



LEED

GREEN BUILDING RATING SYSTEM

Green Building Rating System

**For New Construction &
Major Renovations
LEED® Canada-NC
Version 1.0**



December 2004

Introduction

The Canada Green Building Council (CaGBC) has been officially established as a national not-for-profit corporation and it has signed a Licensing Agreement with the U.S. Green Building Council (USGBC) for the exclusive implementation of the LEED® Green Building Rating System in Canada.

LEED® Canada-NC 1.0 is a Derivative Work of the USGBC’s LEED® Green Building Rating System¹. LEED Canada-NC 1.0 and its companion LEED Canada Reference Guide are intended to facilitate the use of the LEED Green Building Rating System in Canada. LEED Canada-NC 1.0 and the LEED Canada Reference Guide serve two distinct roles:

1. Where appropriate, they provide the set of equivalent Canadian LEED prerequisite and credit requirements, and references to relevant Canadian standards and resource material.
2. They provide the basis for any jurisdictions in Canada who may be interested in creating Supplements that would provide a further level of refinement and specificity.

This version of LEED Canada-NC 1.0 includes clarifications that arose during creation and review of the LEED Canada-NC 1.0 Reference Guide. Prerequisite and credit Submittal documentation requirements developed in Reference Guide creation have been incorporated; and several Requirements have been clarified, but neither balloted Intents nor the substance of balloted Requirements have changed. Changes are highlighted by bar at the side of the page.

LEED Canada-NC 1.0 is modeled on USGBC’s LEED®-NC 2.1, along with the incorporation of some material from the changes contemplated by the USGBC for LEED-2.2, and is specifically applicable to new designs and major renovations of new commercial buildings; institutional buildings; and high-rise residential buildings.

Through its use as a design guideline and third-party certification tool, LEED aims to improve occupant well-being, environmental performance and economic returns of buildings using established and innovative practices, standards and technologies. It provides one definition, widely accepted by industry, for what currently constitutes a “green building.” LEED Canada-NC 1.0 consists 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 Canada-NC 1.0 states the basic intent, requirements and documentation submittals that are necessary to achieve each prerequisite and voluntary “credit.” Projects earn one or more points toward certification by meeting or exceeding each credit’s technical requirements. All prerequisites must be achieved in order to qualify



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for 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 Reference Guide for Version 1.0—the technical companion to the Rating System and Letter Template—provides further background, explanations and instructions, including more detailed submittal requirements if back-up documentation is requested to substantiate the Letter Templates. The Letter Templates are documents that, when completed, form the initial submittal and declaration by the project teams that the requirements of the prerequisites or credits have been achieved.

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*¹Leadership in Energy and Environmental Design – Rating System Version 2.1, U.S. Green Building Council, June 2001, U.S. Green Building Council, Washington DC
www.usgbc.org*



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Project Checklist

Sustainable Sites 14 Possible Points

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

Water Efficiency 5 Possible Points

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

Energy & Atmosphere 17 Possible Points

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Prereq 1	Fundamental Building Systems Commissioning	Required
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Prereq 2	Minimum Energy Performance	Required
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Prereq 3	CFC Reduction in HVAC&R Equipment	Required
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1	Optimize Energy Performance	1 - 10
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2.1	Renewable Energy, 5%	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2.2	Renewable Energy, 10%	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2.3	Renewable Energy, 20%	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 3	Best Practice Commissioning	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4	Ozone Protection	1



<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 5	Measurement & Verification	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 6	Green Power	1

Materials & Resources

14 Possible Points

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Prereq 1	Storage & Collection of Recyclables	Required
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1.1	Building Reuse: Maintain 75% of Existing Walls, Floors, and Roof	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1.2	Building Reuse: Maintain 95% of Existing Walls, Floors, and Roof	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1.3	Building Reuse: Maintain 50% of Interior Non-Structural Elements	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2.1	Construction Waste Management: Divert 50% From Landfill	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2.2	Construction Waste Management: Divert 75% From Landfill	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 3.1	Resource Reuse: 5%	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 3.2	Resource Reuse: 10%	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.1	Recycled Content: 7.5% (post-consumer + ½ post-industrial)	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.2	Recycled Content: 15% (post-consumer + ½ post-industrial)	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 5.1	Regional Materials: 10% Extracted and Manufactured Regionally	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 5.2	Regional Materials: 20% Extracted and Manufactured Regionally	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 6	Rapidly Renewable Materials	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 7	Certified Wood	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 8	Durable Building	1

Indoor Environmental Quality

15 Possible Points

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Prereq 1	Minimum IAQ Performance	Required
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 1	Carbon Dioxide (CO ₂) Monitoring	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 2	Ventilation Effectiveness	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 3.1	Construction IAQ Management Plan: During Construction	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 3.2	Construction IAQ Management Plan: Testing Before Occupancy	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.1	Low-Emitting Materials: Adhesives & Sealants	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.2	Low-Emitting Materials: Paints and Coating	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.3	Low-Emitting Materials: Carpet	1



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<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 4.1	Low-Emitting Materials: Composite Wood and Laminate Adhesives	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 5	Indoor Chemical & Pollutant Source Control	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 6.1	Controllability of Systems: Perimeter Spaces	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 6.2	Controllability of Systems: Non-Perimeter Spaces	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 & Views: Daylight 75% of Spaces	1
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Credit 8.2	Daylight & Views: Views 90% of 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 2.1	LEED Accredited Professional	1

Project Totals 70 Possible Points

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Certified	26 - 32 points
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Silver	33 - 38 points
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Gold	39 - 51 points
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Platinum	52 - 70 points

Sustainable Sites

SS	WE	EA	MR	EQ	ID
Prerequisite 1					

Erosion & Sedimentation Control

Required

Intent

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

Requirements

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

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

Submittals

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

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

- Provide the erosion control plan (or drawings and specifications) with the sediment and erosion control measures highlighted.

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 1					

1 Point

Site Selection

Intent

Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site.

Requirements

Do not develop buildings, roads or parking areas on portions of sites that meet any one of the following criteria:

- Where such designation exists, land that is part of a Provincial Agricultural Land Reserve or Forest Land Reserve (see definitions.)
- Previously undeveloped land whose elevation is either lower than 1500 mm (5 feet) above the elevation of the 100-year flood plain, OR, lower than 900 mm (3 feet) above the elevation of the 200-year flood plain (see definitions.)
- Ecologically sensitive land (see definitions.)
- Land that provides habitat for rare or endangered species (see definitions.)
- Within 30.5 m (100 feet) of any wetland (see definitions.)
- Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public landowner. (Park Authority projects are exempt.)

Submittals

- Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring that the project site meets the credit requirements.

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

- Provide annotated site plan and evidence that the project site does not meet any of the prohibited criteria.

Potential Technologies & Strategies

During the site selection process, give preference to those sites that do not include sensitive site elements and restrictive land types. Select a suitable building location and design the building with the minimal footprint to minimize site disruption. Strategies include stacking the building program, tuck-under parking, and sharing facilities with neighbours.

SS	WE	EA	MR	EQ	ID
Credit 2					

Development Density

1 Point

Intent

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

Requirements

Increase localised density to conform to existing or desired density goals by utilising sites that are located within an existing minimum development density of 13,800m² per hectare (60,000 square feet per acre) (2-story downtown development).

Submittals

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

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

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

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 3					

1 Point

Redevelopment of Contaminated Sites

Intent

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

Requirements

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

Submittals

- Provide a letter from the relevant regulatory agency confirming that the site is classified as a contaminated site.
- Provide the LEED Letter Template signed by the civil engineer or responsible party, declaring the type of damage that existed on the site and describing the remediation performed.

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

- Provide documentation demonstrating that remediation efforts have been performed on the site to clean up or stabilize contaminants.

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 4.1					

1 Point

Alternative Transportation: Public Transportation Access

Intent

Reduce pollution and land development impacts from automobile use.

Requirements

Locate building within 800 metres (0.5 miles) of a commuter rail, light rail or subway station or 400 metres (0.25 miles) of 2 or more public bus lines offering frequent service.

Submittals

- Provide the LEED Letter Template, signed by an appropriate party, declaring that the project building(s) are located within required proximity to mass transit.
- Provide an area drawing 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.

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 4.2					

1 Point

Alternative Transportation: Bicycle Storage & Changing Rooms

Intent

Reduce pollution and land development impacts from automobile use.

Requirements

For commercial or institutional buildings, provide secure bicycle storage, with convenient changing/shower facilities (within 183 metres (200 yards) of the building) for 5% or more of regular building occupants, OR, requirements of local authority, whichever are more stringent. For residential buildings, provide covered storage facilities for securing bicycles for 15% or more of building occupants in lieu of changing/shower facilities, OR, requirements of local authority, whichever are more stringent.

Submittals

- For commercial projects: provide the LEED Letter Template, signed by the architect or responsible party, declaring the distance to bicycle storage and showers from the building entrance and demonstrating that these facilities can accommodate at least 5% of building occupants.

OR

- For residential projects: provide the LEED Letter Template, signed by the architect or responsible party, declaring the design occupancy for the buildings, number of covered bicycle storage facilities for securing bicycles, and demonstrating that these facilities can accommodate at least 15% of building occupants, OR, the requirements of the local authority, whichever are more stringent.

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

- Provide site drawings and specifications highlighting bicycle securing apparatus and changing/shower facilities.
- Calculations demonstrating that these facilities accommodate 5% or more of building occupants in commercial projects or at least 15% of building occupants in residential projects.

Potential Technologies & Strategies

Design the building with transportation amenities such as bicycle racks and showering/changing facilities.

SS	WE	EA	MR	EQ	ID
Credit 4.3					

Alternative Transportation: Hybrid and Alternative Fuel Vehicles

1 Point

Intent

Reduce pollution and land development impacts from automobile use.

Requirements

EITHER,

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

OR,

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

Submittals

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

OR,

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

Potential Technologies & Strategies

Provide transportation amenities such as alternative fuel refuelling stations and carpool/vanpool programs. Consider sharing the costs and benefits of refuelling stations with neighbours.

Credit 4.4

1 Point

Alternative Transportation: Parking Capacity

Intent

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

Requirements

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

OR ,

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

Submittals

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

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

- For new projects provide a copy of the local zoning requirements highlighting the criteria for minimum parking capacity, a parking plan highlighting the total parking capacity, and company literature or calculations demonstrating that carpool and vanpool programs serve 10% of the building occupants.

OR,

SS	WE	EA	MR	EQ	ID
Credit 4.4					

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

Potential Technologies & Strategies

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

Credit 5.1

1 Point

Reduced Site Disturbance: Protect or Restore Open Space

Intent

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

Requirements

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

OR,

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

Submittals

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

OR,

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

Potential Technologies & Strategies

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

Reduced Site Disturbance: Development Footprint

1 Point

Intent

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

Requirements

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

Submittals

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

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

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

Potential Technologies & Strategies

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

1 Point

Stormwater Management: Rate and Quantity

Intent

Limit disruption and pollution of natural water flows by managing stormwater runoff.

Requirements

If existing imperviousness is less than or equal to 50%, implement a stormwater management plan that prevents the post-development 1.5 year, 24 hour peak discharge rate and quantity from exceeding the pre-development 1.5 year, 24 hour peak discharge rate and quantity.

OR,

If existing imperviousness is greater than 50%, implement a stormwater management plan that results in a 25% decrease in the rate and quantity of stormwater runoff.

Submittals

- Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring that the post-development 1.5 year, 24 hour peak discharge rate and quantity does not exceed the pre-development 1.5 year 24 hour peak discharge rate and quantity. Include calculations demonstrating that existing site imperviousness is less than or equal to 50%.

OR,

- Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring and demonstrating that the stormwater management strategies result in at least a 25% decrease in the rate and quantity of stormwater runoff. Include calculations demonstrating that existing site imperviousness exceeds 50%.

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

- For sites with less than 50% net imperviousness, provide pre-construction and post-construction site drawings. Include area calculations demonstrating no increase in net imperviousness of the site.

OR,

- For sites with greater than 50% net imperviousness, provide a copy of the stormwater management plan. Include calculations describing how the measures of the plan decrease net imperviousness of the site by 25% over existing conditions.

Potential Technologies & Strategies

Design the project site to maintain natural stormwater flows by promoting infiltration. Specify garden roofs and pervious paving to minimize impervious surfaces. Reuse stormwater volumes generated for non-potable uses such as landscape irrigation, toilet and urinal flushing and custodial uses.

SS	WE	EA	MR	EQ	ID
Credit 6.2					

Stormwater Management: Treatment

1 Point

Intent

Limit disruption of natural water flows by eliminating stormwater runoff, increasing on-site infiltration and eliminating contaminants.

Requirements

Construct site stormwater treatment systems designed to remove 80% of the average annual post-development total suspended solids (TSS) and 40% of the average annual post-development total phosphorous (TP) based on the average annual loadings from all storms less than or equal to the 2-year/24-hour storm.

Do so by implementing Best Management Practices (BMPs) outlined in Chapter 4, Part 2 (Urban Runoff), of the United States Environmental Protection Agency's (EPA's) Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, January 1993 (Document No. EPA-840-B-92-002) or the local government's BMP document (whichever is more stringent).

Submittals

- Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring that the design complies with or exceeds EPA or local government Best Management Practices (whichever set is more stringent) for removal of total suspended solids and total phosphorous.

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

- Provide drawings and specifications describing EPA Best Management Practices implemented for removal of TSS and TP.
- Provide calculations to demonstrate that the BMPs meet or exceed the minimum treatment requirements of the credit.

Potential Technologies & Strategies

Design mechanical or natural treatment systems such as constructed wetlands, vegetated filter strips and bioswales to treat the site's stormwater.

Credit 7.1

1 Point

Heat Island Effect: Non-Roof

Intent

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

Requirements

Provide shade (within 5 years) and/or use light-coloured / high-albedo materials (reflectance of at least 0.3) and/or open grid pavement for at least 30% of the site's non-roof impervious surfaces, including parking lots, walkways, plazas, etc.;

OR,

Place a minimum of 50% of parking spaces underground or covered by structured parking;

OR,

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

Submittals

Provide the LEED Letter Template, signed by the civil engineer or responsible party, referencing the site plan to demonstrate areas of paving, landscaping (list species) and building footprint, and declaring that:

- A minimum of 30% of non-roof impervious surfaces areas are constructed with high-albedo materials and/or open grid pavement and/or will be shaded within five years

OR,

- A minimum of 50% of parking spaces have been placed underground or are covered by structured parking

OR,

- An open-grid pavement system (less than 50% impervious) has been used for a minimum of 50% of the parking lot area.

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

- Provide drawings highlighting all non-roof impervious surfaces and portions of these surfaces that will be shaded within five years. Include calculations demonstrating that a minimum of 30% of non-roof impervious surfaces areas will be shaded within five years.

OR,

- Provide specifications and cut sheets for high-albedo materials applied to non-roof impervious surfaces highlighting reflectance of the installed materials.

SS	WE	EA	MR	EQ	ID
Credit 7.1					

OR,

- Provide drawings and cut sheets for a pervious paving system with a minimum perviousness of 50%. Include calculations demonstrating that the paving system covers a minimum of 50% of the total parking area.

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 7.2					

1 Point

Heat Island Effect: Roof

Intent

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

Requirements

Use ENERGY STAR® compliant (highly reflective) AND high emissivity roofing (emissivity of at least 0.9 when tested in accordance with ASTM 408) for a minimum of 75% of the roof surface;

OR,

Install a “green” (vegetated) roof for at least 50% of the roof area.

Combinations of high albedo and vegetated roof can be used but they must collectively provide an effective area equal or greater than the 75% coverage that would be provided by a reflective roof alone but accounting for the relative weighted contributions.

Submittals

- Provide the LEED Letter Template, signed by the architect, civil engineer or responsible party, referencing the building plan and declaring that the roofing materials comply with the ENERGY STAR® Label requirements and have a minimum emissivity of 0.9. Demonstrate that high-albedo and vegetated roof areas combined constitute at least 75% of the total roof area.

OR,

- Provide the LEED Letter Template, signed by the architect, civil engineer or responsible party, referencing the building plan and demonstrating that vegetated roof areas constitute at least 50% of the total roof area.

OR

- Provide the LEED Letter Template, signed by the architect or responsible party, referencing the building plan and demonstrating that combined vegetated roof areas and high albedo surfaces are equivalent to at least 75% of the total roof area using a high albedo surface.

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

- Provide specifications and cut sheets highlighting roofing materials that are Energy Star labeled, with a minimum initial reflectance of 0.65, and a minimum three-year-aged reflectance of 0.5, and a minimum emissivity of 0.9. Include area calculations demonstrating that the roofing material covers a minimum of 75% of the total roof area.

OR

SS	WE	EA	MR	EQ	ID
Credit 7.2					

- ❑ Provide specifications and cut sheets highlighting a green vegetated roof system. Include area calculations demonstrating that the roof system covers a minimum of 50% of the total roof area.

OR

- ❑ Provide specifications and cut sheets highlighting reflective, low emittance roofing materials and green vegetated roof system that collectively meet the credit requirement. Include area calculations demonstrating that the combined roof system provides an equivalent minimum area to the 75% coverage using a high albedo surface.

Potential Technologies & Strategies

Visit the ENERGY STAR® Web site, www.energystar.gov, to look for compliant products. Consider installing high-albedo and vegetated roofs to reduce heat absorption.

1 Point

Light Pollution Reduction

Intent

Eliminate light trespass from the building and site, improve night sky access and reduce development impact on nocturnal environments.

Requirements

- Meet or provide 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).
- Design exterior lighting such that all exterior luminaires with more than 1000 initial lamp lumens are shielded and all luminaires with more than 3500 initial lamp lumens meet the Full Cutoff IESNA Classification.
- The maximum candela value of all interior lighting shall fall within the building (not out through windows) and the maximum candela value of all exterior 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.

Submittals

- Provide the LEED Letter Template, signed by a lighting designer or an appropriate party, declaring that the credit requirements have been met.

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

- Provide a brief exterior lighting design narrative and exterior lighting design plan demonstrating the lighting objectives and measures that prevent any direct-beam illumination from leaving the building site.
- Provide an exterior lighting design plan that illustrates the location of all lighting fixtures and the features they are to light.
- Demonstrate that the design will use diffuse or muted light, will meet the IESNA illuminance values measured at eye height, and not create glare or direct lighting onto neighboring property, streets or the night sky.

Potential Technologies & Strategies

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

Water Efficiency

SS	WE	EA	MR	EQ	ID
Credit 1.1					

Water Efficient Landscaping: Reduce by 50%

1 Point

Intent

Limit or eliminate the use of potable water for landscape irrigation.

Requirements

Use high-efficiency irrigation technology. Use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means.

Submittals

- Provide the LEED Letter Template, signed by the architect, engineer or responsible party, declaring that potable water consumption for site irrigation has been reduced by 50%.
- Include a brief narrative of the equipment used and/or the use of drought-tolerant or native plants.

If an audit is requested during the certification process:

- Provide cut sheets for high efficiency irrigation equipment. Include calculations demonstrating that potable water consumption for irrigation is reduced by 50%.

OR,

- Provide drawings and a narrative describing the captured rain system or recycled site water system with the capacity of the system highlighted. Include calculations demonstrating potable water consumption for irrigation is reduced by 50%.

Potential Technologies & Strategies

Perform a soil/climate analysis to determine appropriate landscape types and design the landscape with indigenous plants to reduce or eliminate irrigation requirements. Use high-efficiency irrigation systems and consider using stormwater and/or greywater for irrigation.

SS	WE	EA	MR	EQ	ID
Credit 1.2					

1 Point
in addition to
WE 1.1

Water Efficient Landscaping: No Potable Water Use or No Irrigation

Intent

Limit or eliminate the use of potable water for landscape irrigation.

Requirements

- Use only captured rain or recycled site water to eliminate all potable water use for site irrigation (except for initial watering to establish plants),

OR,

- Do not install permanent landscape irrigation systems.

Submittals

- Provide the LEED Letter Template, signed by the responsible architect and/or engineer, declaring that the project site will not use potable water for irrigation. Include a narrative describing the captured rain system, the recycled site water system, and their holding capacity. List all the plant species used. Include calculations demonstrating that irrigation requirements can be met from captured rain or recycled site water.

OR,

- Provide the LEED Letter Template, signed by the landscape architect or responsible party, declaring that the project site does not have a permanent landscape irrigation system. Include a narrative describing how the landscape design allows for this.

Potential Technologies & Strategies

Perform a soil/climate analysis to determine appropriate landscape types and design the landscape with indigenous plants to reduce or eliminate irrigation requirements. Consider using stormwater and/or greywater for irrigation.

SS	WE	EA	MR	EQ	ID
Credit 2					

Innovative Wastewater Technologies

1 Point

Intent

Reduce generation of wastewater and potable water demand, while increasing the local aquifer recharge.

Requirements

Reduce the use of municipally provided potable water for building sewage conveyance by a minimum of 50%.

OR,

Treat 100% of wastewater on site to tertiary standards.

Submittals

- Provide the LEED Letter Template, signed by the architect, Mechanical/Electrical/Plumbing (MEP) engineer or responsible party, declaring that water for building sewage conveyance will be reduced by at least 50%. Include the spreadsheet calculation and a narrative demonstrating the measures used to reduce wastewater by at least 50% from baseline conditions.

OR,

- Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring that 100% of wastewater will be treated to tertiary standards on site. Include a narrative describing the on-site wastewater treatment system.

If an audit is requested during the certification process:

- Provide drawings, specifications, and other support information that demonstrates how water for building sewage conveyance will be reduced by at least 50%.

OR,

- Provide drawings, specifications, and a narrative demonstrating that 100% of building wastewater volumes is directed to an onsite wastewater treatment system that provides treatment to tertiary levels. Include a letter from the local health department documenting compliance with local codes.

Potential Technologies & Strategies

Specify high-efficiency fixtures and dry fixtures such as composting toilets and waterless urinals to reduce wastewater volumes. Consider reusing stormwater or greywater for sewage conveyance or on-site wastewater treatment systems (mechanical and/or natural).

Credit 3.1

1 Point

Water Use Reduction: 20% Reduction

Intent

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

Requirements

Employ strategies that in aggregate use 20% less potable water than the water use baseline calculated for the building (not including irrigation) after meeting the fixture performance requirements listed in *Table 1*.

Table 1: Baseline Water Fixture Requirements

Toilets	6.0 L/flush	1.6 gal/flush
Urinals	3.8 L/flush	1.0 gal/flush
Showerhead	9.5 L/min	2.5 gal/min
Faucets	9.5 L/min	2.5 gal/min
Replacement Aerators	9.5 L/min	2.5 gal/min
Metering Faucets	0.95 L/cy	0.25 gal/cy

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 building reduce occupancy-based potable water consumption by 20% compared to baseline conditions.

If an audit is requested during the certification process:

- Provide cut sheets for all water consuming fixtures necessary for the occupancy use of the building, with water conservation specifications highlighted. Demonstrate that plumbing fixtures meet or exceed fixture performance requirements listed in *Table 1*.

Potential Technologies & Strategies

Estimate the potable and non-potable water needs for the building. Use high-efficiency fixtures, dry fixtures such as composting toilets and waterless urinals, and occupant sensors to reduce the potable water demand. Consider reuse of stormwater and greywater for non-potable applications such as toilet and urinal flushing, mechanical systems and custodial uses.

Water Use Reduction: 30% Reduction

1 Point

Intent

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

Requirements

Employ strategies that in aggregate use 30% less potable water than the water use baseline calculated for the building (not including irrigation) after meeting the fixture performance requirements listed in *Table 1*.

Table 1: Baseline Water Fixture Requirements

Toilets	6.0 L/flush	1.6 gal/flush
Urinals	3.8 L/flush	1.0 gal/flush
Showerhead	9.5 L/min	2.5 gal/min
Faucets	9.5 L/min	2.5 gal/min
Replacement Aerators	9.5 L/min	2.5 gal/min
Metering Faucets	0.95 L/cy	0.25 gal/cy

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 building reduce occupancy-based potable water consumption by 30% compared to baseline conditions.

If an audit is requested during the certification process:

- Provide cut sheets for all water consuming fixtures necessary for the occupancy use of the building, with water conservation specifications highlighted. Demonstrate that plumbing fixtures meet or exceed fixture performance requirements listed in *Table 1*.

Potential Technologies & Strategies

Estimate the potable and non-potable water needs for the building. Use high-efficiency fixtures, dry fixtures such as composting toilets and waterless urinals, and occupant sensors to reduce the potable water demand. Consider reuse of stormwater and greywater for non-potable applications such as toilet and urinal flushing, mechanical systems and custodial uses.

SS	WE	EA	MR	EQ	ID
Prerequisite 1					

Energy & Atmosphere

Required

Fundamental Building Systems Commissioning

Intent

Verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as intended.

Requirements

Implement or have a contract in place to implement the following fundamental best practice commissioning procedures.

- Engage a commissioning authority that does not include individuals directly responsible for project design or construction management.
- Review the design intent and the basis of design documentation.
- Incorporate commissioning requirements into the construction documents.
- Develop and utilize a commissioning plan.
- Verify installation, functional performance, training and operation and maintenance documentation.
- Complete a commissioning report.

Submittals

- Provide the LEED Letter Template, signed by the owner or commissioning authority, confirming that the fundamental commissioning requirements have been successfully executed or will be provided under existing contract(s).

If an audit is requested during the certification process, provide the following documents to demonstrate performance of this prerequisite:

- an organizational chart of the commissioning team,
- owner's requirements (or design intent),
- basis of design,
- commissioning plan,
- table of contents of operation and maintenance manuals and
- the commissioning report

Potential Technologies & Strategies

Engage a commissioning authority and adopt a commissioning plan. Include commissioning requirements in bid documents and task the commissioning agent to produce a commissioning report once commissioning activities are completed.

Minimum Energy Performance

Required

Intent

Establish the minimum level of energy efficiency for the base building and systems.

Requirements

Option 1 - New Buildings:

- Reduce the design energy consumption to comply with Natural Resources Canada's Commercial Building Incentive Program (CBIP) requirement for a 25% reduction relative to the consumption of the reference building designed to the Model National Energy Code for Buildings 1997 (MNECB) including supplemental CBIP requirements. Compliance shall be demonstrated by using whole building energy simulation. The calculation of percentage energy reduction shall be in accordance with the procedures used in the CBIP program (i.e., includes "non-regulated" plug loads but excludes process equipment).

OR,

- Reduce the design energy cost by 18% relative to the reference building designed to ASHRAE/IESNA 90.1-1999 (without amendments). Compliance shall be demonstrated using whole building energy simulation. The calculation of percentage energy reduction shall be in accordance with ASHRAE 90.1 procedures and excludes "non-regulated" loads.

Option 2 - Major Renovations to Existing Buildings:

- Reduce the design energy consumption by 10% relative to the consumption of the reference building designed to the CBIP adaptation of the MNECB. Compliance shall be demonstrated by a whole building energy simulation. The calculation of percentage energy reduction shall be in accordance with the procedures used in the CBIP program (i.e., includes "non-regulated" plug loads but excludes process equipment).

OR,

- Design the building to comply with ASHRAE/IESNA Standard 90.1-1999 (without amendments).

Option 3 - Low- and High-rise Multi-unit Residential Buildings:

EFFECTIVE UNTIL DECEMBER 31, 2006:

- Design the building to comply with ASHRAE/IESNA Standard 90.1-1999 (without amendments) or 10% better than the MNECB based on energy consumption, or the local energy code, whichever is more stringent. A modeling path (not the prescriptive path) must be used to demonstrate compliance. To establish savings relative to the MNECB, the calculation of percentage energy reduction shall be in accordance with the procedures

Prerequisite 2

Required

Minimum Energy Performance*(continued)*

used in CBIP (i.e. includes “non-regulated” plug loads but excludes process equipment).

- The project must be registered under LEED Canada on or before December 31 2006, AND a building permit must be issued within 12 months of December 31 2006 in order to be eligible for this option.

EFFECTIVE JANUARY 1, 2007:

- The LEED Canada requirements for new and existing buildings as described in options 1 and 2 will come into effect for low- and high-rise residential buildings. Option 3 for low- and high-rise multi-unit residential projects will no longer be available.

Whichever compliance path is chosen for this prerequisite must also be utilized for Energy and Atmosphere Credit 1, Optimize Energy Performance, if that credit is sought.

Computer modeling should follow the procedures in Part 8 of the MNECB 1997 for projects using CBIP compliance and the procedures described in ASHRAE/IESNA 90.1-1999 for projects using ASHRAE compliance. All projects shall follow the modeling guidelines in the most recent version of Natural Resources Canada “Procedures for Modeling Buildings to CBIP and MNECB”. Regulated loads include HVAC (heating, cooling, fans and pumps), service hot water and interior lighting. Non-regulated loads include plug loads, exterior lighting, garage ventilation, elevators (vertical transportation) and process loads.

Submittals

- Provide a LEED Letter Template signed by a licensed professional engineer or architect, stating that the building complies with the appropriate energy performance level (defined above).

AND

For CBIP Projects reviewed and approved by Natural Resources Canada:

- Provide a copy of the letter from Natural Resources Canada indicating that the building qualifies for the CBIP program, and passes LEED Energy & Atmosphere Prerequisite 2 requirements.

For CBIP Projects not reviewed by NRCAN or ineligible CBIP Projects:

- Provide a review report by an independent CBIP Design Assessor indicating that the design meets the requirements of this prerequisite,

OR

SS	WE	EA	MR	EQ	ID
Prerequisite 2					

Minimum Energy Performance

(continued)

Required

- Provide an electronic copy of the computer simulation files, checklist of mandatory items met and documentation supporting the claimed energy savings, including architectural, mechanical and electrical drawings and specifications in electronic form.

For ASHRAE Projects:

- Provide an electronic copy of the Energy Cost Budget and final Proposed Design computer simulation files, checklist of mandatory items met and documentation supporting the claimed energy savings, including architectural, mechanical and electrical drawings and specifications in electronic form.

Potential Technologies & Strategies

Design the building envelope and systems 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 compared to the baseline building.

Required

CFC Reduction in HVAC&R Equipment and Elimination of Halons

Intent

Reduce ozone depletion.

Requirements

Zero use of CFC-based refrigerants in new base building HVAC&R systems and zero use of halons in fire suppression equipment. When reusing existing base building HVAC equipment, complete a comprehensive CFC phase-out conversion.

Submittals

- Provide a LEED Letter Template, signed by a licensed professional engineer or architect, declaring that the building's HVAC&R systems do not use CFC-based refrigerants and that fire suppression equipment does not use halons.

If an audit is requested during the certification process:

- Submittals should include a schedule of all refrigeration equipment showing their refrigerant charges (and non-base building systems if they exceed 15% of the installed cooling capacity), and a schedule of fixed fire suppression equipment showing fire retardants used.

Potential Technologies & Strategies

When reusing existing HVAC systems, conduct an inventory to identify equipment that uses CFC refrigerants and adopt a replacement schedule for these refrigerants. For new buildings, specify new HVAC equipment that uses no CFC refrigerants.

Optimize Energy Performance

1-10 Points

Intent

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

Requirements

New Buildings:

- Reduce design energy cost compared to the energy cost of the MNECB OR ASHRAE/IESNA 90.1-1999 reference building for energy systems regulated by these standards. Points are awarded according to *Table 1*. Compliance shall be demonstrated by using whole building energy simulation using the same compliance path (MNECB/CBIP or ASHRAE 90.1) as was used for EAp2. The calculation of percentage energy cost reduction shall exclude “non-regulated” loads.

Table 1: Points Awarded for Percentage Reductions in Design Energy Cost Relative to MNECB and ASHRAE 90.1 – New Buildings

<i>Points</i>	<i>MNECB</i>	<i>ASHRAE/IESNA 90.1-1999</i>
1	24%	15%
2	29%	20%
3	33%	25%
4	38%	30%
5	42%	35%
6	47%	40%
7	51%	45%
8	55%	50%
9	60%	55%
10	64%	60%

Major Renovations to Existing Buildings:

- Reduce design energy cost compared to the energy cost of the MNECB/ CBIP OR ASHRAE/IESNA 90.1-1999 reference building for energy systems regulated by these standards. Points are awarded according to *Table 2*. Compliance shall be demonstrated by using whole building energy simulation using the same compliance path (MNECB/CBIP or ASHRAE 90.1) as was used for EAp2. The calculation of percentage energy cost reduction shall exclude “non-regulated” loads.

1 - 10 Points

Optimize Energy Performance

(continued)

Table 2: Points Awarded for Percentage Reductions in Design Energy Cost Relative to MNECB and ASHRAE 90.1 – Existing Buildings

<i>Points</i>	<i>MNECB</i>	<i>ASHRAE/IESNA 90.1-1999</i>
1	15%	5%
2	20%	10%
3	24%	15%
4	29%	20%
5	33%	25%
6	38%	30%
7	42%	35%
8	47%	40%
9	51%	45%
10	55%	50%

Regulated loads include HVAC (heating, cooling, fans and pumps), service hot water and interior lighting. Non-regulated loads include plug loads, exterior lighting, garage ventilation, elevators (vertical transportation) and process loads.

Submittals

- Provide a LEED Letter Template signed by the responsible licensed professional engineer or architect, stating that the building complies with the claimed energy performance level (defined above)

AND,

For CBIP Projects reviewed and approved by Natural Resources Canada:

- Provide a copy of the CBIP assessment report from Natural Resources Canada indicating the annual energy savings for the building,

For CBIP Projects not reviewed by NRCAN, ineligible CBIP Projects and ASHRAE Projects:

- Provide a review report by an independent CBIP Design Assessor indicating that the design meets the requirements of this prerequisite,

OR

- Provide an electronic copy of the energy report, and supporting computer simulation files of the reference and proposed models, and documentation supporting the claimed energy savings, including a quantitative summary table listing the energy saving strategies and comparison to the code requirements; zone diagrams, and electronic copies of drawings and

SS	WE	EA	MR	EQ	ID
Credit 1					

Optimize Energy Performance

(continued)

1-10 Points

specifications that affect the energy performance of the building

Potential Technologies and Strategies

Design the building envelope and building systems to maximize energy performance. Use a computer simulation model to assess the energy performance and identify the most cost-effective energy efficiency measures. Quantify energy performance as compared to a baseline building.

SS	WE	EA	MR	EQ	ID
Credit 2.1					

1 Point

Renewable Energy: 5%

Intent

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

Requirements

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

Submittals

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

Potential Technologies & Strategies

Assess the project for non-polluting and renewable energy potential including solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies. When applying these strategies, take advantage of net metering with the local utility.

SS	WE	EA	MR	EQ	ID
Credit 2.2					

Renewable Energy: 10%

Intent

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

Requirements

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

Submittals

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

Potential Technologies & Strategies

Assess the project for non-polluting and renewable energy potential including solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies. When applying these strategies, take advantage of net metering with the local utility.

1 Point
in addition to
EA 2.1

SS	WE	EA	MR	EQ	ID
Credit 2.3					

1 Point
in addition to
EA 2.1 and 2.2

Renewable Energy: 20%

Intent

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

Requirements

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

Submittals

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

Potential Technologies & Strategies

Assess the project for non-polluting and renewable energy potential including solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies. When applying these strategies, take advantage of net metering with the local utility.

SS	WE	EA	MR	EQ	ID
Credit 3					

Best Practice Commissioning

1 Point

Intent

Verify and ensure that the entire building is designed, constructed and calibrated to operate as intended.

Requirements

In addition to the Fundamental Building Commissioning prerequisite, implement or have a contract in place to implement the following additional commissioning tasks:

1. A commissioning authority independent of the design team shall conduct a review of the design prior to the construction documents phase.
2. An independent commissioning authority shall conduct a review of the construction documents near completion of the construction document development and prior to issuing the contract documents for construction.
3. An independent commissioning authority shall review the contractor submittals relative to systems being commissioned.
4. Provide the owner with a single manual that contains the information required for re-commissioning building systems.
5. Have a contract in place to review building operation with O&M staff, including:
 - a plan for how occupants may report IAQ concerns, the subsequent investigation process and how they will be reported back to the occupant, and,
 - a plan for resolution of outstanding commissioning-related issues within one year after construction completion date.

Submittals

- Provide the LEED Letter Template, signed by the owner or independent commissioning agent(s) as appropriate, confirming that the required additional commissioning tasks have been successfully executed or will be provided under existing contract(s).

If this Credit is audited for LEED certification, provide the following documentation to demonstrate credit requirements are met:

- a report on a review by the independent commissioning authority on the schematic design, construction documents, and contractor submittals;
- a copy of the table of contents of recommissioning manual; and
- a copy of the contract and plan for addressing occupant concerns and a one year commissioning review.

Potential Technologies & Strategies

Engage the commissioning authority early in the design phases.

SS	WE	EA	MR	EQ	ID
Credit 4					

1 Point

Ozone Protection

Intent

Reduce ozone depletion and support early compliance with the Montreal Protocol.

Requirements

Install base building level HVAC and refrigeration equipment that do not contain HCFCs.

Submittals

- Provide the LEED Letter Template, signed by the architect, engineer or responsible party, stating that HVAC&R systems as-built are free of HCFCs.

If this Credit is audited for LEED certification:

- Provide a schedule of base building and non-base building HVAC and refrigeration systems, their refrigerants, their cooling capacities and the total installed base building cooling capacity.

Potential Technologies & Strategies

When reusing buildings, inventory existing building systems using refrigerants and fire suppression chemicals and replace those that contain HCFCs. For new buildings, specify refrigeration and fire suppression systems that use no HCFCs.

SS	WE	EA	MR	EQ	ID
Credit 5					

Measurement and Verification

1 Point

Intent

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

Requirements

Install continuous metering equipment for the following end-uses:

- Lighting systems and controls
- Constant and variable motor loads
- Variable frequency drive (VFD) operation
- Chiller efficiency at variable loads (kW/ton)
- 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 risers and outdoor irrigation systems

Develop a Measurement and 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

- Provide the LEED Letter Template, signed by the licensed engineer or other responsible party, indicating that metering equipment has been installed for each end-use and declaring the option to be followed under IPMVP version 2001.
- Provide a copy of the M&V plan following IPMVP, 2001 version, including an executive summary.

Potential Technologies & Strategies

Model the energy and water systems to predict savings. Design the building with equipment to measure energy and water performance. Draft a Measurement & Verification Plan to apply during building operation that compares predicted savings to those actually achieved in the field.

SS	WE	EA	MR	EQ	ID
Credit 6					

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 building's electricity from renewable sources by engaging in at least a two-year renewable energy contract. Renewable sources are those that meet the Environment Canada Environmental Choice programs' EcoLogo requirements for green power supplies.

Submittals

- Provide the LEED Letter Template, signed by the owner or other responsible party, documenting that the supplied renewable 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.

Potential Technologies & Strategies

Determine the energy needs of the building 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 & 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 area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics and metals.

Submittals

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

If an audit of this Credit 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 building occupants.

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 1.1					

1 Point

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

Intent

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

Requirements

Maintain at least 75% of existing building structure and shell (exterior skin and framing, excluding window assemblies and non-structural roofing materials).

Submittals

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

If an audit is requested during the certification process:

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

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 1.2					

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

1 Point
in addition to
MR 1.1

Intent

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

Requirements

Maintain an additional 20% (95% total) of existing building structure and shell (exterior skin and framing, excluding window assemblies and non-structural roofing materials).

Submittals

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

If an audit is requested during the certification process:

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

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 1.3					

1 Point
in addition to
MR 1.1 & MR 1.2

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

Intent

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

Requirements

Maintain at least 50% of non-shell areas (interior walls, doors, floor coverings and ceiling systems).

Submittals

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

If an audit is requested during the certification process:

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

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 2.1					

Construction Waste Management: Divert 50% From Landfill

1 Point

Intent

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

Requirements

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

Submittals

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

If an audit is requested during the certification process:

- Provide a copy of the Waste Management Plan for the project highlighting recycling and salvage requirements. Include calculations demonstrating that 50% of the non-shell components were reused.
- Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged.

Potential Technologies & Strategies

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

Intent

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

Requirements

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

Submittals

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

If an audit is requested during the certification process:

- Provide a copy of the 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.

Potential Technologies & Strategies

Establish goals for landfill diversion and adopt a construction waste management plan to achieve these goals. Consider recycling land clearing debris, cardboard, metal, brick, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area on the construction site for recycling and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials. Note that salvage 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, products and furnishings for at least 5% of the total cost of building materials.

Submittals

- Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the credit requirements have been met and listing each material or product used to meet the credit. Include details demonstrating that the project incorporates the required percentage of reused materials and products and showing their costs and the total cost of materials for the project.
- The salvaged or refurbished status of each material must be validated by a statement from the provider of that material, in case this Credit is audited.

If an audit is requested during the certification process:

- Provide specifications and contractor submittals highlighting salvaged and refurbished materials used on the project.

Potential Technologies & Strategies

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

SS	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, products and furnishings for at least 10% of the total cost of building materials.

Submittals

- Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the credit requirements have been met and listing each material or product used to meet the credit. Include details demonstrating that the project incorporates the required percentage of reused materials and products and showing their costs and the total cost of materials for the project.
- The salvaged or refurbished status of each material must be validated by a statement from the provider of that material, in case this Credit is audited.

If an audit is requested during the certification process:

- Provide specifications and contractor submittals highlighting salvaged and refurbished materials used on the project.

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 4.1					

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

1 Point

Intent

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

Requirements

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

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

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

Submittals

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

- Provide specifications and contractor submittals highlighting recycled content materials installed.

SS	WE	EA	MR	EQ	ID
Credit 4.1					

1 Point

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

(continued)

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 4.2					

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

1 Point
in addition to
MR 4.1

Intent

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

Requirements

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

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

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

Submittals

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

- Provide specifications and contractor submittals highlighting recycled content materials installed.

SS	WE	EA	MR	EQ	ID
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Credit 4.2

1 Point
in addition to
MR 4.1

Recycled Content:
15% (Post-Consumer + 1/2 Post-Industrial)

(continued)

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 5.1					

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 use of indigenous resources and reducing the environmental impacts resulting from transportation.

Requirements

- Use a minimum of 10% of building materials or products for which at least 80% of the mass is extracted, processed and manufactured within 800 km (500 miles) of the project site.

OR,

- Use a minimum of 10% of building materials or products for which at least 80% of the mass is extracted, processed, and manufactured within 2400 km (1,500 miles) of the project site, and shipped by rail or water.

OR,

- Use a minimum of 10% of building materials or products that reflect a combination of the above extraction, processing, manufacturing and shipping criteria (e.g., 5% within 800 km (500 miles) and 5% shipped by rail within 2400 km (1,500 miles)).

Submittals

- ❑ Provide the LEED Letter Template, signed by the architect or responsible party, declaring that the credit requirements have been met. Include evidence of transportation service by rail or water if applicable; and 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 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 site and mode of transportation, and the distances from the materials extraction to the site.

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 5.2					

1 Point
in addition to
MR 5.1

Regional Materials: 20% Extracted and Manufactured Regionally

Intent

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

Requirements

- Use a minimum of 20% of building materials or products for which at least 80% of the mass is extracted, processed and manufactured within 800 km (500 miles) of the project site.

OR,

- Use a minimum of 20% of building materials or products for which at least 80% of the mass is extracted, processed, and manufactured within 2400 km (1,500 miles) of the project site, and shipped by rail or water.

OR,

- Use a minimum of 20% of building materials or products that reflect a combination of the above extraction, processing, manufacturing and shipping criteria (e.g., 5% within 800 km (500 miles) and 5% shipped by rail within 2400 km (1,500 miles).

Submittals

- Provide the LEED Letter Template, signed by the architect or responsible party, declaring that the credit requirements have been met. Include evidence of transportation service by rail or water if applicable; and 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 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 site and mode of transportation, and the distances from the materials extraction to the site.

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 6					

Rapidly Renewable Materials

1 Point

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 building materials and products (made from plants that are typically harvested within a ten-year cycle or shorter) for 5% of the total value of all building materials and products used in the project.

Submittals

- Provide the LEED Letter Template, signed by the architect or 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 is requested during the certification process:

- Provide specifications and contractor submittals highlighting rapidly renewable materials 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, straw board, cotton batt insulation, linoleum flooring, poplar OSB, sunflower 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					

1 Point

Certified Wood

Intent

Encourage environmentally responsible forest management.

Requirements

Use a minimum of 50% of wood-based materials and products, certified in accordance with the Forest Stewardship Council's Principles and Criteria, for wood building components including, but not limited to, structural framing and general dimensional framing, flooring, finishes, furnishings, and non-rented temporary construction applications such as bracing, concrete form work and pedestrian barriers.

Submittals

- Provide the LEED Letter Template, signed by the architect, owner or responsible party, declaring that the credit requirements have been met and listing the FSC-certified materials and products used. Include calculations demonstrating that the project incorporates the required percentage of FSC-certified materials/products 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.

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	EQ	ID
Credit 8					

Durable Building

1 Point

Intent

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

Requirements

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

- Design and construct the building to ensure that the predicted service life exceeds the design service life established in *Table 2 in CSA S478-95 (R2001) – Guideline on Durability in Buildings*.
- Where component and assembly design service lives are shorter than the design service life of the building, design and construct those components and assemblies so that they can be readily replaced, and use a design service life in accordance with *Table 3 in CSA S478-95 (R2001) – Guideline on Durability in Buildings*, as follows:
 - For components and assemblies whose Categories of Failure are 6, 7 or 8 in *Table 3*, use a design service life equal to the design service life of the building.
 - For components and assemblies whose Categories of Failure are 4 or 5 in *Table 3*, use a design service life equal to at least half of the design service life of the building.
- Demonstrate the predicted service life of chosen components or assemblies by documenting demonstrated effectiveness, modeling of the deterioration process or by testing in accordance with *Clause 7.3, 7.4 or 7.5* and by completing *Tables A1, A2 & A3 from CSA S478-95 (R2001) – Guideline on Durability in Buildings*.
- Document the elements of quality assurance activities to be carried out to ensure the predicted service life is achieved, in the format contained in *Table 1, Quality Assurance and the Building Process, of CSA S478-95 (R2001) – Guideline on Durability in Buildings*.
- Develop and document the quality management program for the project that ensures the quality assurance activities are carried out, in accordance with the elements identified in *Clause 5.3, Elements of Quality Management, CSA S478-95 (R2001) – Guideline on Durability in Buildings*.

SS	WE	EA	MR	EQ	ID
Credit 8					

1 Point

Durable Building

(continued)

Submittals

- Provide the LEED Letter Template, signed by the professional responsible and the general contractor, declaring that a Building Durability Plan has been developed and implemented.
- Document the building science qualification certification or training qualifications of the professional(s) responsible for the building envelope design of the building.

Potential Technologies & Strategies

Design strategies specifically included to minimize premature deterioration of the walls and roof and which are appropriate to the region, e.g., shading screens, eaves, overhangs, scuppers, etc., surface materials appropriate to exterior conditions, use of drained walls and continuous air-barrier systems of appropriate strength.

Indoor Environmental Quality

SS	WE	EA	MR	EQ	ID
Prerequisite 1					

Minimum IAQ Performance

Required

Intent

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

Requirements

Meet the minimum requirements of voluntary consensus standard ASHRAE 62-2001, Ventilation for Acceptable Indoor Air Quality, and Addenda approved at the time the building was permitted. Mechanical ventilation systems shall be designed using the Ventilation Rate Procedure.

Submittals

- ❑ Provide the LEED Letter Template, signed by the responsible design professional, declaring that the project is fully compliant with Sections 4, 5, 6, and 7 of ASHRAE 62-2001 and all applicable Addenda, and describing the procedure employed in the IAQ analysis (as a minimum, the standard's Ventilation Rate Procedure for mechanical ventilation systems).

If an audit is requested during the certification process:

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

Potential Technologies & Strategies

Design and construct the building to meet the requirements of Sections 4, 5, 6, and 7 of the referenced standard. See ASHRAE website at <http://www.ashrae.org/> and Standard 62 addenda page at <http://www.ashrae.org/template/AssetDetail/assetid/30205>.

Required

Environmental Tobacco Smoke (ETS) Control

Intent

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

Requirements

Choose one of the following compliance options:

- Option 1. Prohibit smoking in the building.
- Option 2. Establish negative pressure in the rooms with smoking.
- Option 3. Reduce air leakage between rooms with smoking and non-smoking areas in residential buildings. This option is for residential buildings only.

Option 1 - Prohibit smoking in the building.

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

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

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

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

- Prohibit smoking in all common areas of the building
- Locate any exterior designated smoking areas at least 7.5 metres (25 feet)

Environmental Tobacco Smoke (ETS) Control

Required

(continued)

away from entries, outdoor air intakes and operable windows opening to common areas.

- Minimize uncontrolled pathways for ETS transfer between individual residential units by sealing penetrations in walls, ceilings, and floors in the residential units, and by sealing vertical chases adjacent to the units. In addition, all doors in the residential units leading to common hallways shall be weather-stripped to minimize air leakage into the hallway. Acceptable sealing of residential units shall be demonstrated by blower door test conducted in accordance with ANSI/ASTM-779-99 using the progressive sampling methodology defined in Chapter 4 (Home Energy Rating Systems (HERS) Required Verification And Diagnostic Testing) of the California Low Rise Residential Alternative Calculation Method Approval Manual. Residential units must demonstrate less than 0.875 cm² of leakage area per square meter of enclosure area (1.25 in²/100ft.²) at 10 Pa pressure difference.

Submittals

- Provide the LEED Letter Template, signed by the building owner or responsible party, declaring that the building will be operated under a policy prohibiting smoking except in designated areas. If this Prerequisite is audited for certification, submittals would be expected to include a letter signed by the building owner or operator detailing a non-smoking policy compliant with Option 1, or a copy of applicable municipal, regional or provincial regulations or legislation.

OR,

- For *Options 2 and 3*, provide the LEED Letter Template, signed by the responsible design professional, declaring and demonstrating that the design criteria described in the credit requirements have been met and performance has been verified using the method described in the Credit requirements.

If an audit is requested during the certification process:

- For Option 2, provide test records of differential pressure performance for designated smoking rooms, including records of differential pressures between each adjacent space or vertical chase; drawings; and a narrative describing how partition openings are sealed, and the independent ventilation systems designed for designated smoking rooms.
- For Option 3, records of blower door tests conducted in accordance with the referenced standards, for at least 10% of the first 100 dwelling units in the building, and 5% of any additional units. (For example, a 150 unit building would be required to test a total of $10 + 2.5 = 13$ dwelling units.)

Prerequisite 2

Required

Environmental Tobacco Smoke (ETS) Control

(continued)

Distribution of the tested units should reflect wind and buoyancy conditions experienced by the building, i.e., on different faces and elevations in the building; test records should include the normalized leakage area calculated and test reference pressure for each dwelling unit tested, as well as indoor and outdoor temperatures and windspeeds during the tests. For high-rise building constructed during cold outdoor temperatures, summarize measures used to ensure accurate blower door test results.

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 1					

Carbon Dioxide (CO₂) Monitoring

1 Point

Intent

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

Requirements

Install a permanent carbon dioxide (CO₂) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments. Refer to the CO₂ differential for all types of occupancy in accordance with ASHRAE 62-2001, Appendix C.

Submittals

Provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring and summarizing the installation, operational design and controls/zones for the carbon dioxide monitoring system. For mixed-use buildings, calculate CO₂ levels for each separate activity level and use.

If an audit is requested during the certification process:

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

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 2					

1 Point

Ventilation Effectiveness

Intent

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

Requirements

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

Submittals

For mechanically ventilated spaces:

EITHER

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

OR,

For mechanically ventilated spaces:

- Provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring that the design complies with the recommended design approaches in ASHRAE 2001 Fundamentals Chapter 32, Space Air Diffusion.

For naturally ventilated spaces:

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

If an audit is requested during the certification process:

For mechanically ventilated spaces:

EITHER

- Provide a report summarizing the results of tracer gas tests of air change effectiveness following ASHRAE Standard 129-1997 for sample spaces representative of the major building occupancies. The report should

SS	WE	EA	MR	EQ	ID
Credit 2					

Ventilation Effectiveness

1 Point

(continued)

include the type of tracer gas test(s) used, start and stop times and corresponding tracer gas concentrations, supply and exhaust airflow rates, air ages, nominal time constants and air-change effectiveness for each tested space.

OR,

- ❑ Provide scale plans and sections showing essential elements of the ventilation system of each regularly-occupied room type, following ASHRAE Fundamentals Handbook 2001, Chapter 32: Space Air Diffusion guidance. These should show inlets and outlets; air throws; the occupied zone; furniture and typical heat sources. For mixing systems, they should also include characteristic room lengths and ADPI for each room type; for displacement or unidirectional systems, sketches should also show predicted distribution of stratified zones. All submissions should include schedules and equipment cut sheets of installed terminal inlets and outlets, keyed to the drawings; and an as-built inspection report with photographs of each room type. Overall compliance must be shown in both heating and cooling mode.

For naturally ventilated spaces:

- ❑ Provide a report summarizing airflow (CFD or nodal airflow) simulation results for each regularly-occupied zone type in both heating and cooling modes. The report should include a brief narrative describing system operational modes, graphics showing zone and building airflow patterns with local winds in each cardinal and prevailing direction, and identify the computational fluid dynamics or network airflow modeling program used.

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 3.1					

1 Point

Construction IAQ Management Plan: During Construction

Intent

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

Requirements

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

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

Submittals

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

AND,

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

AND 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.

SS	WE	EA	MR	EQ	ID
Credit 3.1					

Construction IAQ Management Plan: During Construction

1 Point

(continued)

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 description of some of the important design approaches employed.

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 3.2					

1 Point

Construction IAQ Management Plan: Testing Before Occupancy

Intent

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

Requirements

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

Option 1. Building Flush Prior to Occupancy

- Prior to occupancy, and after construction ends and all interior finishes are installed, install new filtration media, and flush-out the building by supplying a total air volume of 4,300 m³ of outdoor air per m² of floor area (14,100 ft³ of outdoor air per ft² of floor area) while maintaining an internal temperature of at least 16C (60F) and, where mechanical cooling is operated, relative humidity no higher than 60%.

Option 2. Building Flush Overlapping with Occupancy

- After construction ends and all interior finishes installed, install new filtration media and flush-out the building by supplying a minimum of 0.045 m³/m² (0.15 cfm/ft²) of outside air to all occupied spaces for at least three hours prior to each occupancy; and during occupancy, the greater of 0.045 m³/m² (0.15 cfm/ft²) or the design minimum outside air supply, for the duration of the flush-out period. Spaces may only be occupied following delivery of a minimum of 1,075 m³ of outdoor air per m² of floor area (3,530 ft³ of outdoor air per ft² of floor area). Continue the flush-out until a total air volume of 4,300 m³ of outdoor air per m² of floor area (14,100 ft³ of outdoor air per ft² of floor area) has been provided.

Option 3. IAQ Testing Prior to Occupancy

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

Construction IAQ Management Plan: Testing Before Occupancy

1 Point

(continued)

Table 1: Maximum Concentration Criteria of IAQ Pollutants

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

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

Submittals

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

OR,

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

Potential Technologies & Strategies

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

Copies of the IAQ testing results should describe the contaminant sampling and analytical methods, the locations and duration of contaminant samples, the field sampling 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					

1 Point

Low-Emitting Materials: Adhesives & Sealants

Intent

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

Requirements

The VOC content of adhesives, sealants and sealant primers used must be less than the VOC content limits of the State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168, October 2003.

Submittals

- Provide the LEED Letter Template, signed by the architect or responsible party, listing the adhesives and sealants used in the building and declaring that they meet the noted requirements.

If an audit is requested during the certification process:

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

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 4.2					

Low-Emitting Materials: Paints and Coatings

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

- VOC emissions from paints must not exceed the VOC and chemical component limits of Green Seal's Standard GS-11 January 1997 requirements.

AND,

- The VOC content of anti-corrosive coatings used must be less than the current VOC content limits of Green Seal Standard GS-03 May 1993 requirements.

AND,

- For interior paints and coatings not already covered by GS-11 and GS-03, the VOC content of all primers, under-coatings, sealers and clear wood finishes used must be less than the current VOC content limits of South Coast Air Quality Management District (SCAQMD) Rule #1113 November 1996 requirements.

Submittals

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

If an audit is requested during the certification process:

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

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 4.3					

1 Point

Low-Emitting Materials: Carpet

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 requirements of the Carpet and Rug Institute's Green Label Indoor Air Quality Test Program.

Submittals

- Provide the LEED Letter Template, signed by the architect or responsible party, listing all the carpet systems used in the building and stating that they comply with the VOC limits of the Carpet and Rug Institute's Green Label Indoor Air Quality Test Program.

If an audit is requested during the certification process:

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

Potential Technologies & Strategies

Specify low-VOC carpet products and systems in construction documents. Ensure that VOC limits are clearly stated where carpet systems are addressed.

SS	WE	EA	MR	EQ	ID
Credit 4.4					

Low-Emitting Materials: Composite Wood and Laminate Adhesives

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

Composite wood and agrifiber products, including core materials, must contain no added urea-formaldehyde resins. Adhesives used to fabricate laminated assemblies containing these products must contain no urea-formaldehyde.

Submittals

- Provide the LEED Letter Template, signed by the architect or responsible party, listing all the composite wood products used in the building and stating that they contain no added urea-formaldehyde resins, and listing all the laminating adhesives used in the building and stating that they contain no urea-formaldehyde.
- Provide documentation for all core and adhesive products used on the project indicating that products used contained no added urea-formaldehyde.

If an audit is requested during the certification process:

- Certification submissions should produce cut sheets, 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 adhesive for field and shop applied assemblies, including adhesives and veneers that contain no urea-formaldehyde. Provide product cut sheets, MSD sheets, signed attestations or other official literature from the manufacturer clearly identifying the emission limits.

SS	WE	EA	MR	EQ	ID
Credit 5					

1 Point

Indoor Chemical & Pollutant Source Control

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 pollutant cross-contamination of regularly occupied areas:

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

Submittals

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

SS	WE	EA	MR	EQ	ID
Credit 5					

Indoor Chemical & Pollutant Source Control

(continued)

1 Point

Potential Technologies & Strategies

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

Credit 6.1

1 Point

Controllability of Systems: Perimeter Spaces

Intent

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

Requirements

Provide at least an average of one operable window and one lighting control zone per 18.5 m² (200 ft²) of floor area for all regularly occupied areas within 5 metres (15 feet) of the perimeter wall.

Submittals

- Provide the LEED Letter Template, signed by the architect or responsible party, demonstrating and declaring that for regularly occupied perimeter areas of the building, a minimum of one operable window and one lighting control zone are provided per 18.5 m² (200 ft²) of floor area on average.

Potential Technologies & Strategies

Design the building with occupant controls for airflow, temperature and lighting. Strategies to consider include lighting controls, task lighting and operable windows.

SS	WE	EA	MR	EQ	ID
Credit 6.2					

Controllability of Systems: Non-Perimeter Spaces

1 Point

Intent

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

Requirements

Provide controls for each individual for airflow, temperature and lighting for at least 50% of the occupants in non-perimeter, regularly occupied areas.

Submittals

- Provide the LEED Letter Template, signed by the architect or responsible party, demonstrating and declaring that controls for individual airflow, temperature and lighting are provided for at least 50% of the occupants in non-perimeter, regularly occupied areas.

Potential Technologies & Strategies

Design the building with occupant controls for airflow, temperature and lighting. Strategies to consider include task lighting and underfloor HVAC systems with individual diffusers.

SS	WE	EA	MR	EQ	ID
Credit 7.1					

1 Point

Thermal Comfort: Compliance

Intent

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

Requirements

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

Submittals

- Provide the LEED Letter Template, signed by the engineer or responsible party, declaring that the project complies with ASHRAE Standard 55-2004. Include documentation of compliance per the standard as described in Section 6.1.1-Documentation, including calculations of operative temperature for radiantly conditioned spaces.

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 7.2					

Thermal Comfort: Monitoring

1 Point
in addition to
EQ 7.1

Intent

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

Requirements

Provide a permanent monitoring system to ensure building 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 as may be appropriate.
- Confirm that the temperature and humidity controls (if applicable) were (or will be) tested as part of the scope of work for Energy and Atmosphere Prerequisite 1, Fundamental Building Systems Commissioning. Include the document name and section number where the commissioning work is listed.
- Where humidity control equipment is not provided, provide the LEED Letter Template, signed by the engineer or responsible party, declaring that humidification / dehumidification equipment is neither required nor installed.

If an audit is requested during the certification process:

- Where humidity control equipment is not provided, provide psychrometric analyses for indoor conditions under peak and typical operating conditions which demonstrate that humidity control is unnecessary for the desired comfort conditions.

Potential Technologies & Strategies

Develop a strategy and implement systematic monitoring of the actual performance of the building to the comfort criteria selected per EQ Credit 7.1. As appropriate, monitoring may include measurement and trending of temperatures, relative humidity or air speed selected according to their variability and impact on occupant comfort, or annual validation of continued performance to the selected comfort criteria conducted per ASHRAE Standard 55- 2004, Section 7 - Validation of the Thermal Environment. The monitoring system can be passive and does not have to be connected to a building management system.

Credit 8.1

1 Point

Daylight and Views: Daylight 75% of Spaces

Intent

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

Requirements

Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) or achieve at least 250 Lux (25 footcandles) using a computer simulation model in 75% of all regularly occupied areas with the aid of a computer simulation model. 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 architect or responsible party. Provide area calculations that define the daylight zones and provide a summary of daylight factor prediction calculations through computer simulations illustrating that the footcandle levels have been achieved.

If an audit 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 cut sheets highlighting T_{vis} values and area calculations defining the daylight zone and daylight predictions calculations or daylight simulation results demonstrating a minimum Daylight Factor of 2% in these areas.

Potential Technologies & Strategies

Design the building to maximize interior daylighting. Strategies to consider include building orientation, shallow floor plates, increased building perimeter, exterior and interior permanent shading devices, high performance glazing and photo-integrated light sensors. Predict daylight factors via manual calculations or model daylighting strategies with a physical or computer model to assess illuminance levels and daylight factors achieved. Modeling must demonstrate 250 horizontal Lux (25 footcandles) under clear sky conditions, at noon, on the equinox, at 0.75 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: Views for 90% of Space

1 Point

Intent

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

Requirements

- Achieve direct line of sight to vision glazing for building occupants in 90% of all regularly occupied areas.
- Areas directly connected to perimeter windows must have a glazing-to-floor area ratio of at least 0.07.
- Parts of the floor area with horizontal view angles of less than 10 degrees at 1.27 m (50 inches) above the floor cannot be included in this calculation.
- Areas not directly connected to perimeter windows must have a horizontal view angle of at least 10 degrees at 1.27 m (50 inches) above the floor involving 50% or more of the floor area. If a room meets these requirements then the entire room area is considered to meet the view requirement.
- Exceptions will be considered on their merits.

Submittals

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

Potential Technologies & Strategies

Design the building to maximize view opportunities.

SS	WE	EA	MR	EQ	ID
Credit 1					

Innovation & Design Process

1-4 Points

Innovation in Design

Intent

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

Requirements

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

Submittals

- Provide the proposal(s) within the LEED Letter Template (including intent, requirement, submittals and possible strategies) and relevant evidence of performance achieved.

Potential Technologies & Strategies

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

SS	WE	EA	MR	EQ	ID
Credit 2					

LEED Accredited Professional

1 Point

Intent

To support and encourage the design integration required by a LEED Green Building project and to streamline the application and certification process.

Requirements

At least one principal participant of the project team that 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 Accredited Professional Training Workshop is recommended but not required. Study the LEED Reference Guide. Successfully pass the LEED accreditation exam.