for Homes	1	0	0	0
	1.4 Design Charrette	1	0	0	0
	1.5 Building Orientation for Solar Design	1	0	0	0
<b>2. Durability Management Process</b>	2.1 Durability Planning	Prereq			
	2.2 Durability Management	Prereq			
	2.3 Third-Party Durability Management Verification	3	0	0	0
<b>3. Innovative or Regional Design</b>	3.1 Innovation #1	1	0	0	0
	3.2 Innovation #2	1	0	0	0
	3.3 Innovation #3	1	0	0	0
	3.4 Innovation #4	1	0	0	0
<i>Sub-Total for ID Category:</i>		<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Location and Linkages (LL)</b> (No Minimum Points Required)		Max	Y/Pts	Maybe	No
					Y/Pts
<b>1. LEED ND</b>	1 LEED for Neighborhood Development	LL2-6	10	0	0
<b>2. Site Selection</b>	2 Site Selection		2	0	0
<b>3. Preferred Locations</b>	3.1 Edge Development	LL 3.2	1	0	0
	3.2 Infill		2	0	0
	3.3 Previously Developed		1	0	0
<b>4. Infrastructure</b>	4 Existing Infrastructure		1	0	0
<b>5. Community Resources/ Transit</b>	5.1 Basic Community Resources / Transit	LL 5.2, 5.3	1	0	0
	5.2 Extensive Community Resources / Transit	LL 5.3	2	0	0
	5.3 Outstanding Community Resources / Transit		3	0	0
<b>6. Access to Open Space</b>	6 Access to Open Space		1	0	0
<i>Sub-Total for LL Category:</i>		<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Sustainable Sites (SS)</b> (Minimum of 5 SS Points Required)		Max	Y/Pts	Maybe	No
					Y/Pts
<b>1. Site Stewardship</b>	1.1 Erosion Controls During Construction	Prereq			
	1.2 Minimize Disturbed Area of Site	1	0	0	0
<b>2. Landscaping</b>	2.1 No Invasive Plants	Prereq			
	2.2 Basic Landscape Design	SS 2.5	2	0	0
	2.3 Limit Conventional Turf	SS 2.5	3	0	0
	2.4 Drought Tolerant Plants	SS 2.5	2	0	0
	2.5 Reduce Overall Irrigation Demand by at Least 20%		6	0	0
<b>3. Local Heat Island Effects</b>	3 Reduce Local Heat Island Effects		1	0	0
<b>4. Surface Water Management</b>	4.1 Permeable Lot		4	0	0
	4.2 Permanent Erosion Controls		1	0	0
	4.3 Management of Run-off from Roof		2	0	0
<b>5. Nontoxic Pest Control</b>	5 Pest Control Alternatives		2	0	0
<b>6. Compact Development</b>	6.1 Moderate Density	SS 6.2, 6.3	2	0	0
	6.2 High Density	SS 6.3	3	0	0
	6.3 Very High Density		4	0	0
<i>Sub-Total for SS Category:</i>		<b>22</b>	<b>0</b>	<b>0</b>	<b>0</b>

## LEED for Homes Simplified Project Checklist (continued)

			Project Points				
			Max	Preliminary	Final		
Water Efficiency (WE)	(Minimum of 3 WE Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
<b>1. Water Reuse</b>	1.1	Rainwater Harvesting System	WE 1.3	4	0	0	0
	1.2	Graywater Reuse System	WE 1.3	1	0	0	0
	1.3	Use of Municipal Recycled Water System		3	0	0	0
<b>2. Irrigation System</b>	2.1	High Efficiency Irrigation System	WE 2.3	3	0	0	0
	2.2	Third Party Inspection	WE 2.3	1	0	0	0
	2.3	Reduce Overall Irrigation Demand by at Least 45%		4	0	0	0
<b>3. Indoor Water Use</b>	3.1	High-Efficiency Fixtures and Fittings		3	0	0	0
	3.2	Very High Efficiency Fixtures and Fittings		6	0	0	0
<i>Sub-Total for WE Category:</i>				<b>15</b>	<b>0</b>	<b>0</b>	<b>0</b>
Energy and Atmosphere (EA)	(Minimum of 0 EA Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
<b>1. Optimize Energy Performance</b>	1.1	Performance of ENERGY STAR for Homes		Prereq			
	1.2	Exceptional Energy Performance		34	0	0	0
<b>7. Water Heating</b>	7.1	Efficient Hot Water Distribution		2	0	0	0
	7.2	Pipe Insulation		1	0	0	0
<b>11. Residential Refrigerant Management</b>	11.1	Refrigerant Charge Test		Prereq			
	11.2	Appropriate HVAC Refrigerants		1	0	0	0
<i>Sub-Total for EA Category:</i>				<b>38</b>	<b>0</b>	<b>0</b>	<b>0</b>
Materials and Resources (MR)	(Minimum of 2 MR Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
<b>1. Material-Efficient Framing</b>	1.1	Framing Order Waste Factor Limit		Prereq			
	1.2	Detailed Framing Documents	MR 1.5	1	0	0	0
	1.3	Detailed Cut List and Lumber Order	MR 1.5	1	0	0	0
	1.4	Framing Efficiencies	MR 1.5	3	0	0	0
	1.5	Off-site Fabrication		4	0	0	0
<b>2. Environmentally Preferable Products</b>	2.1	FSC Certified Tropical Wood		Prereq			
	2.2	Environmentally Preferable Products		8	0	0	0
<b>3. Waste Management</b>	3.1	Construction Waste Management Planning		Prereq			
	3.2	Construction Waste Reduction		3	0	0	0
<i>Sub-Total for MR Category:</i>				<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>
Indoor Environmental Quality (EQ)	(Minimum of 6 EQ Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
<b>1. ENERGY STAR with IAP</b>	1	ENERGY STAR with Indoor Air Package		13	0	0	0
<b>2. Combustion Venting</b>	2.1	Basic Combustion Venting Measures	EQ 1	Prereq			
	2.2	Enhanced Combustion Venting Measures	EQ 1	2	0	0	0
<b>3. Moisture Control</b>	3	Moisture Load Control	EQ 1	1	0	0	0
<b>4. Outdoor Air Ventilation</b>	4.1	Basic Outdoor Air Ventilation	EQ 1	Prereq			
	4.2	Enhanced Outdoor Air Ventilation		2	0	0	0
	4.3	Third-Party Performance Testing	EQ 1	1	0	0	0
<b>5. Local Exhaust</b>	5.1	Basic Local Exhaust	EQ 1	Prereq			
	5.2	Enhanced Local Exhaust		1	0	0	0
	5.3	Third-Party Performance Testing		1	0	0	0
<b>6. Distribution of Space Heating and Cooling</b>	6.1	Room-by-Room Load Calculations	EQ 1	Prereq			
	6.2	Return Air Flow / Room by Room Controls	EQ 1	1	0	0	0
	6.3	Third-Party Performance Test / Multiple Zones	EQ 1	2	0	0	0
<b>7. Air Filtering</b>	7.1	Good Filters	EQ 1	Prereq			
	7.2	Better Filters	EQ 7.3	1	0	0	0
	7.3	Best Filters		2	0	0	0
<b>8. Contaminant Control</b>	8.1	Indoor Contaminant Control during Construction	EQ 1	1	0	0	0
	8.2	Indoor Contaminant Control		2	0	0	0
	8.3	Preoccupancy Flush	EQ 1	1	0	0	0
<b>9. Radon Protection</b>	9.1	Radon-Resistant Construction in High-Risk Areas	EQ 1	Prereq			
	9.2	Radon-Resistant Construction in Moderate-Risk Areas	EQ 1	1	0	0	0
<b>10. Garage Pollutant Protection</b>	10.1	No HVAC in Garage	EQ 1	Prereq			
	10.2	Minimize Pollutants from Garage	EQ 1, 10.4	2	0	0	0
	10.3	Exhaust Fan in Garage	EQ 1, 10.4	1	0	0	0
	10.4	Detached Garage or No Garage	EQ 1	3	0	0	0
<i>Sub-Total for EQ Category:</i>				<b>21</b>	<b>0</b>	<b>0</b>	<b>0</b>
Awareness and Education (AE)	(Minimum of 0 AE Points Required)	OR	Max	Y/Pts	Maybe	No	Y/Pts
<b>1. Education of the Homeowner or Tenant</b>	1.1	Basic Operations Training		Prereq			
	1.2	Enhanced Training		1	0	0	0
	1.3	Public Awareness		1	0	0	0
<b>2. Education of Building Manager</b>	2	Education of Building Manager		1	0	0	0
<i>Sub-Total for AE Category:</i>				<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>



for Homes

## LEED for Homes Simplified Project Checklist

### Addendum: Prescriptive Approach for Energy and Atmosphere (EA) Credits

Points cannot be earned in both the Prescriptive (below) and the Performance Approach (pg 2) of the EA section.

Energy and Atmosphere (EA)		(No Minimum Points Required)	OR	Max Points	Project Points			
					Y/Pts	Maybe	No	Final Y/Pts
<b>2. Insulation</b>	2.1 Basic Insulation			Prereq				
	2.2 Enhanced Insulation			2	0	0	0	0
<b>3. Air Infiltration</b>	3.1 Reduced Envelope Leakage			Prereq				
	3.2 Greatly Reduced Envelope Leakage			2	0	0	0	0
	3.3 Minimal Envelope Leakage	<b>EA 3.2</b>		3	0	0	0	0
<b>4. Windows</b>	4.1 Good Windows			Prereq				
	4.2 Enhanced Windows			2	0	0	0	0
	4.3 Exceptional Windows	<b>EA 4.2</b>		3	0	0	0	0
<b>5. Heating and Cooling Distribution System</b>	5.1 Reduced Distribution Losses			Prereq				
	5.2 Greatly Reduced Distribution Losses			2	0	0	0	0
	5.3 Minimal Distribution Losses	<b>EA 5.2</b>		3	0	0	0	0
<b>6. Space Heating and Cooling Equipment</b>	6.1 Good HVAC Design and Installation			Prereq				
	6.2 High-Efficiency HVAC			2	0	0	0	0
	6.3 Very High Efficiency HVAC	<b>EA 6.2</b>		4	0	0	0	0
<b>7. Water Heating</b>	7.1 Efficient Hot Water Distribution			2	0	0	0	0
	7.2 Pipe Insulation			1	0	0	0	0
	7.3 Efficient Domestic Hot Water Equipment			3	0	0	0	0
<b>8. Lighting</b>	8.1 ENERGY STAR Lights			Prereq				
	8.2 Improved Lighting			2	0	0	0	0
	8.3 Advanced Lighting Package	<b>EA 8.2</b>		3	0	0	0	0
<b>9. Appliances</b>	9.1 High-Efficiency Appliances			2	0	0	0	0
	9.2 Water-Efficient Clothes Washer			1	0	0	0	0
<b>10. Renewable Energy</b>	10 Renewable Energy System			10	0	0	0	0
<b>11. Residential Refrigerant Management</b>	11.1 Refrigerant Charge Test			Prereq				
	11.2 Appropriate HVAC Refrigerants			1	0	0	0	0
<i>Sub-Total for EA Category:</i>				<b>38</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>



# LEED BC Registered Project Checklist

Project Name

City, Province

Yes ? No

**Sustainable Sites** 14 Points

<input checked="" type="checkbox"/>	Prereq 1	<b>Erosion &amp; Sedimentation Control</b>	Required
<input checked="" type="checkbox"/>	Prereq 2	<b>Riparian-Wetland Protection</b>	Required
<input type="checkbox"/>	Credit 1	<b>Site Selection</b>	1
<input type="checkbox"/>	Credit 2	<b>Development Density</b>	1
<input type="checkbox"/>	Credit 3	<b>Redevelopment of Contaminated Site</b>	1
<input type="checkbox"/>	Credit 4.1	<b>Alternative Transportation, Public Transportation Access</b>	1
<input type="checkbox"/>	Credit 4.2	<b>Alternative Transportation, Bicycle Storage &amp; Changing Rooms</b>	1
<input type="checkbox"/>	Credit 4.3	<b>Alternative Transportation, Alternative Fuel Vehicles</b>	1
<input type="checkbox"/>	Credit 4.4	<b>Alternative Transportation, Parking Capacity</b>	1
<input type="checkbox"/>	Credit 5.1	<b>Reduced Site Disturbance, Protect or Restore Open Space</b>	1
<input type="checkbox"/>	Credit 5.2	<b>Reduced Site Disturbance, Development Footprint</b>	1
<input type="checkbox"/>	Credit 6.1	<b>Stormwater Management, Rate and Quantity</b>	1
<input type="checkbox"/>	Credit 6.2	<b>Stormwater Management, Treatment</b>	1
<input type="checkbox"/>	Credit 7.1	<b>Heat Island Effect, Non-Roof</b>	1
<input type="checkbox"/>	Credit 7.2	<b>Heat Island Effect, Roof</b>	1
<input type="checkbox"/>	Credit 8	<b>Light Pollution Reduction</b>	1

Yes ? No

**Water Efficiency** 5 Points

<input type="checkbox"/>	Credit 1.1	<b>Water Efficient Landscaping, Reduce by 50%</b>	1
<input type="checkbox"/>	Credit 1.2	<b>Water Efficient Landscaping, No Potable Use or No Irrigation</b>	1
<input type="checkbox"/>	Credit 2	<b>Innovative Wastewater Technologies</b>	1
<input type="checkbox"/>	Credit 3.1	<b>Water Use Reduction, 20% Reduction</b>	1
<input type="checkbox"/>	Credit 3.2	<b>Water Use Reduction, 30% Reduction</b>	1

Yes ? No

**Energy & Atmosphere** 17 Points

<input checked="" type="checkbox"/>	Prereq 1	<b>Fundamental Building Systems Commissioning</b>	Required
<input checked="" type="checkbox"/>	Prereq 2	<b>Minimum Energy Performance</b>	Required
<input checked="" type="checkbox"/>	Prereq 3	<b>CFC Reduction in HVAC&amp;R Equipment</b>	Required
<input type="checkbox"/>	Credit 1	<b>Optimize Energy Performance</b>	1 to 10
<input type="checkbox"/>	Credit 2.1	<b>Renewable Energy, 5%</b>	1
<input type="checkbox"/>	Credit 2.2	<b>Renewable Energy, 10%</b>	1
<input type="checkbox"/>	Credit 2.3	<b>Renewable Energy, 20%</b>	1
<input type="checkbox"/>	Credit 3	<b>Best Practice Commissioning</b>	1
<input type="checkbox"/>	Credit 4	<b>Elimination of HCFCs and Halons</b>	1
<input type="checkbox"/>	Credit 5	<b>Measurement &amp; Verification</b>	1
<input type="checkbox"/>	Credit 6	<b>Green Power</b>	1

Yes ? No

**Materials & Resources** **13 Points**

Y			Prereq 1	<b>Storage &amp; Collection of Recyclables</b>	Required
			Credit 1.1	<b>Building Reuse</b> , Maintain 75% of Existing Walls, Floors and Roof	1
			Credit 1.2	<b>Building Reuse</b> , Maintain 95% of Existing Walls, Floors and Roof	1
			Credit 1.3	<b>Building Reuse</b> , Maintain 95% shell and 50% non-shell	1
			Credit 2.1	<b>Construction Waste Management</b> , Divert 50%	1
			Credit 2.2	<b>Construction Waste Management</b> , Divert 75%	1
			Credit 3.1	<b>Resource Reuse</b> , Specify 5%	1
			Credit 3.2	<b>Resource Reuse</b> , Specify 10%	1
			Credit 4.1	<b>Recycled Content</b> , Specify 5% (post-consumer + 1/2 post-industrial)	1
			Credit 4.2	<b>Recycled Content</b> , Specify 10% (post-consumer + 1/2 post-industrial)	1
			Credit 5.1	<b>Local/Regional Materials</b> , 20% Manufactured Regionally	1
			Credit 5.2	<b>Local/Regional Materials</b> , of 20% Above, 50% Extracted Regionally	1
			Credit 6	<b>Rapidly Renewable Materials</b>	1
			Credit 7	<b>Certified Wood</b>	1

Yes ? No

**Indoor Environmental Quality** **15 Points**

Y			Prereq 1	<b>Minimum IAQ Performance</b>	Required
Y			Prereq 2	<b>Environmental Tobacco Smoke (ETS) Control</b>	Required
			Credit 1	<b>Carbon Dioxide (CO<sub>2</sub>) Monitoring</b>	1
			Credit 2	<b>Increase Ventilation Effectiveness</b>	1
			Credit 3.1	<b>Construction IAQ Management Plan</b> , During Construction	1
			Credit 3.2	<b>Construction IAQ Management Plan</b> , Flushout/Testing	1
			Credit 4.1	<b>Low-Emitting Materials</b> , Adhesives & Sealants	1
			Credit 4.2	<b>Low-Emitting Materials</b> , Paints	1
			Credit 4.3	<b>Low-Emitting Materials</b> , Carpets	1
			Credit 4.4	<b>Low-Emitting Materials</b> , Composite Wood	1
			Credit 5	<b>Indoor Chemical &amp; Pollutant Source Control</b>	1
			Credit 6.1	<b>Controllability of Systems</b> , Perimeter	1
			Credit 6.2	<b>Controllability of Systems</b> , Non-Perimeter	1
			Credit 7.1	<b>Thermal Comfort</b> , Comply with ASHRAE 55-1992	1
			Credit 7.2	<b>Thermal Comfort</b> , Permanent Monitoring System	1
			Credit 8.1	<b>Daylight &amp; Views</b> , Daylight 75% of Spaces	1
			Credit 8.2	<b>Daylight &amp; Views</b> , Views for 90% of Spaces	1

Yes ? No

**Innovation & Design Process** **5 Points**

			Credit 1.1	<b>Innovation in Design</b> : Provide Specific Title	1
			Credit 1.2	<b>Innovation in Design</b> : Provide Specific Title	1
			Credit 1.3	<b>Innovation in Design</b> : Provide Specific Title	1
			Credit 1.4	<b>Innovation in Design</b> : Provide Specific Title	1
			Credit 2	<b>LEED™ Accredited Professional</b>	1

Yes ? No

**Project Totals (pre-certification estimates)** **69 Points**

Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points



## REPORT | POLICY REPORT TO COUNCIL

PRESENTED: April 7<sup>th</sup> 2008

REPORT: 08 - 43

FROM: Community Life

FILE: 7733

SUBJECT: GREEN BUILDING POLICY and WHISTLER GREEN CHECKLIST

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### COMMENT/RECOMMENDATION FROM THE CHIEF ADMINISTRATIVE OFFICER

That the recommendation of the General Manager of Community Life be endorsed.

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### RECOMMENDATION

That Council receive this report and attached draft Green Building Policy;

That Council authorise staff to schedule a public open house to solicit community feedback with respect to the draft Green Building Policy; and further

That Council endorse the current version of Whistler Green for detached and duplex dwellings.

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### ATTACHMENTS

Appendices: "A" DRAFT Green Building Policy  
"B" Whistler Green Checklist

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### PURPOSE

Global trends, government initiatives, and municipal policies all direct Whistler toward higher performance buildings. This policy report provides the rationale and preliminary tools for the RMOW to achieve some of its goals for improving the built environment.

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### BACKGROUND

A range of ecological and human health impacts are associated with the construction and operation of buildings of all types and sizes. They include habitat disturbance, watercourse adjustments, greenhouse gas emissions, depletion of natural resources, and exposure to allergens, pollutants and toxins. An equally broad array of proven measures are available to minimize these effects and improve the quality of the built environment in terms of site impacts, resource efficiency and occupant comfort. Considered early in the building design process, these "green building" measures add little or no capital cost to projects and reduce operating expenses. Despite their proven benefits and, in many cases, relative ease of implementation, meaningful green building strategies are atypical. Local governments have an important role in addressing this disconnect between knowledge and practice, yet their capacity to effect desired changes in the built environment is fraught.

Building codes are the most obvious means to improved performance in most North American jurisdictions. Yet in British Columbia, (as elsewhere) local governments "have little authority to require building standards beyond the standards outlined in the BC Building Code."<sup>1</sup> Recognising the significance of this tool, the provincial Building and Safety Policy Branch is proceeding with measures designed to "green" the code. Proposed changes apply only to energy and water use and, even in these areas, fall short of the community vision described in *Whistler2020*.

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<sup>1</sup> Fraser Basin Council and Community Energy Association (2007) *Energy Efficiency and Buildings: A Resource for BC's Local Governments*

In addition to administering the Building Code, municipalities guide land use and site planning, development density, and some aspects of building design. These powers yield additional, if at times circuitous, opportunities to mandate or encourage more efficient, durable and healthy buildings. Various sources confirm that local governments have no explicit mandate for green buildings; instead they may employ a collection of more or less applicable tools toward this goal<sup>2</sup>. Many approaches are nascent, untested and evolving. The next section of this report outlines policies and regulations available for implementing green buildings and recommends certain among them for application in Whistler.

## DISCUSSION

### A. Policies / Tools

Local governments' regulatory power to achieve green buildings is limited. Opportunities abound; however, to create an appropriate policy framework. The RMOW has established key elements of such a framework; this report suggests some additional measures.

#### 1. *Comprehensive Sustainability Plans*

In addition to their Official Community Plans, which address primarily land use decisions, many communities craft policy documents guiding a wider range of sectors and strategies toward broadly defined sustainability goals. Although lacking legislative authority, these documents provide a strong mandate to pursue green buildings throughout the relevant jurisdiction. Whistler became a pioneer in this trend with the adoption of *Whistler2020*.

#### 2. *Official Community Plans*

Official Community Plans can create an enabling framework for green buildings. Whistler's current OCP does not address green building goals, and will not be reviewed prior to 2011. In the interim the RMOW could reinforce *Whistler2020* by amending the OCP to add green building policies.

#### 3. *Development Permit Areas*

Some green building strategies lie within municipal authority to designate Development Permit (DP) Areas. DP Areas can guide the "form and character" of buildings. Requiring locally available and/or durable exterior materials, appropriate landscaping, and proper solar orientation and access are among the opportunities for guidelines respecting green building goals. New DP Areas include green building requirements; existing DP Areas could be amended to achieve the same<sup>3</sup>.

#### 4. *Community Energy Plan*

As evidence and awareness of climate change increase, many cities and towns develop plans to minimize the use of fossil fuels. Green buildings figure prominently in these plans. The *Whistler2020* Energy Strategy and its predecessor, the *Integrated Energy, Air Quality and Greenhouse Gas Management Plan*, suggest measures to reduce buildings' energy impact.

#### 5. *Sustainability Checklists*

Communities of all types and sizes are pursuing development patterns and projects to moderate the ecological consequences of human settlement. Accordingly, some jurisdictions require applicants to self-evaluate their proposals using a local sustainability checklist<sup>4</sup>. In addition to compact, mixed use, pedestrian oriented development these checklists consistently encourage green buildings.

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<sup>2</sup> Sheltair Group (2006) *Opportunities for Local Government Action on Energy Efficiency*

West Coast Environmental Law (2006) *The Green Buildings Guide: Tools for Local Governments to Support Site Sustainability*

Fraser Basin Council and Community Energy Association (2007) *Energy Efficiency and Buildings: A Resource for BC's Local Governments*

<sup>3</sup> Detached and duplex dwellings do not typically fall within DP Areas.

<sup>4</sup> The cities of New Westminster and Port Coquitlam have implemented sustainability checklists.

#### 6. *Green Building Policy*

The policies and tools mentioned above encourage green buildings either directly or indirectly, but none provide specific direction with respect to building type, measurement tools or targets. A green building policy can address this lacuna by establishing clear expectations for building performance. The draft policy attached for Council consideration establishes targets for new construction and renovation projects throughout the community.

#### 7. *Green Building Guidelines*

As green buildings advance in terms of technology, public awareness, and actual results, tools to evaluate building performance are also evolving. Through research, consultation and public review, the RMOW has developed Whistler Green – guidelines for residential construction. Whistler Green complements programs such as LEED and Built Green BC by providing a locally-based and administered evaluation tool. This report requests Council endorsement of the attached Whistler Green checklist for detached and duplex dwellings<sup>5</sup>.

### **B. Regulations**

Assuming adoption of a green building policy and Whistler Green guidelines, the RMOW will have a clear policy foundation and some supporting tools for green buildings. This foundation sets goals and expectations with respect to building performance and enables staff to work with architects, builders, homeowners and other applicants to develop and select appropriate regulatory approaches. The following discussion considers some of these regulations.

#### 1. *Building Code*

The BC building code governs the construction of buildings throughout the province. Municipalities administer the Code – a new version of which will be introduced in April 2008 – through the building permit process. Revisions include energy and water requirements more rigorous than currently required, but still less stringent than necessary to meet provincial and municipal goals. In December 2007 the RMOW sent a letter supporting more significant green building amendments to the BC Building Code, and contributed to a joint submission from a group of BC Municipalities and non-government organizations.

#### 2. *Related Bylaws*

Though not empowered to require construction practices in addition to those mandated by the Building Code, local governments may enact bylaws in respect of certain green building goals. Only Vancouver is empowered to create a separate energy code; however, storm water management, water use, topsoil deposit and/or removal, and tree protection can be addressed in municipal bylaws.

#### 3. *Zoning*

Zoning regulates land use and density, not building performance. Density bonuses use zoning to allow additional development with the provision of amenities. Certain green building features might be considered amenities: for example, a municipality could allow additional residential development in a given zone, provided that the buildings had green roofs, or met a specific energy performance target<sup>6</sup>. The difficulty in this scenario is that the provision of the amenity can not be verified until after the additional density has been built.

#### 4. *Covenants*

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<sup>5</sup> A Whistler Green checklist for multi-unit residential buildings will be presented for Council consideration later this year.

<sup>6</sup> West Coast Environmental Law, *op. cit.*

Covenants are the most flexible among the regulatory tools considered herein. Their weaknesses include complexity, inconsistent application, and enforcement. Covenants may require lengthy negotiations concerning content; can be enacted only with the consent of a property owner; and in the case of considerations such as energy use, material source, or adhesives, compliance may be difficult to verify. On the other hand, covenants can be designed to suit specific neighbourhood and building requirements, and do not risk violating a local government's delegated authority.

5. *Statutory Building Schemes*<sup>7</sup>

Building schemes are a specific type of covenant requiring that structures meet certain standards, typically with respect to their physical appearance. Like all covenants they are registered voluntarily, binding on future property owners, and must affect the land to which the scheme applies. This last requirement limits their relevance to interior features, but items such as building form, solar orientation, exterior materials, landscaping and in some cases energy and water efficiency could reasonably be the subject of building scheme restrictions<sup>7</sup>.

C. Summary of Recommended approach

Integrating the range of policies and regulations described above, the table below lists the recommended elements of a green building strategy. Many elements are already in place, some are being proposed for immediate adoption, and others will be explored in the context of future development and potential changes in provincial regulations.

Policy	Application
Sustainability plan	<ul style="list-style-type: none"> <li>In place, evolving through annual task force process</li> </ul>
Energy plan	<ul style="list-style-type: none"> <li>In place</li> </ul>
Development permit guidelines	<ul style="list-style-type: none"> <li>Revise existing DP guidelines as appropriate</li> <li>Incorporate solar access, appropriate landscaping and other relevant green building goals in all new DP area guidelines</li> </ul>
Green building policy	<ul style="list-style-type: none"> <li>Attached for adoption</li> </ul>
Green building guidelines	<ul style="list-style-type: none"> <li>Whistler Green attached for endorsement; other programs available and recommended for reference depending on building type and size</li> </ul>
Regulation	Application
Building Code	<ul style="list-style-type: none"> <li>Continue to participate in code revisions</li> </ul>
Bylaws	<ul style="list-style-type: none"> <li>Pesticide bylaw adopted recently, water use under review</li> <li>Review tree protection, soil, and storm water bylaws</li> <li>Consider local service area bylaw for District Energy</li> </ul>
Zoning	<ul style="list-style-type: none"> <li>Discuss with legal counsel the use of density bonuses and Phased Development Agreements for green building amenities</li> </ul>
Covenants	<ul style="list-style-type: none"> <li>Negotiate covenants concerning green building features with willing property owners</li> <li>Provide model green building covenants</li> </ul>

**WHISTLER 2020 ANALYSIS**

1. *Descriptions of Success*

<sup>7</sup> *ibid.*, page 27

Descriptions of success that resolution moves us TOWARD	Comments
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*Built Environment*

Building design, construction and operation is characterized by efficiency, durability and flexibility for changing and long-term uses

The new and renovated built environment has transitioned towards sustainable management of energy and materials

Landscaped areas consist of native plant species that eliminate the need for watering and chemical use

Whistler's green building sector contributes to the local economy

Green buildings are a key element, if not a necessary precursor, in meeting these descriptions.

Policy and regulatory measure supporting green buildings, and related communication and educational programs, can contribute to local green building expertise and economic activity.

*Energy*

Energy is generated, distributed, and used efficiently, through market transformation, design, and appropriate end uses

Green buildings use energy more efficiently than conventional structures.

*Materials and Solid Waste*

Whistler is using durable materials that are less environmentally harmful, preferring recycled, natural and sustainably harvested materials, and plentiful metals

Whistler has adopted 'zero waste' as a defined goal

Substances and chemicals that are harmful to human health are being eliminated, replaced, or managed in a way that they do not disperse in nature

Materials that fit this description are required or encouraged in nearly all green building programs.

Green building practices reduce construction and operating waste.

Healthy indoor environments minimize the use of harmful chemicals in paints, adhesives, cabinets and flooring.

*Resident Housing*

Housing is healthy and liveable, and housing design, construction and operations are evolving toward sustainable and efficient energy and materials management

Incorporating green building measures in resident housing will help to meet this description.

*Water*

All potable water is used sparingly and only used to meet appropriate needs

Green buildings (and landscaping) minimize and optimize the use of potable water.

*Visitor Experience*

The visitor experience is based on practices and systems that efficiently use sustainable materials and energy

Green practices for new construction and renovation of commercial buildings can be shared with visitors to the resort.

Green buildings use energy, water and materials efficiently, and in some cases employ environmentally benign forms of these resources (objective #1). They generate less harmful waste products in construction and operation (objective #2), and reduce site disturbance (objective #3). Finally, green features decrease the ongoing cost of operating and maintaining buildings (objective #4). In all respects, then, green buildings are consistent with Whistler's sustainability objectives.

Yet their benefits are not unchallenged.

Data from many sectors in the economy suggest that efficiency and conservation measures actually increase usage by lowering the price of energy inputs<sup>8,9</sup>. This observation, known as the Khazzoom-Brookes Postulate, suggests that efficiency improvements such as those achieved through green buildings will not reduce, and in fact tend to increase, usage. Whistler's sustainability objectives require that efficiency and conservation are part of a framework to reduce overall consumption and emphasize the use of clean and renewable resources. *Whistler2020* provides this framework; the Khazzoom-Brookes Postulate reminds us that green buildings are not an end in themselves.

### 3. Flexibility

Encouraging green buildings in Whistler means improving performance with respect to resource efficiency, waste production, site impacts and indoor air quality. The policy and regulatory tools recommended in this report allow flexibility in meeting these goals by setting performance targets (e.g. LEED Gold, Energuide 78, durable materials) rather than specific technical solutions (e.g. air source heat pumps, Hardi siding). In some cases the use of a green building checklist to gauge performance implies certain approaches to achieving broad performance goals, but innovation is never precluded. Most green building rating systems reward flexibility either implicitly or explicitly: electric resistance heating, for instance, is inflexible and does not score well for energy performance.

### 4. Financial investment

Green building is regularly criticized for inflating construction costs, and, especially when buildings are LEED-certified, for adding unnecessary administration expenses. These concerns are legitimate, but easily addressed.

Some of the most emphatic green building choices (for example: smaller buildings, simple shapes and open floor plans) tend to reduce design, construction, materials, and energy costs. These are particularly relevant to residential construction and renovation projects in Whistler. As green building evolves the marginal costs of adding high performance features such as heat recovery ventilators, better windows and water-efficient plumbing continue to decrease. Lower operating and maintenance costs provide quick payback on most, if not all, green building investments.

## ENVIRONMENTAL IMPLICATIONS

Encouraging green building practices throughout the community should help to minimise Whistler's environmental impacts in terms of energy, water and materials use, site and watercourse disturbance, and waste generation.

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<sup>8</sup> Rubin, J (2007) *The Efficiency Paradox* CIBC World Markets

<sup>9</sup> Monbiot, G (2006) "A Ration of Freedom" in *Heat: How to stop the planet burning* London: Allen Lane.

## **SOCIAL IMPLICATIONS**

The social implications of green buildings are less direct, measureable and immediate than their environmental benefits. They include a healthier population due to better indoor air quality and happier occupants because buildings are more comfortable and allow more natural light.

## **HUMAN RESOURCES IMPLICATIONS**

The proposed green building strategy requires staff commitment to a number of items:

- Communicating the Green Building Policy and Whistler Green guidelines throughout the community, and particularly to design, building, development and real estate professionals.
- Revising and updating the Whistler Green guidelines in response to changing green building practices and technologies, and remaining well-informed as LEED, Built Green and other programs evolve.
- Reviewing Building Performance Briefs and Checklists that will be submitted along with Building Permit and Development Permit applications.
- Ongoing participation in related provincial initiatives, such as building code revisions.
- Reviewing tree protection, soil and other relevant bylaws.
- Revising or introducing development permit guidelines to reflect green building goals.
- Examining the feasibility of using density bonuses and Phased Development Agreements to require green building commitments.
- Encouraging property owners to register covenants requiring specific green building measures.

These items can be addressed with existing planning staff resources, but do require ongoing attention. If the RMOW pursues green building goals more aggressively or comprehensively than suggested in this report, additional staff time would be required. Some municipalities have created positions such as Green Building Coordinator, or Energy Planner, but this step is not recommended for the RMOW at this time.

## **BUDGET CONSIDERATIONS**

Some of the items included in this strategy are already complete and, therefore, carry no costs. Others can be implemented with little or no cost. Others have budget implications.

Maintaining Whistler Green as a relevant local green building standard requires ongoing consultation with technical experts. A yearly or biannual review of the existing, voluntary, single detached and duplex dwelling program would be a minimum requirement of less than \$5,000; additional funds would be necessary to develop further the multi-unit program (\$10,000 - \$15,000) and to create a certification program for Whistler Green homes (\$5,000 - \$10,000).

A communication strategy to promote Whistler Green throughout the community could be implemented for \$20,000 - \$25,000.

Amending zoning to create density bonuses, phased development agreements or covenants for green buildings requires legal review. Some legal fees will be borne by development applicants, but the RMOW can expect to bear costs of perhaps \$1,500 - \$2,000 for initial research regarding the feasibility and application of these regulatory mechanisms.

## COMMUNITY ENGAGEMENT AND CONSULTATION

The role of green buildings in Whistler's vision for sustainability has been developed and emphasised through the *Whistler2020* task force process. Each year at least two of the 17 community task forces develop actions that direct certain partner organizations, including the RMOW and the Whistler Housing Authority, toward green building practices. In this respect green building has broadly received thorough community engagement and consultation.

More specifically, the Whistler Green guidelines for detached and duplex dwellings were developed in consultation with a community steering committee and have been reviewed by architects, builders and interested citizens. At least three local newspaper articles and/or columns have described the Whistler Green program.

The attached Draft Green Building Policy (Appendix A) is more comprehensive than the Whistler Green guidelines: it suggests goals for all building types, and additional requirements for development application. These goals and procedures have not been subject to public review; therefore staff request Council authorisation to proceed with a public open house to solicit feedback on the draft policy.

The tools described in this report are simply means to achieve the policy goals which have been developed with significant community input; public engagement is not recommended in devising, for example, building covenants applicable to individual properties.

## SUMMARY

The RMOW is working toward a more efficient, flexible, and healthy built environment. This report includes a Draft Green Building Policy for Council's information and requests Council endorsement of the revised Whistler Green checklist for detached dwellings.

Respectfully submitted,

*(Signed original on file)*

Guy Patterson  
HOUSING PLANNER  
for  
Bob MacPherson  
GENERAL MANAGER, COMMUNITY LIFE

Budget Considerations Reviewed by

Name of Reviewer  
TITLE OF REVIEWER

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