



# LEED

GREEN BUILDING RATING SYSTEM

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## Rating System *Addendum*

for New Construction and  
Major Renovations  
LEED® Canada-NC  
Version 1.0

March 2007



This addendum updates LEED Canada-NC Version 1.0 (December 2004) to reflect recent developments, correct or clarify requirements and to streamline submittal requirements.



Several credits were modified to bring them in line with the requirements of USGBC LEED-NC Version 2.2. This USGBC version of LEED-NC introduced changes that made credits easier or harder to achieve. These changes were not incorporated into this addendum because the purpose of this addendum is to clarify and streamline the LEED process and not to create a new rating system. At this point, Credit Interpretation Requests (CIRs) for acceptance of USGBC LEED-NC 2.2 changes not included in this addendum will not be accepted by the CaGBC. Readers are encouraged to review the CIRs on the CaGBC website ([www.cagbc.org](http://www.cagbc.org)) for the latest rulings on the credit requirements.

This addendum has been formatted showing the entire page for the credit with wording changes underlined. Only the pages with changes are included in the addendum. With this format, the new pages can easily replace the existing pages in the Rating System. Words that have been removed are not shown in order to keep the formatting simple and easy to read.

All projects registered after February 1, 2008 will need to comply with the content of this addendum to achieve credits. Projects registered prior to this date may continue with version 1.0 or may use the addendum in its entirety or may use selected portions of the addendum on a credit by credit basis.

A new version of the LEED Letter Templates will be available in July 2007 to aid in the use of the addendum. Projects mixing LEED Canada-NC 1.0 with the addendum changes will have to use a mixture of templates or make notations to the signed declaration. Applicants should clearly state in the front end narrative if they are selectively picking from the addendum and identify which credits.

For further information or questions, please contact the LEED Program Coordinator at [cloader@cagbc.org](mailto:cloader@cagbc.org).



## Table of Contents

### Sustainable Sites

Prerequisite 1	Erosion & Sedimentation Control.....	6
Credit 2	Development Density .....	7
Credit 3	Redevelopment of Contaminated Sites .....	9
Credit 4	Alternative Transportation:	
Credit 4.1	Public Transportation Access .....	10
Credit 4.3	Hybrid and Alternative Fuel Vehicles.....	11
Credit 4.4	Parking Capacity .....	12
Credit 5	Reduced Site Disturbance:	
Credit 5.1	Protect or Restore Open Space.....	14
Credit 5.2	Development Footprint.....	16
Credit 7	Heat Island Effect:	
Credit 7.1	Non-Roof .....	17
Credit 7.2	Roof.....	19
Credit 8	Light Pollution Reduction.....	21

### Energy & Atmosphere

Credit 2.1	Renewable Energy: 5% .....	24
Credit 2.2	Renewable Energy: 10% .....	25
Credit 2.3	Renewable Energy: 20% .....	26
Credit 5	Measurement and Verification.....	27

### Materials & Resources

Prerequisite 1	Storage & Collection of Recyclables .....	28
Credit 1	Building Reuse:	
Credit 1.1	Maintain 75% of Existing Walls, Floors, and Roof .....	29
Credit 1.2	Maintain 95% of Existing Walls, Floors, and Roof .....	30
Credit 1.3	Maintain 50% of Interior Non-Structural Elements .....	31
Credit 2	Construction Waste Management:	
Credit 2.1	Divert 50% From Landfill .....	32
Credit 2.2	Divert 75% From Landfill .....	33
Credit 3.1	Resource Reuse: 5% .....	34
Credit 3.2	Resource Reuse: 10% .....	35
Credit 4.1	Recycled Content: 7.5% (Post-Consumer + ½ Pre-Consumer)..	36
Credit 4.2	Recycled Content: 15% (Post-Consumer + ½ Pre-Consumer)...	38
Credit 7	Certified Wood .....	40
Credit 8	Durable Building.....	41

## Indoor Environmental Quality

Prerequisite 1	Minimum IAQ Performance .....	43
Prerequisite 2	Environmental Tobacco Smoke (ETS) Control.....	44
Credit 1	Carbon Dioxide (CO <sub>2</sub> ) Monitoring .....	46
Credit 2	Ventilation Effectiveness .....	47
Credit 3	Construction IAQ Management Plan:	
Credit 3.1	During Construction .....	49
Credit 3.2	Testing Before Occupancy.....	51
Credit 4	Low-Emitting Materials:	
Credit 4.1	Adhesives & Sealants .....	53
Credit 4.2	Paints and Coatings .....	54
Credit 5	Indoor Chemical & Pollutant Source Control .....	56
Credit 7.1	Thermal Comfort: Compliance with ASHRAE 55-2004 .....	58
Credit 8.2	Daylight and Views: Views for 90% of Space .....	59

## Innovation & Design

Credit 1	Innovation in Design.....	60
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SS	EA	MR	EQ	ID
<b>Prerequisite 1</b>				

## Erosion & Sedimentation Control

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### Intent

Control erosion to reduce negative impacts on water and air quality.

### Requirements

Design a sediment and erosion control plan, specific to the site that conforms to United States Environmental Protection Agency (EPA) Document No. EPA 832/R-92-005 (September 1992), Storm Water Management for Construction Activities, Chapter 3, OR local erosion and sedimentation control standards and codes, whichever is more stringent. The plan shall meet the following objectives:

- Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent sedimentation of storm sewer or receiving streams.
- Prevent polluting the air with dust and particulate matter.

### Submittals

- Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring whether the project follows local erosion and sedimentation control standards or the referenced EPA standard. Provide a brief list of the measures implemented. If local standards and codes are followed, describe how they meet or exceed the referenced EPA standard.

*If an audit of this Credit is requested during the certification process:*

- Provide the erosion control plan; or drawings and specifications with the sediment and erosion control measures highlighted; or photographs of typical installed sediment and erosion control measures.

### Potential Technologies & Strategies

Adopt an erosion and sediment control plan for the project site during construction. Consider employing strategies such as temporary and permanent seeding, mulching, earth dikes, silt fencing, sediment traps and sediment basins.

## Development Density

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SS	EA	MR	EQ	ID
<b>Credit 2</b>				

### Intent

Channel development to urban areas with existing infrastructure, protect green-fields and preserve habitat and natural resources.

### Requirements

#### *Option 1:*

Increase localized density to conform to existing or desired density goals by utilizing sites that are located within an existing minimum development density of 13,800m<sup>2</sup> per hectare (60,000 ft<sup>2</sup> per acre) (2 storey downtown development).

OR

#### *Option 2:*

Construct or renovate a building that conforms with a minimum development density of 13,800 m<sup>2</sup> per hectare requirement (60,000 ft<sup>2</sup> per acre) AND is within 800 metres (½ mile) of a residential zone or neighbourhood with an average density of 25 units per hectare (10 units per acre net) (unless the project itself contains residential units) AND is within 800 metres (½ mile) of at least 6 of the 12 amenities listed below AND has pedestrian access between the building and the services.

#### **Amenities:**

- a. Community Centre / Youth Activity Centre
- b. General Office
- c. Supermarket
- d. School
- e. Restaurant
- f. Post Office
- g. Pharmacy
- h. Park / Recreational Facility
- i. Senior Care / Daycare
- j. Medical / Dental
- k. Bank
- l. Café / Bakery / Convenience Grocery

Each amenity may be counted no more than once and must exist or be under construction at the time of certification. Services within your building may be counted except for the primary use of the building.

Proximity is determined by drawing an 800 metre (½ mile) radius around the main building entrance on a site map and counting the services within that radius. Pedestrian access must be safe, convenient and direct, and is defined as a dedicated space for non-motorized mobility, specifically designed for pedestrian use. Maximum walking distance to any of the basic services must be no more than 1,100 metres (0.7 mile) along pedestrian access routes.

SS	EA	MR	EQ	ID
<b>Credit 2</b>				

## Submittals

### Option 1:

- Provide the LEED Letter Template, signed by the civil engineer, architect or other responsible party, declaring that the project has achieved the required development densities. Provide density for the project and for the surrounding area.

AND

- Provide an area plan, or a marked up satellite photo, indicating the project location and the radius used for density calculation.

### Option 2:

OR

- Provide the LEED Letter Template, signed by the civil engineer, architect or other responsible party, declaring that:
  - the project has achieved the required development density on its site;
  - the project is within 800 metres (½ mile) of a residential zone or neighbourhood with an average density of 25 units per hectare (10 units per acre net) (unless the project itself contains residential units);
  - the project has 6 unique amenities in or within 800 metres of the project; and,
  - the project has pedestrian access between the building and the services.

AND

- Provide a site vicinity drawing showing the project site, the 800 metres (½ mile) community radius, and the locations of the amenities surrounding the project site. Sketches, block diagrams, maps, and aerial photos are all acceptable for this purpose. Either note the 800 metres (½ mile) radius on the drawing or note the drawing scale. Submit a listing (including business name and type) of all amenities within the 800 metres (½ mile) radius). Ensure that no business is further than 1,100 metres (0.7 mile) along pedestrian access routes.

*If an audit of this Credit is requested during the certification process:*

### Option 1:

- Provide the calculations showing the derivation of the development density for both the project and the surrounding area.

OR

- In cases where it is clear that the site meets the development density requirement, provide digital photos displaying surrounding building heights within the development density circle. Cross reference buildings to area plan or marked up satellite photo as required above.

### Option 2:

No specific audit submittals are required.

## Potential Technologies & Strategies

During the site selection process, give preference to urban areas.



## Redevelopment of Contaminated Sites

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SS	EA	MR	EQ	ID
<b>Credit 3</b>				

### Intent

Rehabilitate damaged sites where development is complicated by real or perceived environmental contamination, reducing pressure on undeveloped land.

### Requirements

Develop on a contaminated site and provide remediation as required by Provincial Contaminated Sites Program.

### Submittals

- Provide a letter from the relevant regulatory agency, or an independent environmental assessment firm, confirming that the site was classified as a contaminated site and has been remediated.
  
- Provide the LEED Letter Template signed by the civil or environmental engineer or responsible party, declaring the type of damage that existed on the site and describing the remediation performed.

*If an audit of this Credit is requested during the certification process:*

- Provide documentation demonstrating that remediation efforts have been performed on the site to clean up or stabilize contaminants, such as the Executive Summary of an Environmental Assessment report, and documents demonstrating that remediation is complete.

### Potential Technologies & Strategies

During the site selection process, give preference to previously contaminated sites. Identify tax incentives and property cost savings. Develop and implement a site remediation plan using strategies such as pump-and-treat, bioreactors, land farming and in-situ remediation.

SS	EA	MR	EQ	ID
Credit 4.1				

## Alternative Transportation: Public Transportation Access

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### Intent

Reduce pollution and land development impacts from automobile use.

### Requirements

Locate building within 800 metres (0.5 miles) of a commuter rail, light rail or subway station or 400 metres (0.25 miles) of 2 or more public bus lines offering frequent service. Planned and funded, in addition to existing, commuter rail, light rail or subway stations, are acceptable for the purpose of achieving this credit.

### Submittals

- ❑ Provide the LEED Letter Template, signed by an appropriate party, declaring that the project building(s) are located within required proximity to mass transit.
- ❑ Provide an area drawing, or marked up transit map, highlighting the building location, the fixed rail stations (existing/planned and funded) and bus lines, and indicate the accessible walking distances between them. Include a scale bar for distance measurement.

### Potential Technologies & Strategies

Perform a transportation survey of future building occupants to identify transportation needs. Site the building near mass transit.

## Alternative Transportation: Hybrid and Alternative Fuel Vehicles

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SS	EA	MR	EQ	ID
<b>Credit 4.3</b>				

### Intent

Reduce pollution and land development impacts from automobile use.

### Requirements

EITHER

Provide low consumption, high efficiency hybrid or alternative fuel vehicles for 3% of building occupants AND provide preferred parking for these vehicles and highly efficient fuel-efficient vehicles,

OR

Install alternative-fuel refuelling stations within 500 metres (545 yards) of the site for 3% of the total vehicle parking capacity of the site. Liquid or gaseous fuelling facilities must be separately ventilated or located outdoors.

### Submittals

- Provide the LEED Letter Template and proof of ownership of, or 2 year lease agreement for, low consumption, high efficiency hybrid or alternative fuel vehicles (AFVs) and calculations indicating that the vehicles will serve 3% of building occupants. Provide site drawings or parking plan highlighting preferred parking for low consumption, high efficiency hybrid or alternative fuel vehicles.

OR

- Provide the LEED Letter Template with specifications and site drawings highlighting alternative-fuel refuelling stations. Provide calculations demonstrating that these facilities accommodate 3% or more of the total vehicle parking capacity.

### Potential Technologies & Strategies

Provide transportation amenities such as alternative fuel refuelling stations and carpool/vanpool programs. Consider sharing the costs and benefits of refuelling stations with neighbours. Provide fleet vehicles or encourage occupants to purchase vehicles with a fuel consumption of 5 L/100 km or lower. In addition for diesel, emissions of 120 g/km of CO<sub>2</sub> or less and meet at least Euro 4 level of particulates at 0.025 g/km.

SS	EA	MR	EQ	ID
<b>Credit 4.4</b>				

## Alternative Transportation: Parking Capacity

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### Intent

Reduce pollution and land development impacts from single occupancy vehicle use.

### Requirements

Size parking capacity to meet, but not exceed, minimum local zoning requirements AND provide preferred and designated parking for carpools, vanpools or car co-ops equal to 10% of the total number of non-visitor parking spaces.

OR

Add no new parking for rehabilitation projects AND provide preferred parking and designated parking for carpools, vanpools, or car co-ops equal to 10% of the total number of non-visitor parking spaces.

### Submittals

- For new projects, provide:
  - The LEED Letter Template signed by the civil engineer or responsible party stating any relevant minimum zoning requirements and declaring that parking capacity is sized to meet, but not exceed them.
  - A statement that preferred and designated parking for carpools, van pools or car co-ops are equal to 10% of the total number of non-visitor parking spaces and a management plan showing how carpooling or car co-ops will be encouraged and organized.
- For rehabilitation projects provide:
  - The LEED Letter Template signed by the civil engineer or responsible party declaring that no new parking capacity has been added AND that preferred parking and designated parking has been added for car pools, vanpools, or co-ops equal to 10% of the total number of non-visitor parking spaces.
  - A management plan showing how carpooling or car co-ops will be encouraged and organized.

*If an audit of this Credit is requested during the certification process:*

- For new projects provide a copy of the local zoning requirements highlighting the criteria for minimum parking capacity, a parking plan highlighting the total parking capacity, and calculations demonstrating that carpool and vanpool programs serve 10% of the total number of non-visitor parking spaces.

OR

- For rehabilitation projects, provide a pre-rehabilitation parking plan and a post-rehabilitation parking plan demonstrating that no new parking capacity was added, and highlighting designated parking for car pools, van pools, or co-ops equal to 10% of the total number of non-visitor parking spaces.

## Potential Technologies & Strategies

Minimize parking lot/garage size. Consider sharing parking facilities with adjacent buildings.

<b>SS</b>	<b>EA</b>	<b>MR</b>	<b>EQ</b>	<b>ID</b>
<b>Credit 4.4</b>				



SS	EA	MR	EQ	ID
Credit 5.1				

## Reduced Site Disturbance: Protect or Restore Open Space

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### Intent

Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

### Requirements

EITHER

On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 12 metres (40 feet) beyond the building perimeter, 1.5 metres (5 feet) beyond primary roadway curbs, walkways, and main utility branch trenches, and 7.5 metres (25 feet) beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities and playing fields) that require additional staging areas in order to limit compaction in the constructed area;

OR

On previously developed sites, restore a minimum of 50% of the site area (excluding the building footprint) by replacing impervious surfaces with native or adaptive vegetation.

OR

On previously developed sites also earning SS Credit 2 (Development Density), restore a minimum of 50% of the site area (excluding the building footprint) or restore a minimum of 20% of the site area (including the building footprint), whichever is greater, by replacing impervious surfaces with native or adaptive vegetation. Projects using this pathway can now apply "green" (vegetated) roof surfaces to this calculation if the plants meet the definition of native/adaptive.

### Submittals

- For greenfield sites, provide the LEED Letter Template, signed by the civil engineer or responsible party, demonstrating and declaring that site disturbance (including earthwork and clearing of vegetation) has been limited to 12 metres (40 feet) beyond the building perimeter, 1.5 metres (5 feet) beyond primary roadway curbs, walk ways and main utility branch trenches, and 7.5 metres (25 feet) beyond constructed areas with permeable surfaces. Provide scaled site drawings and specifications highlighting limits of construction disturbance.

OR

- For previously developed sites, provide a LEED Letter Template, signed by the civil engineer or responsible party, declaring and describing restoration of degraded habitat areas. Include highlighted scaled site drawings with area calculations demonstrating that 50% of the site area that does not fall within the building footprint has been restored.

*If an audit of this Credit is requested during the certification process:*

- For greenfield sites, submit 12 photographs of disturbed site areas, displaying that project requirements are met.

OR

- For previously developed sites, submit at least 4 photographs that together show the entire completed site and its landscaping.

AND

- Provide a list of native/adaptive vegetation.

SS	EA	MR	EQ	ID
<b>Credit 5.1</b>				

### Potential Technologies & Strategies

Perform a site survey to identify site elements and adopt a master plan for development of the project site. Select a suitable building location and design the building with a minimal footprint to minimize site disruption. Strategies include stacking the building program, tuck-under parking and sharing facilities with neighbours. Establish clearly marked construction boundaries to minimize disturbance of the existing site and restore previously degraded areas to their natural state.

SS	EA	MR	EQ	ID
<b>Credit 5.2</b>				

## Reduced Site Disturbance: Development Footprint

---

### Intent

Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

### Requirements

Reduce the development footprint (defined as entire building footprint, access roads and parking) to exceed the local zoning's open space requirement for the site by 25%. For areas with no local zoning requirements (e.g., some university campuses and military bases), designate open space area adjacent to the building that is equal to the building footprint.

Projects earning SS Credit 2 (Development Density) and using "green" (vegetated) roof surfaces may apply the green roof surface to the open space calculation, if the green roof surface is accessible by building occupants/users.

### Submittals

- Provide a copy of the local zoning requirements highlighting the criteria for open space. Provide the LEED Letter Template, signed by the civil engineer or responsible party, demonstrating and declaring that the open space exceeds the local zoning open space requirement for the site by 25%.
- For areas with no local zoning requirements (e.g., some university campuses and military bases), designate open space area adjacent to the building that is equal to the building footprint. Provide a letter from the property owner stating that the open space will be conserved for the life of the building.

*If an audit of this Credit is requested during the certification process:*

- Provide highlighted site drawings with area calculations demonstrating that the project open space exceeds the local zoning open space requirement for the site by 25%.
- For areas with no local zoning requirements (e.g., university campuses, military bases), provide site plans highlighting the designated open space area adjacent to the building that is equal to the building footprint.

### Potential Technologies & Strategies

Perform a site survey to identify site elements and adopt a master plan for development of the project site. Select a suitable building location and design the building with a minimal footprint to minimize site disruption. Strategies include stacking the building program, tuck-under parking and sharing facilities with neighbours. Establish clearly marked construction boundaries to minimize disturbance of existing and restore previously degraded areas to their natural state.



## Heat Island Effect: Non-Roof

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SS	EA	MR	EQ	ID
Credit 7.1				

### Intent

Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

### Requirements

Provide shade (within 5 years) and/or use light-coloured/high-albedo materials (Solar Reflectance Index (SRI) of at least 29) and/or open grid pavement for at least 50% of the site's non-roof impervious surfaces, including parking lots, walkways, plazas, etc.;

OR

Place a minimum of 50% of parking spaces underground or covered by structured parking (i.e., minimum 2 level parking garage) or covered by a building.

### Submittals

Provide the LEED Letter Template, signed by the architect or responsible party, showing SRI of paving materials and referencing the scaled site plan that shows paved and landscaped areas (list species) and the building footprint, and declaring that:

- A minimum of 50% of non-roof impervious surfaces areas are constructed with high-albedo materials and/or open grid pavement and/or will be shaded within five years

OR

- A minimum of 50% of parking spaces have been placed underground (defined as underground, under parking deck, or under building).

AND (For either compliance path)

- Provide an optional narrative to describe any special circumstances or non-standard compliance paths taken by the project.

*If an audit of this Credit is requested during the certification process:*

- Provide drawings highlighting all non-roof impervious surfaces and portions of these surfaces that will be shaded at noon on June 21st within five years. Include calculations demonstrating that a minimum of 50% of non-roof impervious surfaces areas will be shaded within five years and/or are constructed with high-albedo materials and/or open-grid pavement.

AND

- Provide specifications and cut sheets for high-albedo materials applied to non-roof impervious surfaces highlighting reflectance and emittance (to calculate SRI –OR- the actual SRI –OR- the default SRI value from Table 1) of the installed materials.

OR

- Provide the total number of parking spaces on-site and the total number of covered spaces on-site.

<b>SS</b>	<b>EA</b>	<b>MR</b>	<b>EQ</b>	<b>ID</b>
<b>Credit 7.1</b>				

**Table 1: Solar Reflectance Index (SRI) for Standard Paving Materials**

<b>Material</b>	<b>Emissivity</b>	<b>Reflectance</b>	<b>SRI</b>
<u>Typical New Gray Concrete</u>	<u>0.9</u>	<u>0.35</u>	<u>35</u>
<u>Typical Weathered* Gray Concrete</u>	<u>0.9</u>	<u>0.2</u>	<u>19</u>
<u>Typical New White Concrete</u>	<u>0.9</u>	<u>0.7</u>	<u>86</u>
<u>Typical Weathered* White Concrete</u>	<u>0.9</u>	<u>0.4</u>	<u>45</u>
<u>New Asphalt</u>	<u>0.9</u>	<u>0.05</u>	<u>0</u>
<u>Weathered Asphalt</u>	<u>0.9</u>	<u>0.1</u>	<u>6</u>

*\*Reflectance of surfaces can be maintained with cleaning. Typical pressure washing of cementitious materials can restore close to original value. Weathered values are based on no cleaning.*

### **Potential Technologies & Strategies**

Shade constructed surfaces on the site with landscape features and minimize the overall building footprint. Consider replacing constructed surfaces (i.e. roof, roads, sidewalks, etc.) with vegetated surfaces such as garden roofs and open grid paving or specify high-albedo materials to reduce heat absorption.

## Heat Island Effect: Roof

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SS	EA	MR	EQ	ID
<b>Credit 7.2</b>				

### Intent

Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

### Requirements

Use roofing materials having a Solar Reflectance Index (SRI) equal to or greater than the values in the table below for a minimum of 75% of the roof surface;

Roof Type	Slope	SRI
<u>Low-sloped Roof</u>	<u>≤ 2:12</u>	<u>78</u>
<u>Steep-sloped Roof</u>	<u>&gt; 2:12</u>	<u>29</u>

OR

Install a “green” (vegetated) roof for at least 50% of the roof area. Combinations of high-albedo and vegetated roof can be used provided that the combination of areas is as follows: (Area of SRI Roof/0.75) + (Area of Vegetated Roof/0.5) ≥ Total Roof Area

### Submittals

- Provide copies of the project’s roof drawings to highlight the location of specific roof materials and/or green roof systems.

AND

- Provide an optional narrative to describe any special circumstances or non-standard compliance paths taken by the project.

AND

- Provide the LEED Letter Template, signed by the architect or responsible party, referencing the building plan and declaring that the roofing materials comply with the SRI requirements. Demonstrate that 75% of the total roof area is covered with high-albedo materials.

OR

- Provide the LEED Letter Template, signed by the architect or responsible party, referencing the building plan and demonstrating that the combination of roof areas satisfies the equation:

$$\text{(Area of SRI Roof/0.75) + (Area of Vegetated Roof/0.5) ≥ Total Roof Area}$$

*If an audit of this Credit is requested during the certification process:*

- Provide specifications and cut sheets highlighting reflectance and emittance, or SRI, of roofing materials. Include area calculations demonstrating that the compliant roofing materials cover a minimum of 75% of the total roof area.

OR

SS	EA	MR	EQ	ID
<b>Credit 7.2</b>				

- Provide specifications and cut sheets, or at least 4 photographs, highlighting a green vegetated roof system. Include area calculations demonstrating that the roof system covers a minimum of 50% of the total roof area.

AND

- Provide specifications and cut sheets highlighting reflectance and emittance, or SRI, of roofing materials that collectively with the green vegetated roof system meet the Credit requirement. Include area calculations demonstrating that the combined roof system satisfies the equation:  

$$\text{(Area of SRI Roof/0.75) + (Area of Vegetated Roof/0.5) } \geq \text{Total Roof Area}$$

### **Potential Technologies & Strategies**

Consider installing high-albedo and vegetated roofs to reduce heat absorption. SRI is calculated according to ASTM E 1980. Reflectance is measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance is measured according to ASTM E 408 or ASTM C 1371. Product information is available from the Cool Roof Rating Council website, at [www.coolroofs.org](http://www.coolroofs.org).

## Light Pollution Reduction

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SS	EA	MR	EQ	ID
<b>Credit 8</b>				

### Intent

Minimize light trespass from the building and site, improve night sky access, improve nighttime visibility through glare reduction and reduce development impact on nocturnal environments.

### Requirements

#### FOR INTERIOR LIGHTING

The angle of maximum candela from each interior luminaire as located in the building shall intersect opaque building interior surfaces and not exit out through the windows.

OR

All non-emergency interior lighting shall be automatically controlled to turn off during non-business hours. Provide manual override capability for after hours use.

AND

#### FOR EXTERIOR LIGHTING

Only light areas as required for safety and comfort. Do not exceed 80% of the lighting power densities for exterior areas and 50% for building facades and landscape features as defined in ASHRAE/IESNA Standard 90.1-2004, Exterior Lighting Section, without amendments.

All projects shall be classified under one of the following zones, as defined in IESNA RP-33, and shall follow all of the requirements for that specific zone:

#### **LZ1 – Dark (Park and Rural Settings)**

Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.11 horizontal and vertical lux (0.01 horizontal and vertical footcandles) at the site boundary and beyond. Document that 0% of the total initial designed fixture lumens are emitted at an angle of 90 degrees or higher from nadir (straight down).

#### **LZ2 – Low (Residential Areas)**

Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 1.1 horizontal and vertical lux (0.10 horizontal and vertical footcandles) at the site boundary and no greater than 0.11 horizontal lux (0.01 horizontal footcandles) 3 metres (10 feet) beyond the site boundary. Document that no more than 2% of the total initial designed fixture lumens are emitted at an angle of 90 degrees or higher from nadir (straight down). For site boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the site boundary.

#### **LZ3 – Medium (Commercial/Industrial, High-Density Residential)**

Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 2.2 horizontal and vertical lux (0.20 horizontal and vertical footcandles) at the site boundary and no greater than 0.11 horizontal lux (0.01 horizontal footcandles) 4.6 metres (15 feet) beyond the

SS	EA	MR	EQ	ID
<b>Credit 8</b>				

site. Document that no more than 5% of the total initial designed fixture lumens are emitted at an angle of 90 degrees or higher from nadir (straight down). For site boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the site boundary.

**LZ4 – High (Major City Centres, Entertainment Districts)**

Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 6.5 horizontal and vertical lux (0.60 horizontal and vertical footcandles) at the site boundary and no greater than 0.11 horizontal lux (0.01 horizontal footcandles) 4.6 metres (15 feet) beyond the site. Document that no more than 10% of the total initial designed site lumens are emitted at an angle of 90 degrees or higher from nadir (straight down). For site boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the site boundary.

**Submittals**

- Provide the LEED Letter Template, signed by a lighting designer or an appropriate party, with the following information:

**For Interior Lighting**

- Confirm that the interior lighting design has been evaluated to ensure that the maximum candela from each interior luminaire intersects opaque interior surfaces and does not exit through windows.

OR

- Confirm that automatic controls have been installed to turn off interior lighting.

AND

**For Projects with No Exterior Lighting**

- Confirm that no exterior lighting has been installed.

OR

**For Projects with Exterior Lighting**

- Complete the Lighting Power Density tables on the Letter Template for both exterior site lighting and façade/landscape lighting.
- Confirm the site zone classification for the project.
- Complete the Site Lumen Calculation on the Letter Template.

*If an audit of this Credit is requested during the certification process:*

- Provide a brief exterior lighting design narrative that includes specific information regarding the light trespass analysis conducted to determine compliance. Please provide any additional comments or notes regarding special circumstances or considerations regarding the project’s credit approach.
- Provide copies of the project lighting drawings (interior and site) to document the location and type of fixtures installed. Interior drawings should clearly show exterior building surfaces to confirm that the maximum candela from interior fixtures does not intersect transparent or translucent building surfaces.

**For Projects with Exterior Lighting:**

- Provide night photographs of all building elevations and its site with exterior lighting on.

<b>SS</b>	<b>EA</b>	<b>MR</b>	<b>EQ</b>	<b>ID</b>
<b>Credit 8</b>				

**Potential Technologies & Strategies**

Adopt site lighting criteria to maintain safe light levels while avoiding off-site lighting and night sky pollution. Minimize site lighting where possible and model the site lighting using a computer model. Technologies to reduce light pollution include full cutoff luminaires, low-reflectance surfaces and low-angle spotlights.

SS	EA	MR	EQ	ID
Credit 2.1				

## Renewable Energy: 5%

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### Intent

Encourage and recognize increasing levels of on-site renewable energy self-supply in order to reduce environmental impacts associated with fossil fuel energy use.

### Requirements

Supply at least 5% of the building's total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.

### Submittals

- Provide the LEED Letter Template, signed by the architect, owner or responsible party, declaring that at least 5% of the building's energy is provided by on-site renewable energy.
- Include a narrative describing on-site renewable energy systems installed in the building and calculations demonstrating that at least 5% of total energy costs are supplied by the renewable energy system(s).

### Potential Technologies & Strategies

Assess the project for non-polluting and renewable energy potential including solar, wind, geothermal (heat or electricity generated from steam or high-temperature hot water released from the Earth – not ground-source heat-pumps), low-impact hydro, biomass, bio-gas, and solar thermal (heating of gas or liquid circulating through a solar collector) strategies. When applying these strategies, take advantage of net metering with the local utility.



## Renewable Energy: 10%

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SS	EA	MR	EQ	ID
<b>Credit 2.2</b>				

### Intent

Encourage and recognize increasing levels of on-site renewable energy self-supply in order to reduce environmental impacts associated with fossil fuel energy use.

### Requirements

Supply at least 10% of the building's total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.

### Submittals

- Provide the LEED Letter Template, signed by the architect, owner or responsible party, declaring that at least 10% of the building's energy is provided by on-site renewable energy.
- Include a narrative describing on-site renewable energy systems installed in the building and calculations demonstrating that at least 10% of total energy costs are supplied by the renewable energy system(s).

### Potential Technologies & Strategies

Assess the project for non-polluting and renewable energy potential including solar, wind, geothermal (heat or electricity generated from steam or high-temperature hot water released from the Earth – not ground-source heat-pumps), low-impact hydro, biomass, bio-gas, and solar thermal (heating of gas or liquid circulating through a solar collector) strategies. When applying these strategies, take advantage of net metering with the local utility.

SS	EA	MR	EQ	ID
<b>Credit 2.3</b>				

## Renewable Energy: 20%

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### Intent

Encourage and recognize increasing levels of on-site renewable energy self-supply in order to reduce environmental impacts associated with fossil fuel energy use.

### Requirements

Supply at least 20% of the building's total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.

### Submittals

- Provide the LEED Letter Template, signed by the architect, owner or responsible party, declaring that at least 20% of the building's energy is provided by on-site renewable energy.
- Include a narrative describing on-site renewable energy systems installed in the building and calculations demonstrating that at least 20% of total energy costs are supplied by the renewable energy system(s).

### Potential Technologies & Strategies

Assess the project for non-polluting and renewable energy potential including solar, wind, geothermal (heat or electricity generated from steam or high-temperature hot water released from the Earth – not ground-source heat-pumps), low-impact hydro, biomass, bio-gas, and solar thermal (heating of gas or liquid circulating through a solar collector) strategies. When applying these strategies, take advantage of net metering with the local utility.

## Measurement and Verification

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SS	<b>EA</b>	MR	EQ	ID
<b>Credit 5</b>				

### Intent

Provide for the ongoing accountability of building energy and water consumption performance over time.

### Requirements

Develop and implement a Measurement & Verification (M&V) Plan consistent with Option D: Calibrated Simulation (Savings Estimation Method 2), or Option B: Energy Conservation Measure Isolation, as specified in the *International Performance Measurement & Verification Protocol (IPMVP) Volume III: Concepts and Options for Determining Energy Savings in New Construction*, April, 2003.

The energy M&V program shall be supplemented by a water M&V program consistent with the principles of IPMVP Volumes I (2002) and III, utilizing Baseline and projected water use as defined by Water Efficiency Credits 1, 2, and 3.

The M&V period shall cover a period of no less than one year of post-construction occupancy.

### Submittals

- Provide the LEED Letter Template, signed by the licensed engineer or other responsible party, indicating that metering equipment has been installed for each end-use and declaring the option to be followed under IPMVP version 2003.

*If an audit is requested during the certification process:*

- Provide a copy of the M&V plan following IPMVP, 2003 version, including an executive summary.

### Potential Technologies & Strategies

Develop an M&V Plan to evaluate building and/or system energy and water performance. Characterize the building and/or energy systems through energy simulation or engineering analysis. Characterize the building and/or water systems through WE Credits 1-3 as applicable. Install the necessary metering equipment to measure energy and water use. Track performance by comparing predicted performance to actual performance, broken down by component or system as appropriate. Evaluate energy and water efficiency by comparing actual performance to baseline performance.

While the IPMVP describes specific actions for verifying savings associated with energy conservation measures (ECMs) and strategies, this LEED credit expands upon typical IPMVP M&V objectives. M&V activities should not necessarily be confined to energy or water systems where ECMs, energy conservation strategies, or water conservation strategies have been implemented. The IPMVP provides guidance on M&V strategies and their appropriate applications for various situations. These strategies should be used in conjunction with monitoring and trend logging of significant energy and water systems to provide for the ongoing accountability of building energy and water performance.

SS	EA	MR	EQ	ID
<b>Prerequisite 1</b>				

## Storage & Collection of Recyclables

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### Intent

Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.

### Requirements

Provide an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics and metals.

### Submittals

- Provide the LEED Letter Template, signed by the architect or owner, declaring that the area dedicated to recycling is easily accessible and accommodates the building's recycling needs.
- Provide a floorplan showing the area(s) dedicated to recycled material collection and storage, and indicating the path from recycling locations to the building loading dock.

*If an audit is requested during the certification process:*

- Provide at least 4 photographs showing the areas dedicated to the collection and storage of recycled materials.

### Potential Technologies & Strategies

Designate an area for recyclable collection and storage that is appropriately sized and located in a convenient area. Identify local waste handlers and buyers for glass, plastic, office paper, newspaper, cardboard and organic wastes. Instruct occupants on building recycling procedures. Consider employing cardboard balers, aluminum can crushers, recycling chutes and other waste management technologies to further enhance the recycling program.

## Building Reuse: Maintain 75% of Existing Walls, Floors, and Roof

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SS	EA	MR	EQ	ID
<b>Credit 1.1</b>				

### Intent

Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

### Requirements

Maintain at least 75% (based on surface area) of existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing, excluding window assemblies and non-structural roofing material). Hazardous materials that are remediated as a part of the project scope shall be excluded from the calculation of the percentage maintained. If the project includes an addition to an existing building, this credit is not applicable if the square footage of the addition is more than 2 times the square footage of the existing building.

### Submittals

- ❑ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, listing the retained elements and declaring that the credit requirements have been met.

*If an audit is requested during the certification process:*

- ❑ Provide pre-construction and post-construction plan and elevation drawings highlighting reused structural/envelope elements. Include calculations demonstrating that 75% of the structure and shell was reused.

### Potential Technologies & Strategies

Consider reuse of existing buildings, including structure, shell and non-shell elements. Remove elements that pose contamination risk to building occupants and upgrade outdated components such as windows, mechanical systems and plumbing fixtures. Quantify the extent of building reuse.

SS	EA	MR	EQ	ID
Credit 1.2				

## Building Reuse: Maintain 95% of Existing Walls, Floors, and Roof

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### Intent

Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

### Requirements

Maintain an additional 20% (95% total, based on surface area) of existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing, excluding window assemblies and non-structural roofing material). Hazardous materials that are remediated as a part of the project scope shall be excluded from the calculation of the percentage maintained. If the project includes an addition to an existing building, this credit is not applicable if the square footage of the addition is more than 2 times the square footage of the existing building.

### Submittals

- Provide the LEED Letter Template, signed by the architect, owner or other responsible party, listing the retained elements and declaring that the credit requirements have been met.

*If an audit is requested during the certification process:*

- Provide pre-construction and post-construction plan and elevation drawings highlighting reused structural/envelope elements. Include calculations demonstrating that at least 95% of the structure and shell was reused.

### Potential Technologies & Strategies

Consider reuse of existing buildings, including structure, shell and non-shell elements. Remove elements that pose contamination risk to building occupants and upgrade outdated components such as windows, mechanical systems and plumbing fixtures. Quantify the extent of building reuse.

## Building Reuse: Maintain 50% of Interior Non-Structural Elements

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SS	EA	MR	EQ	ID
<b>Credit 1.3</b>				

### Intent

Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

### Requirements

Maintain at least 50% (by area) of existing interior non-structural elements (interior walls, doors, floor coverings, ceiling systems and built-in casework) in the completed building (including additions). If the project includes an addition to an existing building, this credit is not applicable if the square footage of the addition is more than 2 times the square footage of the existing building.

### Submittals

- Provide the LEED Letter Template, signed by the architect, owner or other responsible party, demonstrating the retained elements and declaring that the credit requirements have been met.

*If an audit is requested during the certification process:*

- Provide pre-construction and post-construction drawings highlighting reused interior walls, floor coverings and ceilings.
- Include calculations demonstrating that 50% of the non-structural components were reused.

### Potential Technologies & Strategies

Consider reuse of existing buildings, including structure, shell and non-shell elements. Remove elements that pose contamination risk to building occupants and upgrade outdated components such as windows, mechanical systems and plumbing fixtures. Quantify the extent of building reuse.

SS	EA	MR	EQ	ID
Credit 2.1				

## Construction Waste Management: Divert 50% From Landfill

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### Intent

Divert construction, demolition and land clearing debris from landfill disposal. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites.

### Requirements

Develop and implement a waste management plan, quantifying material diversion goals. Recycle and/or salvage at least 50% of construction, demolition and land clearing waste. Calculations can be done by weight or volume, but must be consistent throughout.

### Submittals

- Provide the LEED Letter Template, signed by the architect, owner or other responsible party, tabulating the total waste material, quantities diverted and the means by which diverted, and declaring that the credit requirements have been met.

*If an audit is requested during the certification process:*

- Provide a list of the projects' waste management firms or other waste receivers, and document the amounts and types of waste received by each, by providing waybills or letters from waste receivers that indicate amounts recycled, salvaged or landfilled.

### Potential Technologies & Strategies

Establish goals for landfill diversion and adopt a construction waste management plan to achieve these goals. Consider recycling land clearing debris, cardboard, metal, brick, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area on the construction site for recycling and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle designated materials. Note that salvage may include donation of materials to charitable organizations such as Habitat for Humanity.



## Construction Waste Management: Divert 75% From Landfill

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SS	EA	MR	EQ	ID
<b>Credit 2.2</b>				

### Intent

Divert construction, demolition and land clearing debris from landfill disposal. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites.

### Requirements

Develop and implement a waste management plan, quantifying material diversion goals. Recycle and/or salvage an additional 25% (75% total) of construction, demolition and land clearing waste. Calculations can be done by weight or volume, but must be consistent throughout.

### Submittals

- ❑ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, tabulating the total waste material, quantities diverted and the means by which diverted, and declaring that the credit requirements have been met.

*If an audit is requested during the certification process:*

- ❑ Provide a list of the projects' waste management firms or other waste receivers, and document the amounts and types of waste received by each, by providing waybills or letters from waste receivers that indicate amounts recycled, salvaged or landfilled.

### Potential Technologies & Strategies

Establish goals for landfill diversion and adopt a construction waste management plan to achieve these goals. Consider recycling land clearing debris, cardboard, metal, brick, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area on the construction site for recycling and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle designated materials. Note that salvage may include donation of materials to charitable organizations such as Habitat for Humanity.

SS	EA	MR	EQ	ID
Credit 3.1				

## Resource Reuse: 5%

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### Intent

Reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources.

### Requirements

Use salvaged, refurbished or reused materials, products and furnishings for at least 5% of the total cost of building materials.

### Submittals

- Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the credit requirements have been met and listing each material or product used to meet the credit. Include details demonstrating that the project incorporates the required percentage of reused materials and products and showing their costs and the total cost of materials for the project.

*If an audit is requested during the certification process:*

- Provide specifications and contractor submittals highlighting salvaged and refurbished materials used on the project.
- Provide statements from suppliers stating the salvaged or refurbished status of materials contributing to this credit and providing evidence for cost estimates (e.g., insurance statements, appraiser estimates, catalogue listings of equivalent products, etc.).

### Potential Technologies & Strategies

Identify opportunities to incorporate salvaged materials into building design and research potential material suppliers. Consider salvaged materials such as beams and posts, flooring, paneling, doors and frames, cabinetry and furniture, brick and decorative items.

## Resource Reuse: 10%

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SS	EA	MR	EQ	ID
<b>Credit 3.2</b>				

### Intent

Reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources.

### Requirements

Use salvaged, refurbished or reused materials, products and furnishings for at least 10% of the total cost of building materials.

### Submittals

- Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the credit requirements have been met and listing each material or product used to meet the credit. Include details demonstrating that the project incorporates the required percentage of reused materials and products and showing their costs and the total cost of materials for the project.

*If an audit is requested during the certification process:*

- Provide specifications and contractor submittals highlighting salvaged and refurbished materials used on the project.
- Provide statements from suppliers stating the salvaged or refurbished status of materials contributing to this credit and providing evidence for cost estimates (e.g., insurance statements, appraiser estimates, catalogue listings of equivalent products, etc.).

### Potential Technologies & Strategies

Identify opportunities to incorporate salvaged materials into building design and research potential material suppliers. Consider salvaged materials such as beams and posts, flooring, paneling, doors and frames, cabinetry and furniture, brick and decorative items.

SS	EA	MR	EQ	ID
<b>Credit 4.1</b>				

## Recycled Content: 7.5% (Post-Consumer + ½ Pre-Consumer)

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### Intent

Increase demand for building products that incorporate recycled content materials, therefore reducing impacts resulting from extraction and processing of new virgin materials and by-passing energy and greenhouse gas intensive industrial and manufacturing processes.

### Requirements

Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 7.5% of the total value of the materials in the project.

The value of the recycled content portion of a material or furnishing shall be determined by dividing the weight of recycled content in the item by the total weight of all material in the item, then multiplying the resulting percentage by the total cost of the item.

Mechanical and electrical components shall not be included in this calculation. Recycled content materials shall be defined in accordance with the Federal Trade Commission document, Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e), available at [www.ftc.gov/bcp/grnrule/guides980427.htm](http://www.ftc.gov/bcp/grnrule/guides980427.htm).

### Submittals

- Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the Credit requirements have been met and listing the recycled content products used. Include details demonstrating that the project incorporates the required percentage of recycled content materials and products and showing their cost and percentage(s) of post-consumer and/ or pre-consumer content, and the total cost of all materials for the project.
- If *Supplementary Cementing Materials* (SCMs) are used as part of the percentage recycled content, a letter signed by the concrete supplier/ manufacturer or professional engineer must be submitted that certifies the reduction in Portland cement from **Base Mix** to **Actual SCM Mix** (as a percentage). This can be provided as a total reduction in Portland cement for all the concrete used on the project.

*If an audit is requested during the certification process:*

- Provide specifications and contractor submittals highlighting recycled content materials installed.
- Provide cut sheets, product literature or other documentation, such as letters from manufacturers, that clearly indicate percentage by weight of post-consumer and/or pre-consumer recycled content for each recycled material installed.

## Potential Technologies & Strategies

Establish a project goal for recycled content materials and identify material suppliers that can achieve this goal. During construction, ensure that the specified recycled content materials are installed and quantify the total percentage of recycled content materials installed.

SS	EA	<b>MR</b>	EQ	ID
<b>Credit 4.1</b>				



SS	EA	MR	EQ	ID
<b>Credit 4.2</b>				

## Recycled Content: 15% (Post-Consumer + ½ Pre-Consumer)

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### Intent

Increase demand for building products that incorporate recycled content materials, therefore reducing impacts resulting from extraction and processing of new virgin materials and by-passing energy and greenhouse gas intensive industrial and manufacturing processes.

### Requirements

Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 15% of the total value of the materials in the project.

The value of the recycled content portion of a material or furnishing shall be determined by dividing the weight of recycled content in the item by the total weight of all material in the item, then multiplying the resulting percentage by the total cost of the item.

Mechanical and electrical components shall not be included in this calculation. Recycled content materials shall be defined in accordance with the Federal Trade Commission document, Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e), available at [www.ftc.gov/bcp/grnrule/guides980427.htm](http://www.ftc.gov/bcp/grnrule/guides980427.htm).

### Submittals

- Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the Credit requirements have been met and listing the recycled content products used. Include details demonstrating that the project incorporates the required percentage of recycled content materials and products and showing their cost and percentage(s) of post-consumer and/ or pre-consumer content, and the total cost of all materials for the project.
- If *Supplementary Cementing Materials* (SCMs) are used as part of the percentage recycled content, a letter signed by the concrete supplier/ manufacturer or professional engineer must be submitted that certifies the reduction in Portland cement from **Base Mix** to **Actual SCM Mix** (as a percentage). This can be provided as a total reduction in Portland cement for all the concrete used on the project.

*If an audit is requested during the certification process:*

- Provide specifications and contractor submittals highlighting recycled content materials installed.
- Provide cut sheets, product literature or other documentation, such as letters from manufacturers, that clearly indicate percentage by weight of post-consumer and/or pre-consumer recycled content for each recycled material installed.

**Potential Technologies & Strategies**

Establish a project goal for recycled content materials and identify material suppliers that can achieve this goal. During construction, ensure that the specified recycled content materials are installed and quantify the total percentage of recycled content materials installed.

SS	EA	<b>MR</b>	EQ	ID
<b>Credit 4.2</b>				



SS	EA	MR	EQ	ID
<b>Credit 7</b>				

## Certified Wood

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### Intent

Encourage environmentally responsible forest management.

### Requirements

Use a minimum of 50% of wood-based materials and products, certified in accordance with the Forest Stewardship Council's (FSC) Principles and Criteria, for wood building components. These components include, but are not limited to, structural framing and general dimensional framing, flooring, sub-flooring, wood doors and finishes.

Only include materials permanently installed in the project. Temporary construction applications such as bracing, concrete form work and pedestrian barriers are excluded from the calculation. Furniture and other Division 12 items may be included, providing those items are included consistently in MR Credits 3-7.

### Submittals

- ❑ Provide the LEED Letter Template, signed by the architect, owner or responsible party, declaring that the credit requirements have been met and listing the FSC-certified materials and products used. Include calculations demonstrating that the project incorporates the required percentage of FSC-certified materials/products by cost. For each material/product used to meet these requirements, provide the vendor's or manufacturer's Forest Stewardship Council chain-of-custody certificate number.

*If an audit is requested during the certification process:*

- ❑ Provide vendor invoices and/or letters from suppliers for each product installed that clearly demonstrates supplied wood products meet FSC certification requirements. Documentation should include the vendor's chain-of-custody certificate number and identify certified products on an item-by item basis.

### Potential Technologies & Strategies

Establish a project goal for FSC-certified wood products and identify suppliers that can achieve this goal. During construction, ensure that the FSC-certified wood products are installed and quantify the total percentage of FSC-certified wood products installed.



## Durable Building

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SS	EA	MR	EQ	ID
<b>Credit 8</b>				

### Intent

Minimize materials use and construction waste over a building's life resulting from premature failure of the building and its constituent components and assemblies.

### Requirements

Develop and implement a Building Durability Plan, in accordance with the principles in *CSA S478-95 (R2001) - Guideline on Durability in Buildings*, for the components within the scope of the Guideline, for the construction and preoccupancy phases of the building as follows:

- Design and construct the building with the intent that the predicted service life equals or exceeds the design service life established in *Table 2* in *CSA S478-95 (R2001) - Guideline on Durability in Buildings*.
  - Where component and assembly design service lives are shorter than the design service life of the building, design and construct those components and assemblies so that they can be readily replaced, and use a design service life in accordance with *Table 3* in *CSA S478-95 (R2001) - Guideline on Durability in Buildings*, as follows:
    - For components and assemblies whose Categories of Failure are 6, 7 or 8 in *Table 3*, use a design service life equal to the design service life of the building.
    - For components and assemblies whose Categories of Failure are 4 or 5 in *Table 3*, use a design service life equal to at least half of the design service life of the building.
  - Demonstrate the predicted service life of chosen components or assemblies by documenting demonstrated effectiveness, modeling of the deterioration process or by testing in accordance with *Clauses 7.3, 7.4 or 7.5* and by completing *Tables A1, A2 & A3* from *CSA S478-95 (R2001) - Guideline on Durability in Buildings*, or the LEED Canada CaGBC Durable Building Tables, which correspond to *CSA S478 Tables A1, A2 and A3*.
  - Develop and document the quality management program in accordance with the elements identified in Clause 5.3, Elements of Quality Management, CSA S478- 95 (R2001) - Guideline on Durability in Buildings.
  - Document the elements of quality assurance activities (including design and field reviews) carried out in the format contained in *Table 1, Quality Assurance and the Building Process*, of *CSA S478-95 (R2001) - Guideline on Durability in Buildings*.
  - Utilize a qualified building science professional to develop and deliver the Building Durability Plan who:
    - Is employed by a firm with an engineering Certificate of Authorization or an architectural Certificate of Practice;
- AND
- Has experience in performing building science reviews focused on the envelope durability for at least two prior buildings;

AND

SS	EA	MR	EQ	ID
<b>Credit 8</b>				

- One of the following:
  - o Has successfully completed at least 35 hours of instruction in building science courses that address envelope durability within the last 10 years, or
  - o Has a certificate demonstrating building envelope expertise from a building warranty program (e.g., TARION), or
  - o Is independent of the architectural firm of record.

### Submittals

- Provide the LEED Letter Template, with the following declarations:
  - Confirmation that the Building Durability Plan has been developed, signed by the responsible building science professional;
  - Confirmation that the building envelope construction is in general conformance with the design details, co-signed by the building science professional and the general contractor; and,
  - Confirmation that the Building Durability Plan has been endorsed and implemented, signed by building owner.
- Provide documentation of the qualifications of the building science professional as per the requirements.

*If an audit is requested during the certification process:*

- Provide the following documentation to demonstrate Credit requirements are met:
  - A copy of the Building Envelope Design Review Report;
  - A copy of a building envelope field review report by the building science professional, demonstrating review of details at approximately 75% to 100% completion of the building envelope; and,
  - A copy of the Building Durability Plan that includes the completed LEED Canada Durable Building Tables or CSA S478-95 (2001) Tables A1, A2 and A3.

### Potential Technologies & Strategies

Design strategies for building durability that will minimize premature deterioration of the walls and roof, while harmonizing and integrating Architectural, Mechanical, Landscape, and Electrical performance requirements, and meet the needs of the Owner and Contractor. Appropriate technologies and strategies must be appropriate to the region, for example: rain screen walls, overhangs, etc.

## Minimum IAQ Performance

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SS	EA	MR	<b>EQ</b>	ID
<b>Prerequisite 1</b>				

### Intent

Establish minimum indoor air quality (IAQ) performance to enhance indoor air quality in buildings, thus contributing to the comfort and well-being of the occupants.

### Requirements

Meet the minimum requirements of voluntary consensus standard ASHRAE 62.1-2004, Ventilation for Acceptable Indoor Air Quality, and Addenda approved at the time the building was permitted. Mechanical ventilation systems shall be designed using the Ventilation Rate Procedure.

Naturally ventilated buildings shall comply with ASHRAE 62.1-2004 paragraph 5.1.

### Submittals

- Provide the LEED Letter Template, signed by the responsible design professional, declaring that the project meets the minimum requirements of Sections 4 through 7 of ASHRAE 62.1-2004 and all applicable Addenda, and describing the procedure employed in the IAQ analysis (as a minimum, the standard's Ventilation Rate Procedure for mechanical ventilation systems). Ventilation for Acceptable Indoor Air Quality must be met in order to achieve this prerequisite.

*If an audit is requested during the certification process:*

- Submissions for designs using the Ventilation Rate Procedure should include a table of outdoor air flows, including assumptions such as occupancy type, floor area or estimated maximum occupancy, supply air flow rate and ventilation effectiveness, and HVAC system type to each regularly occupied space within the building.
- Submissions for designs using a natural ventilation strategy should include a table including the free, unobstructed openable area of wall and roof openings, the floor area, the percentage ratio of wall and roof openings to floor area, the distance of the space to the nearest openable wall or roof opening, and, for interior spaces not adjacent to the outdoors, the free open area between the adjacent perimeter space and the interior space, for each regularly occupied space within the building. An alternative to such a table would be engineering calculations or a summary of output from a suitable computer model that shows outdoor air flows for each regularly occupied space within the building under peak heating and cooling conditions.

### Potential Technologies & Strategies

Design and construct the building to meet the requirements of Sections 4, 5, 6, and 7 of the referenced standard. See ASHRAE website at <http://www.ashrae.org/> and Standard 62.1 addenda page at <http://www.ashrae.org/template/AssetDetail/assetid/49645>.

SS	EA	MR	EQ	ID
<b>Prerequisite 2</b>				

## Environmental Tobacco Smoke (ETS) Control

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### Intent

Prevent or minimize exposure of building occupants, indoor surfaces, and systems to Environmental Tobacco Smoke (ETS).

### Requirements

Choose one of the following compliance options:

*Option 1 - Prohibit smoking in the building.*

- Prohibit smoking in the building
- Locate any exterior designated smoking areas at least 7.5 metres (25 feet) away from entries, outdoor air intakes and operable windows.

*Option 2 - Establish negative pressure in the rooms with smoking.*

- Prohibit smoking in the building except in designated smoking areas
- Locate any exterior designated smoking areas at least 7.5 metres (25 feet) away from entries, outdoor air intakes and operable windows.
- Provide one or more designated smoking rooms designed to effectively contain, capture and remove ETS from the building. At a minimum, the smoking room must be directly exhausted to the outdoors with no re-circulation of ETS-containing air to the non-smoking area of the building; enclosed with impermeable deck-to-deck partitions; and operated at a negative pressure compared with the surrounding spaces of at least an average of 5Pa (0.02 inches of water gauge) and with a minimum of 1Pa (0.004 inches of water) when the door(s) to the smoking room are closed.
- Performance of the smoking room differential air pressures shall be verified by conducting 15 minutes of measurement, with a minimum of one measurement every 10 seconds, of the differential pressure in the smoking room with respect to each adjacent area and in each adjacent vertical chase with the doors to the smoking room closed. The testing will be conducted with each space configured for worst case conditions of transport of air from the smoking rooms to adjacent spaces.

*Option 3 - Reduce air leakage between rooms with smoking and non-smoking areas in residential buildings.* This option is for residential buildings only.

- Prohibit smoking in all common areas of the building
- Locate any exterior designated smoking areas at least 7.5 metres (25 feet) away from entries, outdoor air intakes and operable windows opening to common areas.
- Minimize uncontrolled pathways for ETS transfer between individual residential units by sealing penetrations in walls, ceilings, and floors in the residential units, and by sealing vertical chases adjacent to the units. In addition, all doors in the residential units leading to common hallways shall be weather-stripped to minimize air leakage into the hallway. Acceptable sealing of residential units shall be demonstrated by blower door test conducted in accordance with ANSI/ASTM-779-99 using the progressive

sampling methodology defined in Chapter 4 (Home Energy Rating Systems (HERS) Required Verification And Diagnostic Testing) of the California Low Rise Residential Alternative Calculation Method Approval Manual Residential units must demonstrate less than 0.875 cm<sup>2</sup> of leakage area per square meter of enclosure area (1.25 in<sup>2</sup>/100ft<sup>2</sup>) at 10 Pa pressure difference.

SS	EA	MR	<b>EQ</b>	ID
<b>Prerequisite 2</b>				

## Submittals

- ❑ For Option 1, provide the LEED Letter Template, signed by the building owner or responsible party, declaring that the building will be operated under a policy prohibiting smoking except in designated areas.
- ❑ For Options 2 and 3, provide the LEED Letter Template, signed by the responsible design professional, declaring and demonstrating that the design criteria described in the credit requirements have been met and performance has been verified using the method described in the Credit requirements.

*If an audit is requested during the certification process:*

- ❑ For Option 1 include a letter signed by the building owner or operator detailing a non-smoking policy compliant with Option 1, or a copy of applicable municipal, regional or provincial regulations or legislation.
- ❑ For Option 2, provide test records of differential pressure performance for designated smoking rooms, including records of differential pressures between each adjacent space or vertical chase; drawings; and a narrative describing how partition openings are sealed, and the independent ventilation systems designed for designated smoking rooms.
- ❑ For Option 3, records of blower door tests conducted in accordance with the referenced standards, for at least 10% of the first 100 dwelling units in the building, and 5% of any additional units. (For example, a 150 unit building would be required to test a total of  $10 + 2.5 = 13$  dwelling units.) Distribution of the tested units should reflect wind and buoyancy conditions experienced by the building, i.e., on different faces and elevations in the building; test records should include the normalized leakage area calculated and test reference pressure for each dwelling unit tested, as well as indoor and outdoor temperatures and windspeeds during the tests. For high-rise buildings constructed during cold outdoor temperatures, summarize measures used to ensure accurate blower door test results.

## Potential Technologies & Strategies

Prohibit smoking in the building or provide negative pressure smoking rooms. For residential buildings, a third option is to provide very tight construction to minimize ETS transfer among dwelling units.

SS	EA	MR	EQ	ID
Credit 1				

## Carbon Dioxide (CO<sub>2</sub>) Monitoring

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### Intent

Provide capacity for indoor air quality (IAQ) monitoring to help sustain long-term occupant comfort and well-being.

### Requirements

Install a permanent carbon dioxide (CO<sub>2</sub>) monitoring system that provides feedback on space ventilation performance to ensure that ventilation systems maintain design minimum ventilation requirements and in a form that affords operational adjustments. Configure all monitoring equipment to generate an alarm if under-ventilation is detected, via either a building automation system alarm to the building operator or via an alarm that alerts building occupants.

Refer to the CO<sub>2</sub> differential for all types of occupancy in accordance with ASHRAE 62.1-2004, Appendix C.

### Submittals

- Provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring and summarizing the installation, operational design and controls/zones for the carbon dioxide monitoring system. For mixed-use buildings, calculate CO<sub>2</sub> levels for each separate activity level and use.

*If an audit is requested during the certification process:*

- Submissions should include drawings, specifications and cut sheets describing the installed carbon dioxide monitoring system. Include a narrative that describes the sequence of operation and control of building ventilation systems with initial control setpoints and operational ranges for control parameters.

### Potential Technologies & Strategies

Design the HVAC system with carbon dioxide monitoring sensors and integrate these sensors with the building automation system (BAS).

## Ventilation Effectiveness

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SS	EA	MR	<b>EQ</b>	ID
<b>Credit 2</b>				

### Intent

Provide for the effective delivery and mixing of supply air to support the safety, comfort and well-being of building occupants.

### Requirements

For mechanically ventilated buildings, design ventilation systems that result in an air change effectiveness ( $E_{ac}$ ) greater than or equal to 0.9 as determined by ASHRAE Standard 129-1997. For naturally ventilated spaces demonstrate a distribution and laminar flow pattern that involves not less than 90% of the room or zone area in the direction of air flow for at least 95% of hours of occupancy.

### Submittals

For mechanically ventilated spaces:

- Provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring that the design achieves air change effectiveness ( $E_{ac}$ ) of 0.9 or greater in each regularly-occupied room type. Complete a table summarizing the air change effectiveness achieved for each room type.

For naturally ventilated spaces:

- Provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring that the design provides effective ventilation in at least 90% of each room or zone area in the direction of airflow for at least 95% of hours of occupancy. Include a table summarizing the airflow simulation results for each zone. Include sketches indicating the airflow pattern for each zone.

*If audit is requested during the certification process:*

For mechanically ventilated spaces:

EITHER

- Provide a report summarizing the results of tracer gas tests of air change effectiveness following ASHRAE Standard 129-1997 for sample spaces representative of the major building occupancies. The report should include the type of tracer gas test(s) used, start and stop times and corresponding trace gas concentrations, supply and exhaust airflow rates, air ages, nominal time constants and air-change effectiveness for each tested space.

OR

- Provide a table summarizing the location of the air inlets and outlets, supply air temperatures in heating and cooling modes, room ventilation effectiveness, and a short narrative justifying the effectiveness value for each room type.

For naturally ventilated spaces:

- Provide a report summarizing airflow (CFD or nodal airflow) simulation results for each regularly-occupied zone type in both heating and cooling modes. The report should include a brief narrative describing system

SS	EA	MR	EQ	ID
<b>Credit 2</b>				

operational modes, graphics showing zone and building airflow patterns with local winds in each cardinal and prevailing direction, and identify the computational fluid dynamics or network airflow modeling program used.

### **Potential Technologies & Strategies**

Design the HVAC system and building envelope to optimize air change effectiveness. Air change effectiveness can be optimized using a variety of ventilation strategies including displacement ventilation, low-velocity ventilation, plug-flow ventilation such as under floor or near floor delivery, and operable windows. Test the air change effectiveness of the building after construction.



## Construction IAQ Management Plan: During Construction

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SS	EA	MR	<b>EQ</b>	ID
<b>Credit 3.1</b>				

### Intent

Prevent indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and building occupants.

### Requirements

Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:

- During construction meet or exceed the recommended Design Approaches of the Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3.
- Protect stored on-site or installed absorptive materials from moisture damage.
- If air handlers must be used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grill, as determined by ASHRAE 52.2-1999.
- Make provisions for inspections of building and HVAC systems for deficiencies that could adversely affect the IAQ (e.g. moisture in HVAC system, water damaged walls, construction debris in ceiling spaces, materials stored near air intakes, etc.), and the correction of any deficiencies found from building inspections.

### Submittals

- Provide the LEED Letter Template, signed by the general contractor or responsible party, declaring that a Construction IAQ Management Plan has been developed and implemented, and listing each air filter used during construction and at the end of construction. Include the MERV value, manufacturer name and model number.

AND

- Provide the LEED Letter Template, signed by the responsible party, verifying that any necessary corrections and/or mitigations resulting from inspections that could adversely affect IAQ have been completed.

AND

- Provide 18 photographs - 6 photographs taken on 3 different occasions during construction - along with identification of the SMACNA approach featured by each photograph, in order to show consistent adherence to the Credit requirements.

SS	EA	MR	<b>EQ</b>	ID
<b>Credit 3.1</b>				

### Potential Technologies & Strategies

Adopt an IAQ management plan to protect the HVAC system during construction, control pollutant sources and interrupt contamination pathways. Sequence the installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile and gypsum wall board.

## Construction IAQ Management Plan: Testing Before Occupancy

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SS	EA	MR	<b>EQ</b>	ID
<b>Credit 3.2</b>				

### Intent

Minimize indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and building occupants.

### Requirements

Develop and implement an Indoor Air Quality (IAQ) Management Plan for the pre-occupancy phase that follows one of the three options below:

#### *Option 1. Building Flush Prior to Occupancy*

Prior to occupancy, and after construction ends and all interior finishes are installed, install new filtration media, and flush-out the building by supplying a total air volume of 4,300 m<sup>3</sup> of outdoor air per m<sup>2</sup> of floor area (14,100 ft<sup>3</sup> of outdoor air per ft<sup>2</sup> of floor area) while maintaining an internal temperature of at least 16C (60F) and, where mechanical cooling is operated, relative humidity no higher than 60%.

#### *Option 2. Building Flush Overlapping with Occupancy*

After construction ends and all interior finishes installed, install new filtration media and flush-out the building by supplying a minimum of 0.76 L/s/m<sup>2</sup> (0.15 cfm/ft<sup>2</sup>) of outside air to all occupied spaces for at least three hours prior to each occupancy; and during occupancy, the greater of 0.76 L/s/m<sup>2</sup> (0.15 cfm/ft<sup>2</sup>) or the design minimum outside air supply, for the duration of the flush-out period. Spaces may only be occupied following delivery of a minimum of 1,075 m<sup>3</sup> of outdoor air per m<sup>2</sup> of floor area (3,530 ft<sup>3</sup> of outdoor air per ft<sup>2</sup> of floor area). Continue the flush-out until a total air volume of 4,300 m<sup>3</sup> of outdoor air per m<sup>2</sup> of floor area (14,100 ft<sup>3</sup> of outdoor air per ft<sup>2</sup> of floor area) has been provided.

#### *Option 3. IAQ Testing Prior to Occupancy*

Conduct baseline IAQ testing, after construction ends and prior to occupancy, using testing protocols consistent with the United States Environmental Protection Agency "Compendium of Methods for the Determination of Air Pollutants in Indoor Air" and demonstrate that the contaminants listed in Table 1 are not exceeded, taking remedial actions and repeating procedure until all requirements have been met.

### Submittals

- If either of the first two compliance option are used, provide the LEED Letter Template, signed by the architect, general contractor or responsible party, describing the building flush-out procedures, including start and stop dates, outdoor airflow volumes and durations, and total volume of flush air. In the event of an audit of this Credit, document the background calculations that demonstrate that the required total air volumes and minimum ventilation rates have been delivered.

SS	EA	MR	EQ	ID
<b>Credit 3.2</b>				

OR

- If the IAQ testing option is used, provide the LEED Letter Template, signed by the environmental consultant, declaring that the referenced standard's IAQ testing protocols have been followed, and provide a copy of IAQ testing results indicating that the air quality testing has been completed and maximum chemical contaminant concentration requirements are not exceeded in the areas tested.

**Table 1:** Maximum Concentration Criteria of IAQ Pollutants

Contaminant	Maximum Concentration
Particulate Matter (PM10)	50 ug/m <sup>3</sup>
Formaldehyde	50 parts per billion
Total Volatile Organic Compounds	500 ug/m <sup>3</sup>
Carbon Monoxide	9 PPM and no greater than 2 PPM
4-Phenylcyclohexene (4-PC) *	6.5 ug/m <sup>3</sup>

\* Required only if carpets with Styrene Butadiene (SB) latex backing material are installed.

### Potential Technologies and Strategies

Following construction and prior to occupancy, conduct baseline IAQ testing as described in the LEED Canada Reference Guide.

Copies of the IAQ testing results should describe the contaminant sampling and analytical methods, the locations and duration of contaminant samples, the field sampling logs sheets and laboratory analytical data and the methods and results utilized to determine that the ventilation system was started at the normal daily start time and operated at the minimum outside air floor rate for the occupied mode through the duration of air testing.

## Low-Emitting Materials: Adhesives & Sealants

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SS	EA	MR	<b>EQ</b>	ID
<b>Credit 4.1</b>				

### Intent

Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants.

### Requirements

The VOC content of adhesives, sealants and sealant primers used must be less than the VOC content limits of the State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168, June 2006.

### Submittals

- Provide the LEED Letter Template, signed by the architect or responsible party, listing the adhesives and sealants used within the weatherproofing system of the building and declaring that they meet the noted requirements. List the adhesives and sealants by application type (as noted in SCAQMD) and the required VOC limit.

*If an audit is requested during the certification process:*

- Provide cut sheets, Material Safety Data sheets (MSDSs), signed attestations or other official literature from manufacturers clearly identifying product emissions rates.

### Potential Technologies & Strategies

Specify low-VOC materials in construction documents. Ensure that VOC limits are clearly stated in each section of the specifications where adhesives and sealants are addressed. Provide product cut sheet, MSDS sheets, signed attestations or other official literature from the manufacturer clearly identifying the emissions limits.

SS	EA	MR	EQ	ID
<b>Credit 4.2</b>				

## Low-Emitting Materials: Paints and Coatings

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### Intent

Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants.

### Requirements

Paints and coatings used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall comply with the following criteria:

- ❑ Architectural paints, coatings and primers applied to interior walls and ceilings: Do not exceed the VOC content limits established in Green Seal Standard GS-11, Paints, First Edition, May 20, 1993.
  - Flats
  - Non-Flats
- ❑ Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates: Do not exceed the VOC content limit established in Green Seal Standard GC-03, Anti-Corrosive Paints, Second Edition, January 7, 1997.
- ❑ Clear wood finishes, floor coatings, stains, and shellacs applied to interior elements: Do not exceed the VOC content limits established in South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect at the time of building permit.
  - Clear wood finishes: varnish, lacquer
  - Floor coatings
  - Sealers: waterproofing sealers, sanding sealers, all other sealers:
  - Shellacs: Clear, pigmented
  - Stains

### Submittals

- ❑ Provide the LEED Letter Template, signed by the architect or responsible party, listing all the interior paints and coatings used in the building that are addressed by Green Seal Standard GS-11, Green Seal Standard GC-03 and the SCAQMD Rule #1113. State that they comply with the VOC and chemical component limits and/or chemical component restrictions of the each standard and state which standard the product applies to.

*If an audit is requested during the certification process:*

- ❑ Provide cut sheets, Material Safety Data sheets (MSDSs), signed attestations or other official literature from manufacturers clearly identifying VOC contents.

## Potential Technologies & Strategies

Specify low-VOC paints and coatings in the construction documents. Ensure that VOC limits are clearly stated in each section of the specification where paints are addressed. Provide product cut sheet, MSD sheets, signed attestations or other official literature from the manufacturer clearly identifying the emission limit.

SS	EA	MR	<b>EQ</b>	ID
<b>Credit 4.2</b>				

SS	EA	MR	EQ	ID
<b>Credit 5</b>				

## Indoor Chemical & Pollutant Source Control

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### Intent

Provide capacity for indoor air quality (IAQ) monitoring to help sustain long-term occupant comfort and well-being.

Minimize exposure of building occupants to potentially hazardous particulates, biological contaminants and chemical pollutants that adversely impact air and water quality.

### Requirements

Design to minimize pollutant cross-contamination of regularly occupied areas:

- Employ permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways.
- Where hazardous gases or chemicals may be present or used (including garages, housekeeping/laundry areas, and copying/printing rooms), provide segregated areas with deck to deck partitions with separate outside exhaust at a rate of at least 9.2 cubic metres per hour per square metre (0.50 cubic feet per minute per square foot), no air re-circulation, and operated at a negative pressure compared with the surrounding spaces of at least an average of 5 Pa (0.02 inches of water gauge) and with a minimum of 1 Pa (0.004 inches of water) when the door(s) to the room(s) are closed.
- Provide containment drains plumbed for appropriate disposal of hazardous liquid wastes in places where water and chemical concentrate mixing occurs for maintenance or laboratory purposes.
- Replace all filtration media immediately prior to occupancy. Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13, as determined by ASHRAE 52.2-1999 for media installed at the end of construction.

### Submittals

- ❑ Provide the LEED Letter Template, signed by the architect or responsible party, declaring that:
  - Permanent entryway systems (grilles, grates, etc.) to capture dirt, particulates, etc. are provided at all high volume entryways.
  - Chemical use areas and copy rooms have been physically separated with deck-to-deck partitions and self-closing doors; and independent exhaust ventilation has been installed that meets Credit requirements.
  - In spaces where water and chemical concentrate mixing occurs, drains are plumbed for environmentally appropriate disposal of liquid waste, as determined by applicable regulations and standards.

*If an audit is requested during the certification process:*

- ❑ Provide annotated photographs of entryway systems, chemical use areas, copy rooms and containment drains/sinks for disposal of hazardous liquid wastes.



- ❑ Provide mechanical plans that show independent exhaust ventilation for all chemical use and copy rooms.
- ❑ Provide a schedule listing filtration media installed prior to occupancy, including its MERV value. Provide an approved shop drawing of each type of filtration media listed in the schedule.

SS	EA	MR	<b>EQ</b>	ID
<b>Credit 5</b>				

### **Potential Technologies & Strategies**

Design separate exhaust and plumbing systems for rooms with contaminants to achieve physical isolation from the rest of the building. Install permanent architectural entryway systems such as grills or grates to prevent occupant-borne contaminants from entering the building.

SS	EA	MR	EQ	ID
Credit 7.1				

## Thermal Comfort: Compliance with ASHRAE 55-2004

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### Intent

Provide a thermally comfortable environment that supports the productivity and well-being of building occupants.

### Requirements

Comply with ASHRAE Standard 55-2004, Thermal Comfort Conditions for Human Occupancy.

### Submittals

- Provide the LEED Letter Template, signed by the engineer or responsible party, declaring that the project complies with ASHRAE Standard 55-2004.

*If an audit is requested during the certification process:*

- Provide documentation of compliance per the standard as described in Section 6.1.1-Documentation, including calculations of operative temperature for radiantly conditioned spaces.

## Daylight and Views: Views for 90% of Space

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SS	EA	MR	<b>EQ</b>	ID
<b>Credit 8.2</b>				

### Intent

Provide for the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

### Requirements

Achieve direct line of sight to the outdoor environment via vision glazing between 0.76 m (2'6") and 2.3 m (7'6") above finish floor for building occupants in 90% of all regularly occupied areas. Areas directly connected to perimeter windows must have a glazing-to-floor area ratio of at least 0.07. Determine the area with direct line of sight by totalling the regularly occupied square footage that meets the following criteria:

- In plan view, the area is within sight lines drawn from perimeter vision glazing.
- In section view, a direct sight line can be drawn from the area to perimeter vision glazing at a recommended height of 1.1 m. (42"), representing the average seated height, or at an otherwise appropriate height as determined by the design team.

Line of sight may be drawn through interior glazing. For private offices, the entire square footage of the office can be counted if 75% or more of the area has direct line of sight to perimeter vision glazing. In all other cases, if the view area of any applicable room exceeds 90%, the entire square footage of the room can be counted.

### Submittals

- Provide the LEED Letter Template declaring that the building occupants in 90% of regularly occupied areas will have direct lines of site to perimeter glazing, with calculations that note actual glazing-to-floor area ratios for perimeter windows. Provide floor plan drawings highlighting areas in non perimeter zones with a direct line of sight to vision glazing in a perimeter window that complies with the requirements.

*If an audit of this Credit is requested during the certification process:*

- Provide section drawings for each typical window and wall height condition showing the direct line of sight for a seated occupant in non-perimeter areas.

### Potential Technologies & Strategies

Design the building to maximize daylight and view opportunities. Strategies to consider include lower partition heights, interior shading devices, interior glazing, and automatic photocell-based controls.

SS	EA	MR	EQ	<b>ID</b>
<b>Credit 1</b>				

## Innovation in Design

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### Intent

To provide design teams and projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.

### Requirements

- Credit 1.1 (1 point) Identify the intent of the proposed innovation Credit, the proposed requirement for compliance, the proposed submittals to demonstrate compliance, and the design approach (strategies) that might be used to meet the requirements.
- Credit 1.2 (1 point) Same as Credit 1.1
- Credit 1.3 (1 point) Same as Credit 1.1
- Credit 1.4 (1 point) Same as Credit 1.1

### Submittals

- Provide the LEED letter Template signed by the appropriate individual and a narrative of the proposed ID credit including intent, requirements and submittals.

#### AND

- If Innovation in Design (ID) credit is based on Exemplarily Performance of a LEED Canada-NC credit provide all audit material required of that credit (Note: in most cases this will be counted as one of the six credits selected for audit).

#### OR

- If ID credit is based on achievement of a LEED credit from another LEED rating system, provide the submittal information required for that credit.

#### OR

- For all other cases, provide a detailed narrative (approximately 1 page) describing the project's approach to achievement of this credit. This narrative should include a description of the environmental benefits of the credit proposal and include calculations quantifying the benefit. Provide copies of technical information (e.g., shop drawings, manufacturer's literature), photographs of the installation and supporting research, articles or letters as to the environmental benefit of the proposed credit.

### Potential Technologies & Strategies

Substantially exceed a LEED performance credit such as energy performance or water efficiency. Apply strategies or measures that are not covered by LEED such as acoustic performance, education of occupants, community development or lifecycle analysis of material choices.

NOTES:

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