



# LEED

GREEN BUILDING RATING SYSTEM

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## Green Building Rating System

LEED® Canada

Green Building Rating System  
for Commercial Interiors

Version 1.0



September 2006



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# LEED

## Table of Contents

<b>Acknowledgements</b>	<b>7</b>
<b>Introduction</b>	<b>8</b>
<b>Project Checklist</b>	<b>11</b>
<b>Sustainable Sites</b>	<b>14</b>
Credit 1 Site Selction	14
Credit 2 Development Density and Community Connectivity	18
Credit 3.1 Alternative Transportation, Public Transportation Access	20
Credit 3.2 Alternative Transportation, Bicycle Storage & Changing Rooms	21
Credit 3.3 Alternative Transportation, Parking Availability	22
<b>Water Efficiency</b>	<b>24</b>
Credit 1.1 Water Use Reduction, 20% Reduction	24
Credit 1.2 Water Use Reduction, 30% Reduction	26
<b>Energy &amp; Atmosphere</b>	<b>27</b>
Prerequisite 1 Fundamental Commissioning	27
Prerequisite 2 Minimum Energy Performance	29
Prerequisite 3 CFC Reduction in HVAC&R Equipment	30
Credit 1.1 Optimize Energy Performance, Lighting Power	31
Credit 1.2 Optimize Energy Performance, Lighting Controls	32
Credit 1.3 Optimize Energy Performance, HVAC	33
Credit 1.4 Optimize Energy Performance, Equipment & Appliances	36
Credit 2 Enhanced Commissioning	37
Credit 3 Energy Use, Measurement & Payment Accountability	38
Credit 4 Green Power	40
<b>Materials &amp; Resources</b>	<b>41</b>
Prerequisite 1 Storage and Collection of Recyclables	41
Credit 1.1 Tenant Space, Long-Term Commitment	42
Credit 1.2 Building Reuse, Maintain 40% of Interior Non-Structural Components	43
Credit 1.3 Building Reuse, Maintain 60% of Interior Non-Structural Components	44



# LEED

Credit 2.1	Construction Waste Management, Divert 50% From Landfill	45
Credit 2.2	Construction Waste Management, Divert 75% From Landfill	46
Credit 3.1	Resource Reuse, 5%	47
Credit 3.2	Resource Reuse, 10%	48
Credit 3.3	Resource Reuse, 30% Furniture and Furnishings	49
Credit 4.1	Recycled Content, 10% (post-consumer + 1/2 pre-consumer)	50
Credit 4.2	Recycled Content, 20% (post-consumer + 1/2 pre-consumer)	52
Credit 5.1	Regional Materials, 20% Manufactured Regionally	54
Credit 5.2	Regional Materials, 10% Extracted and Manufactured Regionally	55
Credit 6	Rapidly Renewable Materials	56
Credit 7	Certified Wood	57
<b>Indoor Environmental Quality</b>		<b>58</b>
Prerequisite 1	Minimum IAQ Performance	58
Prerequisite 2	Environmental Tobacco Smoke (ETS) Control	60
Credit 1	Outdoor Air Delivery Monitoring	63
Credit 2	Increased Ventilation	65
Credit 3.1	Construction IAQ Management Plan, During Construction	67
Credit 3.2	Construction IAQ Management Plan, Before Occupancy	68
Credit 4.1	Low-Emitting Materials, Adhesives and Sealants	71
Credit 4.2	Low-Emitting Materials, Paints and Coatings	72
Credit 4.3	Low-Emitting Materials, Carpet Systems	73
Credit 4.4	Low-Emitting Materials, Composite Wood and Laminate Adhesives	74
Credit 4.5	Low-Emitting Materials, Systems Furniture and Seating	75
Credit 5	Indoor Chemical and Pollutant Source Control	77
Credit 6.1	Controllability of Systems, Lighting	79
Credit 6.2	Controllability of Systems, Temperature and Ventilation	80
Credit 7.1	Thermal Comfort, Compliance	81
Credit 7.2	Thermal Comfort, Monitoring	82



# LEED

Credit 8.1	Daylight and Views, Daylight 75% of Spaces	83
Credit 8.2	Daylight and Views, Daylight 90% of Spaces	85
Credit 8.3	Daylight and Views, Views for 90% of Seated Spaces	86
<b>Innovation &amp; Design Process</b>		<b>87</b>
Credit 1	Innovation in Design	87
Credit 2	LEED Accredited Professional	88



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# LEED

## Introduction

Buildings fundamentally impact people's lives and the health of the planet. In Canada, buildings use nearly one-third of our total energy, two-thirds of our electricity, one-eighth of our water, and transform land that provides valuable ecological resources. The Leadership in Energy and Environmental Design (LEED) Rating Systems are aimed at providing authoritative, independent certification of exemplary environmentally-responsible buildings. Since the first LEED Green Building Rating System for New Construction was published in 1999, it has helped professionals across Canada to improve the quality of buildings and to lessen their impact on the environment.

As the green building sector grows exponentially, more and more building professionals, owners, and operators are seeing the benefits of green building and LEED certification. Green design not only makes a positive impact on public health and the environment, it also reduces operating costs, enhances building and organizational marketability, potentially increases occupant productivity, and helps create a sustainable community. LEED fits into this market by providing rating systems that are voluntary, consensus-based, market-driven, based on accepted energy and environmental principles, and balanced between established practices and emerging concepts.

Through use as design guidelines and third-party certification tools, LEED aims to improve occupant well-being, environmental performance and economic returns of buildings using established and innovative practices, standards and technologies. It provides definitions, widely accepted by industry, for what currently constitutes a "green building" or a "green retrofit". LEED Rating Systems consist of an explicit set of environmental performance criteria, organized within five key performance categories: Sustainable Sites; Water Efficiency; Energy and Atmosphere; Materials and Resources, and Indoor Environmental Quality. A sixth category, Innovation and Design Process, rewards exceptional environmental performance or innovation over and above that explicitly covered in the basic LEED Credits.

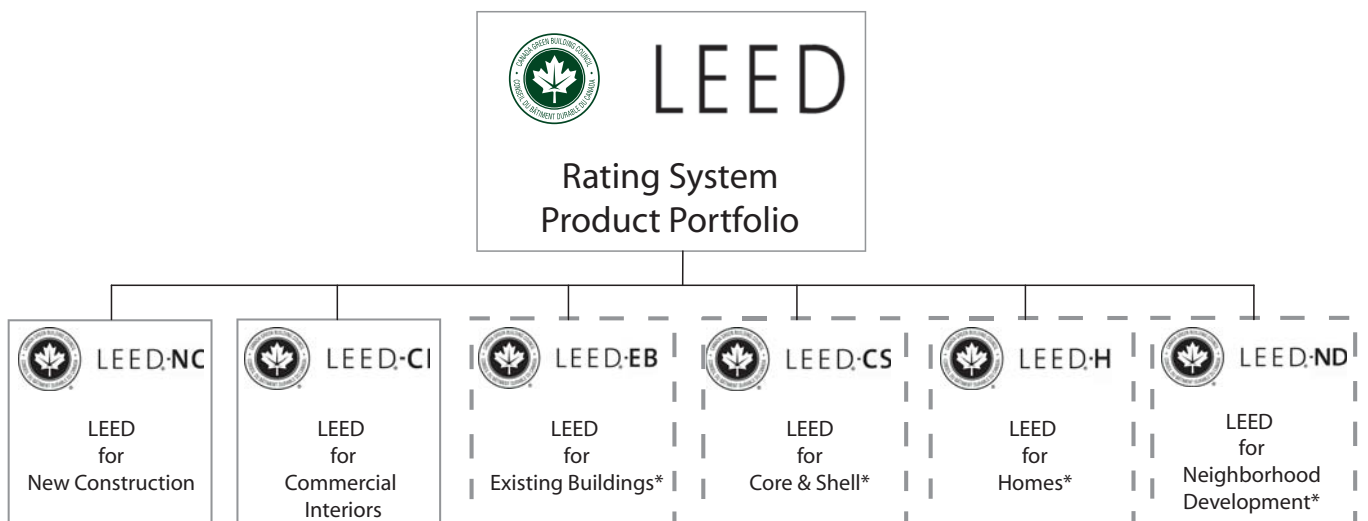
LEED Rating Systems state the basic Intent, Requirements and documentation Submittals that are necessary to achieve each Prerequisite and voluntary Credit. Projects earn points toward certification by meeting or exceeding each Credit's technical Requirements. All Prerequisites must be achieved in order to qualify for Canada Green Building Council certification. Points add up to a final score that relates to one of four possible levels of certification: LEED® CERTIFIED, SILVER, GOLD or PLATINUM. See the LEED Checklist for a summary of credit topics and point values.

A short description of technologies and strategies is included for each Credit to briefly inform those who are unfamiliar with the particular topic. The LEED Canada-CI Reference Guide - the technical companion to the Rating System - provides further background, explanations and instructions, including case studies and sources for further information. The Letter Templates are documents that, when completed, form the initial submittal and declaration by the project teams that the requirements of Prerequisites or Credits have been achieved.

## Canada Green Building Council and the LEED Canada-CI Rating System

The Canada Green Building Council (CaGBC) is a national not-for-profit organization, created to accelerate the design and construction of green buildings and communities across Canada. The Council is a broad-based inclusive coalition of a variety of building stakeholders. The CaGBC has entered into a Licensing Agreement with the U.S. Green Building Council (USGBC) for the exclusive implementation of LEED® Green Building Rating Systems in Canada.

The LEED rating systems are developed by USGBC and CaGBC committees, in adherence with their policies and procedures guiding the development and maintenance of rating systems. LEED Canada for Commercial Interiors (LEED Canada-CI) is only possible due to the generous volunteer efforts of many individuals, and (with its US basis) has been in development for over 5 years. LEED Canada-CI is one of a growing portfolio of rating system products serving specific Canadian market sectors.



*\*Under Development or Consideration as of June 2006*

LEED® Canada-CI 1.0 is a derivative work of Version 2.0 of the USGBC’s LEED® for Commercial Interiors Green Building Rating System. LEED Canada-CI 1.0 and its companion LEED Canada-CI Reference Guide are intended to facilitate the use of the LEED Green Building Rating System in Canada. LEED Canada-CI 1.0 serves two distinct roles:

1. Where appropriate, it references relevant Canadian standards, resource material and case studies.
2. It provides a basis for any jurisdictions in Canada who may be interested in creating Supplements that would provide a further level of refinement and specificity.



# LEED

## **LEED Canada for Commercial Interiors**

The LEED Canada-CI Rating System is applicable to tenant improvements of new or existing office space. However it is important to note that LEED Canada-CI applies to both tenants' and base building owner's work associated with the commercial interiors improvements project.

This Canadian version of LEED-CI includes clarifications considered useful for Canadian projects during creation and review of the USGBC's LEED-CI Version 2.0 Reference Guide. Prerequisites and Credit Intents and Requirements were not changed from the USGBC version; but Submittals for initial certification review and audit submittals are explicitly listed in the Canadian version.

## **Why Certify?**

While LEED Rating Systems can be useful just as tools for building professionals, there are many reasons why LEED project certification can be an asset:

- Be recognized for your commitment to environmental issues in your community, your organization (including stockholders), and your industry;
- Receive third party validation of achievement;
- Qualify for a growing array of municipal, provincial and federal government initiatives;
- Receive marketing exposure through the CaGBC website, Greenbuild conferences, case studies, and media announcements.

## **Certification Process**

Project teams interested in obtaining LEED certification for their project must first register online. Registration during early phases of the project will ensure maximum potential for certification. The CaGBC website, [www.cagbc.org](http://www.cagbc.org), contains important details about the certification review process, schedule and fees. The applicant project must satisfactorily document achievement of all the prerequisites and a minimum number of points. See the LEED Canada-CI project checklist for the number of points required to achieve LEED Canada-CI rating levels.

## **Additional LEED Resources**

Visit the CaGBC website for available tools and support, such as the LEED Canada-CI Reference Guide (essential for all LEED Canada-CI project teams), the LEED Canada-NC Reference Guide technical support via LEED Canada-NC Credit Interpretations, and training workshops. Links to USGBC LEED-CI, LEED-NC and CIR information can also be found on the CaGBC website.

## Project Checklist

### Sustainable Sites 7 Possible Points

<input type="checkbox"/>	<input type="checkbox"/>	Credit 1	Site Selection, Select a LEED Certified Building - OR - Locate the tenant space in a building with following characteristics (up to 3 points):	3
<input type="checkbox"/>	<input type="checkbox"/>	Option 1A	Brownfield Redevelopment	1/2
<input type="checkbox"/>	<input type="checkbox"/>	Option 1B	Stormwater Management, Rate and Quantity	1/2
<input type="checkbox"/>	<input type="checkbox"/>	Option 1C	Stormwater Management, Treatment	1/2
<input type="checkbox"/>	<input type="checkbox"/>	Option 1D	Heat Island Reduction, Non-Roof	1/2
<input type="checkbox"/>	<input type="checkbox"/>	Option 1E	Heat-Island Reduction, Roof	1/2
<input type="checkbox"/>	<input type="checkbox"/>	Option 1F	Light Pollution Reduction	1/2
<input type="checkbox"/>	<input type="checkbox"/>	Option 1G	Water Efficient Irrigation, Reduce by 50%	1/2
<input type="checkbox"/>	<input type="checkbox"/>	Option 1H	Water Efficient Irrigation, No Potable Use or No Irrigation	1/2
<input type="checkbox"/>	<input type="checkbox"/>	Option 1I	Innovative Wastewater Technologies	1/2
<input type="checkbox"/>	<input type="checkbox"/>	Option 1J	Water Use Reduction, 20% or 30% Reduction	1/2 - 1
<input type="checkbox"/>	<input type="checkbox"/>	Option 1K	Onsite Renewable Energy	1/2 - 1
<input type="checkbox"/>	<input type="checkbox"/>	Option 1L	Other Quantifiable Environmental Performance	1/2 - 3
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2	Development Density and Community Connectivity	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.1	Alternative Transportation, Public Transportation Access	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.3	Alternative Transportation, Parking Availability	1

### Water Efficiency 2 Possible Points

<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.1	Water Use Reduction, 20% Reduction	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.2	Water Use Reduction, 30% Reduction	1

### Energy & Atmosphere 12 Possible Points

<input type="checkbox"/>	<input type="checkbox"/>	Prereq 1	Fundamental Commissioning	Required
<input type="checkbox"/>	<input type="checkbox"/>	Prereq 2	Minimum Energy Performance	Required
<input type="checkbox"/>	<input type="checkbox"/>	Prereq 3	CFC Reduction in HVAC&R Equipment	Required
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.1	Optimize Energy Performance, Lighting Power	3
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.2	Optimize Energy Performance, Lighting Controls	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.3	Optimize Energy Performance, HVAC	2



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<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.4	Optimize Energy Performance, Equipment & Appliances	2
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2	Enhanced Commissioning	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3	Energy Use, Measurement & Payment Accountability	2
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4	Green Power	1

## Materials & Resources

**14 Possible Points**

<input type="checkbox"/>	<input type="checkbox"/>	Prereq 1	Storage and Collection of Recyclables	Required
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.1	Tenant Space, Long-Term Commitment	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.2	Building Reuse, Maintain 40% of Interior Non-Structural Components	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.3	Building Reuse, Maintain 60% of Interior Non-Structural Components	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2.1	Construction Waste Management, Divert 50% From Landfill	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2.2	Construction Waste Management, Divert 75% From Landfill	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.1	Resource Reuse, 5%	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.2	Resource Reuse, 10%	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.3	Resource Reuse, 30% Furniture and Furnishings	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.1	Recycled Content, 10% (post-consumer + 1/2 pre-consumer)	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.2	Recycled Content, 20% (post-consumer + 1/2 pre-consumer)	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 5.1	Regional Materials, 20% Manufactured Regionally	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 5.2	Regional Materials, 10% Extracted and Manufactured Regionally	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 6	Rapidly Renewable Materials	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 7	Certified Wood	1

## Indoor Environmental Quality

**17 Possible Points**

<input type="checkbox"/>	<input type="checkbox"/>	Prereq 1	Minimum IAQ Performance	Required
<input type="checkbox"/>	<input type="checkbox"/>	Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
<input type="checkbox"/>	<input type="checkbox"/>	Credit 1	Outdoor Air Delivery Monitoring	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 2	Increased Ventilation	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.1	Construction IAQ Management Plan, During Construction	1
<input type="checkbox"/>	<input type="checkbox"/>	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1



# LEED

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.1	Low-Emitting Materials, Adhesives and Sealants	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.2	Low-Emitting Materials, Paints and Coatings	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.3	Low-Emitting Materials, Carpet Systems	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.4	Low-Emitting Materials, Composite Wood and Laminate Adhesives	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 4.5	Low-Emitting Materials, Systems Furniture and Seating	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 5	Indoor Chemical and Pollutant Source Control	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 6.1	Controllability of Systems, Lighting	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 6.2	Controllability of Systems, Temperature and Ventilation	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 7.1	Thermal Comfort, Compliance	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 7.2	Thermal Comfort, Monitoring	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 8.1	Daylight and Views, Daylight 75% of Spaces	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 8.2	Daylight and Views, Daylight 90% of Spaces	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 8.3	Daylight and Views, Views for 90% of Seated Spaces	1

### **Innovation & Design Process**

### **5 Possible Points**

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.1	Innovation in Design	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.2	Innovation in Design	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.3	Innovation in Design	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 1.4	Innovation in Design	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Credit 2	LEED Accredited Professional	1

### **Project Totals**

### **57 Possible Points**

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Certified</b>	21 – 26 Points
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Silver</b>	27 – 31 Points
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Gold</b>	32 – 41 Points
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Platinum</b>	42 – 57 Points

SS	WE	EA	MR	EQ	ID
Credit 1					

# Sustainable Sites

3 Points

## Site Selection

---

3 points may be earned for locating the tenant space in a LEED certified building,  
OR

up to a total of 3 points may be earned in ½-point increments if the building in which the tenant space is located meets any of the stated requirements. Two ½ points are needed to earn 1 point; no rounding up is permitted. In the case of exceptional performance (for example, exceeding stated thresholds) an additional ½ point may be achieved; however, no single requirement may earn more than 1 point. The requirements below have been gathered from other LEED Rating Systems, and are detailed within the LEED Canada-CI Reference Guide.

### Intent

Encourage tenants to select buildings with best practices systems and employed green strategies.

### Requirements

- Select a LEED certified building

OR

- Locate the tenant space in a building that has in place two or more of the following characteristics at time of submittal:

#### *Option A. Brownfield Redevelopment: (½ point)*

A building developed on a site that has been documented as contaminated by means of an assessment following the CSA Z769 Standard for Phase II Environmental Site Assessments. Effective remediation of site contamination must have been completed to earn this ½ point.

OR

A building located on a site that has been classified as contaminated by a local, provincial or federal government agency. Effective remediation of site contamination must have been completed to earn this ½ point.

#### *Option B. Stormwater Management, Rate and Quantity: (½ point)*

A building that prior to its development had:

Less than or equal to 50% imperviousness and has implemented a stormwater management plan that equals or is less than the pre-developed 1.5 year, 24 hour rate and quantity discharge.

OR

If greater than 50% imperviousness, has implemented a stormwater management plan that reduced pre-developed 1.5 year, 24 hour rate and quantity discharge by 25% of the annual stormwater load falling on the site. (This is based on actual local rainfall unless the actual exceeds the 10-year annual average local rainfall - then use the 10-year annual average.) This mitigation can be through a variety of measures including perviousness of site, stormwater retention ponds, capture of rainwater for reuse or other measures.

### 3 Points

*Option C. Stormwater Management, Treatment: (½ point)*

A building that has in place site stormwater treatment systems designed to remove 80% of the average annual site area Total Suspended Solids (TSS) and 40% of the average annual site area Total Phosphorous (TP).

These values are based on the average annual loadings from all storms less than or equal to the 2-year/24-hour storm. The building must implement and maintain Best Management Practices (BMPs) outlined in Chapter 4, Part 2 (Urban Runoff), of the United States Environmental Protection Agency’s Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, January 1993 (Document No. EPA 840B92002) or the local government’s BMP document, whichever is more stringent.

*Option D. Heat Island Reduction, Non-Roof: (½ point)*

A building that provides shade (or will have within 5 years of landscape installation) and/or uses light-coloured/high-albedo materials with a Solar Reflectance Index (SRI) of at least 30, and/or open grid pavement, that individually or in total equals at least 30% of the site’s non-roof impervious surfaces, which include parking areas, walkways, plazas, fire lanes, etc.,

OR

has placed a minimum of 50% of parking spaces underground or covered by structured parking,

OR

used an open-grid pavement system (less than 50% impervious) for 50% of the parking lot area.

*Option E. Heat Island Reduction, Roof: (½ point)*

A building with roofing having a Solar Reflectance Index (SRI) greater than or equal to the value in *Table 1* for a minimum of 75% of the roof surface;

**Table 1**

Roof Type	Slope	SRI
Low-Sloped Roof	≤ 2:12	78
Steep-Sloped Roof	> 2:12	29

OR

A building that has installed a “green” (vegetated) roof for at least 50% of the roof area;

OR

A building having in combination high SRI roofs and vegetated roofs that satisfy the following area requirement:

$$\text{Total Roof Area} \leq [(\text{Area of SRI roof} \times 1.33) + (\text{Area of vegetated roof} \times 2)]$$

SS	WE	EA	MR	EQ	ID
Credit 1					

**3 Points**

*Option F. Light Pollution Reduction: (½ point)*

A building that meets or provides lower light levels and uniformity ratios than those recommended by the Illuminating Engineering Society of North America (IESNA) *Recommended Practice Manual: Lighting for Exterior Environments* (RP-33-99). The building must have designed the exterior lighting such that all exterior luminaires with more than 1,000 initial lamp lumens are shielded and all luminaires with more than 3,500 initial lamp lumens meet the Full Cutoff IESNA Classification. The maximum candela value of all interior lighting shall fall within the property. Any luminaire within a distance of 2.5 times its mounting height from the property boundary shall have shielding such that no light from that luminaire crosses the property boundary.

*Option G. Water Efficient Irrigation: Reduced Potable Water Consumption: (½ point)*

A building that employs high-efficiency irrigation technology,

OR

uses captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means.

*Option H. Water Efficient Irrigation, No Potable Use or No Irrigation: (½ point in addition to prior requirement)*

A building that uses only captured rain or recycled site water to eliminate all potable water use for site irrigation (except for initial watering to establish plants),

OR

does not have permanent landscaping irrigation systems.

*Option I. Innovative Wastewater Technologies: (½ point)*

A building that reduces the use of municipally provided potable water for building sewage conveyance by a minimum of 50%,

OR

treats 100% of wastewater on-site to tertiary standards.

*Option J. Water Use Reduction, 20% or 30% Reduction: (up to 1 point)*

A building that meets the 20% or 30% reduction in water use requirement for the entire building and has an ongoing plan to require future occupants to comply.

**Table 2**

Water Use Reduction	Points
20%	½
30%	1

*Option K. Onsite Renewable Energy: (up to 1 point)*

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

3 Points

**Table 3**

On-site Renewable Energy as Percent of Total	Points
5%	½
10%	1

*Option L. Other Quantifiable Environmental Performance: (½ point)*

A building that had in place at time of selection other quantifiable environmental performance, for which the requirements may be found in other LEED rating systems.

**Submittals**

- Provide the LEED Letter Template, signed by the architect, interior designer, building owner, engineer or responsible party, declaring compliance with each claimed Requirement based on the applicable standards as defined in the applicable LEED Green Building Rating System.

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

- Audit information requested for each Sustainable Sites Credit 1 option can be found in the Reference Guide.

**Potential Technologies & Strategies**

During the building selection process, give preference to those properties with a demonstrated track record of efficient energy and water use, and/or employing green building strategies that have a track record of high performance. If the selected building is LEED certified, review to the LEED Canada-NC checklist of credits achieved.

1 Point

## Development Density and Community Connectivity

---

### Intent

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

### Requirements

*Option A:*

- Select space in a building that is located in an established, walkable community with a minimum density of 13,800m<sup>2</sup> per hectare (60,000 square feet per acre), two-story downtown development,

*Option B:*

- select space in a building that is located 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,
- the building has pedestrian access to at least 10 of the basic services below within 800 metres (½ mile):

- |                        |                          |  |
|------------------------|--------------------------|--|
| 1. Bank                | 8. Hardware              | 15. Post Office  |
| 2. Place of Worship    | 9. Laundry               | 16. Restaurant   |
| 3. Convenience Grocery | 10. Library              | 17. School   |
| 4. Day Care            | 11. Medical / Dental     | 18. Supermarket  |
| 5. Cleaners            | 12. Senior Care Facility | 19. Commercial Office                                  |
| 6. Fire Station        | 13. Park                 | 20. Community Center                                   |
| 7. Hair Care           | 14. Pharmacy             | 21. Other recognized services evaluated on their merit |

*Note: Greenfield developments and projects that do not use existing infrastructure are not eligible.*

### Submittals

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

AND EITHER:

*Option A:*

- Provide an area plan with the project location highlighted.

*Option B:*

- Provide an area plan highlighting the building location, the residential zone or neighbourhood; label and highlight applicable basic services located within 800 metres (½ mile) of the project space (inclusive of the building selected).

SS	WE	EA	MR	EQ	ID
Credit 2					

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

1 Point

*Option A:*

- Provide calculations that show how development density for both the project and the surrounding area were derived.

*Option B:*

- There are no Audit Requirements for Option B of this Credit.

### **Potential Technologies & Strategies**

During the site selection process, give preference to urban sites with pedestrian access to a variety of services.

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

1 Point

## Alternative Transportation, Public Transportation Access

---

### Intent

Reduce pollution and land development impacts from automobile use.

### Requirements

- Tenant to select building within 800 metres (½ mile) of a commuter rail, light rail or subway station or 400 metres (¼ mile) of two or more public or campus bus lines usable by tenant occupants.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer or other responsible party, declaring that the project building(s) are located within the required proximity to mass transit.
- Provide an area drawing highlighting the building location, the fixed rail stations and bus lines, and indicate the accessible walking distances between them. Include a scale bar for distance measurement.

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

- If achievement of this credit is based in part of the use of private shuttle buses, the project may need to provide documentation of shuttle capacity and schedule demonstrating that it is capable of serving commuting needs of the building population.

### Potential Technologies & Strategies

Perform a transportation survey of potential tenant occupants to identify transportation needs. Choose a building that provides convenient pedestrian access to mass transit.

SS	WE	EA	MR	EQ	ID
Credit 3.2					

## Alternative Transportation, Bicycle Storage & Changing Rooms

---

1 Point

### Intent

Reduce pollution and land development impacts from automobile use.

### Requirements

- Provide secure bicycle storage, with convenient changing/shower facilities within 183 metres (200 yards) of the building for 5% or more of tenant occupants.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer or other responsible party, declaring the distance to the bicycle storage and changing/shower facilities from the building entrance and demonstrating that these facilities can accommodate at least 5% of tenant occupants.

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

- Provide site drawings highlighting locations of bicycle securing apparatus and changing/shower facilities, and the main building entrance.
- Provide 3-10 photographs/sketches of tenant occupants' bicycle storage and cyclist changing/shower facilities.
- Provide calculations demonstrating that these facilities accommodate 5% or more of building occupants in commercial projects.

### Potential Technologies & Strategies

Select a building with transportation amenities such as bicycle racks and changing/shower facilities or add them as part of the tenant fit-out, or consider incorporating bicycle storage, shower, and changing facilities within the fit-up of the space.

SS	WE	EA	MR	EQ	ID
Credit 3.3					

1 Point

## Alternative Transportation, Parking Availability

---

### Intent

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

### Requirements

Case 1: For projects occupying less than 75% of gross building area:

*Option A:*

- Parking spaces provided to tenant shall not exceed minimum number required by local zoning regulations.
- Priority parking for carpools or vanpools will be provided for 5% or more of tenant occupants.

*Option B:*

- No parking will be provided or subsidized for tenant occupants.

Case 2: For projects occupying 75% or over of gross building area:

*Option A:*

- Parking capacity will not exceed minimum local zoning requirements.
- Priority parking for carpools or vanpools will be provided capable of serving 5% of the building occupants.

*Option B:*

- No new parking will be added for rehabilitation projects.
- Preferred parking for carpools or vanpools will be provided capable of serving 5% of the building occupants.

### Submittals

Case 1 and Case 2 Option A:

- Provide the LEED Letter Template, signed by the architect, interior designer or other responsible party, stating any relevant section of local zoning regulation defining parking requirements for tenant's occupancy group and zone and number of priority parking stalls.

Case 1 and Case 2 Options A and B:

- Provide the LEED Letter Template, signed by the architect, interior designer or other responsible party, showing the section of the tenant's lease that indicates parking allocations.

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

Case 1 Option A and Case 2 Option A:

- Provide a copy of the local zoning requirements highlighting the criteria for minimum parking capacity and any relevant zoning calculations.
- Provide calculations which illustrate the parking capacity required for the project.

SS	WE	EA	MR	EQ	ID
Credit 3.3					

1 Point

Case 1 Option A and Case 2 Options A and B:

- Provide a copy of the tenant's lease with information specific to this credit highlighted.
- Provide a copy of a carpooling plan/policy and documentation of how the spaces are designated as reserved for car-pooling (photos, signage).

Case 2 Option B:

- Provide documentation on pre-rehabilitation and post-rehabilitation plans indicating the amount of parking on each, demonstrating that no new parking capacity has been added.

**Potential Technologies & Strategies**

Select a building with minimized car parking capacity and include limited parking inclusions in the lease.

# Water Efficiency

1 Point

Water Use Reduction, 20% Reduction

## Intent

Maximize water efficiency within tenant spaces to reduce the burden on municipal water supply and wastewater systems.

## Requirements

Based on tenant occupancy requirements, employ strategies that in aggregate use 20% less potable water than the water use baseline calculated for the tenant space (not including irrigation) after meeting the Energy Policy Act of 1992 fixture performance requirements listed in *Table 1*.

**Table 1: Baseline Water Fixture Requirements**

Fixture	Minimum Flow Requirement			
Water Closets	6.0	[LPF]	1.6	[GPF]
Urinals	3.8	[LPF]	1.0	[GPF]
Showerheads	9.5	[LPM]*	2.5	[GPM]*
Faucets	8.3	[LPM]*	2.2	[GPM]*
Replacement Aerators	8.3	[LPM]*	2.2	[GPM]*
Metering Faucets	0.95	[L/CY]*	0.25	[G/CY]*

\* At flowing water pressure of 552 kPa or 80 PSI

## Submittals

- Provide the LEED Letter Template, signed by the Mechanical Electrical & Plumbing (MEP) engineer or responsible party, declaring that the project uses 20% less water than the baseline fixture performance requirements listed in *Table 1*.
- Provide the spreadsheet calculation demonstrating that water-consuming fixtures specified for the stated occupancy and use of the tenant reduce occupancy-based potable water consumption by 20% compared to baseline conditions.
- Provide narrative and/or documentation on daily use rates if they differ from standard LEED assumptions.

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

- Provide a narrative describing the installed plumbing systems and any special water supply systems and assumptions (e.g., grey water reclamation, rainwater collection, unusual consumption patterns, etc.)
- Provide highlighted drawings showing any special water supply/collection systems that contribute to water use reduction.
- Provide a schedule of installed water use fixtures and equipment, and approved contractor's shop drawings and product data with water conservation specifications highlighted, confirming LEED Letter Template data.

SS	WE	EA	MR	EQ	ID
Credit 1.1					

**Potential Technologies & Strategies**

Estimate the potable water needs for the tenant space. Use high-efficiency fixtures such as composting toilet systems and waterless urinals, and occupant sensors to reduce the potable water demand.

1 Point

SS	WE	EA	MR	EQ	ID
Credit 1.2					

1 Point  
in addition to  
WE 1.1

## Water Use Reduction, 30% Reduction

---

### Intent

Maximize water efficiency within tenant spaces to reduce the burden on municipal water supply and wastewater systems.

### Requirements

Based on tenant occupancy requirements, employ strategies that in aggregate use 30% less potable water than the water use baseline calculated for the tenant space (not including irrigation) after meeting the Energy Policy Act of 1992 fixture performance requirements listed in *Table 1*.

### Submittals

- Provide the LEED Letter Template, signed by the Mechanical Electrical & Plumbing (MEP) engineer or responsible party, declaring that the project uses 30% less water than the baseline fixture performance requirements listed in *Table 1*.
- Provide the spreadsheet calculation demonstrating that water-consuming fixtures specified for the stated occupancy and use of the tenant reduce occupancy-based potable water consumption by 30% compared to baseline conditions.
- Provide narrative and/or documentation on daily use rates if they differ from standard LEED assumptions.

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

- Provide a narrative describing the installed plumbing systems and any special water supply systems and assumptions (e.g., grey water reclamation, rainwater collection, unusual consumption patterns, etc.)
- Provide highlighted drawings showing any special water supply/collection systems that contribute to water use reduction.
- Provide a schedule of installed water use fixtures and equipment, and approved contractor's shop drawings and product data with water conservation specifications highlighted, confirming LEED Letter Template data.

### Potential Technologies & Strategies

Estimate the potable water needs for the tenant space. Use high-efficiency fixtures such as composting toilets, waterless urinals and occupant sensors to reduce the potable water demand.

# Energy & Atmosphere

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

## Fundamental Commissioning

---

Required

### Intent

Verify that the project's energy-related systems are installed, calibrated and perform as intended.

### Requirements

The following commissioning process activities shall be completed by the commissioning team:

- Designate an individual as the Commissioning Authority to lead the commissioning process activities. This individual should not be directly responsible for project design or construction management.
- Clearly document the tenant's project requirements and the basis of design for the building's energy-related systems. Updates to these documents shall be made during design and construction by the design team.
- Develop and incorporate commissioning requirements into the construction documents.
- Develop and utilize a commissioning plan.
- Verify that the installation and performance of energy consuming systems meet the tenant's project requirements and basis of design.
- Complete a Commissioning Report.

### Commissioned Systems

The energy-related systems to be included in the commissioning process activities include as a minimum, systems within the control of the tenant such as:

- Heating, ventilating, air conditioning and refrigeration (HVAC&R) systems (mechanical and passive) and associated controls
- Lighting controls, including daylighting
- Domestic hot water systems
- Renewable energy systems (PV, wind, solar, etc.)

### Submittals

- Provide the LEED Letter Template, signed by the Commissioning Authority and tenant confirming that the fundamental commissioning requirements have been successfully executed or will be provided under existing contract(s).
- Provide a narrative and drawings or diagrams indicating project scope of work, how the HVAC system works, portions shared with other tenants or the base building, and improvements made as part of the project to common building systems serving the tenant space. It is important to understand that this narrative is used to facilitate the review of the Submittal not only for the prerequisite but also other EA and EQ credits.

SS	WE	EA	MR	EQ	ID
Prerequisite 1					

## Required

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

- Provide a narrative outlining the role of the Commissioning Authority and/or Agent, and their relationship to the project team.
- Provide the basis of design and evidence of the review of the basis of design, a copy of the commissioning plan showing tenant's project requirements and design intent, pre-functional data and commissioning specs.
- Provide the project's Commissioning Report.
- Provide the Table of Contents of Operation and Maintenance Manuals.
- For those items that may be under contract at the time of submittal, be prepared to supply an excerpt from the contract demonstrating prerequisite achievement.

### **Potential Technologies & Strategies**

Engage a Commissioning Authority prior to the start of design. Determine the tenant's program and initial design intent. Develop and maintain a commissioning plan for use during design and construction. Incorporate commissioning requirements in bid documents. Assemble the commissioning team, and prior to occupancy verify the performance of energy consuming systems. Complete the Commissioning Reports with recommendations prior to acceptance of the HVAC&R systems.

## Minimum Energy Performance

---

Required

### Intent

Establish the minimum level of energy efficiency for the tenant space systems.

### Requirements

Design portions of the building as covered by the tenant's scope of work to comply with ASHRAE/IESNA Standard 90.1-2004 or the local energy code, whichever is more stringent.

### Submittals

- Provide the LEED Letter Template, signed by the professional engineer, or responsible party, stating that the tenant space complies with ASHRAE/IESNA 90.1-2004 or local energy codes, whichever is more stringent. If local energy codes were applied, demonstrate that the local energy code is more stringent than ASHRAE/IESNA 90.1-2004.
- Provide a narrative describing the key HVAC and lighting energy efficiency measures incorporated.
- Provide schedule(s) of HVAC and lighting equipment installed within the tenants' scope or work, identifying equipment and its capacities, efficiencies and controls; and corresponding ASHRAE Standard 90.1 or code-mandated requirements.

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

- Provide HVAC and lighting drawings, and approved shop drawings confirming schedule's key HVAC and lighting equipment data.
- If energy simulations were done according to ASHRAE/IESNA Standard 90.1-2004, Section 11 and/or its Appendix G, provide a completed Energy Cost Budget (ECB) Compliance Form per the ASHRAE/IESNA Standard 90.1 User's Manual. If energy simulations were done according to the Canadian Model National Energy Code 1997 and applicable Commercial Buildings Incentive Program (CBIP) energy simulation guidance, provide a final CBIP assessment report.

### Potential Technologies & Strategies

Design the systems impacted in the tenant's scope of work to maximize energy performance. Use a computer simulation model to assess the energy performance and identify the most cost effective energy measures. Quantify energy performance as compared to the baseline building.

SS	WE	EA	MR	EQ	ID
Prerequisite 3					

Required

## CFC Reduction in HVAC&R Equipment

---

### Intent

Reduce ozone depletion.

### Requirements

Zero use of CFC-based refrigerants in new tenant HVAC&R systems when within scope of work.

### Submittals

- Provide the LEED Letter Template, signed by a licensed professional engineer or responsible party declaring that there are no CFCs in HVAC&R systems that have been installed or renovated within the LEED Canada-CI project scope.

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

- Provide a schedule of all refrigeration equipment installed within the tenants' scope or work, identifying their refrigerant charges.
- Provide manufacturer's cut sheets confirming the schedule's equipment refrigerant charges.

### Potential Technologies & Strategies

When reusing existing HVAC&R systems, conduct an inventory to identify equipment that uses CFC refrigerants and replace or retrofit these systems with non-CFC refrigerants. For new installations, specify new HVAC&R equipment that uses no CFC refrigerants.

SS	WE	EA	MR	EQ	ID
Credit 1.1					

## Optimize Energy Performance, Lighting Power

---

1 - 3 Points

### Intent

Achieve increasing levels of energy conservation beyond the referenced standard to reduce environmental impacts associated with excessive energy use.

### Requirements

Reduce connected lighting power density below that allowed by ASHRAE/IESNA Standard 90.1-2004 using either the Space-by-Space Method or by applying the whole building lighting power allowance to the entire tenant space.

*Option A:*

Reduce lighting power density to 15% below the standard. (1 point)

*Option B:*

Reduce lighting power density to 25% below the standard. (2 points)

*Option C:*

Reduce lighting power density to 35% below the standard. (3 points)

### Submittals

- Provide the LEED Letter Template, signed by the professional engineer or other responsible party, stating that the lighting power density is reduced below ASHRAE requirements consistent with the level of credit being sought, with calculations showing the percentage reduction in lighting power.
- Provide lighting equipment schedule(s), confirming LEED Letter Template entries, of lighting equipment installed within the tenants' scope or work, identifying luminaires, lamps, ballasts, and their efficiencies and controls; and their corresponding ASHRAE Standard 90.1 and code-mandated requirements.

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

- Provide reflected ceiling plans showing lighting layout, keyed to lighting, equipment schedules.
- Provide completed Lighting Compliance Documentation per the ASHRAE/IESNA Standard 90.1 User's Manual.
- Provide manufacturer's cut literature confirming lighting equipment schedule data.

### Potential Technologies & Strategies

Design the connected lighting power to maximize energy performance. If the project warrants, consider a computer simulation model to assess the performance and identify the most cost-effective energy efficiency measures.

SS	WE	EA	MR	EQ	ID
Credit 1.2					

1 Point

## Optimize Energy Performance, Lighting Controls

---

### Intent

Achieve increasing levels of energy conservation beyond the prerequisite standard to reduce environmental impacts associated with excessive energy use.

### Requirements

Install daylight responsive controls in all regularly occupied spaces within 4.5 meters (15 feet) of windows and under skylights.

### Submittals

- Provide the LEED Letter Template, signed by the professional engineer or responsible party, stating that lighting controls were installed consistent with the Credit Requirement.
- Provide a narrative describing the lighting controls that have been incorporated in the tenant space design and plans of lighting control zones showing each control device and lighting equipment controlled.
- Provide one or more lighting equipment schedule(s) of lighting equipment installed within the tenants' and relevant base building owners' scopes of work, identifying luminaires, lamps, ballasts, and their efficiencies and controls; and corresponding ASHRAE Standard 90.1 or code-mandated requirements.

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

- Provide a narrative describing the lighting controls incorporated in the tenant space design; a plan of lighting control zones showing each control device and lighting equipment controlled, and a schedule of lighting controls showing model, type and other characteristics.
- Provide completed Lighting Compliance Documentation per the ASHRAE/IESNA Standard 90.1 User's Manual.
- Provide manufacturer's cut literature confirming lighting narrative and equipment schedule data.

### Potential Technologies & Strategies

Design the lighting controls to maximize energy performance.

SS	WE	EA	MR	EQ	ID
Credit 1.3					

## Optimize Energy Performance, HVAC

---

1 - 2 Points

### Intent

Achieve increasing levels of energy conservation beyond the prerequisite standard to reduce environmental impacts associated with excessive energy use.

### Requirements

*Option A:*

Implement one or both of the following strategies:

- **Equipment Efficiency: (1 point)**  
Install HVAC systems which comply with the efficiency requirements outlined in the New Buildings Institute, Inc.'s publication "Advanced Buildings: Energy Benchmark for High Performance Buildings (E-Benchmark)" prescriptive criteria for mechanical equipment efficiency requirements, sections 2.4 (less ASHRAE standard 55), 2.5, and 2.6.
- **Appropriate Zoning and Controls: (1 point)**  
Zone tenant fit out of spaces to meet the following requirements:
  - Every solar exposure must have a separate control zone;
  - Interior spaces must be separately zoned;
  - Private offices and specialty occupancies (conference rooms, kitchens, etc.) must have active controls capable of sensing space use and modulating HVAC system in response to space demand.

*Option B:*

Reduce design energy cost compared to the energy cost budget for regulated energy components described in the requirements of ASHRAE/IESNA Standard 90.1-2004.

- Demonstrate that HVAC system component performance criteria used for tenant space are 15% better than a system that is in minimum compliance with ASHRAE/IESNA Standard 90.1-2004. (1 point)

OR

- Demonstrate that HVAC system component performance criteria used for tenant space are 30% better than a system that is in minimum compliance with ASHRAE/IESNA Standard 90.1-2004. (2 points)

### Submittals

*Option A:*

- Provide the LEED Letter Template, signed by a licensed professional engineer or architect, stating that the strategy employed meets the Credit Requirements.
- Provide a narrative description of the HVAC system serving the tenant space and of base-building systems. Identify key equipment and its capacities, efficiencies and controls; and corresponding ASHRAE Standard 90.1, E-Benchmark, code or regulation-mandated requirements. Provide the LEED Letter Template, signed by a licensed professional engineer or responsible party, stating that the strategy employed meets the credit requirements.

SS	WE	EA	MR	EQ	ID
Credit 1.3					

1 - 2 Points

*Option B:*

- Provide the LEED Letter Template, signed by the professional engineer or architect, stating that the HVAC system energy consumption complies with *Option B*, with calculations indicating annual energy savings and energy end-use intensities of the tenant space;

AND

- Provide a narrative description of the HVAC system serving the tenant space, and of base-building systems. Identify key equipment and its capacities, efficiencies and controls; and corresponding ASHRAE Standard 90.1, E-Benchmark, code or regulation-mandated requirements.

AND EITHER

- If energy simulations were done according to ASHRAE/IESNA Standard 90.1-2004, Section 11 and / or its Appendix G, provide a completed Energy Cost Budget (ECB) Compliance Form per the ASHRAE/IESNA Standard 90.1 User's Manual;

OR

- If energy simulations were done according to the Canadian Model National Energy Code 1997 and applicable Commercial Buildings Incentive Program (CBIP) energy simulation guidance, provide a final CBIP assessment report. If this option is taken, address the performance differences between the two standards.

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

*Option A:*

- Provide highlighted plans locating and identifying HVAC and lighting equipment within or serving the space, including schedule(s) identifying equipment and its capacities, efficiencies and controls; and applicable ASHRAE Standard 90.1, E-Benchmark, code or regulation-mandated requirements.
- Provide manufacturer's cut literature confirming schedule's key HVAC and lighting equipment data.

*Option B:*

- Provide plans showing HVAC and lighting equipment within or serving the space, including one or more schedule(s) identifying equipment and its capacities, efficiencies and controls; and corresponding ASHRAE Standard 90.1, E-Benchmark, code or regulation-mandated requirements.
- Provide an electronic copy of the energy simulation report(s) and supporting computer simulation files of the Budget or Reference, and Proposed models.
- Provide approved shop drawings and manufacturer's literature confirming HVAC and lighting equipment schedule's key data.

SS	WE	EA	MR	EQ	ID
Credit 1.3					

### Potential Technologies & Strategies

Design the HVAC system components to maximize energy performance. Review compliance options for EA Credit 1.3 and determine the most appropriate approach. Option A provides a more prescriptive approach to recognizing energy efficient HVAC design, while Option B is performance based. In Canada, this may be demonstrated either by following ASHRAE Standard 90.1 or Model National Energy Code for Buildings and current CBIP energy simulation requirements.

1 - 2 Points

SS	WE	<b>EA</b>	MR	EQ	ID
Credit 1.4					

1 - 2 Points

## Optimize Energy Performance, Equipment & Appliances

---

### Intent

Achieve increasing levels of energy conservation beyond the prerequisite standard to reduce environmental impacts associated with excessive energy use.

### Requirements

For all ENERGY STAR® eligible equipment and appliances installed in the project, including appliances, office equipment, electronics, and commercial food service equipment (but excluding HVAC, lighting, and building envelope products):

- 70%, by rated-power, of ENERGY STAR® eligible equipment and appliances shall be ENERGY STAR® rated (1 point);

OR

- 90%, by rated-power, of ENERGY STAR® eligible equipment and appliances shall be ENERGY STAR® rated (2 points).

### Submittals

- Provide the LEED Letter Template, signed by the responsible party, declaring that applicable eligible equipment and appliances are ENERGY STAR® rated and yield the indicated percentage of the total, determined by rated-power.
- Provide a narrative describing the equipment and appliances that will be installed in the project scope of work.
- Provide a completed Letter Template schedule listing the types and quantities of equipment and appliances included in the project scope of work, identifying each equipment types' ENERGY STAR® rated power (or rated fuel input for commercial cooking equipment), and its percentage of the total rated power or fuel input of ENERGY STAR® eligible equipment and appliances.

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

- Provide manufacturer's cut literature confirming the Letter Templates' equipment and appliance schedule's ENERGY STAR® data.

### Potential Technologies & Strategies

Select energy efficient equipment and appliances, as qualified by the EPA's ENERGY STAR® Program ([www.energystar.gov](http://www.energystar.gov)).

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

## Enhanced Commissioning

---

1 Point

### Intent

Verify and ensure that the tenant space is designed, constructed and calibrated to operate as intended.

### Requirements

In addition to the Fundamental Commissioning Prerequisite, implement or have a contract in place to implement the following additional commissioning process activities:

1. Designate an individual as the Commissioning Authority, independent of the firms represented on the design and construction team, to lead the commissioning design review activities prior to the end of Design Development.
2. Conduct a review of the tenant space's energy-related systems contractor submittals.
3. Develop a single manual that contains the information required for re-commissioning the tenant space's energy related systems.
4. Verify that the requirements for training operating personnel and tenant space occupants are completed. Have a contract in place to review tenant space operation with O&M staff and occupants including a plan for resolution of outstanding commissioning-related issues 8 to 10 months after final acceptance.

### Submittals

- Provide the LEED Letter Template, signed by the tenant and independent Commissioning Authority, confirming that the required enhanced commissioning process requirements 1 and 2 have been successfully executed and that a contract for completing requirements 3 and 4 is in place.

*If an audit of this Credit is requested during the certification process, provide the following documentation to demonstrate credit requirements are met:*

- Provide a report on a review by the independent Commissioning Authority on the Schematic Design, construction documents, and contractor submittals;
- Provide a copy of the table of contents of re-commissioning manual; and
- Provide a copy of the contract for a commissioning review within one year of final acceptance.

### Potential Technologies & Strategies

Engage a Commissioning Authority that is an independent third party. In addition to the strategies discussed in EA Prerequisite 1, Fundamental Commissioning, the Commissioning Authority must review the design of all energy-related systems prior to the completion of design development. The Commissioning Authority is also responsible for a review of contractor submittals for all energy-related systems and for the development or review of a re-commissioning plan for the energy-related systems.

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

2 Points

## Energy Use, Measurement & Payment Accountability

---

### Intent

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

### Requirements

#### Case 1:

For those projects with an area that constitute less than 75% of the total building area:

- Install sub-metering equipment to measure and record energy uses within the tenant space. (1 point.)
- Negotiate a lease where energy costs are paid by the tenant and not included in the base rent. (1 point)

#### Case 2:

For those projects with an area that constitutes 75% or more of the total building area, install continuous metering equipment for the following end-uses: (2 points)

- Lighting systems and controls
- Constant and variable motor loads
- Variable frequency drive (VFD) operation
- Chiller efficiency at variable loads (kW/tonne)
- Cooling load
- Air and water economizer and heat recovery cycles
- Air distribution static pressures and ventilation air volumes
- Boiler efficiencies
- Building-related process energy systems and equipment
- Indoor water riser and outdoor irrigation systems

Develop a Measurement & Verification plan that incorporates the monitoring information from the above end-uses and is consistent with Option B, C or D of the 2001 *International Performance Measurement & Verification Protocol (IPMVP) Volume I: Concepts and Options for Determining Energy and Water Savings*.

### Submittals

#### Case 1:

- For projects with an area that constitutes less than 75% of the total building area provide the LEED Letter Template, signed by a professional engineer or responsible party, describing the metering equipment installed for each end use, and/or indicating that energy costs are paid by the tenant and not included in the base rent, which must be confirmed by providing a copy of the applicable portion of the lease.

#### Case 2:

- For projects with an area that constitutes 75% or more of the total building area provide the LEED Letter Template, signed by a professional engineer or other responsible party, indicating that metering equipment has been installed for each end-use and declaring the option to be followed under

SS	WE	EA	MR	EQ	ID
Credit 3					

IPMVP, 2001 version, plus provide a copy of the M&V plan following IPMVP, 2001 version, including an executive summary.

2 Points

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

- Provide copies of the utility invoices or landlord statements confirming that payment is based on actual consumption and demonstrate the relationship of the tenant area to the total building area.

### **Potential Technologies & Strategies**

For projects with an area that constitutes less than 75% of the total building area, tenant space is sub-metered and has a direct pay clause in their lease for energy actually used instead of on a square foot basis. For projects with an area that constitutes 75% or more of the total building area, model the energy and water systems to predict savings. Design the project with equipment to measure energy and water performance. Draft a Measurement & Verification Plan to apply during building operations that compares predicted savings to those actually achieved in the field.

SS	WE	EA	MR	EQ	ID
Credit 4					

1 Point

## Green Power

---

### Intent

Encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.

### Requirements

Provide at least 50% of the tenant's electricity from renewable sources by engaging in at least a two-year renewable energy contract. Renewable sources are as defined those that meet Environment Canada Environmental Choice program's EcoLogo requirements for green power supplies.

### Submittals

- Provide the LEED Letter Template, signed by the tenant or other responsible party, documenting that the supplied power is equal to 50% of the project's energy consumption and the sources meet the EcoLogo program criteria.
- Provide a copy of the two-year electric utility purchase contract for power generated from renewable sources.

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

- Provide information supporting the determination of the annual green power contract amount. When the Design Energy Cost amount was used, have available a summary of the simulation. When annual utility costs were used, have copies of the electric utility bills available. Be able to confirm the building components—lighting, plug loads, process uses—were covered by that service.

OR

- When the project occupant is not the holder of the Green-e contract, (i.e. as in the case when the building owner holds the contract), be able to provide the details on any proration.

### Potential Technologies & Strategies

Estimate the energy needs of the tenant space and investigate opportunities to engage in a green power contract with the local utility. Green power is derived from solar, wind, geothermal, biomass or low-impact hydro sources.

# Materials & Resources

SS	WE	EA	MR	EQ	ID
Prerequisite 1					

## Storage and Collection of Recyclables

---

Required

### Intent

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

### Requirements

Provide an easily accessible dedicated area that serves the tenant space for the 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 tenant or other responsible party, declaring that the area dedicated to recycling is easily accessible and accommodates the tenant's recycling needs.
- Provide a plan showing the area(s) dedicated to recycled material collection and storage.
- Provide a letter from the base building owner or manager describing base building recycling and waste disposal facilities and programs.

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

- Provide drawings highlighting locations for collection and storage of materials separated for recycling.
- Indicate the path from recycling locations to the building loading dock and demonstrate that the recycling area can handle the recycling material volumes generated by the tenant.
- Provide the calculations used in determining the area required for recycling storage and any correspondence with the building owner concerning the availability and adequacy of building-wide collection and storage.

### 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. Instruct occupants on the recycling procedures. Consider employing cardboard balers, aluminum can crushers, recycling chutes and other waste management technologies to further enhance the recycling program.

SS	WE	EA	MR	EQ	ID
Credit 1.1					

1 Point

## Tenant Space, Long-Term Commitment

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### **Intent**

Encourage choices that will conserve resources, reduce waste and reduce the environmental impacts of tenancy as they relate to materials, manufacturing and transport.

### **Requirements**

Occupant commits to remain in the same location for not less than 10 years.

### **Submittals**

- Provide the LEED Letter Template, signed by the building owner or other responsible party, declaring that the building occupant either owns its space or has signed a lease for at least 10 years.

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

- Where the project is in a leased space, the project team should provide a copy of lease commitments.

### **Potential Technologies & Strategies**

Suggest negotiations resulting in longer leases or ownership.

SS	WE	EA	MR	EQ	ID
Credit 1.2					

## Building Reuse, Maintain 40% of Interior Non-Structural Components

1 Point

### **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 40% by area of the existing non-shell, non-structure components (walls, flooring and ceiling systems).

### **Submittals**

- Provide the LEED Letter Template, signed by the architect, interior designer, or other responsible party, listing the types and areas of retained elements and declaring that the Credit Requirements have been met.

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

- Provide photographs and/or pre-construction and post-construction drawings highlighting reused walls, flooring and ceiling systems.
- Include calculations demonstrating that 40% of the non-shell and non-structure components were reused.

### **Potential Technologies & Strategies**

Identify during the selection and design of the tenant space the potential to maintain as many of the existing interior elements as possible. Remove elements that pose contamination risk to occupants and update outdated components. Quantify the extent of reuse.

SS	WE	EA	MR	EQ	ID
Credit 1.3					

1 Point  
in addition to  
MR 1.2

## Building Reuse, Maintain 60% of Interior Non-Structural Components

### **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 60% by area of the existing non-shell, non-structure components (walls, flooring and ceiling systems).

### **Submittals**

- Provide the LEED Letter Template, signed by the architect, interior designer, or other responsible party, listing the retained elements and declaring that the Credit Requirements have been met.

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

- Provide photographs or pre-construction and/or post-construction drawings highlighting reused walls, flooring and ceiling systems.
- Include calculations demonstrating that 60% of the non-shell and non-structure components were reused.

### **Potential Technologies & Strategies**

Identify during the selection and design of the tenant space the potential to maintain as many of the existing interior elements as possible. Remove elements that pose contamination risk to occupants and update outdated components. Quantify the extent of reuse.

SS	WE	EA	MR	EQ	ID
Credit 2.1					

## Construction Waste Management, Divert 50% From Landfill

1 Point

### Intent

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

### Requirements

Develop and implement a Construction Waste Management Plan, quantifying material diversion goals. Recycle and/or salvage at least 50% of construction, demolition and packaging debris. Calculation may be done by weight or volume, but must be consistent throughout.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer, 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 of this Credit is requested during the certification process:*

- Provide a copy of the Construction Waste Management Plan for the project highlighting recycling and salvage requirements.
- Provide a copy of demolition plans prepared, if any.
- Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were diverted from landfill.
- Provide either weighbills or a letter from the owner authorizing use of base-building recycling services & bins.

### Potential Technologies & Strategies

Establish goals for diversion from disposal in landfills and incinerators and adopt a Construction Waste Management Plan to achieve these goals. Consider recycling cardboard, metal, brick, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area(s) on the construction site for segregated or commingled collection of recyclable materials, and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials, and seek verification that the diverted materials are recycled or salvaged, as intended. Note that diversion may include donation of materials to charitable organizations such as Habitat for Humanity®.

SS	WE	EA	MR	EQ	ID
Credit 2.2					

1 Point  
in addition to  
MR 2.1

## Construction Waste Management, Divert 75% From Landfill

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### Intent

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

### Requirements

Develop and implement a Construction Waste Management Plan, quantifying material diversion goals. Recycle and/or salvage at least 75% of construction, demolition and packaging debris. Calculation may be done by weight or volume, but must be consistent throughout.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer, 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 of this Credit is requested during the certification process:*

- Provide a copy of the Construction Waste Management Plan for the project highlighting recycling and salvage requirements.
- Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged and diverted from landfill.
- Provide either weighbills or a letter from the base building management authorizing use of base-building recycling services & bins.

### Potential Technologies & Strategies

Establish goals for diversion from disposal in landfills and incinerators and adopt a Construction Waste Management Plan to achieve these goals. Consider recycling cardboard, metal, brick, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area(s) on the construction site for segregated or commingled collection of recyclable materials, and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials, and seek verification that the diverted materials are recycled or salvaged, as intended. Note that diversion may include donation of materials to charitable organizations such as Habitat for Humanity®.

SS	WE	EA	MR	EQ	ID
Credit 3.1					

## Resource Reuse, 5%

---

1 Point

### 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 for at least 5% of building (construction) materials, excluding furniture and furnishings.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer, 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, showing their costs and the total cost of all materials for the project.

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

- Provide highlighted specifications, and indicate how the value of each reused material was determined for salvaged and refurbished materials used on the project.
- Provide statements or approved shop drawings from suppliers noting the salvaged or refurbished status of each material contributing to this Credit, and the source, modifications or refurbishments of these materials.

### Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 3.2					

1 Point  
in addition to  
MR 3.1

## Resource Reuse, 10%

---

### 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 for at least 10% of building (construction) materials, excluding furniture and furnishings.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer, 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, showing their costs and the total cost of all materials for the project.

*If an audit of this Credit 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.

### Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 3.3					

## Resource Reuse, 30% Furniture and Furnishings

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1 Point

### Intent

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

### Requirements

Use salvaged, refurbished or used furniture and furnishings for 30% of the total furniture and furnishings budget.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer, or other responsible party, declaring that the Credit Requirements have been met.
- Provide a listing of the reused furniture and furnishings with their replacement value and documentation for the value of the balance of new furniture and furnishings.

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

- Provide an inventory of all furniture and furnishings, those that qualify as reused, their source(s) and costs. Indicate how replacement values for salvaged, refurbished or used furniture and furnishings were determined.

### Potential Technologies & Strategies

Identify opportunities to salvage and reuse furniture into project design and research potential material suppliers. Consider salvaging and reusing systems furniture and furnishings such as case pieces, seating, filing systems, decorative lighting and accessories.

SS	WE	EA	MR	EQ	ID
Credit 4.1					

1 Point

Recycled Content, 10% (post-consumer + 1/2 pre-consumer)

---

### Intent

Increase demand for building products that incorporate recycled content materials, therefore reducing impacts resulting from extraction and processing of virgin materials.

### Requirements

Use materials, including furniture and furnishings, with recycled content such that the sum of post-consumer recycled content plus 1/2 (one-half) of the pre-consumer content constitutes at least 10% 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. Plumbing products however may be included. 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/gnrnrule/guides980427.htm](http://www.ftc.gov/bcp/gnrnrule/guides980427.htm)

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer, or other responsible party, declaring that the Credit Requirements have been met and listing the recycled content products used. Include a completed Letter Template tables 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 (excluding mechanical and electrical equipment).
- 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), where **Base Mix** is defined in LEED reference guide calculations. This can be provided as a total reduction in Portland cement for all the concrete used on the project.

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

- Provide specifications and contractor submittals highlighting recycled content materials installed.
- Provide cut sheets, approved shop drawings, 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.

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

**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.

1 Point

SS	WE	EA	MR	EQ	ID
Credit 4.2					

1 Point  
in addition to  
MR 4.1

## Recycled Content, 20% (post-consumer + 1/2 pre-consumer)

---

### Intent

Increase demand for building products that incorporate recycled content materials, therefore reducing impacts resulting from extraction and processing of virgin materials.

### Requirements

Use materials, including furniture and furnishings, with recycled content such that the sum of post-consumer recycled content plus ½ (one-half) of the pre-consumer content constitutes at least 20% 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. Plumbing products however may be included. 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/gnrnrule/guides980427.htm](http://www.ftc.gov/bcp/gnrnrule/guides980427.htm).

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer, 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 (excluding mechanical and electrical equipment).
- 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), where **Base Mix** is defined in LEED reference guide calculations. This can be provided as a total reduction in Portland cement for all the concrete used on the project.

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

- Provide specifications and contractor submittals highlighting recycled content materials installed.
- Provide cut sheets, approved shop drawings, 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.

SS	WE	EA	MR	EQ	ID
Credit 4.2					

**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.

1 Point  
in addition to  
MR 4.1

SS	WE	EA	MR	EQ	ID
Credit 5.1					

1 Point

## Regional Materials, 20% Manufactured Regionally

---

### Intent

Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the regional economy and reducing the environmental impacts resulting from transportation.

### Requirements

Use a minimum of 20% of the combined value of construction and Division 12 (Furniture) materials and products that are manufactured regionally within a radius of 800 kilometres (500 miles).

Manufacturing refers to the final assembly of components into the building product that is furnished and installed by the tradesmen. For example, if the hardware comes from Dallas, Texas, the lumber from Vancouver, British Columbia and the joist is assembled in Kent, Washington, then the location of the final assembly is Kent, Washington.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer, or other responsible party, declaring that the Credit Requirements have been met. Include calculations demonstrating that the project incorporates the required percentage of regional materials/products and showing their cost, distance from project to the site of final manufacture, and the total cost of all materials for the project.

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

- Provide product cut sheets, product literature, letters from the manufacturers or other evidence showing the distances and modes of transportation from the final point of manufacture to the project site.

### Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 5.2					

## Regional Materials, 10% Extracted and Manufactured Regionally

---

1 Point

### Intent

Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the regional economy and reducing the environmental impacts resulting from transportation.

### Requirements

In addition to the requirements of MR 5.1, use a minimum of 10% of the combined value of construction and Division 12 (Furniture) materials and products extracted, harvested or recovered, as well as manufactured, within 800 kilometres (500 miles) of the project.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer, or other responsible party, declaring that the Credit Requirements have been met. Include calculations demonstrating that the project incorporates the required percentage of regional materials/products and showing their cost, distance from project to furthest site of extraction or manufacture, and the total cost of all materials for the project.

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

- Provide product cut sheets, product literature, letters from the manufacturers or other evidence showing the distances from the final point of manufacture to the project site, and the distances from the materials extraction to the project site.

### Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 6					

1 Point

## Rapidly Renewable Materials

---

### Intent

Reduce the use and depletion of finite raw materials and long-cycle renewable materials by replacing them with rapidly renewable materials.

### Requirements

Use rapidly renewable construction and Division 12 (Furniture and Furnishings) materials and products, made from plants that are typically harvested within a 10-year or shorter cycle, for 5% of the total value (\$) of all new materials and products used in the project.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer or other responsible party, declaring that the Credit Requirements have been met. Include calculations demonstrating that the project incorporates the required percentage of rapidly renewable products. Show their cost and percentage of rapidly renewable components, and the total cost of all materials for the project.

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

- Provide approved shop drawings, manufacturers product literature, and/or statements from manufacturers highlighting each rapidly renewable material installed.

### Potential Technologies & Strategies

Establish a project goal for rapidly renewable materials and identify materials and suppliers that can achieve this goal. Consider materials such as bamboo flooring, wool carpets, PLA fiber carpets, straw board, cotton batt insulation, linoleum flooring, poplar OSB, sun flower seed board, wheatgrass cabinetry and others. During construction, ensure that the specified rapidly renewable materials are installed.

SS	WE	EA	MR	EQ	ID
Credit 7					

## Certified Wood

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1 Point

### Intent

Encourage environmentally responsible forest management.

### Requirements

When using new wood-based products and materials, use a minimum of 50% that are certified in accordance with the Forest Stewardship Council's Principles and Criteria. Division 12 (Furniture) material value is included in the determination of the certified wood content.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer, or other 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 and their cost together with the total cost of all materials for the project. 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 of this Credit 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 reference 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.

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

# Indoor Environmental Quality

Required

Minimum IAQ Performance

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## Intent

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

## Requirements

Meet the minimum requirements of the voluntary consensus standard ASHRAE 62.1-2004, Ventilation for Acceptable Indoor Air Quality Mechanical ventilation systems shall perform according to the Ventilation Rate Procedure.

Naturally ventilated buildings must comply with ASHRAE 62.1-2004 Section 5.1.

Modify or maintain existing building outside-air (OA) ventilation distribution system to supply at least the outdoor air ventilation rate required by ASHRAE Standard 62.1-2004.

If the project cannot meet the outside air requirements of ASHRAE 62.1-2004 (all other requirements must be met), it must document the space and system constraints that make it not possible, and complete an engineering assessment of the system's maximum litres per second (L/s) capability towards meeting the requirements of ASHRAE 62.1-2004, and achieve those levels, with an absolute minimum of 4.72 L/s (10 CFM) per person.

## Submittals

- ❑ Provide the LEED Letter Template, signed by the professional engineer, declaring that the project is fully compliant with Sections 4, 5, 6 and 7 of ASHRAE 62.1-2004 and all accepted Addenda. Provide a completed Letter Template summary table of outdoor air ventilation rates, with 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.
- ❑ For existing buildings that cannot meet the ASHRAE 62.1-2004 minimum requirements, provide a letter from a professional engineer outlining the space and system constraints that preclude compliance with the Standards' minimum outdoor air supplies; and indicating the maximum outdoor air supplies that can be provided with these constraints. Provide photographs/specs or manufacturer's literature of installed mechanical equipment, as-built Mechanical plans; or as-built single line drawings highlighting space-constrained aspects in system (e.g., vertical riser/horizontal chase space).
- ❑ For designs using a natural ventilation strategy, submit a Letter Template 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

SS	WE	EA	MR	EQ	ID
Prerequisite 1					

from a suitable computer model that shows outdoor air flows for each regularly occupied space within the building under peak heating and cooling conditions.

Required

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

No audit submittals are detailed for this Credit.

**Potential Technologies & Strategies**

Design the HVAC system to meet the ventilation requirements of Sections 4, 5, 6 and 7 of the referenced standard. Identify potential IAQ problems on the site.

SS	WE	EA	MR	EQ	ID
Prerequisite 2					

Required

## Environmental Tobacco Smoke (ETS) Control

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### Intent

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

### Requirements

Minimize exposure of non-smokers to ETS by one of the following options:

#### *Option A:*

- Locating tenant space in a building that prohibits smoking by all occupants and users and maintains any exterior designated smoking areas at least 7.6 metres (25 feet) away from entries, outdoor air intakes and operable windows.

#### *Option B:*

- In buildings where smoking is permitted, confirming that smoking is prohibited in the portions of the tenant space not designated as a smoking space, in all other building areas served by the same HVAC system, and the common areas used by tenant's occupants, and that there is no migration of ETS by either mechanical or natural ventilation from other areas of the building.
- If the tenant's occupants are permitted to smoke, providing one or more designated smoking rooms designed to effectively contain, capture and remove ETS from the building. At a minimum, each smoking room must be directly exhausted to the outdoors with no recirculation of ETS-containing air to the nonsmoking area of a building, enclosed with impermeable deck-to-deck partitions and operated at a negative pressure compared to 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 gauge) when the doors to the smoking room are closed.
- Performance of the smoking rooms differential air pressure 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 rooms 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 C:*

- For multi-unit residential buildings, 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 a blower door test conducted in accordance with ANSI/ASTM-779-99, Standard Test Method for Determining Air Leakage Rate By Fan Pressurization.
- Use the progressive sampling methodology defined in Chapter 7 (Home Energy Rating Systems (HERS) Required Verification And Diagnostic Testing) of the California Low Rise Residential Alternative Calculation Method Approval Manual, found at: [http://energy.ca.gov/title24/2005standards/residential\\_acm/2005\\_RES\\_ACM\\_CHAPT7.PDF](http://energy.ca.gov/title24/2005standards/residential_acm/2005_RES_ACM_CHAPT7.PDF)

SS	WE	EA	MR	EQ	ID
Prerequisite 2					

Required

- Residential units must demonstrate less than 806 mm<sup>2</sup> (1.25 square inches) leakage area per 9.2 m<sup>2</sup> (100 square feet) of enclosure area (i.e., sum of all wall, ceiling and floor areas).

### Submittals

#### Option A:

- Provide the LEED Letter Template, signed by the tenant or responsible party, declaring that the building will be operated under a policy prohibiting smoking, and the exterior designated smoking areas are at least 7.6 metres (25 feet) away from entries and operable windows.

#### Option B:

- Provide the LEED Letter Template, signed by the tenant or responsible party, declaring and demonstrating that smoking is prohibited in that portion of the tenant space not designated as a smoking space and all other areas of the building serviced by the same HVAC system, plus common areas used by tenant occupants. If the tenant's occupants are permitted to smoke, declare and demonstrate that designated smoking rooms met the design criteria described in the credit requirements and performance has been verified using the method described in the Credit Requirements.

#### Option C:

- Provide the LEED Letter Template, signed by the tenant or responsible party, declaring and demonstrating that the credit requirements for ETS transfer between individual residential units have been satisfied.

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

#### Option A:

No audit submittals are detailed for Option A of this Credit.

#### Option B:

- 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.

#### Option C:

- Provide 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 wind speeds during the tests. For high-rise buildings constructed during cold outdoor temperatures, summarize measures used to ensure accurate blower door test results.

SS	WE	EA	MR	EQ	ID
Prerequisite 2					

Required

- Provide a brief narrative describing the quality assurance activities undertaken to seal uncontrolled pathways for transfer of indoor air pollutants between individual dwelling units and other areas. Provide 6-12 photographs of sealing of sealed plumbing and duct penetrations, and sealing of wall, floor and ceiling intersections for at least two dwelling units.

**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.

## Outdoor Air Delivery Monitoring

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1 Point

### Intent

Provide capacity for ventilation system monitoring to help sustain long-term occupant comfort and well-being.

### Requirements

Install permanent monitoring and alarm systems that provide feedback on ventilation system performance to ensure that ventilation systems maintain design minimum ventilation requirements in a form that affords operational adjustments:

- For mechanical ventilation systems that predominantly serve densely occupied spaces (those with a design occupant density greater than or equal to 25 people per 93 m<sup>2</sup> (1000 sq. ft)), install a CO<sub>2</sub> sensor within each densely occupied space.
- For all other mechanical ventilation systems, provide an outdoor airflow measurement device capable of measuring the minimum outdoor airflow rate at all expected system operating conditions within 15% of the design minimum outdoor air rate.
- For natural ventilation systems, install a CO<sub>2</sub> sensor within each naturally ventilated space.

### Submittals

- Provide the LEED Letter Template, signed by the responsible party, declaring and summarizing the installation, operational design and controls/zones for the carbon dioxide or outdoor airflow monitoring system.

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

- Provide drawings, specifications and approved contractor's shop drawings and product data describing the installed carbon dioxide or outdoor airflow monitoring system. Include a narrative that describes building ventilation system control sequences, initial control setpoints and operational ranges for control parameters.

### Potential Technologies & Strategies

To ensure that sensors can reliably indicate that ventilation systems are operating as designed:

- CO<sub>2</sub> sensors shall be located within the breathing zone of the room as defined in ASHRAE Standard 62.1-2004.
- CO<sub>2</sub> sensors shall be certified by the manufacturer to have an accuracy of no less than 75 ppm, factory calibrated or calibrated at start-up, and certified by the manufacturer to require calibration no more frequently than once every 5 years.
- Required CO<sub>2</sub> sensors and outdoor airflow monitors should be configured to generate an alarm if the indicated outdoor airflow rate drops more than 15% below the minimum outdoor air rate required by ASHRAE Standard 62.1-2004 (see EQ Prerequisite 1) in one of the following ways:

SS	WE	EA	MR	EQ	ID
Credit 1					

1 Point

- A building automation system alarm visible to the system operator/engineer.
  - An alarm that is clearly visible to or audible by occupants.
  - CO<sub>2</sub> sensors may also be used for demand controlled ventilation provided the control strategy complies with ASHRAE Standard 62.1-2004 (see EQ Prerequisite 1), including maintaining the area-based component of the design ventilation rate.
- Space CO<sub>2</sub> alarms and demand controlled ventilation set points shall be based on the differential corresponding to the ventilation rates prescribed in ASHRAE Standard 62.1 plus the outdoor air CO<sub>2</sub> concentration, which shall be determined by one of the following:
- Outdoor CO<sub>2</sub> concentration shall be assumed to be 400 ppm without any direct measurement;
- OR
- Outdoor CO<sub>2</sub> concentration shall be dynamically measured using a CO<sub>2</sub> sensor located near the position of the outdoor air intake.

SS	WE	EA	MR	EQ	ID
Credit 2					

## Increased Ventilation

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1 Point

### Intent

Provide additional air ventilation to improve indoor air quality for improved occupant comfort, well-being and productivity.

### Requirements

#### Case 1:

For mechanically ventilated spaces:

- Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates required by ASHRAE 62.1-2004 as determined by EQ Prerequisite 1.

#### Case 2:

For naturally ventilated spaces:

- Design natural ventilation systems for occupied spaces to meet the recommendations set forth in the Carbon Trust "Good Practice Guide 237" [1998]. Determine that natural ventilation is an effective strategy for the project by following the flow diagram process shown in Figure 1.18 of the CIBSE (The Chartered Institution of Building Services Engineers) "Applications Manual 10: 2005, Natural ventilation in non-domestic buildings."

AND EITHER

- Use diagrams and calculations to show that the design of the natural ventilation systems meets the recommendations set forth in the CIBSE "Applications Manual 10: 2005, Natural ventilation in non-domestic buildings."

OR

- Use a macroscopic, multi-zone analytic model to predict that room-by-room airflows will effectively naturally ventilate at least 90% of occupied spaces.

### Submittals

#### Case 1:

- For mechanical ventilation systems, provide the LEED Letter Template, signed by the mechanical engineer or other responsible party, declaring that the outdoor air ventilation rates at the breathing zone of all occupied spaces are at least 30% above the minimum rates required by ASHRAE 62.1-2004.

#### Case 2:

- For natural ventilation systems, provide the LEED Letter Template, signed by the mechanical engineer or other responsible party, declaring that the project meets the natural ventilation requirements of the credit.

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

#### Case 1:

- For mechanical ventilation systems, provide scale plans and sections showing essential elements of the ventilation system of each regularly-occupied room type in both heating and cooling modes, following ASHRAE Fundamentals Handbook 2001, Chapter 32: Space Air Diffusion guidance.

SS	WE	EA	MR	EQ	ID
Credit 2					

1 Point

Show inlets and outlets; air throws; occupied zone; furniture and typical heat sources. For mixing systems, include characteristic room lengths and ADPI for each room type; for displacement or unidirectional systems, show predicted distribution of stratified zones. Include equipment schedules and approved contractor submittals of installed terminal inlets and outlets.

Case 2:

- Provide documentation that natural ventilation is an effective strategy for the project and follows the design recommendations established by CIBSE. Provide either of the following: diagrams and calculations based on CIBSE AM10, or diagrams and calculations based on results provided by a multi-zone analytical model.

OR

- For natural ventilation systems designed using computer simulation, 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 operational modes, graphics showing zone and building airflow patterns with local prevailing winds, and identify the computational fluid dynamics or network airflow modeling program used.

**Potential Technologies & Strategies**

For mechanically ventilated spaces, design ventilation systems to provide breathing zone ventilation rates at least 30% larger than the minimum rates prescribed by the referenced standard.

For naturally ventilated spaces, follow the eight design steps described in Carbon Trust "Good Practice Guide 237" including:

- 1) Develop design requirements,
- 2) Plan airflow paths,
- 3) Identify building uses and features that might require special attention,
- 4) Determine ventilation requirements,
- 5) Estimate external driving pressures,
- 6) Select types of ventilation devices,
- 7) Size ventilation devices,
- 8) Analyze the design.

Some of the public domain software packages available to analytically predict room-by-room airflows include but are not limited to NIST's CONTAM, Multizone Modeling Software, along with LoopDA, Natural Ventilation Sizing Tool. TAS. esp-R, Energy Plus and others.

SS	WE	EA	MR	EQ	ID
Credit 3.1					

## Construction IAQ Management Plan, During Construction

1 Point

### 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 tenant space as follows:

- During construction meet or exceed the recommended Design Approaches of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) IAQ Guideline for Occupied Buildings Under Construction, 1995, Chapter 3.
- Protect stored on-site and 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.
- Replace all filtration media immediately prior to occupancy. Coordinate with EQ Credits 3.2 and 5, installing only a single set of final filtration media.

### 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 and at the end of construction. Include the MERV value, manufacturer name and model number.

AND EITHER

- Provide 18 photographs—six photographs taken on three 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.

OR

- Declare the five Design Approaches of SMACNA IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3, which were used during building construction. Include a brief listing of some of the important design approaches employed.

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

No audit submittals are detailed for this Credit.

### Potential Technologies & Strategies

Adopt an IAQ Management Plan that minimizes the exposure of absorptive materials to moisture and airborne contaminants and that protects the HVAC system during construction. Sequence the installation of absorptive materials, such as insulation, carpeting, ceiling tile and gypsum wall board, to avoid contamination.

1 Point

## Construction IAQ Management Plan, Before Occupancy

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### Intent

Reduce indoor air quality problems resulting from the construction/renovation process, to sustain long-term worker and occupant comfort and well-being.

### Requirements

Develop and implement an Indoor Air Quality (IAQ) Management Plan for the preoccupancy phases as follows:

#### *Option A: Flush-Out Procedure:*

- After construction ends and with all interior finishes installed, as described in the LEED Canada CI Reference Guide, 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 (14,000 ft<sup>3</sup> of outdoor air per ft<sup>2</sup> of floor area) while maintaining an internal temperature of at least 16°C (60°F) and, where mechanical cooling is operated, relative humidity no higher than 60%.
- The space may only be occupied following delivery of a minimum of 1075 m<sup>3</sup> of outdoor air per m<sup>2</sup> of floor area (3,500 ft<sup>3</sup> of outdoor air per ft<sup>2</sup> of floor area), and provided the space is ventilated at minimum rate of 0.090 m<sup>3</sup>/m<sup>2</sup> (0.30 cfm per ft<sup>2</sup>) of outside air or the design minimum outside air rate, whichever is greater, a minimum of three hours prior to occupancy and during occupancy, until a total of 4,300 m<sup>3</sup> of outdoor air per m<sup>2</sup> of floor area (14,000 ft<sup>3</sup> of outdoor air per ft<sup>2</sup> of floor area) air has been delivered to the space.

#### *Option B: IAQ Test Procedure:*

- Conduct baseline IAQ testing, after construction ends and prior to occupancy, using testing protocols consistent with the U.S. Environmental Protection Agency "Compendium of Methods for the Determination of Air Pollutants in Indoor Air" and as additionally detailed in the LEED Canada CI Reference Guide.
- Demonstrate that the contaminants' concentration levels listed in *Table 1* are not exceeded:

**Table 1**

Contaminant	Maximum Concentration
Formaldehyde	50 parts per billion
Particulates (PM10)	50 ug/m <sup>3</sup>
Total Volatile Organic Compounds (TVOC)	500 ug/m <sup>3</sup>
* 4-Phenylcyclohexene (4-PCH)	6.5 ug/m <sup>3</sup>
Carbon Monoxide (CO)	9 parts per million and no greater than 2 parts per million above outdoor levels

*\*This test is only required only if carpets and fabrics with Styrene Butadiene (SB) latex backing material are installed as part of the base building systems.*

SS	WE	EA	MR	EQ	ID
Credit 3.2					

1 Point

- For each sampling point where the maximum concentration limits are exceeded based on the table above, conduct additional flush-out with outside air and retest the specific parameter(s) that were exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting non-complying building areas, take samples from the same locations as in the first test.
- The air sample testing shall be conducted as follows:
  - All measurements shall be conducted prior to occupancy, but during normal occupied hours, and with the building ventilation system starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.
  - The building shall have all interior finishes installed, including but not limited to millwork, doors, paint, carpet and acoustic tiles. Non-fixed furnishings such as workstations and partitions are required to be in place for the testing.
  - The number of sampling locations will vary depending upon the size of the building and number of ventilation systems. For each portion of the building served by a separate ventilation system, the number of sampling points shall not be less than one per 2300 m<sup>2</sup> (25,000 ft<sup>2</sup>), or for each contiguous floor area, whichever is larger, and include areas with the least ventilation and greatest presumed source strength.
  - Air samples shall be collected between 1.2 m (4 ft.) and 2.1m (7 ft.) from the floor to represent the breathing zone of occupants and over a minimum 4 hour period.

### Submittals

#### Option A:

- Provide the LEED Letter Template, signed by the architect, interior designer or other responsible party, describing flush-out procedures and dates.
- Provide the background calculations demonstrating that the required total air volumes and minimum ventilation volumes and rates have been delivered.

#### Option B:

- Provide the LEED Letter Template, signed by the environmental consultant or other responsible party, indicating that the air quality testing procedure has been conducted and that all areas tested do not exceed the maximum allowable concentration limits.
- Provide a copy of the IAQ testing results that includes documentation of the results and identifying the EPA testing method used. If alternative testing protocols are used, provide documentation and rationale justifying that the measured results meet the intent of the EPA testing methods.

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

No audit submittals are detailed for this Credit.

SS	WE	EA	MR	EQ	ID
Credit 3.2					

1 Point

**Potential Technologies & Strategies**

Prior to occupancy, perform two-week flush-out or test for contaminant levels in the tenant space.

For IAQ testing, consider using a recognized measurement protocol such as the EPA “Compendium of Methods for the Determination of Air Pollutants in Indoor Air.” If alternative testing protocols are used, provide justification that the measured test results meet the intent of the EPA testing methods.

Copies of the IAQ testing results should describe the contaminant sampling and analytical methods, the locations and duration of contaminant samples, the field sampling log 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 flow rate for the occupied mode through the duration of the air testing.

SS	WE	EA	MR	EQ	ID
Credit 4.1					

## Low-Emitting Materials, Adhesives and Sealants

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1 Point

### 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

All materials listed below that are used in the building interior, (i.e., inside of the exterior air barrier) must not exceed the following requirements:

- Adhesives, Sealants and Sealant Primers: South Coast Air Quality Management District (SCAQMD) Rule #1168 requirements in effect on January 1, 2003 and rule amendment dated October 3, 2003.
- Aerosol Adhesives: Green Seal Standard GC-36 requirements in effect on October 19, 2000.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer or other responsible party, listing the adhesives, sealants, sealant primers and aerosol adhesives used in the building and declaring that they meet the noted requirements. For each product in the listing, state the VOC level, the applicable standard, the classification of material and the VOC limit.

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

- Provide approved shop drawings and Material Safety Data Sheets (MSDSs) or 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. Review product cut sheets, Material Safety Data Sheets (MSDSs), signed attestations or other official literature from the manufacturer clearly identifying the VOC contents or compliance with referenced standards.

SS	WE	EA	MR	EQ	ID
Credit 4.2					

1 Point

## 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

Interior paints and coating applied on-site must meet the limitations and restrictions concerning chemical components set by the following standards:

- Topcoat Paints: Green Seal Standard GS-11, Paints, January 1997.
- Anti-Corrosive and Anti-Rust Paints: Green Seal Standard GS-03, Anti-Corrosive Paints, Second Edition, January 7, 1997 For Applications on Ferrous Metal Substrates.
- All other Architectural Coatings, Primers and Undercoats: South Coast Air Quality Management District (SCAQMD) Rule #1113, Architectural Coatings, rules in effect on January 1, 2004.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer or other responsible party, listing all the interior paints and coatings used in the building addressed by the cited standard(s). State that they comply with the VOC and chemical component limits and/or chemical component restrictions of the applicable standard(s).

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

- For each product in the Letter Template list, identify the VOC and components governed by the cited standard(s), their materials classifications, and VOC and other chemical components limits of the applicable standard(s).
- Provide approved shop drawings and Material Safety Data Sheets (MSDSs), signed attestations or other official literature from manufacturers clearly identifying product emissions rates and components governed by the applicable standard.

### Potential Technologies & Strategies

Specify low-VOC paints and coatings in construction documents. Ensure that VOC limits are clearly stated in each section where paints and coatings are addressed.

SS	WE	EA	MR	EQ	ID
Credit 4.3					

## Low-Emitting Materials, Carpet Systems

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1 Point

### 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

Carpet systems must meet or exceed the Carpet and Rug Institute's Green Label Plus testing and product requirements. (Green Label Plus does not address backer or adhesive.) Carpet pad must meet or exceed CRI Green Label testing and product requirements. Carpet adhesive must meet the requirements of Credit 4.1.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer or other responsible party, listing all the carpet systems used in the tenant space and stating that they meet or exceed the Carpet and Rug Institute's Green Label Plus testing and product requirements.

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

- Provide specifications of all installed carpet systems.
- Provide approved shop drawings, Material Safety Data Sheets (MSDSs), signed attestations or other official literature from manufacturers of all installed carpet systems, clearly identifying product emissions rates governed by the cited standard.

### Potential Technologies & Strategies

Specify low-VOC carpet products and systems in construction documents. Provide product cut sheets, Material Safety Data Sheets (MSDSs), signed attestations or other official literature from the manufacturer clearly identifying the affected products meet these requirements. Ensure that requirements are clearly stated in each section of the specifications where these materials are addressed.

SS	WE	EA	MR	EQ	ID
Credit 4.4					

1 Point

## Low-Emitting Materials, Composite Wood and Laminate Adhesives

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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

Composite wood and agrifiber products, including core materials, must contain no added urea-formaldehyde resins. Laminate adhesives used to fabricate on-site and shop applied assemblies containing these laminate adhesives must contain no urea-formaldehyde. Products covered by EQ Credit 4.5, Low-Emitting Materials, System Furniture and Seating shall be excluded from these requirements.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer or responsible party, listing all the composite wood products used in the tenant space and stating that they contain no added urea-formaldehyde resins, and listing all the laminating adhesives used in the tenant space and stating that they contain no urea-formaldehyde.
- Provide manufacturers product information for core and laminate adhesive products used on the project highlighting statements that they contain no added urea-formaldehyde.

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

- Provide approved shop drawings, Material Safety Data Sheets (MSDSs), signed attestations or other official literature from manufacturers clearly identifying product emissions rates.

### Potential Technologies & Strategies

Specify wood and agrifiber products that contain no added urea-formaldehyde resins. Specify laminating adhesives for field and shop applied assemblies, including adhesives and veneers that contain no urea-formaldehyde. Review product cut sheets, Material Safety Data Sheets (MSDSs), signed attestations or other official literature from the manufacturer.

## Low-Emitting Materials, Systems Furniture and Seating

1 Point

### 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

All systems furniture and seating\* introduced into the project space that has been manufactured, refurbished or refinished within one year prior to occupancy must meet one of the requirements below.

*Option A:*

Greenguard Indoor Air Quality Certified.

*Option B:*

Calculated indoor air concentrations that are less than or equal to those established in *Table 1* for furniture systems and seating determined by a procedure based on the U.S. Environmental Protection Agency's Environmental Technology Verification (ETV) Large Chamber Test Protocol for Measuring Emissions of VOCs and Aldehydes (September 1999) testing protocol conducted in an independent air quality testing laboratory.

**Table 1: Indoor Air Concentrations**

Chemical Contaminant	Emission Limits Systems Furniture	Emission Limits Seating
TVOC	0.5 mg/m <sup>3</sup>	0.25 mg/m <sup>3</sup>
Formaldehyde	50 parts per billion	25 parts per billion
Total Aldehydes	100 parts per billion	50 parts per billion
4 – Phenylcyclohexene (4-PCH)	0.0065 mg/m <sup>3</sup>	0.00325 mg/m <sup>3</sup>

\* Systems furniture is defined as either a panel-based workstation comprised of modular interconnecting panels, hang-on components and drawer/filing components or a freestanding grouping of furniture items and their components that have been designed to work in concert.

\* Seating is defined as task and guest chairs used with systems furniture.

\* Furniture other than systems furniture and task and guest chairs used with systems furniture is defined as occasional furniture and is excluded from the credit requirements.

\* Salvaged and used furniture that is more than one year old at time of occupancy is excluded from the credit requirements.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer or other responsible party, declaring that all systems furniture and seating covered by this credit complies with the cited standard(s). Provide a completed Letter Template table that lists the manufacturer and product line, item description, period of manufacture, form of compliance and the test date or certification period of the applicable standard.

SS	WE	EA	MR	EQ	ID
Credit 4.5					

1 Point

AND EITHER

*Option A:*

- For Greenguard Indoor Air Quality Certified systems furniture and seating, provide a copy of the product certification, complete with the start and end dates of certification. The period covered must have begun before and extend through the actual manufacturing dates of the product used on the project.

*Option B:*

- For systems furniture and seating tested using a procedure based on the U.S. EPA ETV protocol, provide details of the procedure, and the emission factors from the large-chamber testing of the systems furniture, showing the calculations used in determining the emission limits, complete with the air exchange rate, demonstrating that emissions limits have not exceeded those shown in *Table 1*. Test results and supporting calculations must be dated and signed by an officer of the independent laboratory where the testing was conducted. Test results must represent the manufacturing practices employed for the product used on the project. Tests must have been completed before the start of manufacturing but no earlier than 24 months prior to the last manufacturing date.

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

*Option A:*

- Provide approved shop drawings, Material Safety Data Sheets (MSDSs), signed attestations or other official literature from manufacturers clearly identifying product emissions rates.

*Option B:*

- Provide copies of reports on emissions rates established by testing.

### **Potential Technologies & Strategies**

Specify Low-VOC materials in construction documents. Ensure that VOC limits are clearly stated in each section where furniture assemblies are addressed.

SS	WE	EA	MR	EQ	ID
Credit 5					

## Indoor Chemical and Pollutant Source Control

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1 Point

### Intent

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 and control pollutant or biological contaminant entry into the tenant space and later cross-contamination of regularly occupied areas:

- Employ permanent entryway systems (such as grills or grates) to capture dirt, particulates, etc. from entering the building at all high volume exterior entryways within the tenant area.
- Where hazardous gasses or chemicals may be present or used (including housekeeping/laundry areas and copying/printing rooms), provide segregated areas with deck-to-deck partitions with separate outside exhausting at a rate of at least 9.2 m<sup>3</sup>/hour per m<sup>2</sup> (0.5 cu. ft per minute per ft<sup>2</sup>), no air recirculation 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 gauge) when the doors to the rooms are closed.
- Provide containment drains plumbed for appropriate disposal of hazardous liquid wastes in spaces where water and chemical concentrate mixing occurs for maintenance, or laboratory purposes.
- Provide regularly occupied areas of the tenant space with new air filtration media prior to occupancy that provides a Minimum Efficiency Reporting Value (MERV) of 13 or better.

### Submittals

- Provide the LEED Letter Template, signed by the architect, interior designer or other responsible party, declaring that:
  - Permanent entryway systems (grilles, grates, etc.) to capture dirt, particulates, etc. are provided at all high volume exterior entryways within the tenant area.
  - 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 at the required exhaust rate and negative pressure differential.
  - Where water and chemical concentrate mixing occurs within the tenant space, drains are plumbed for environmentally appropriate disposal of hazardous liquid wastes, as determined by applicable regulations and standards.
  - Filters used meet the MERV requirements with new media installed prior to occupancy. Provide a listing of each filter installed including the MERV value, manufacturer name and model number.

SS	WE	EA	MR	EQ	ID
Credit 5					

1 Point

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

- Provide highlighted copies of final construction drawings showing locations of installed permanent entryway systems; deck-to-deck partitions, self-closing doors and dedicated exhaust systems; and drains for water and chemical concentrate mixing.
- Provide approved shop drawings or contractor's submittals for installed entryway systems, and filtration media.

**Potential Technologies & Strategies**

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

SS	WE	EA	MR	EQ	ID
Credit 6.1					

## Controllability of Systems, Lighting

---

1 Point

### Intent

Provide a high level of lighting system control for individual occupants, and specific groups in multi-occupant spaces (e.g., classrooms and conference areas), to promote the productivity, comfort and well-being of building occupants.

### Requirements

Provide lighting controls for:

- At least 90% of occupants, enabling adjustments to suit individual task needs and preferences,
- All shared multi-occupant spaces where transient groups must share lighting controls.

### Submittals

- Provide the LEED Letter Template, signed by the professional engineer or other responsible party, demonstrating and declaring that the required lighting controls are provided.

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

- Provide 6-12 photographs or approved shop drawings of task lighting and shared lighting controls.
- Provide a narrative describing the lighting system, including task lighting and lighting sensors and controls.

### Potential Technologies & Strategies

Design the tenant space with occupant controls for lighting. Strategies to consider include lighting controls and task lighting.

SS	WE	EA	MR	EQ	ID
Credit 6.2					

1 Point

## Controllability of Systems, Temperature and Ventilation

---

### Intent

Provide a high level of thermal and ventilation control for individual occupants, and specific groups in multi-occupant spaces (e.g., classrooms and conference areas), to promote the productivity, comfort and well-being of building occupants.

### Requirements

Provide thermal and ventilation controls for:

- At least 50% of the space occupants that enable adjustment to suit individual needs and preferences,
- All shared multi-occupant spaces where transient groups must share controls.

Operable windows may be used in lieu of individual controls for occupants near windows (6.1 metres (20 feet) inside of and 3.0 metres (10 feet) to either side of the operable part of the window), and where the operable windows meet the requirements of ASHRAE Standard 62-2004 Section 5.1 Natural Ventilation.

### Submittals

- Provide the LEED Letter Template, signed by the professional engineer or other responsible party, demonstrating and declaring that the required ventilation and temperature controls are provided.

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

- Provide specifications and approved shop drawings for installed thermal and ventilation controls.

### Potential Technologies & Strategies

Design the tenant space with occupant controls for airflow and temperature. Naturally ventilated spaces must include strategies for control of temperature and ventilation.

SS	WE	EA	MR	EQ	ID
Credit 7.1					

## Thermal Comfort, Compliance

---

1 Point

### Intent

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

### Requirements

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

### Submittals

- Provide the LEED Letter Template, signed by the professional engineer or responsible party, declaring that the project complies with ASHRAE Standard 55-2004. Include documentation of compliance per the standard as described in Section 6.1.1-Documentation, including calculations of operative temperature for radiantly conditioned spaces.
- Where humidity control equipment is not provided, provide the LEED Letter Template, signed by the professional engineer or responsible party, declaring that humidification / dehumidification equipment is neither required nor installed. Submit psychrometric analyses for indoor conditions under peak and typical operating conditions that demonstrate that humidity control is unnecessary.

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

No audit submittals are detailed for this Credit.

### Potential Technologies & Strategies

Establish comfort criteria per the standard, and design the tenant space envelope and HVAC system to maintain these comfort ranges.

SS	WE	EA	MR	EQ	ID
Credit 7.2					

1 Point  
in addition to  
EQ 7.1

## Thermal Comfort, Monitoring

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### Intent

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

### Requirements

Provide a permanent monitoring system and process for corrective action to ensure performance to the desired comfort criteria as determined by EQ Credit 7.1, Thermal Comfort, Compliance.

### Submittals

- Provide the LEED Letter Template, signed by the engineer or responsible party, that identifies the comfort criteria, strategy for ensuring performance to the comfort criteria, description of the permanent monitoring system implemented, and process for corrective action.

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

- Confirm that temperature, airflow and humidity controls (if applicable) were (or will be) tested as part of the scope of work for Energy and Atmosphere Prerequisite 1, Fundamental Commissioning. Include the document name and section number where the commissioning work is listed.
- A description of the permanent monitoring system implemented, either environmental monitoring or occupant surveying:
- If environmental monitoring is employed, a description of the quantity, type, and location of space temperature and humidity sensors, along with the data monitoring and reporting procedures.
- A description of the process for corrective action based on data from the thermal comfort monitoring system.

OR

- If occupant surveying is employed, a description of the survey techniques and frequency, including the survey results reporting procedures.
- A description of the process for corrective action based on data from the thermal comfort monitoring system.

### Potential Technologies & Strategies

ASHRAE Standard 55-2004 Paragraph 7 Evaluation of the Thermal Environment provides guidance on measurement of building performance parameters and two methods for validating performance: (a) Survey Occupants and (b) Analyze Environment Variables. The permanent monitoring system required here may apply either approach - survey or technical system - where the process or system is integrated into the standard operating processes of the building.

SS	WE	EA	MR	EQ	ID
Credit 8.1					

## Daylight and Views, Daylight 75% of Spaces

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1 Point

### Intent

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

### Requirements

For at least 75% of all regularly occupied areas:

*Option A:*

- Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetrations)

*Option B:*

- Using a computer simulation model, achieve at least 250 Lux (25 footcandles)
- Provide daylight redirection and/or glare control devices to ensure daylight effectiveness.

Note: For both *Option A* and *Option B* exceptions for areas where tasks would be hindered by the use of daylight will be considered on their merits.

### Submittals

*Option A and B:*

- Provide the LEED Letter Template, signed by the responsible party, indicating the required daylighting is accomplished in at least 75% of the regularly occupied areas.

*Option A:*

- Provide area calculations that define the daylight zones and provide a summary of manual daylight factor prediction calculations, illustrating that the footcandle levels have been achieved.

OR

*Option B:*

- Provide area calculations that define the daylight zones and provide a summary of computer simulations illustrating that the footcandle levels have been achieved.

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

- Provide drawings and a narrative highlighting critical visual task areas and typical room sections highlighting shading devices for sun control.
- Provide highlighted specifications and approved contractor's shop drawings and product data for applicable glazing products highlighting  $T_{vis}$  values and area calculations defining the daylight zone and daylight prediction calculations or daylight simulation results demonstrating a minimum Daylight Factor of 2% in these areas.
- Provide highlighted specifications and approved contractor's shop drawings and product data for installed shading devices.

SS	WE	EA	MR	EQ	ID
Credit 8.1					

1 Point

**Potential Technologies & Strategies**

Design the space to maximize interior daylighting and view opportunities. Strategies to consider include lower partition heights, interior shading devices, interior glazing and photo-integrated light sensors. Predict daylight factors via manual calculations or model daylighting strategies with a physical or computer model to assess footcandle levels and daylight factors achieved. Modeling must demonstrate 250 Lux (25 horizontal footcandles) under clear sky conditions, at noon, on the equinox, at 0.76 m (30 inches) above the floor. Any portion of a room achieving the requirements can qualify for this credit.

SS	WE	EA	MR	EQ	ID
Credit 8.2					

## Daylight and Views, Daylight 90% of Spaces

1 Point

### Intent

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

### Requirements

For at least 90% of all regularly occupied areas:

*Option A:*

- Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetrations)

*Option B:*

- Using a computer simulation model, achieve at least 250 Lux (25 footcandles)
- Provide daylight redirection and/or glare control devices to ensure daylight effectiveness.

Note: For both *Option A* and *Option B* exceptions for areas where tasks would be hindered by the use of daylight will be considered on their merits.

### Submittals

- Provide the LEED Letter Template, signed by the responsible party, indicating the required daylighting is accomplished in at least 90% of the regularly occupied areas.
- Provide area calculations that define the daylight zones and provide a summary of daylight factor prediction calculations through manual methods or a summary of computer simulations illustrating that the footcandle levels have been achieved.

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

- Provide drawings and a narrative highlighting critical visual task areas and typical room sections highlighting shading devices for direct sun control.
- Provide glazing approved contractor's shop drawings and product data highlighting  $T_{vis}$  values and area calculations defining the daylight zone and daylight prediction calculations or daylight simulation results demonstrating a minimum Daylight Factor of 2% in these areas.

### Potential Technologies & Strategies

Design the space to maximize interior daylighting and view opportunities. Strategies to consider include lower partition heights, interior shading devices, interior glazing and photo-integrated light sensors. Predict daylight factors via manual calculations or model daylighting strategies with a physical or computer model to assess footcandle levels and daylight factors achieved. Modeling must demonstrate 250 Lux (25 horizontal footcandles) under clear sky conditions, at noon, on the equinox, at 0.76 m (30 inches) above the floor. Any portion of a room achieving the requirements can qualify for this credit.

SS	WE	EA	MR	EQ	ID
Credit 8.3					

1 Point

## Daylight and Views, Views for 90% of Seated Spaces

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### Intent

Provide the occupants with a connection between indoor spaces and the outdoor environment through the introduction of daylight and views into the regularly occupied areas of the tenant space.

### Requirements

- Achieve direct line of sight to the outdoor environment (vision glazing between 0.76 metres (2'-6") and 2.3 metres (7'-6") for building occupants in 90% of all regularly occupied areas. Determine the area with direct line of sight by totaling the regularly occupied area 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 a point 1.1 m (42 in.) above the floor to perimeter vision glazing.
- Line of sight may be drawn through interior glazing. For private offices, the entire area of the office can be counted if 75% or more of the area has direct line of sight to perimeter vision glazing. If less than 75% of the area has direct line of sight then only the area with the direct line of sight will be counted towards meeting the credit requirement not the whole office area. For multi-occupant spaces, the actual area with direct line of sight to perimeter vision glazing is counted.

### Submittals

- Provide the LEED Letter Template and calculations signed by the architect, interior designer or other responsible party declaring that the building occupants in 90% of regularly occupied areas will have direct lines of site to perimeter glazing; and briefly describing design features that ensures this.

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

- Provide floor plans and representative sections highlighting the areas with direct line of sight and showing interior partitions and perimeter windows with respect to the view at 1.1m (42 in.) above the floor.

### Potential Technologies & Strategies

Design the space to maximize view opportunities. Strategies to consider include lower partition heights and interior glazing.

# Innovation & Design Process

SS	WE	EA	MR	EQ	ID
Credit 1.1 - 1.4					

## Innovation in Design

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1- 4 Points

### Intent

Provide design teams and projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED Canada-CI 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 **Requirements** 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 proposal(s) within the LEED Letter Template (including Intent, Requirements, Submittals and Possible Strategies) and relevant evidence of performance achieved.

### Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 2					

1 Point

LEED® Accredited Professional

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**Intent**

Support and encourage the design integration required by a LEED Canada-CI Green Building project and streamline the application and certification process.

**Requirements**

At least one principal participant in the project team has successfully completed the LEED Accredited Professional Exam.

**Submittals**

- Provide the LEED Letter Template stating the LEED Accredited Professional’s name, title, company and contact information. Include a copy of this person’s LEED Accredited Professional Certificate.

**Potential Technologies & Strategies**

Attending a LEED Canada NC: Technical Review (NC) Training Workshop is recommended, but not required. Study the LEED Canada-CI and LEED Canada-NC Reference Guide. Successfully pass the LEED Professional Accreditation Exam.

## NOTES

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## NOTES

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## NOTES

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