RATING SYSTEM

LEED v4 for
BUILDING DESIGN AND CONSTRUCTION

Updated April 1, 2015

Includes:
LEED BD+C: New Construction
LEED BD+C: Core and Shell
LEED BD+C: Schools
LEED BD+C: Retail
LEED BD+C: Data Centers
LEED BD+C: Warehouses and Distribution Centers
LEED BD+C: Hospitality
LEED BD+C: Healthcare

PREREQUISITE: INTEGRATIVE PROJECT PLANNING AND DESIGN
Required

This prerequisite applies to:

- Healthcare

Intent

Maximize opportunities for integrated, cost-effective adoption of green design and construction strategies, emphasizing human health as a fundamental evaluative criterion for building design, construction and operational strategies. Utilize innovative approaches and techniques for green design and construction.

Requirements

HEALTHCARE

Use cross-discipline design and decision making, beginning in the programming and pre-design phase. At a minimum, ensure the following process:

Owner's Project Requirements Document. Prepare an Owner's Project Requirements (OPR) document. Develop a health mission statement and incorporate it in the OPR. The health mission statement must address "triple bottom line" values—economic, environmental and social. Include goals and strategies to safeguard the health of building occupants, the local community and the global environment, while creating a high-performance healing environment for the building's patients, caregivers and staff.

Preliminary Rating Goals. As early as practical and preferably before schematic design, conduct a preliminary LEED meeting with a minimum of four key project team members and the owner or owner's representative. As part of the meeting, create a LEED® action plan that, at a minimum:

- Determines the LEED certification level to pursue (Certified, Silver, Gold, or Platinum);
- Selects the LEED credits to meet the targeted certification level; and
- Identifies the responsible parties to ensure the LEED requirements for each prerequisite and selected credit are met.

Integrated Project Team. Assemble an integrated project team and include as many of the following professionals as feasible (minimum of four), in addition to the owner or owner's representative.

- Owner's capital budget manager
- Architect or building designer
- Mechanical engineer
- Structural engineer
- Energy modeler
- Equipment planner
- Acoustical consultant
- Telecommunications designer
- Controls designer
- Food Service Consultant
- Infection Control Staff
- Building science or performance testing agents
- Green building or sustainable design consultant
- Facility green teams
- Physician and nursing teams
- Facility managers
- Environmental services staff
- Functional and space programmers
- Commissioning agent
- Community representatives
- Civil engineer
- Landscape architect
- Ecologist
- Land planner
- Construction manager or general contractor
- Life cycle cost analyst; construction cost estimator
- Lighting Designer
- Other disciplines appropriate to the specific project type

Design Charrette. As early as practical and preferably before schematic design, conduct a minimum four-hour , integrated design charrette with the project team as defined above. The goal is to optimize the integration of green strategies across all aspects of building design, construction and operations, drawing on the expertise of all participants.

CREDIT: INTEGRATIVE PROCESS

BD&C
1 point
This credit applies to

- New Construction
- Core & Shell
- Schools
- Retail
- Data Centers
- Warehouses & Distribution Centers
- Hospitality
- Healthcare

Intent

To support high-performance, cost-effective project outcomes through an early analysis of the interrelationships among systems.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Beginning in pre-design and continuing throughout the design phases, identify and use opportunities to achieve synergies across disciplines and building systems. Use the analyses described below to inform the owner's project requirements (OPR), basis of design (BOD), design documents, and construction documents.

Energy-Related Systems

Discovery: Perform a preliminary "simple box" energy modeling analysis before the completion of schematic design that explores how to reduce energy loads in the building and accomplish related sustainability goals by questioning default assumptions. Assess at least two potential strategies associated with the following:

- *Site conditions.* Assess shading, exterior lighting, hardscape, landscaping, and adjacent site conditions.
- *Massing and orientation.* Assess massing and orientation affect HVAC sizing, energy consumption, lighting, and renewable energy opportunities.
- *Basic envelope attributes.* Assess insulation values, window-to-wall ratios, glazing characteristics, shading, and window operability.
- *Lighting levels.* Assess interior surface reflectance values and lighting levels in occupied spaces.
- *Thermal comfort ranges.* Assess thermal comfort range options.
- *Plug and process load needs.* Assess reducing plug and process loads through programmatic solutions (e.g., equipment and purchasing policies, layout options).
- *Programmatic and operational parameters.* Assess multifunctioning spaces, operating schedules, space allotment per person, teleworking, reduction of building area, and anticipated operations and maintenance.

Implementation: Document how the above analysis informed design and building form decisions in the project's OPR and BOD and the eventual design of the project, including the following, as applicable:

- Building and site program;
- Building form and geometry;
- Building envelope and façade treatments on different orientations;
- Elimination and/or significant downsizing of building systems (e.g., HVAC, lighting, controls, Exterior materials, interior finishes, and functional program elements); and
- Other systems.

AND

Water-Related Systems

Discovery: Perform a preliminary water budget analysis before the completion of schematic design that explores how to reduce potable water loads in the building and accomplish related sustainability goals. Assess and estimate the project's potential nonpotable water supply sources and water demand volumes, including the following:

- *Indoor water demand.* Assess flow and flush fixture design case demand volumes, calculated in accordance with WE Prerequisite Indoor Water Use Reduction.
- *Outdoor water demand.* Assess landscape irrigation design case demand volume calculated in accordance with WE Credit Outdoor Water-Use Reduction.
- *Process water demand.* Assess kitchen, laundry, cooling tower, and other equipment demand volumes, as applicable.
- *Supply sources.* Assess all potential nonpotable water supply source volumes, such as on-site rainwater and graywater, municipally supplied nonpotable water, and HVAC equipment condensate.

Implementation: Document how the above analysis informed building and site design decisions in the project's OPR and BOD. Demonstrate how at least one on-site nonpotable water supply source was used to reduce the burden on municipal supply or wastewater treatment systems by contributing to at least two of the water demand components listed above. Demonstrate how the analysis informed the design of the project, including the following, as applicable:

- plumbing systems;
- sewage conveyance and/or on-site treatment systems;
- rainwater quantity and quality management systems;
- landscaping, irrigation, and site elements;
- roofing systems and/or building form and geometry; and
- other systems.

LOCATION AND TRANSPORATION (LT)

LT CREDIT: LEED FOR NEIGHBORHOOD DEVELOPMENT LOCATION

BD&C
3–16 points
This credit applies to

- New Construction (8–16 points)
- Core & Shell (8–20 points)
- Schools (8–15 points)
- Retail (8–16 points)
- Data Centers (8–16 points)
- Warehouses & Distribution Centers (8–16 points)
- Hospitality (8–16 points)
- Healthcare (5–9 points)

Intent

To avoid development on inappropriate sites. To reduce vehicle distance traveled. To enhance livability and improve human health by encouraging daily physical activity.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Locate the project within the boundary of a development certified under LEED for Neighborhood Development (Stage 2 or Stage 3 under the Pilot or 2009 rating systems, Certified Plan or Certified Project under the LEED v4 rating system).

Projects attempting this credit are not eligible to earn points under other Location and Transportation credits.

Table 1. Points for LEED ND location.

Certification level	Points BD&C	Points BD&C (Core and Shell)	Points BD&C (Schools)	Points BD&C (Healthcare)
Certified	8	8	8	5
Silver	10	12	10	6
Gold	12	16	12	7
Platinum	16	20	15	9

LT CREDIT: SENSITIVE LAND PROTECTION

BD&C
1-2 points
This credit applies to

- New Construction (1 point)
- Core & Shell (2 points)
- Schools (1 point)
- Retail (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Healthcare (1 point)

Intent

To avoid the development of environmentally sensitive lands and reduce the environmental impact from the location of a building on a site.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Option 1.
Locate the development footprint on land that has been *previously developed*.

OR

Option 2.
Locate the development footprint on land that has been *previously developed* or that does not meet the following criteria for sensitive land:

- *Prime farmland.* Prime farmland, unique farmland, or farmland of statewide or local importance as defined by the U.S. Code of Federal Regulations, Title 7, Volume 6, Parts 400 to 699, Section 657.5 (or local equivalent for projects outside the U.S.) and identified in a state Natural Resources Conservation Service soil survey (or local equivalent for projects outside the U.S.).
- *Floodplains*. A flood hazard area shown on a legally adopted flood hazard map or otherwise legally designated by the local jurisdiction or the state. For projects in places without legally adopted flood hazard maps or legal designations, locate on a site that is entirely outside any floodplain subject to a 1% or greater chance of flooding in any given year.
- *Habitat*. Land identified as habitat for the following:
    - species listed as threatened or endangered under the U.S. Endangered Species Act or the state's endangered species act, or
    - species or ecological communities classified by NatureServe as GH (possibly extinct), G1 (critically imperiled), or G2 (imperiled), or
    - species listed as threatened or endangered specifies under local equivalent standards (for projects outside the U.S.) that are not covered by NatureServe data.
- *Water bodies.* Areas on or within 100 feet (30 meters) of a *water body*, except for minor improvements.
- *Wetlands*. Areas on or within 50 feet (15 meters) of a *wetland*, except for minor improvements.

Minor improvements within the wetland and water body buffers may be undertaken to enhance appreciation of them, provided such facilities are open all building users. Only the following improvements are considered minor:

- Bicycle and pedestrian pathways no more than 12 feet wide (3.5 meters), of which no more than 8 feet (2.5 meters) may be impervious;
- Activities to maintain or restore native natural communities and/or natural hydrology;
- One single-story structure per 300 linear feet (90 linear meters) on average, not exceeding 500 square feet (45 square meters);
- Grade changes necessary to ensure public access;
- Clearings, limited to one per 300 linear feet (90 linear meters) on average, not exceeding 500 square feet (45 square meters) each;
- Removal of the following tree types:
    - Hazardous trees, up to 75% of dead trees
    - Trees less than 6 inches (150 millimeters) diameter at breast height
    - Up to 20% of trees more than 6 inches (150 millimeters) diameter at breast height with a condition rating of 40% or higher.
    - Trees under 40% condition rating

  The condition rating must be based on an assessment by an arborist certified by the International Society of Arboriculture (ISA) using ISA standard measures, or local equivalent for projects outside the U.S.
- *Brownfield* remediation activities.

LT CREDIT: HIGH-PRIORITY SITE

BD&C
2-3 points
This credit applies to

- New Construction (1-2 points)
- Core & Shell (2-3 points)
- Schools (1-2 points)
- Retail (1-2 points)
- Data Centers (1-2 points)
- Warehouses & Distribution Centers (1-2 points)
- Hospitality (1-2 points)
- Healthcare (1-2 points)

Intent

To encourage project location in areas with development constraints and promote the health of the surrounding area.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Option 1. Historic District (1 point BD&C except Core and Shell, 2 points Core and Shell)

Locate the project on an *infill* location in a *historic district*.

OR

Option 2. Priority Designation (1 point BD&C except Core and Shell, 2 points Core and Shell)

Locate the project on one of the following:

- a site listed by the EPA National Priorities List;
- a Federal Empowerment Zone site;
- a Federal Enterprise Community site;
- a Federal Renewal Community site;
- a Department of the Treasury Community Development Financial Institutions Fund Qualified Low-Income Community (a subset of the New Markets Tax Credit Program);
- a site in a U.S. Department of Housing and Urban Development's Qualified Census Tract (QCT) or Difficult Development Area (DDA); or
- a local equivalent program administered at the national level for projects outside the U.S.

OR

Option 3. Brownfield Remediation (2 points BD&C except Core and Shell, 3 points Core and Shell)

Locate on a *brownfield* where soil or groundwater contamination has been identified, and where the local, state, or national authority (whichever has jurisdiction) requires its remediation. Perform remediation to the satisfaction of that authority.

LT CREDIT: SURROUNDING DENSITY AND DIVERSE USES

BD&C
1–6 points
This credit applies to

- New Construction (1–5 points)
- Core & Shell (1–6 points)
- Schools (1–5 points)
- Retail (1–5 points)
- Data Centers (1–5 points)
- Warehouses & Distribution Centers (1–5 points)
- Hospitality (1–5 points)
- Healthcare (1 points)

Intent

To conserve land and protect farmland and wildlife habitat by encouraging development in areas with existing infrastructure. To promote walkability, and transportation efficiency and reduce vehicle distance traveled. To improve public health by encouraging daily physical activity.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Option 1. Surrounding Density (2–3 points BD&C except Core and Shell, 2-4 points Core and Shell)

Locate on a site whose surrounding existing density within a ¼-mile (400-meter) radius of the project boundary meets the values in Table 1. Use either the "separate residential and nonresidential densities" or the "combined density" values.

Table 1a. Points for average density within 1/4 mile of project (IP units)

Combined density	Separate residential and nonresidential densities		Points BD&C (except Core and Shell)	Points BD&C (Core and Shell)
Square feet per acre of buildable land	Residential density (DU/acre)	Nonresidential density (FAR)		
22,000	7	0.5	2	2
35,000	12	0.8	3	4

Table 1b. Points for average density within 400 meters of project (SI units)

Combined density	Separate residential and nonresidential densities	Points BD&C (except Core

			and Shell)	(Core and Shell)
Square meters per hectare of buildable land	Residential density (DU/hectare)	Nonresidential density (FAR)		
5,050	17.5	0.5	2	2
8,035	30	0.8	3	4

DU = dwelling unit; FAR = floor-area ratio.

Schools only
Physical education spaces that are part of the project site, such as playing fields and associated buildings used during sporting events only (e.g., concession stands) and playgrounds with play equipment, are excluded from the development density calculations.

AND/OR

Option 2. Diverse Uses (1–2 points)

Construct or renovate a building or a space within a building such that the building's main entrance is within a ½-mile (800-meter) walking distance of the main entrance of four to seven (1 point) or eight or more (2 points) existing and publicly available diverse uses (listed in Appendix 1).

The following restrictions apply.

- A use counts as only one type (e.g., a retail store may be counted only once even if it sells products in several categories).
- No more than two uses in each use type may be counted (e.g. if five restaurants are within walking distance, only two may be counted).
- The counted uses must represent at least three of the five categories, exclusive of the building's primary use.

WAREHOUSES & DISTRIBUTION CENTERS

Option 1. Development and Adjacency (2–3 points)

Construct or renovate the project on a previously developed site that was used for industrial or commercial purposes. (2 points).

OR

Construct or renovate the project on a site that is both a previously developed and an adjacent site. The adjacent sites must be currently used for industrial or commercial purposes (3 points).

AND/OR

Option 2. Transportation Resources (1–2 points)

Construct or renovate the project on a site that has two or three (1 point) or four (2 points) of the following transportation resources:

- The site is within a 10-mile (16 kilometer) driving distance of a main logistics hub, defined as an airport, seaport, *intermodal facility*, or *freight village* with intermodal transportation.
- The site is within a 1-mile (1600-meter) driving distance of an on-off ramp to a *highway.*

- The site is within a 1-mile (1600-meter) driving distance of an access point to an active freight rail line.
- The site is served by an active freight rail spur.

In all cases, a planned transportation resource must be sited, funded, and under construction by the date of the certificate of occupancy and complete within 24 months of that date.

HEALTHCARE

Option 1. Surrounding Density (1 point)

Locate on a site whose surrounding existing density within a ¼-mile (400-meter) radius of the project boundary is:

1. At least 7 dwelling units per acre (17.5 DU per hectare) with a 0.5 floor-area ratio. The counted density must be *existing* density, not zoned density, or
2. At least 22,000 square feet per acre (5 050 square meters per hectare) of buildable land.

For previously developed existing rural healthcare campus sites, achieve a minimum development density of 30,000 square feet per acre (6890 square meters per hectare).

OR

Option 2. Diverse Uses (1 point)

Construct or renovate a building on a site such that the building's main entrance is within a ½-mile (800-meter) walking distance of the main entrance of at least seven operational and publicly accessible uses (listed in Appendix 1).

The following restrictions apply.

- A use may be counted as only one type (e.g., a retail store may be counted only once even if it sells products in several categories).
- No more than two uses in each use type may be counted (e.g., if five restaurants are within walking distance, only two may be counted).
- The counted uses must represent at least three of the five categories, exclusive of the building's primary use.

LT CREDIT: ACCESS TO QUALITY TRANSIT

BD&C
1–6 points
This credit applies to

- New Construction (1–5 points)
- Core & Shell (1–6 points)
- Schools (1–4 points)
- Data Centers (1–5 points)
- Warehouses & Distribution Centers (1–5 points)
- Hospitality (1–5 points)
- Retail (1–5 points)
- Healthcare (1–2 points)

Intent

To encourage development in locations shown to have multimodal transportation choices or otherwise reduced motor vehicle use, thereby reducing greenhouse gas emissions, air pollution, and other environmental and public health harms associated with motor vehicle use.

Requirements

NC, CS, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, RETAIL

Locate any *functional entry* of the project within a ¼-mile (400-meter) *walking distance* of existing or planned bus, *streetcar*, or *rideshare stops,* or within a ½-mile (800-meter) walking distance of existing or planned *bus rapid transit* stops, light or heavy rail stations, commuter rail stations, or commuter ferry terminals. The transit service at those stops and stations in aggregate must meet the minimums listed in Tables 1 and 2. Planned stops and stations may count if they are sited, funded, and under construction by the date of the certificate of occupancy and are complete within 24 months of that date.

Both weekday and weekend trip minimums must be met.

- Qualifying transit routes must have paired route service (service in opposite directions).
- For each qualifying transit route, only trips in one direction are counted towards the threshold.
- If a qualifying transit route has multiple stops within the required walking distance, only trips from one stop are counted towards the threshold.

Table 1. Minimum daily transit service for projects with multiple transit types (bus, *streetcar*, rail, or ferry)

Weekday trips	Weekend trips	Points BD&C (except Core and Shell)	Points BD&C (Core and shell
72	40	1	1
144	108	3	3
360	216	5	6

Table 2. Minimum daily transit service for projects with commuter rail or ferry service only

Weekday trips	Weekend trips	Points
24	6	1
40	8	2

60	12	3

Projects served by two or more transit routes such that no one route provides more than 60% of the documented levels may earn one additional point, up to the maximum number of points.

If *existing* transit service is temporarily rerouted outside the required distances for less than two years, the project may meet the requirements, provided the local transit agency has committed to restoring the routes with service at or above the prior level.

SCHOOLS

Option 1. Transit-Served Location (1–4 points)

Locate any *functional entry* of the project within a ¼-mile (400-meter) *walking distance* of existing or planned bus, *streetcar*, or rideshare stops, or within a ½-mile (800-meter) walking distance of existing or planned *bus rapid transit* stops, light or heavy rail stations, commuter rail stations or commuter ferry terminals. The transit service at those stops and stations must meet the minimums listed in Tables 1 and 2. Planned stops and stations may count if they are sited, funded, and under construction by the date of the certificate of occupancy and are complete within 24 months of that date.

- Qualifying transit routes must have paired route service (service in opposite directions).
- For each qualifying transit route, only trips in one direction are counted towards the threshold.
- If a qualifying transit route has multiple stops within the required walking distance, only trips from one stop are counted towards the threshold.

Table 1. Minimum daily transit service for projects with multiple transit types (bus, *streetcar*, rail, or ferry)

Weekday trips	Points
72	1
144	2
360	4

Table 2. Minimum daily transit service for projects with commuter rail or ferry service only

Weekday trips	Points
24	1
40	2
60	3

Projects served by two or more transit routes such that no one route provides more than 60% of the prescribed levels may earn one additional point, up to the maximum number of points.

If existing transit service is temporarily rerouted outside the required distances for less than two years, the project may meet the requirements, provided the local transit agency has committed to restoring the routes with service at or above the prior level.

OR

Option 2. Pedestrian Access (1–4 points)
Show that the project has an *attendance boundary* such that the specified percentages of students live within no more than a 3/4-mile (1200-meter) walking distance (for grades 8 and below, or ages 14 and

below), and 1 1/2-mile (2400-meter) walking distance (for grades 9 and above or ages 15 and above) of a functional entry of a school building. Points are awarded according to Table 3.

Table 3. Points for student population within walking distance

Percentage of students	Points
50%	1
60%	2
70% or more	4

In addition, locate the project on a site that allows pedestrian access to the site from all residential neighborhoods that house the planned student population.

HEALTHCARE

Locate any *functional entry* of the project within a ¼-mile (400-meter) *walking distance* of existing or planned bus, *streetcar*, or rideshare stops, or within a ½-mile (800-meter) walking distance of existing or planned *bus rapid transit* stops, light or heavy rail stations, commuter rail stations or commuter ferry terminals. The transit service at those stops and stations in aggregate must meet the minimums listed in Tables 1 and 2. Planned stops and stations may count if they are sited, funded, and under construction by the date of the certificate of occupancy and are complete within 24 months of that date.

Both weekday and weekend trip minimums must be met.

- Qualifying transit routes must have paired route service (service in opposite directions).
- For each qualifying transit route, only trips in one direction are counted towards the threshold.
- If a qualifying transit route has multiple stops within the required walking distance, only trips from one stop are counted towards the threshold.

Table 1. Minimum daily transit service for projects with multiple transit types (bus, *streetcar*, rail, or ferry).

Weekday trips	Weekend trips	Points
72	40	1
144	108	2

Table 2. Minimum daily transit service for projects with commuter rail or ferry service only

Weekday trips	Weekend trips	Points
24	6	1
40	8	2

Projects served by two or more transit routes such that no one route provides more than 60% of the prescribed levels may earn one additional point, up to the maximum number of points.

If *existing* transit service is temporarily rerouted outside the required distances for less than two years, the project may meet the requirements, provided the local transit agency has committed to restoring the routes with service at or above the prior level.

LT CREDIT: BICYCLE FACILITIES

BD&C
1 point
This credit applies to

- New Construction (1 point)
- Core & Shell (1 point)
- Schools (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Retail (1 point)
- Healthcare (1 point)

Intent

To promote bicycling and transportation efficiency and reduce vehicle distance traveled. To improve public health by encouraging utilitarian and recreational physical activity.

Requirements

NC, CS, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY

Bicycle Network

Design or locate the *project* such that a *functional entry* or bicycle storage is within a 200-yard (180-meter) *walking distance* or *bicycling distance* from a *bicycle network* that connects to at least one of the following:

- at least 10 diverse uses (see Appendix 1);
- a school or *employment center,* if the project total floor area is 50% or more residential; or
- *a bus rapid transit* stop, light or heavy rail station, commuter rail station, or ferry terminal.

All destinations must be within a 3-mile (4800-meter) bicycling distance of the project boundary.

Planned bicycle trails or lanes may be counted if they are fully funded by the date of the certificate of occupancy and are scheduled for completion within one year of that date.

Bicycle Storage and Shower Rooms

Case 1. Commercial or Institutional Projects
Provide *short-term bicycle storage* for at least 2.5% of all peak visitors, but no fewer than four storage spaces per building.

Provide *long-term bicycle storage* for at least 5% of all regular building occupants, but no fewer than four storage spaces per building in addition to the short-term bicycle storage spaces.

Provide at least one on-site shower with changing facility for the first 100 regular building occupants and one additional shower for every 150 regular building occupants thereafter.

Case 2. Residential Projects
Provide *short-term bicycle storage* for at least 2.5% of all peak visitors but no fewer than four storage spaces per building.

Provide *long-term bicycle storage* for at least 30% of all regular building occupants, but no less than one storage space per residential unit.

Case 3. Mixed-Use Projects
Meet the Case 1 and Case 2 storage requirements for the nonresidential and residential portions of the project, respectively.

For All Projects
Short-term bicycle storage must be within 100 feet (30 meters) walking distance of any main entrance. *Long-term bicycle storage* must be within 100 feet (30 meters) walking distance of any *functional entry*.

Bicycle storage capacity may not be double-counted: storage that is fully allocated to the occupants of nonproject facilities cannot also serve project occupants.

Core & Shell projects should refer to Appendix 2, Default Occupancy Counts, for occupancy count requirements and guidance.

SCHOOLS

Bicycle Network
Design or locate the *project* such that a *functional entry* and/or bicycle storage is within a 200-yard (180-meter) *walking distance* or *bicycling distance* of a *bicycle network* that connects to at least one of the following:

- at least 10 diverse uses (see Appendix 1); or
- a *bus rapid transit* stop, light or heavy rail station, commuter rail station, or ferry terminal.

All destinations must be within a 3-mile (4800-meter) bicycling distance of the project boundary.

Provide dedicated bicycle lanes that extend at least to the end of the school property with no barriers (e.g., fences) on school property.

Planned bicycle trails or lanes may be counted if they are fully funded by the date of the certificate of occupancy and are scheduled for completion within one year of that date.

Bicycle Storage and Shower Rooms
Provide *long-term bicycle storage* for at least 5% of all regular building occupants (excluding students grade 3 and younger), but no fewer than four storage spaces per building.

Provide at least one on-site shower with changing facility for the first 100 regular building occupants (excluding students) and one additional shower for every 150 regular building occupants (excluding students) thereafter.

Long-term storage spaces must be easily accessible to occupants and be within 100 feet (30 meters) walking distance of any main entrance.

Bicycle storage capacity may not be double-counted: storage that is fully allocated to the occupants of nonproject facilities cannot also serve project occupants.

RETAIL

Bicycle Network

Design or locate the *project* such that a *functional entry* and/or bicycle storage is within a 200-yard (180-meter) *walking distance* or *bicycling distance* of a *bicycle network* that connects to at least one of the following:

- at least 10 diverse uses (see Appendix 1); or
- a *bus rapid transit* stop, light or heavy rail station, commuter rail station, or ferry terminal.

All destinations must be within a 3-mile (4800-meter) bicycling distance of the project boundary.

Planned bicycle trails or lanes may be counted if they are fully funded by the date of the certificate of occupancy and are scheduled for completion within one year of that date.

Bicycle Storage and Shower Rooms

Provide at least two *short-term bicycle storage* spaces for every 5,000 square feet (465 square meters), but no fewer than two storage spaces per building.

Provide *long-term bicycle storage* for at least 5% of regular building occupants, but no fewer than two storage spaces per building in addition to the short-term bicycle storage spaces.

Provide at least one on-site shower with changing facility for the first 100 regular building occupants and one additional shower for every 150 regular building occupants thereafter.

Short-term bicycle storage must be within 100 feet (30 meters) walking distance of any main entrance. *Long-term bicycle storage* must be within 100 feet (30 meters) walking distance of any *functional entry*.

Bicycle storage capacity may not be double-counted: storage that is fully allocated to the occupants of nonproject facilities cannot also serve project occupants.

Provide a bicycle maintenance program for employees or bicycle route assistance for employees and customers. Route assistance must be provided in a manner easily accessible to both employees and customers.

For projects that are part of a multitenant complex only: If bicycle storage spaces have been provided in the complex in which the project is located, determine the number of spaces that may be attributed to the project by dividing the project's floor area by the total floor area of the development (buildings only) and multiplying the percentage result by the total number of spaces. If this number does not meet the credit requirement, the project must provide additional bicycle storage.

HEALTHCARE

Bicycle Network

Design or locate the *project* such that a *functional entry* and/or bicycle storage is within a 200-yard (180-meter) *walking distance* or *bicycling distance* of a *bicycle network* that connects to at least one of the following:

- at least 10 diverse uses (see Appendix 1); or
- a *bus rapid transit* stop, light or heavy rail station, commuter rail station, or ferry terminal.

All destinations must be within a 3-mile (4800-meter) bicycling distance of the project boundary.

Planned bicycle trails or lanes may be counted if they are fully funded by the date of the certificate of occupancy and are scheduled for completion within one year of that date.

Bicycle Storage and Shower Rooms

Case 1. Commercial or Institutional Projects

Provide *short-term bicycle storage* for at least 2.5% of all peak visitors, but no fewer than four storage spaces per building.

Provide *long-term bicycle storage* for at least 5% of regular building occupants (excluding patients), but no fewer than four storage spaces per building in addition to the short-term bicycle storage spaces.

Provide at least one on-site shower with changing facility for the first 100 regular building occupants (excluding patients) and one additional shower for every 150 regular building occupants thereafter.

Case 2. Residential Projects
Provide secure, enclosed bicycle storage for at least 30% of all regular building occupants (excluding patients) measured at peak periods, but no less than one storage space per residential unit.

For All Projects

Short-term bicycle storage must be within 100 feet (30 meters) walking distance of any main entrance. *Long-term bicycle storage* must be within 100 feet (30 meters) walking distance of any functional entry.

Bicycle storage capacity may not be double counted: storage that is fully allocated to the occupants of nonproject facilities cannot also serve project occupants.

LT CREDIT: REDUCED PARKING FOOTPRINT

BD&C
1 point
This credit applies to

- New Construction (1 point)
- Core & Shell (1 point)
- Schools (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Retail (1 point)
- Healthcare (1 point)

Intent

To minimize the environmental harms associated with parking facilities, including automobile dependence, land consumption, and rainwater runoff.

Requirements

NC, CS, RETAIL, SCHOOLS, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Do not exceed the minimum local code requirements for parking capacity.

Provide parking capacity that is a percentage reduction below the base ratios recommended by the Parking Consultants Council, as shown in the Institute of Transportation Engineers' Transportation Planning Handbook, 3rd edition, Tables 18-2 through 18-4.

Case 1. Baseline Location

Projects that have not earned points under LT Credit Surrounding Density and Diverse Uses or LT Credit Access to Quality Transit must achieve a 20% reduction from the base ratios.

Case 2. Dense and/or Transit-Served Location

Projects earning 1 or more points under either LT Credit Surrounding Density and Diverse Uses or LT Credit Access to Quality Transit must achieve a 40% reduction from the base ratios.

For All Projects
The credit calculations must include all existing and new off-street parking spaces that are leased or owned by the project, including parking that is outside the project boundary but is used by the project. On-street parking in public rights-of-way is excluded from these calculations.

For projects that use pooled parking, calculate compliance using the project's share of the pooled parking.

Provide preferred parking for carpools for 5% of the total parking spaces after reductions are made from the base ratios. Preferred parking is not required if no off-street parking is provided.

Mixed-use projects should determine the percentage reduction by first aggregating the parking amount of each use (as specified by the base ratios) and then determining the percentage reduction from the aggregated parking amount.

Do not count parking spaces for fleet and inventory vehicles unless these vehicles are regularly used by employees for commuting as well as business purposes.

LT CREDIT: GREEN VEHICLES

BD&C
1 point
This credit applies to

- New Construction (1 point)
- Core & Shell (1 point)
- Data Centers (1 point)
- Hospitality (1 point)
- Retail (1 point)
- Healthcare (1 point)
- Schools (1 point)
- Warehouses & Distribution Centers (1 point)

Intent

To reduce pollution by promoting alternatives to conventionally fueled automobiles.

Requirements

NC, CS, DATA CENTERS, HOSPITALITY. RETAIL, HEALTHCARE

Designate 5% of all parking spaces used by the project as *preferred parking* for green vehicles. Clearly identify and enforce for sole use by green vehicles. Distribute preferred parking spaces proportionally among various parking sections (e.g. between short-term and long-term spaces).

Green vehicles must achieve a minimum green score of 45 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide (or local equivalent for projects outside the U.S.).

A discounted parking rate of at least 20% for green vehicles is an acceptable substitute for preferred parking spaces. The discounted rate must be publicly posted at the entrance of the parking area and permanently available to every qualifying vehicle.

In addition to preferred parking for green vehicles, meet one of the following two options for alternative-fuel fueling stations:

Option 1. Electric Vehicle Charging
Install *electrical vehicle supply equipment (EVSE)* in 2% of all parking spaces used by the project. Clearly identify and reserve these spaces for the sole use by plug-in electric vehicles. EVSE parking spaces must be provided in addition to preferred parking spaces for green vehicles.

The EVSE must:

- Provide a Level 2 charging capacity (208 – 240 volts) or greater.
- Comply with the relevant regional or local standard for electrical connectors, such as SAE Surface Vehicle Recommended Practice J1772, SAE Electric Vehicle Conductive Charge Coupler or IEC 62196 of the International Electrotechnical Commission for projects outside the U.S.
- Be networked or internet addressable and be capable of participating in a demand-response program or time-of-use pricing to encourage off-peak charging.

OR

Option 2. Liquid, gas, or battery facilities

Install liquid or gas *alternative fuel* fueling facilities or a battery switching station capable of refueling a number of vehicles per day equal to at least 2% of all parking spaces.

SCHOOLS

Option 1: Green passenger vehicles

Designate 5% of all parking spaces used by the project as *preferred parking* for green vehicles. Clearly identify and enforce for sole use by green vehicles. Distribute preferred parking spaces proportionally among various parking sections (e.g. between short-term and long-term spaces).

Green vehicles must achieve a minimum green score of 45 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide (or local equivalent for projects outside the U.S.

A discounted parking rate of at least 20% for green vehicles is an acceptable substitute for preferred parking spaces. The discounted rate must be publicly posted at the entrance of the parking area and permanently available to every qualifying vehicle.

In addition to preferred parking for green vehicles, meet one of the following two options for alternative-fuel fueling stations:

Path 1. Electric Vehicle Charging
Install *electrical vehicle supply equipment (EVSE)* in 2% of all parking spaces used by the project. Clearly identify and reserve these spaces for the sole use by plug-in electric vehicles. EVSE parking spaces must be provided in addition to preferred parking spaces for green vehicles.

The EVSE must:

- Provide a Level 2 charging capacity (208 – 240 volts) or greater.
- Comply with the relevant regional or local standard for electrical connectors, such as SAE Surface Vehicle Recommended Practice J1772, SAE Electric Vehicle Conductive Charge Coupler or IEC 62196 of the International Electrotechnical Commission for projects outside the U.S.
- Be networked or internet addressable and be capable of participating in a demand-response program or time-of-use pricing to encourage off-peak charging.

OR

Path 2. Liquid, gas, or battery facilities

Install liquid or gas *alternative fuel* fueling facilities or a battery switching station capable of refueling a number of vehicles per day equal to at least 2% of all parking spaces.

OR

Option 2: Green buses or school-owned vehicles

Develop and implement a plan for every bus serving the school to meet the following emissions standards within seven years of the building certificate of occupancy:

- nitrogen oxide (NOx) emissions of 0.50 grams or less per brake horsepower-hour; and
- particulate matter emissions of 0.01 grams or less per brake horsepower-hour.

Emission standards must be met for each bus and not by an average of the entire fleet serving the school.

Develop and implement a plan for 100% of all other (non-bus) vehicles owned or leased to serve the school to be green vehicles. Green vehicles must achieve a minimum green score of 45 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide (or local equivalent for projects outside the U.S).

WAREHOUSES & DISTRIBUTION CENTERS

Option 1. Alternative-Fuel Vehicles (1 point)
Provide an on-site fleet with at least one *yard tractor* that is powered by electricity, propane, or natural gas. Provide on-site charging or refueling stations for the vehicles. Liquid or gas refueling stations must be separately ventilated or located outdoors.

OR

Option 2. Reduced Truck Idling (1 point)
Provide an electrical connection for at least 50% of all dock door locations to limit truck idling at the dock.

SUSTAINABLE SITES (SS)

SS PREREQUISITE: CONSTRUCTION ACTIVITY POLLUTION PREVENTION Required

BD&C
This prerequisite applies to

- New Construction
- Core & Shell
- Schools
- Retail
- Data Centers
- Warehouses & Distribution Centers
- Hospitality
- Healthcare

Intent
To reduce pollution from construction activities by controlling soil erosion, waterway sedimentation, and airborne dust.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Create and implement an erosion and sedimentation control plan for all construction activities associated with the project. The plan must conform to the erosion and sedimentation requirements of the 2012 U.S. Environmental Protection Agency (EPA) Construction General Permit (CGP) or local equivalent, whichever is more stringent. Projects must apply the CGP regardless of size. The plan must describe the measures implemented.

SS PREREQUISITE: ENVIRONMENTAL SITE ASSESSMENT
Required

BD&C
This prerequisite applies to

- Schools
- Healthcare

Intent
To protect the health of vulnerable populations by ensuring that the site is assessed for environmental contamination and that any environmental contamination has been remediated.

Requirements

SCHOOLS, HEALTHCARE

Conduct a Phase I Environmental Site Assessment as described in ASTM E1527–05 (or a local equivalent) to determine whether environmental contamination exists at the site. If contamination is suspected, conduct a Phase II Environmental Site Assessment as described in ASTM E1903–11 (or a local equivalent).

If a site is contaminated, remediate the site to meet local, state, or national environmental protection agency region residential (unrestricted) standards, whichever are most stringent.

SS CREDIT: SITE ASSESSMENT

BD&C
1 point
This credit applies to

- New Construction (1 point)
- Core & Shell (1 point)
- Schools (1 point)
- Retail (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Healthcare (1 point)

Intent
To assess site conditions before design to evaluate sustainable options and inform related decisions about site design.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Complete and document a site survey or assessment[1] that includes the following information:

- *Topography.* Contour mapping, unique topographic features, slope stability risks.
- *Hydrology.* Flood hazard areas, delineated wetlands, lakes, streams, shorelines, rainwater collection and reuse opportunities, TR-55 initial water storage capacity of the site (or local equivalent for projects outside the U.S.).
- *Climate.* Solar exposure, heat island effect potential, seasonal sun angles, prevailing winds, monthly precipitation and temperature ranges.
- *Vegetation.* Primary vegetation types, greenfield area, significant tree mapping, threatened or endangered species, unique habitat, invasive plant species.
- *Soils.* Natural Resources Conservation Service soils delineation, U.S. Department of Agriculture prime farmland, healthy soils, previous development, disturbed soils (local equivalent standards may be used for projects outside the U.S.).
- *Human use.* Views, adjacent transportation infrastructure, adjacent properties, construction materials with existing recycle or reuse potential.
- *Human health effects.* Proximity of vulnerable populations, adjacent physical activity opportunities, proximity to major sources of air pollution.

The survey or assessment should demonstrate the relationships between the site features and topics listed above and how these features influenced the project design; give the reasons for not addressing any of those topics.

[1] Components adapted from the Sustainable Sites Initiative: Guidelines and Performance Benchmarks 2009, Prerequisite 2.1: Site Assessment.

SS CREDIT: SITE DEVELOPMENT—PROTECT OR RESTORE HABITAT

BD&C
1–2 points
This credit applies to

- New Construction (1–2 points)
- Core & Shell (1–2 points)
- Schools (1–2 points)
- Retail (1–2 points)
- Data Centers (1–2 points)
- Warehouses & Distribution Centers (1–2 points)
- Hospitality (1–2 points)
- Healthcare (1 point)

Intent
To conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Preserve and protect from all development and construction activity 40% of the greenfield area on the site (if such areas exist).

AND

Option 1. On-Site Restoration (2 points except Healthcare, 1 point Healthcare)

Using native or adapted vegetation, restore 30% (including the building footprint) of all portions of the site identified as previously disturbed. Projects that achieve a density of 1.5 floor-area ratio may include vegetated roof surfaces in this calculation if the plants are native or adapted, provide habitat, and promote biodiversity.

Restore all disturbed or compacted soils that will be revegetated within the project's development footprint to meet the following requirements[2]:

- Soils (imported and in situ) must be reused for functions comparable to their original function.
- Imported topsoils or soil blends designed to serve as topsoil may not include the following:
  - soils defined regionally by the Natural Resources Conservation Service web soil survey (or local equivalent for projects outside the U.S.) as prime farmland, unique farmland, or farmland of statewide or local importance; or
  - soils from other greenfield sites, unless those soils are a byproduct of a construction process.
- Restored soil must meet the criteria of *reference soils* in categories 1–3 and meet the criteria of either category 4 or 5:
  1. organic matter;
  2. compaction;
  3. infiltration rates;
  4. soil biological function; and
  5. soil chemical characteristics.

[2] Components adapted from the Sustainable Sites Initiative: Guidelines and Performance Benchmarks 2009, Credit 7.2: Restore Soils Disturbed During Construction

Project teams may exclude vegetated landscape areas that are constructed to accommodate rainwater infiltration from the vegetation and soils requirements, provided all such rainwater infiltration areas are treated consistently with SS Credit Rainwater Management.

Schools only:
Dedicated athletic fields that are solely for athletic uses are exempted from the soil restoration criteria. These areas may not count toward the minimum required area.

OR

Option 2. Financial Support (1 point)
Provide financial support equivalent to at least $0.40 per square foot (US$4 per square meter) for the total site area (including the building footprint).

Financial support must be provided to a nationally or locally recognized land trust or conservation organization within the same EPA Level III ecoregion or the project's state (or within 100 miles of the project [160 kilometers] for projects outside the U.S.). For U.S. projects, the land trust must be accredited by the Land Trust Alliance.

SS CREDIT: OPEN SPACE

BD&C
1 point
This credit applies to

- New Construction (1 point)
- Core & Shell (1 point)
- Schools (1 point)
- Retail (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Healthcare (1 point)

Intent
To create exterior open space that encourages interaction with the environment, social interaction, passive recreation, and physical activities.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Provide outdoor space greater than or equal to 30% of the total site area (including building footprint). A minimum of 25% of that outdoor space must be vegetated (turf grass does not count as vegetation) or have *overhead vegetated canopy*.

The outdoor space must be physically accessible and be one or more of the following:

- a pedestrian-oriented paving or turf area with physical site elements that accommodate outdoor social activities;
- a recreation-oriented paving or turf area with physical site elements that encourage physical activity;
- a garden space with a diversity of vegetation types and species that provide opportunities for year-round visual interest;
- a garden space dedicated to community gardens or urban food production;
- preserved or created habitat that meets the criteria of SS Credit Site Development—Protect or Restore Habitat and also includes elements of human interaction.

For projects that achieve a density of 1.5 floor-area ratio (FAR), and are physically accessible, extensive or intensive vegetated roofs can be used toward the minimum 25% vegetation requirement, and qualifying roof-based physically accessible paving areas can be used toward credit compliance.

Wetlands or naturally designed ponds may count as open space if the side slope gradients average 1:4 (vertical : horizontal) or less and are vegetated.

For projects that are part of a multitenant complex only
Open space can be either adjacent to the building or at another location in the *site master plan*. The open space may be at another master plan development site as long as it is protected from development. If the open space is not adjacent to the building, provide documentation showing that the requirements have been met and the land is in a natural state or has been returned to a natural state and conserved for the life of the building.

SS CREDIT: RAINWATER MANAGEMENT

BD&C
1–3 points
This credit applies to

- New Construction (2–3 points)
- Core & Shell (2–3 points)
- Schools (2–3 points)
- Retail (2–3 points)
- Data Centers (2–3 points)
- Warehouses & Distribution Centers (2–3 points)
- Hospitality (2–3 points)
- Healthcare (1–2 points)

Intent
To reduce runoff volume and improve water quality by replicating the natural hydrology and water balance of the site, based on historical conditions and undeveloped ecosystems in the region.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Option 1. Percentile of Rainfall Events

Path 1. 95th Percentile (2 points except Healthcare, 1 point Healthcare)
In a manner best replicating *natural site hydrology* processes, *manage on site* the runoff from the developed site for the 95th percentile of regional or local rainfall events using *low-impact development (LID)* and *green infrastructure*.

Use daily rainfall data and the methodology in the U.S. Environmental Protection Agency (EPA) Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act to determine the 95th percentile amount.

OR

Path 2. 98th Percentile (3 points except Healthcare, 2 points Healthcare)
Achieve Path 1 but for the 98th percentile of regional or local rainfall events, using LID and green infrastructure.

OR

Path 3. Zero Lot Line projects only – 85th Percentile (3 points except Healthcare, 2 points Healthcare)
The following requirement applies to zero lot line projects in urban areas with a minimum density of 1.5 FAR. In a manner best replicating natural site hydrology processes, manage on site the runoff from the developed site for the 85th percentile of regional or local rainfall events, using LID and green infrastructure.

OR

Option 2. Natural Land Cover Conditions (3 points except Healthcare, 2 points Healthcare)

Manage on site the annual increase in runoff volume from the natural land cover condition to the postdeveloped condition.

Projects that are part of a multitenant complex only

The credit requirements may be met using a coordinated approach affecting the defined project site that is within the *master plan boundary*. Distributed techniques based on a watershed approach are then required.

SS CREDIT: HEAT ISLAND REDUCTION

BD&C
1–2 points
This credit applies to

- New Construction (1-2 points)
- Core & Shell (1-2 points)
- Schools (1-2 points)
- Retail (1-2 points)
- Data Centers (1-2 points)
- Warehouses & Distribution Centers (1-2 points)
- Hospitality (1-2 points)
- Healthcare (1 point)

Intent
To minimize effects on microclimates and human and wildlife habitats by reducing heat islands.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Choose one of the following options:

Option 1. Nonroof and Roof (2 points except Healthcare, 1 point Healthcare)
Meet the following criterion:

$$\frac{\text{Area of Nonroof Measures}}{0.5} + \frac{\text{Area of High-Reflectance Roof}}{0.75} + \frac{\text{Area of Vegetated Roof}}{0.75} \geq \text{Total Site Paving Area} + \text{Total Roof Area}$$

Alternatively, an SRI and SR weighted average approach may be used to calculate compliance.

Use any combination of the following strategies.

Nonroof Measures

- Use the existing plant material or install plants that provide shade over paving areas (including playgrounds) on the site within 10 years of planting. Install vegetated planters. Plants must be in place at the time of occupancy permit and cannot include artificial turf.
- Provide shade with structures covered by energy generation systems, such as solar thermal collectors, photovoltaics, and wind turbines.
- Provide shade with architectural devices or structures that have a three-year aged *solar reflectance (SR)* value of at least 0.28. If three-year aged value information is not available, use materials with an initial SR of at least 0.33 at installation,
- Provide shade with vegetated structures.
- Use paving materials with a three-year aged *solar reflectance (SR)* value of at least 0.28. If three-year aged value information is not available, use materials with an initial SR of at least 0.33 at installation.
- Use an *open-grid pavement system* (at least 50% unbound).

High-Reflectance Roof
Use roofing materials that have an SRI equal to or greater than the values in Table 1. Meet the three-year aged SRI value. If three-year aged value information is not available, use materials that meet the initial SRI value.

Table 1. Minimum solar reflectance index value, by roof slope

	Slope	**Initial SRI**	**3-year aged SRI**
Low-sloped roof	≤ 2:12	82	64
Steep-sloped roof	> 2:12	39	32

Vegetated Roof
Install a vegetated roof.

OR

Option 2. Parking under Cover (1 point)
Place a minimum of 75% of *parking spaces under cover*. Any roof used to shade or cover parking must (1) have a three-year aged SRI of at least 32 (if three-year aged value information is not available, use materials with an initial SRI of at least 39 at installation), (2) be a vegetated roof, or (3) be covered by energy generation systems, such as solar thermal collectors, photovoltaics, and wind turbines .

SS CREDIT: LIGHT POLLUTION REDUCTION

BD&C
1 point
This credit applies to

- New Construction (1 point)
- Core & Shell (1 point)
- Schools (1 point)
- Retail (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Healthcare (1 point)

Intent
To increase night sky access, improve nighttime visibility, and reduce the consequences of development for wildlife and people.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Meet uplight and light trespass requirements, using either the backlight-uplight-glare (BUG) method (Option 1) or the calculation method (Option 2). Projects may use different options for uplight and light trespass.

Meet these requirements for all exterior luminaires located inside the project boundary (except those listed under "Exemptions"), based on the following:

- the photometric characteristics of each luminaire when mounted in the same orientation and tilt as specified in the project design; and
- the lighting zone of the project property (at the time construction begins). Classify the project under one lighting zone using the lighting zones definitions provided in the Illuminating Engineering Society and International Dark Sky Association (IES/IDA) Model Lighting Ordinance (MLO) User Guide.

Additionally, meet the internally illuminated signage requirement.

Uplight

Option 1. BUG Rating Method

Do not exceed the following luminaire uplight ratings, based on the specific light source installed in the luminaire, as defined in IES TM-15-11, Addendum A.

Table 1. Maximum uplight ratings for luminaires

MLO lighting zone	Luminaire uplight rating
LZ0	U0
LZ1	U1
LZ2	U2
LZ3	U3

LZ4	U4

OR

Option 2. Calculation Method

Do not exceed the following percentages of total lumens emitted above horizontal.

Table 2. Maximum percentage of total lumens emitted above horizontal, by lighting zone

MLO lighting zone	Maximum allowed percentage of total luminaire lumens emitted above horizontal
LZ0	0%
LZ1	0%
LZ2	1.5%
LZ3	3%
LZ4	6%

AND

Light Trespass

Option 1. BUG Rating Method

Do not exceed the following luminaire backlight and glare ratings (based on the specific light source installed in the luminaire), as defined in IES TM-15-11, Addendum A, based on the mounting location and distance from the lighting boundary.

Table 3. Maximum backlight and glare ratings

	MLO lighting zone				
Luminaire mounting	LZ0	LZ1	LZ2	LZ3	LZ4
	Allowed backlight ratings				
> 2 mounting heights from lighting boundary	B1	B3	B4	B5	B5
1 to 2 mounting heights from lighting boundary and properly oriented	B1	B2	B3	B4	B4
0.5 to 1 mounting height to lighting boundary and properly oriented	B0	B1	B2	B3	B3
< 0.5 mounting height to lighting boundary and properly oriented	B0	B0	B0	B1	B2
	Allowed glare ratings				
Building-mounted > 2 mounting heights from any lighting boundary	G0	G1	G2	G3	G4

Building-mounted 1–2 mounting heights from any lighting boundary	G0	G0	G1	G1	G2
Building-mounted 0.5 to 1 mounting heights from any lighting boundary	G0	G0	G0	G1	G1
Building-mounted < 0.5 mounting heights from any lighting boundary	G0	G0	G0	G0	G1
All other luminaires	G0	G1	G2	G3	G4

The lighting boundary is located at the property lines of the property, or properties, that the LEED project occupies. The lighting boundary can be modified under the following conditions:

- When the property line abuts a public area that includes, but is not limited to, a walkway, bikeway, plaza, or parking lot, the lighting boundary may be moved to 5 feet (1.5 meters) beyond the property line.
- When the property line abuts a public street, alley, or transit corridor, the lighting boundary may be moved to the center line of that street, alley, or corridor.
- When there are additional properties owned by the same entity that are contiguous to the property, or properties, that the LEED project is within and have the same or higher MLO lighting zone designation as the LEED project, the lighting boundary may be expanded to include those properties.

Orient all luminaires less than two mounting heights from the lighting boundary such that the backlight points toward the nearest lighting boundary line. Building-mounted luminaires with the backlight oriented toward the building are exempt from the backlight rating requirement.

OR

Option 2. Calculation Method

Do not exceed the following vertical illuminances at the lighting boundary (use the definition of lighting boundary in Option 1). Calculation points may be no more than 5 feet (1.5 meters) apart. Vertical illuminances must be calculated on vertical planes running parallel to the lighting boundary, with the normal to each plane oriented toward the property and perpendicular to the lighting boundary, extending from grade level to 33 feet (10 meters) above the height of the highest luminaire.

Table 4. Maximum vertical illuminance at lighting boundary, by lighting zone

MLO lighting zone	Vertical illuminance
LZ0	0.05 fc (0.5 lux)
LZ1	0.05 fc (0.5 lux)
LZ2	0.10 fc (1 lux)
LZ3	0.20 fc (2 lux)
LZ4	0.60 fc (6 lux)

FC = footcandle.

AND

Internally Illuminated Exterior Signage
Do not exceed a luminance of 200 cd/m^2 (nits) during nighttime hours and 2000 cd/m^2 (nits) during daytime hours.

Exemptions from Uplight and Light Trespass Requirements
The following exterior lighting is exempt from the requirements, provided it is controlled separately from the nonexempt lighting:

- specialized signal, directional, and marker lighting for transportation;
- lighting that is used solely for façade and landscape lighting in MLO lighting zones 3 and 4, and is automatically turned off from midnight until 6 a.m.;
- lighting for theatrical purposes for stage, film, and video performances;
- government-mandated roadway lighting;
- hospital emergency departments, including associated helipads;
- lighting for the national flag in MLO lighting zones 2, 3, or 4; and
- internally illuminated signage.

SS CREDIT: SITE MASTER PLAN

BD&C
1 point
This credit applies to

- Schools

Intent
To ensure that the sustainable site benefits achieved by the project continue, regardless of future changes in programs or demographics.

Requirements

SCHOOLS

The project must achieve at least four of the following six credits, using the associated calculation methods. The achieved credits must then be recalculated using the data from the master plan.

- LT Credit: High Priority Site
- SS Credit: Site Development—Protect or Restore Habitat
- SS Credit: Open Space
- SS Credit: Rainwater Management
- SS Credit: Heat Island Reduction
- SS Credit: Light Pollution Reduction

A *site master plan* for the school must be developed in collaboration with school authorities. Previous sustainable site design measures should be considered in all master-planning efforts so that existing infrastructure is retained whenever possible. The master plan must therefore include current construction activity plus future construction (within the building's lifespan) that affects the site. The master plan development footprint must also include parking, paving, and utilities.

Projects where no future development is planned are not eligible for this credit.

SS CREDIT: TENANT DESIGN AND CONSTRUCTION GUIDELINES

BD&C
1 point
This credit applies to

- Core & Shell

Intent
To educate tenants in implementing sustainable design and construction features in their tenant improvement build-outs.

Requirements

CS

Publish for tenants an illustrated document with the following content, as applicable:

- a description of the sustainable design and construction features incorporated in the core and shell project and the project's sustainability goals and objectives, including those for tenant spaces;
- recommendations, including examples, for sustainable strategies, products, materials, and services; and
- information that enables a tenant to coordinate space design and construction with the building systems when pursuing the following LEED v4 for Interior Design and Construction prerequisites and credits:
    - WE Prerequisite: Indoor Water Use Reduction
    - WE Credit: Indoor Water Use Reduction
    - EA Prerequisite: Minimum Energy Performance
    - EA Prerequisite: Fundamental Refrigerant Management
    - EA Credit: Optimize Energy Performance
    - EA Credits: Advanced Energy Metering
    - EA Credit: Renewable Energy Production
    - EA Credit: Enhanced Refrigerant Management
    - MR Prerequisite: Storage and Collection of Recyclables
    - EQ Prerequisite: Minimum Indoor Air Quality Performance
    - EQ Prerequisite: Environmental Tobacco Smoke Control
    - EQ Credit: Enhanced Indoor Air Quality Strategies
    - EQ Credit: Low-Emitting Materials
    - EQ Credit: Construction Indoor Air Quality Management Plan
    - EQ Credit: Indoor Air Quality Assessment
    - EQ Credit: Thermal Comfort
    - EQ Credit: Interior Lighting
    - EQ Credit: Daylight
    - EQ Credit: Quality Views
    - EQ Credit: Acoustic Performance

Provide the guidelines to all tenants before signing the lease.

SS CREDIT: PLACES OF RESPITE

BD&C
1 point
This credit applies to
- Healthcare

Intent
To provide patients, staff, and visitors with the health benefits of the natural environment by creating outdoor places of respite on the healthcare campus.

Requirements

HEALTHCARE

Provide places of respite that are accessible to patients and visitors, equal to 5% of the *net usable program area* of the building.
Provide additional dedicated places of respite for staff, equal to 2% of the net usable program area of the building.
Places of respite must be outdoors, or be located in interior atria, greenhouses, solaria, or conditioned spaces; such interior spaces may be used to meet up to 30% of the required area if 90% of each qualifying space's gross floor area achieves a direct line of sight to unobstructed views of nature.

All areas must meet the following requirements.
- The area is accessible from within the building or located within 200 feet (60 meters) of a building entrance or access point.
- The area is located where no medical intervention or direct medical care is delivered.
- Options for shade or indirect sun are provided, with at least one seating space per 200 square feet (18.5 square meters) of each respite area, with one wheelchair space per five seating spaces..
- Horticulture therapy and other specific clinical or special-use gardens unavailable to all building occupants may account for no more than 50% of the required area.
- Universal-access natural trails that are available to visitors, staff, or patients may account for no more than 30% of the required area, provided the trailhead is within 200 feet (60 meters) of a building entrance.

Additionally, outdoor areas must meet the following requirements.
- A minimum of 25% of the total outdoor area must be vegetated at the ground plane (not including turf grass) or have *overhead vegetated canopy*.
- The area is open to fresh air, the sky, and the natural elements.
- Signage must meet the 2010 FGI Guidelines for Design and Construction of Health Care Facilities (Section 1.2-6.3 and Appendix A1.2-6.3:Wayfinding).
- Places of respite may not be within 25 feet (7.6 meters) of a smoking area (see EQ Prerequisite Environmental Tobacco Smoke Control).

Existing places of respite on the hospital campus may qualify if they otherwise meet the credit requirements.

SS CREDIT: DIRECT EXTERIOR ACCESS

BD&C
1 point
This credit applies to

- Healthcare

Intent
To provide patients and staff with the health benefits associated with direct access to the natural environment.

Requirements

HEALTHCARE

Provide direct access to an exterior courtyard, terrace, garden, or balcony. The space must be at least 5 square feet (0.5 square meters) per patient for 75% of all inpatients and 75% of qualifying outpatients whose clinical length of stay (LOS) exceeds four hours.

Patients whose length of stay exceeds four hours, and whose treatment makes them unable to move, such as emergency, stage 1 surgical recovery, and critical care patients, may be excluded.

Places of respite outside the building envelope that meet the requirements of SS Credit Places of Respite that are immediately adjacent to clinical areas or with direct access from inpatient units may be included.

Qualifying spaces must be designated as nonsmoking The spaces must also meet the requirements for outdoor air contaminant concentrations enumerated in EQ Credit Enhanced Indoor Air Quality Strategies, Option 2 and be located more than 100 feet (30 meters) from building exhaust air locations, loading docks, and roadways with idling vehicles.

SS CREDIT: JOINT USE OF FACILITIES

BD&C
1 point
This credit applies to
- Schools

Intent
To integrate the school with the community by sharing the building and its playing fields for nonschool events and functions.

Requirements

SCHOOLS

Option 1. Make Building Space Open to the General Public (1 point)
In collaboration with the school authorities, ensure that at least three of the following types of spaces in the school are accessible to and available for shared use by the general public:
- auditorium;
- gymnasium;
- cafeteria;
- one or more classrooms;
- playing fields and stadiums; and
- joint parking.

Provide access to toilets in joint-use areas after normal school hours.

OR

Option 2. Contract with Specific Organizations to Share Building Space (1 point)
In collaboration with the school authorities, contract with community or other organizations to provide at least two types of dedicated-use spaces in the building, such as the following:
- commercial office;
- health clinic;
- community service centers (provided by state or local offices);
- police office;
- library or media center;
- parking lot; and
- one or more commercial businesses.

Provide access to toilets in joint-use areas after normal school hours.

OR

Option 3. Use Shared Space Owned by Other Organizations (1 point)
In collaboration with the school authorities, ensure that at least two of the following six types of spaces that are owned by other organizations or agencies are accessible to students:
- auditorium;
- gymnasium;
- cafeteria;
- one or more classrooms;
- swimming pool; and
- playing fields and stadiums.

Provide direct pedestrian access to these spaces from the school. In addition, provide signed joint-use agreements with the other organizations or agencies that stipulate how these spaces will be shared.

WATER EFFICIENCY (WE)

WE PREREQUISITE: OUTDOOR WATER USE REDUCTION
Required

BD&C
This prerequisite applies to

- New Construction
- Core & Shell
- Schools
- Retail
- Data Centers
- Warehouses & Distribution Centers
- Hospitality
- Healthcare

Intent

To reduce outdoor water consumption.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Reduce outdoor water use through one of the following options. Nonvegetated surfaces, such as permeable or impermeable pavement, should be excluded from the landscape area calculations. Athletic fields and playgrounds (if vegetated) and food gardens may be included or excluded at the project team's discretion.

Option 1. No Irrigation Required

Show that the landscape does not require a permanent irrigation system beyond a maximum two-year establishment period.

OR

Option 2. Reduced Irrigation

Reduce the project's landscape water requirement by at least 30% from the calculated baseline for the site's peak watering month. Reductions must be achieved through plant species selection and irrigation system efficiency, as calculated by the Environmental Protection Agency (EPA) WaterSense Water Budget Tool.

WE PREREQUISITE: INDOOR WATER USE REDUCTION
Required

BD&C
This prerequisite applies to

- New Construction
- Core & Shell
- Schools
- Retail
- Data Centers
- Warehouses & Distribution Centers
- Hospitality
- Healthcare

Intent

To reduce indoor water consumption.

Requirements

NC, CS, SCHOOLS, NC-RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, NC-HOSPITALITY, HEALTHCARE

Building Water Use

For the fixtures and fittings listed in Table 1, as applicable to the project scope, reduce aggregate water consumption by 20% from the baseline. Base calculations on the volumes and flow rates shown in Table 1.

All newly installed toilets, urinals, private lavatory faucets, and showerheads that are eligible for labeling must be WaterSense labeled (or a local equivalent for projects outside the U.S.).

Table 1. Baseline water consumption of fixtures and fittings

Fixture or fitting	*Baseline (IP units)*	*Baseline (SI units)*
Toilet (water closet)*	1.6 gpf	6 lpf
Urinal*	1.0 gpf	3.8 lpf
Public lavatory (restroom) faucet	0.5 gpm at 60 psi** all others except private applications	1.9 lpm at 415 kPa, all others except private applications
Private lavatory faucets	2.2 gpm at 60 psi	8.3 lpm at 415 kPa
Kitchen faucet (excluding faucets used exclusively for filling operations)	2.2 gpm at 60 psi	8.3 lpm at 415 kPa
Showerhead*	2.5 gpm at 80 psi per shower stall	9.5 lpm at 550 kPa per shower stall

* WaterSense label available for this product type
gpf = gallons per flush
gpm = gallons per minute
psi = pounds per square inch
lpf = liters per flush
lpm = liters per minute
kPa = kilopascals

Appliance and Process Water Use

Install appliances, equipment, and processes within the project scope that meet the requirements listed in the tables below.

Table 2. Standards for appliances

Appliance	*Requirement*
Residential clothes washers	ENERGY STAR or performance equivalent
Commercial clothes washers	CEE Tier 3A
Residential dishwashers (standard and compact)	ENERGY STAR or performance equivalent
Prerinse spray valves	≤ 1.3 gpm (4.9 lpm)
Ice machine	ENERGY STAR or performance equivalent and use either air-cooled or closed-loop cooling, such as chilled or condenser water system

gpm = gallons per minute

lpm = liters per minute

Table 3. Standards for processes

Process	*Requirement*
Heat rejection and cooling	No once-through cooling with potable water for any equipment or appliances that reject heat
Cooling towers and evaporative condensers	Equip with • makeup water meters • conductivity controllers and overflow alarms • efficient drift eliminators that reduce drift to maximum of 0.002% of recirculated water volume for counterflow towers and 0.005% of recirculated water flow for cross-flow towers

Healthcare, Retail, Schools, and Hospitality Only

In addition, water-consuming appliances, equipment, and processes must meet the requirements listed in Tables 4 and 5.

Table 4. Standards for appliances

Kitchen equipment		*Requirement (IP units)*	*Requirement (SI units)*
Dishwasher	Undercounter	≤ 1.6 gal/rack	≤ 6.0 liters/rack
	Stationary, single tank, door	≤ 1.4 gal/rack	≤ 5.3 liters/rack
	Single tank, conveyor	≤ 1.0 gal/rack	≤ 3.8 liters/rack
	Multiple tank, conveyor	≤ 0.9 gal/rack	≤ 3.4 liters/rack
	Flight machine	≤ 180 gal/hour	≤ 680 liters/hour
Food steamer	Batch	≤ 6 gal/hour/pan	≤ 23 liters/hour/pan
	Cook-to-order	≤ 10 gal/hour/pan	≤ 38 liters/hour/pan
Combination oven,	Countertop or stand	≤ 3.5 gal/hour/pan	≤ 13 liters/hour/pan
	Roll-in	≤ 3.5 gal/hour/pan	≤ 13 liters/hour/pan

Table 5. Process requirements

Discharge water temperature tempering	Where local requirements limit discharge temperature of fluids into drainage system, use tempering device that runs water only when equipment discharges hot water OR Provide thermal recovery heat exchanger that cools drained discharge water below code-required maximum discharge temperatures while simultaneously preheating inlet makeup water OR If fluid is steam condensate, return it to boiler
Venturi-type flow-through vacuum generators or aspirators	Use no device that generates vacuum by means of water flow through device into drain

WE PREREQUISITE: BUILDING-LEVEL WATER METERING
Required

BD&C
This prerequisite applies to

- New Construction
- Core & Shell
- Schools
- Retail
- Data Centers
- Warehouses & Distribution Centers
- Hospitality
- Healthcare

Intent

To support water management and identify opportunities for additional water savings by tracking water consumption.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Install permanent water meters that measure the total potable water use for the building and associated grounds. Meter data must be compiled into monthly and annual summaries; meter readings can be manual or automated.

Commit to sharing with USGBC the resulting whole-project water usage data for a five-year period beginning on the date the project accepts LEED certification or typical occupancy, whichever comes first.

This commitment must carry forward for five years or until the building changes ownership or lessee.

WE CREDIT: OUTDOOR WATER USE REDUCTION

BD&C
1–2 points
This credit applies to

- New Construction (1–2 points)
- Core & Shell (1–2 points)
- Schools (1–2 points)
- Retail (1–2 points)
- Data Centers (1–2 points)
- Warehouses & Distribution Centers (1–2 points)
- Hospitality (1–2 points)
- Healthcare (1 point)

Intent

To reduce outdoor water consumption.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Reduce outdoor water use through one of the following options. Nonvegetated surfaces, such as permeable or impermeable pavement, should be excluded from landscape area calculations. Athletic fields and playgrounds (if vegetated) and food gardens may be included or excluded at the project team's discretion.

Option 1. No Irrigation Required (2 points except Healthcare, 1 point Healthcare)

Show that the landscape does not require a permanent irrigation system beyond a maximum two-year establishment period.

OR

Option 2. Reduced Irrigation (1-2 points except Healthcare, 1 point Healthcare)

Reduce the project's landscape water requirement (LWR) by at least 50% from the calculated baseline for the site's peak watering month. Reductions must first be achieved through plant species selection and irrigation system efficiency as calculated in the Environmental Protection Agency (EPA) WaterSense Water Budget Tool.

Additional reductions beyond 30% may be achieved using any combination of efficiency, alternative water sources, and smart scheduling technologies.

Table 1. Points for reducing irrigation water

Percentage reduction from baseline	*Points (except Healthcare)*	*Points (Healthcare)*
50%	1	1
100%	2	—

WE CREDIT: INDOOR WATER USE REDUCTION

BD&C
1–7 points
This credit applies to

- New Construction (1–6 points)
- Core & Shell (1–6 points)
- Schools (1–7 points)
- Retail (1–7 points)
- Data Centers (1–6 points)
- Warehouses & Distribution Centers (1–6 points)
- Hospitality (1–6 points)
- Healthcare (1–7 points)

Intent

To reduce indoor water consumption.

Requirements

NC, CS, SCHOOLS, NC-RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, NC-HOSPITALITY, HEALTHCARE

Further reduce fixture and fitting water use from the calculated baseline in WE Prerequisite Indoor Water Use Reduction. Additional potable water savings can be earned above the prerequisite level using alternative water sources. Include fixtures and fittings necessary to meet the needs of the occupants. Some of these fittings and fixtures may be outside the tenant space (for Commercial Interiors) or project boundary (for New Construction). Points are awarded according to Table 1.

Table 1. Points for reducing water use

Percentage reduction	Points (BD&C)	Points (Schools, Retail, Hospitality, Healthcare)
25%	1	1
30%	2	2
35%	3	3
40%	4	4
45%	5	5
50%	6	--

Schools, Retail, Hospitality, and Healthcare only

Meet the percentage reduction requirements above.

AND

Appliance and Process Water. Install equipment within the project scope that meets the minimum requirements in Table 2, 3, 4, or 5 . One point is awarded for meeting all applicable requirements in any one table. All applicable equipment listed in each table must meet the standard.

Schools, Retail, and Healthcare projects can earn a second point for meeting the requirements of two tables.

Table 2. Compliant commercial washing machines

To use Table 2, the project must process at least 120,000 lbs (57 606 kg) of laundry per year.

Washing machine	*Requirement (IP units)*	*Requirement (SI units)*
On-premise, minimum capacity 2,400 lbs (1 088 kg) per 8-hour shift	Maximum 1.8 gals per pound *	Maximum 7 liters per 0.45 kilograms *

* Based on equal quantities of heavy, medium, and light soil laundry.

Table 3. Standards for commercial kitchen equipment

To use Table 3, the project must serve at least 100 meals per day of operation. All process and appliance equipment listed in the category of kitchen equipment and present on the project must comply with the standards.

Kitchen equipment		*Requirement (IP units)*	*Requirement (SI units)*
Dishwasher	Undercounter	ENERGY STAR	ENERGY STAR or performance equivalent
	Stationary, single tank, door	ENERGY STAR	ENERGY STAR or performance equivalent
	Single tank, conveyor	ENERGY STAR	ENERGY STAR or performance equivalent
	Multiple tank, conveyor	ENERGY STAR	ENERGY STAR or performance equivalent
	Flight machine	ENERGY STAR	ENERGY STAR or performance equivalent
Food steamer	Batch (no drain connection)	≤ 2 gal/hour/pan including condensate cooling water	≤ 7.5 liters/hour/pan including condensate cooling water
	Cook-to-order (with drain connection)	≤ 5 gal/hour/pan including condensate cooling water	≤ 19 liters/hour/pan including condensate cooling water
Combination oven,	Countertop or stand	≤ 1.5 gal/hour/panincluding condensate cooling water	≤ 5.7 liters/hour/pan including condensate cooling water

	Roll-in	≤ 1.5 gal/hour/pan including condensate cooling water	≤ 5.7 liters/hour/pan including condensate cooling water
Food waste disposer	Disposer	3-8 gpm, full load condition, 10 minute automatic shutoff; or 1 gpm, no-load condition	11–30 lpm, full load condition, 10-min automatic shutoff; or 3.8 lpm, no-load condition
	Scrap collector	Maximum 2 gpm makeup water	Maximum 7.6 lpm makeup water
	Pulper	Maximum 2 gpm makeup water	Maximum 7.6 lpm makeup water
	Strainer basket	No additional water usage	No additional water usage

gpm = gallons per minute
gph = gallons per hour
lpm = liters per minute
lph = liters per hour

Table 4. Compliant laboratory and medical equipment

To use Table 4, the project must be a medical or laboratory facility.

Lab equipment	*Requirement (IP units)*	*Requirement (SI units)*
Reverse-osmosis water purifier	75% recovery	75% recovery
Steam sterilizer	For 60-inch sterilizer, 6.3 gal/U.S. tray For 48-inch sterilizer, 7.5 gal/U.S. tray	For 1520-mm sterilizer, 28.5 liters/DIN tray For 1220-mm sterilizer, 28.35 liters/DIN tray
Sterile process washer	0.35 gal/U.S. tray	1.3 liters/DIN tray
X-ray processor, 150 mm or more in any dimension	Film processor water recycling unit	
Digital imager, all sizes	No water use	

Table 5. Compliant municipal steam systems

To use Table 5, the project must be connected to a municipal or district steam system that does not allow the return of steam condensate.

Steam system	*Standard*
Steam condensate disposal	Cool municipally supplied steam condensate (no return) to drainage system with heat recovery system or reclaimed water
OR	
Reclaim and use steam condensate	100% recovery and reuse

WE CREDIT: COOLING TOWER WATER USE

BD&C
1–2 points
This credit applies to

- New Construction (1–2 points)
- Core & Shell (1–2 points)
- Schools (1–2 points)
- Retail (1–2 points)
- Data Centers (1–2 points)
- Warehouses & Distribution Centers (1–2 points)
- Hospitality (1–2 points)
- Healthcare (1–2 points)

Intent

To conserve water used for cooling tower makeup while controlling microbes, corrosion, and scale in the condenser water system.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE,

For cooling towers and evaporative condensers, conduct a one-time potable water analysis, measuring at least the five control parameters listed in Table 1.

Table 1. Maximum concentrations for parameters in condenser water

Parameter	*Maximum level*
Ca (as $CaCO_3$)	1000 ppm
Total alkalinity	1000 ppm
SiO_2	100 ppm
Cl^-	250 ppm
Conductivity	2000 µS/cm

ppm = parts per million
µS/cm = micro siemens per centimeter

Calculate the number of cooling tower cycles by dividing the maximum allowed concentration level of each parameter by the actual concentration level of each parameter found in the potable makeup water. Limit cooling tower cycles to avoid exceeding maximum values for any of these parameters.

Table 2. Points for cooling tower cycles

Cooling tower cycles	*Points*
Maximum number of cycles achieved without exceeding any filtration levels or affecting operation of condenser water system (up to maximum of 10 cycles)	1

Achieve a minimum 10 cycles by increasing the level of treatment in condenser or make-up water OR Meet the minimum number of cycles to earn 1 point and use a minimum 20% recycled nonpotable water	2

WE CREDIT: WATER METERING

BD&C
1 point
This credit applies to

- New Construction (1 point)
- Core & Shell (1 point)
- Schools (1 point)
- Retail (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Healthcare (1 point)

Intent

To support water management and identify opportunities for additional water savings by tracking water consumption.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Install permanent water meters for two or more of the following water subsystems, as applicable to the project:

- *Irrigation.* Meter water systems serving at least 80% of the irrigated landscaped area. Calculate the percentage of irrigated landscape area served as the total metered irrigated landscape area divided by the total irrigated landscape area. Landscape areas fully covered with xeriscaping or native vegetation that requires no routine irrigation may be excluded from the calculation.

- *Indoor plumbing fixtures and fittings.* Meter water systems serving at least 80% of the indoor fixtures and fitting described in WE Prerequisite Indoor Water Use Reduction, either directly or by deducting all other measured water use from the measured total water consumption of the building and grounds.

- *Domestic hot water.* Meter water use of at least 80% of the installed domestic hot water heating capacity (including both tanks and on-demand heaters).

- *Boiler with aggregate projected annual water use of 100,000 gallons (378 500 liters) or more, or boiler of more than 500,000 BtuH (150 kW).* A single makeup meter may record flows for multiple boilers.

- *Reclaimed water.* Meter reclaimed water, regardless of rate. A reclaimed water system with a makeup water connection must also be metered so that the true reclaimed water component can be determined.

- *Other process water.* Meter at least 80% of expected daily water consumption for process end uses, such as humidification systems, dishwashers, clothes washers, pools, and other subsystems using process water.

Healthcare Projects only
In addition to the requirements above, install water meters in any five of the following:

- purified water systems (reverse-osmosis, de-ionized);

- filter backwash water;
- water use in dietary department;
- water use in laundry;
- water use in laboratory;
- water use in central sterile and processing department;
- water use in physiotherapy and hydrotherapy and treatment areas;
- water use in surgical suite;
- closed-looped hydronic system makeup water; and
- cold-water makeup for domestic hot water systems.

ENERGY AND ATMOSPHERE

EA PREREQUISITE: FUNDAMENTAL COMMISSIONING AND VERIFICATION Required

BD&C
This prerequisite applies to

- New Construction
- Core & Shell
- Schools
- Retail
- Data Centers
- Warehouses & Distribution Centers
- Hospitality
- Healthcare

Intent

To support the design, construction, and eventual operation of a project that meets the owner's project requirements for energy, water, indoor environmental quality, and durability.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Commissioning Process Scope
Complete the following commissioning (Cx) process activities for mechanical, electrical, plumbing, and renewable energy systems and assemblies, in accordance with ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1–2007 for HVAC&R Systems, as they relate to energy, water, indoor environmental quality, and durability.

Requirements for exterior enclosures are limited to inclusion in the owner's project requirements (OPR) and basis of design (BOD), as well as the review of the OPR, BOD and project design. NIBS Guideline 3-2012 for Exterior Enclosures provides additional guidance.

- Develop the OPR.
- Develop a BOD.

The commissioning authority (CxA) must do the following:

- Review the OPR, BOD, and project design.
- Develop and implement a Cx plan.
- Confirm incorporation of Cx requirements into the construction documents.
- Develop construction checklists.
- Develop a system test procedure.
- Verify system test execution.
- Maintain an issues and benefits log throughout the Cx process.
- Prepare a final Cx process report.
- Document all findings and recommendations and report directly to the owner throughout the process.

The review of the exterior enclosure design may be performed by a qualified member of the design or

construction team (or an employee of that firm) who is not directly responsible for design of the building envelope.

Commissioning Authority
By the end of the design development phase, engage a commissioning authority with the following qualifications.

- The CxA must have documented commissioning process experience on at least two building projects with a similar scope of work. The experience must extend from early design phase through at least 10 months of occupancy;
- The CxA may be a qualified employee of the owner, an independent consultant, or an employee of the design or construction firm who is not part of the project's design or construction team, or a disinterested subcontractor of the design or construction team.
    - For projects smaller than 20,000 square feet (1 860 square meters), the CxA may be a qualified member of the design or construction team. In all cases, the CxA must report his or her findings directly to the owner.

Project teams that intend to pursue EA Credit Enhanced Commissioning should note a difference in the CxA qualifications: for the credit, the CxA may not be an employee of the design or construction firm nor a subcontractor to the construction firm.

Current Facilities Requirements and Operations and Maintenance Plan
Prepare and maintain a current facilities requirements and operations and maintenance plan that contains the information necessary to operate the building efficiently. The plan must include the following:

- a sequence of operations for the building;
- the building occupancy schedule;
- equipment run-time schedules;
- setpoints for all HVAC equipment;
- set lighting levels throughout the building;
- minimum outside air requirements;
- any changes in schedules or setpoints for different seasons, days of the week, and times of day;
- a systems narrative describing the mechanical and electrical systems and equipment;
- a preventive maintenance plan for building equipment described in the systems narrative; and
- a commissioning program that includes periodic commissioning requirements, ongoing commissioning tasks, and continuous tasks for critical facilities.

<u>Data Centers only</u>
For small projects with computer room peak cooling loads less than 2,000,000 Btu/h (600 kW) or a total computer room peak cooling load less than 600,000 Btu/h (175 kW), the CxA may be a qualified employee of the design or construction team.

EA PREREQUISITE: MINIMUM ENERGY PERFORMANCE
Required

BD&C
This prerequisite applies to

- New Construction
- Core & Shell
- Schools
- Retail
- Data Centers
- Warehouses & Distribution Centers
- Hospitality
- Healthcare

Intent

To reduce the environmental and economic harms of excessive energy use by achieving a minimum level of energy efficiency for the building and its systems.

Requirements

NC, CS, SCHOOLS, RETAIL, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Option 1. Whole-Building Energy Simulation
Demonstrate an improvement of 5% for new construction, 3% for major renovations, or 2% for core and shell projects in the proposed building performance rating compared with the baseline building performance rating. Calculate the baseline building performance according to ANSI/ASHRAE/IESNA Standard 90.1–2010, Appendix G, with errata (or a USGBC-approved equivalent standard for projects outside the U.S.), using a simulation model.

Projects must meet the minimum percentage savings before taking credit for renewable energy systems.

The proposed design must meet the following criteria:

- compliance with the mandatory provisions of ANSI/ASHRAE/IESNA Standard 90.1–2010, with errata (or a USGBC-approved equivalent standard for projects outside the U.S.);
- inclusion of all energy consumption and costs within and associated with the building project; and
- comparison against a baseline building that complies with Standard 90.1–2010, Appendix G, with errata (or a USGBC-approved equivalent standard for projects outside the U.S.).

Document the energy modeling input assumptions for unregulated loads. Unregulated loads should be modeled accurately to reflect the actual expected energy consumption of the building.

If unregulated loads are not identical for both the baseline and the proposed building performance rating, and the simulation program cannot accurately model the savings, follow the exceptional calculation method (ANSI/ASHRAE/IESNA Standard 90.1–2010, G2.5). Alternatively, use the COMNET Modeling Guidelines and Procedures to document measures that reduce unregulated loads.

Retail only

For Option 1, Whole-Building Energy Simulation, process loads for retail may include refrigeration equipment, cooking and food preparation, clothes washing, and other major support appliances. Many of the industry standard baseline conditions for commercial kitchen equipment and refrigeration are defined

in Appendix 3, Tables 1–4. No additional documentation is necessary to substantiate these predefined baseline systems as industry standard.

OR

Option 2. Prescriptive Compliance: ASHRAE 50% Advanced Energy Design Guide

Comply with the mandatory and prescriptive provisions of ANSI/ASHRAE/IESNA Standard 90.1–2010, with errata (or a USGBC-approved equivalent standard for projects outside the U.S.).

Comply with the HVAC and service water heating requirements, including equipment efficiency, economizers, ventilation, and ducts and dampers, in Chapter 4, Design Strategies and Recommendations by Climate Zone, for the appropriate ASHRAE 50% Advanced Energy Design Guide and climate zone:

- ASHRAE 50% Advanced Energy Design Guide for Small to Medium Office Buildings, for office buildings smaller than 100,000 square feet (9 290 square meters);
- ASHRAE 50% Advanced Energy Design Guide for Medium to Large Box Retail Buildings, for retail buildings with 20,000 to 100,000 square feet (1 860 to 9 290 square meters);
- ASHRAE 50% Advanced Energy Design Guide for K–12 School Buildings; or
- ASHRAE 50% Advanced Energy Design Guide for Large Hospitals, for hospitals over 100,000 square feet (9 290 square meters).

For projects outside the U.S., consult ASHRAE/ASHRAE/IESNA Standard 90.1–2010, Appendixes B and D, to determine the appropriate climate zone.

OPTION 3. Prescriptive Compliance: Advanced Buildings™ Core Performance™ Guide
Comply with the mandatory and prescriptive provisions of ANSI/ASHRAE/IESNA Standard 90.1-2010, with errata (or USGBC approved equivalent standard for projects outside the U.S.).

Comply with Section 1: Design Process Strategies, Section 2: Core Performance Requirements, and the following three strategies from Section 3: Enhanced Performance Strategies, as applicable. Where standards conflict, follow the more stringent of the two. For projects outside the U.S., consult ASHRAE/ASHRAE/IESNA Standard 90.1-2010, Appendixes B and D, to determine the appropriate climate zone.

3.5 Supply Air Temperature Reset (VAV)
3.9 Premium Economizer Performance
3.10 Variable Speed Control

To be eligible for Option 3, the project must be less than 100,000 square feet (9 290 square meters).

Note: Healthcare, warehouse or laboratory projects are ineligible for Option 3.

DATA CENTERS

Whole-Building Energy Simulation
Demonstrate a 5% improvement in the proposed performance rating over the baseline performance rating. To determine total energy cost savings, create two models, one for building energy cost and the other for IT equipment energy cost. Calculate the baseline building performance according to ANSI/ASHRAE/IESNA Standard 90.1–2010, Appendix G, with errata (or a USGBC-approved equivalent standard for projects outside the U.S.), using a simulation model for the whole building and data center modeling guidelines.

Determine the power utilization effectiveness (PUE) value of the proposed design.

For this prerequisite, a minimum of 2% of the 5% energy savings must come from building power and cooling infrastructure.

Projects must meet the minimum percentage savings before taking credit for renewable energy systems.

The proposed design must meet the following criteria:

- compliance with the mandatory provisions of ANSI/ASHRAE/IESNA Standard 90.1–2010, with errata (or a USGBC-approved equivalent standard for projects outside the U.S.);
- inclusion of all energy consumption and costs within and associated with the building project; and
- comparison against a baseline building that complies with ANSI/ASHRAE/IESNA Standard 90.1–2010, Appendix G, with errata (or a USGBC-approved equivalent standard for projects outside the U.S.), and data center modeling guidelines.

For data centers, regulated energy includes cooling units for computer and data processing rooms, critical power conditioning equipment, critical distribution equipment, heat rejection plants, and mechanical and electrical support rooms.

Include in process loads both the unregulated load and the IT equipment load. The IT load comprises critical systems and electrical power transformation, which may include servers, storage and networking power use, and operations affecting monthly server CPU utilization percentages.

Develop two sets of IT load models using two scenarios, one at the maximum estimated IT load rating and the second at the startup IT rating expected at the time of commissioning.

Document the energy modeling input assumptions for unregulated loads. Unregulated loads should be modeled accurately to reflect the actual expected energy consumption of the building.

If unregulated loads are not identical for both the baseline and the proposed building performance rating, and the simulation model cannot accurately model the savings, follow the exceptional calculation method (ANSI/ASHRAE/IESNA Standard 90.1–2010, G2.5) to document measures that reduce unregulated loads.

EA PREREQUISITE: BUILDING-LEVEL ENERGY METERING
Required

BD&C
This prerequisite applies to

- New Construction
- Core & Shell
- Schools
- Retail
- Data Centers
- Warehouses & Distribution Centers
- Hospitality
- Healthcare

Intent

To support energy management and identify opportunities for additional energy savings by tracking building-level energy use.

Requirements

NC, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Install new or use existing building-level energy meters, or submeters that can be aggregated to provide building-level data representing total building energy consumption (electricity, natural gas, chilled water, steam, fuel oil, propane, biomass, etc). Utility-owned meters capable of aggregating building-level resource use are acceptable.

Commit to sharing with USGBC the resulting energy consumption data and electrical demand data (if metered) for a five-year period beginning on the date the project accepts LEED certification. At a minimum, energy consumption must be tracked at one-month intervals.

This commitment must carry forward for five years or until the building changes ownership or lessee.

CS

Install new or use existing base building-level energy meters, or submeters that can be aggregated to provide base building-level data representing total building energy consumption (electricity, natural gas, chilled water, steam, fuel oil, propane, etc.). Utility-owned meters capable of aggregating base building-level resource use are acceptable.

Commit to sharing with USGBC the resulting energy consumption data and electrical demand data (if metered) for a five-year period beginning on the date the project accepts LEED certification or typical occupancy, whichever comes first. At a minimum, energy consumption must be tracked at one-month intervals.

This commitment must carry forward for five years or until the building changes ownership or lessee.

EA PREREQUISITE: FUNDAMENTAL REFRIGERANT MANAGEMENT
Required

BD&C
This prerequisite applies to

- New Construction
- Core & Shell
- Schools
- Retail
- Data Centers
- Warehouses & Distribution Centers
- Hospitality
- Healthcare

Intent
To reduce stratospheric ozone depletion.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Do not use chlorofluorocarbon (CFC)-based refrigerants in new heating, ventilating, air-conditioning, and refrigeration (HVAC&R) systems. When reusing existing HVAC&R equipment, complete a comprehensive CFC phase-out conversion before project completion. Phase-out plans extending beyond the project completion date will be considered on their merits.

Existing small HVAC&R units (defined as containing less than 0.5 pound [225 grams] of refrigerant) and other equipment, such as standard refrigerators, small water coolers, and any other equipment that contains less than 0.5 pound (225 grams) of refrigerant, are exempt.

EA CREDIT: ENHANCED COMMISSIONING

BD&C
2-6 points
This credit applies to

- New Construction (2-6 points)
- Core & Shell (2-6 points)
- Schools (2-6 points)
- Retail (2-6 points)
- Data Centers (2-6 points)
- Warehouses & Distribution Centers (2-6 points)
- Hospitality (2-6 points)
- Healthcare (2-6 points)

Intent

To further support the design, construction, and eventual operation of a project that meets the owner's project requirements for energy, water, indoor environmental quality, and durability.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Implement, or have in place a contract to implement, the following commissioning process activities in addition to those required under EA Prerequisite Fundamental Commissioning and Verification.

Commissioning Authority

- The CxA must have documented commissioning process experience on at least two building projects with a similar scope of work. The experience must extend from early design phase through at least 10 months of occupancy;
- The CxA may be a qualified employee of the owner, an independent consultant, or a disinterested subcontractor of the design team.

Option 1. Enhanced Systems Commissioning (3-4 points)

Path 1: Enhanced Commissioning (3 points)

Complete the following commissioning process (CxP) activities for mechanical, electrical, plumbing, and renewable energy systems and assemblies in accordance with ASHRAE Guideline 0–2005 and ASHRAE Guideline 1.1–2007 for HVAC&R systems, as they relate to energy, water, indoor environmental quality, and durability.

The commissioning authority must do the following:

- Review contractor submittals.
- Verify inclusion of systems manual requirements in construction documents.
- Verify inclusion of operator and occupant training requirements in construction documents.
- Verify systems manual updates and delivery.
- Verify operator and occupant training delivery and effectiveness.
- Verify seasonal testing.
- Review building operations 10 months after substantial completion.
- Develop an on-going commissioning plan.

Include all enhanced commissioning tasks in the OPR and BOD.

OR

Path 2: Enhanced and Monitoring-Based Commissioning (4 points)

Achieve Path 1.

AND

Develop monitoring-based procedures and identify points to be measured and evaluated to assess performance of energy- and water-consuming systems.

Include the procedures and measurement points in the commissioning plan. Address the following:

- roles and responsibilities;
- measurement requirements (meters, points, metering systems, data access);
- the points to be tracked, with frequency and duration for trend monitoring;
- the limits of acceptable values for tracked points and metered values (where appropriate, predictive algorithms may be used to compare ideal values with actual values);
- the elements used to evaluate performance, including conflict between systems, out-of-sequence operation of systems components, and energy and water usage profiles;
- an action plan for identifying and correcting operational errors and deficiencies;
- training to prevent errors;
- planning for repairs needed to maintain performance; and
- the frequency of analyses in the first year of occupancy (at least quarterly).

Update the systems manual with any modifications or new settings, and give the reason for any modifications from the original design.

AND/OR

Option 2. Envelope Commissioning (2 points)

Fulfill the requirements in EA Prerequisite Fundamental Commissioning and Verification as they apply to the building's thermal envelope in addition to mechanical and electrical systems and assemblies.

Complete the following commissioning process (CxP) activities for the building's thermal envelope in accordance with ASHRAE Guideline 0–2005 and the National Institute of Building Sciences (NIBS) Guideline 3–2012, Exterior Enclosure Technical Requirements for the Commissioning Process, as they relate to energy, water, indoor environmental quality, and durability.

Commissioning authority must complete the following:

- Review contractor submittals.
- Verify inclusion of systems manual requirements in construction documents.
- Verify inclusion of operator and occupant training requirements in construction documents.
- Verify systems manual updates and delivery.
- Verify operator and occupant training delivery and effectiveness.
- Verify seasonal testing.
- Review building operations 10 months after substantial completion.
- Develop an on-going commissioning plan.

<u>Data Centers only</u>

Projects that select Option 1 must complete the following commissioning process.

For small projects with peak cooling loads less than 2,000,000 Btu/h (600 kW), or a total computer room peak cooling load less than 600,000 Btu/h (175 kW), the CxA must perform the following activities:

- conduct at least one commissioning verification review of the owner's project requirements, basis of design, and design documents before mid-construction documents development;
- back-check the review comments in all subsequent design submissions; and
- conduct an additional full verification review at 95% completion of the design documents and basis of design.

For projects with peak cooling loads 2,000,000 Btu/h (600 kW) or more, or a total computer room peak cooling load 600,000 Btu/h (175 kW) or more, the CxA must conduct at least three verification reviews of the basis of design:

- one verification review of design documents before the start of design development;
- one verification review of design documents before midconstruction documents; and
- one final verification review of 100% complete design documents, verifying achievement of the owner's project requirements and adjudication of previous review comments.

EA CREDIT: OPTIMIZE ENERGY PERFORMANCE

BD&C
1–20 points
This credit applies to

- New Construction (1–18 points)
- Core & Shell (1–18 points)
- Schools (1–16 points)
- Retail (1–18 points)
- Data Centers (1–18 points)
- Warehouses & Distribution Centers (1–18 points)
- Hospitality (1–18 points)
- Healthcare (1–20 points)

Intent

To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic harms associated with excessive energy use.

Requirements

NC, CS, SCHOOLS, RETAIL, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Establish an energy performance target no later than the schematic design phase. The target must be established as kBtu per square foot-year (kW per square meter-year) of source energy use.

Choose one of the options below.

Option 1. Whole-Building Energy Simulation (1–18 points except Schools and Healthcare, 1–16 points Schools, 1–20 points Healthcare)
Analyze efficiency measures during the design process and account for the results in design decision making. Use energy simulation of efficiency opportunities, past energy simulation analyses for similar buildings, or published data (e.g., Advanced Energy Design Guides) from analyses for similar buildings.

Analyze efficiency measures, focusing on load reduction and HVAC-related strategies (passive measures are acceptable) appropriate for the facility. Project potential energy savings and holistic project cost implications related to all affected systems.

Project teams pursuing the Integrative Process credit must complete the basic energy analysis for that credit before conducting the energy simulation.

Follow the criteria in EA Prerequisite Minimum Energy Performance to demonstrate a percentage improvement in the proposed building performance rating compared with the baseline. Points are awarded according to Table 1.

Table 1. Points for percentage improvement in energy performance

New Construction	Major Renovation	Core and Shell	Points (except Schools, Healthcare)	Points Healthcare	Points Schools
6%	4%	3%	1	3	1

8%	6%	5%	2	4	2
10%	8%	7%	3	5	3
12%	10%	9%	4	6	4
14%	12%	11%	5	7	5
16%	14%	13%	6	8	6
18%	16%	15%	7	9	7
20%	18%	17%	8	10	8
22%	20%	19%	9	11	9
24%	22%	21%	10	12	10
26%	24%	23%	11	13	11
29%	27%	26%	12	14	12
32%	30%	29%	13	15	13
35%	33%	32%	14	16	14
38%	36%	35%	15	17	15
42%	40%	39%	16	18	16
46%	44%	43%	17	19	-
50%	48%	47%	18	20	-

Retail only

For all process loads, define a clear baseline for comparison with the proposed improvements. The baselines in Appendix 3, Tables 1–4, represent industry standards and may be used without additional documentation. Calculate the baseline and design as follows:

- *Appliances and equipment.* For appliances and equipment not covered in Tables 1–4, indicate hourly energy use for proposed and budget equipment, along with estimated daily use hours. Use the total estimated appliance/equipment energy use in the energy simulation model as a plug load. Reduced use time (schedule change) is not a category of energy improvement in this credit. ENERGY STAR ratings and evaluations are a valid basis for performing this calculation.
- *Display lighting.* For display lighting, use the space-by-space method of determining allowed lighting power under ANSI/ASHRAE/IESNA Standard 90.1–2010, with errata (or a USGBC-approved equivalent standard for projects outside the U.S.), to determine the appropriate baseline for both the general building space and the display lighting.
- *Refrigeration.* For hard-wired refrigeration loads, model the effect of energy performance improvements with a simulation program designed to account for refrigeration equipment.

OR

Option 2. Prescriptive Compliance: ASHRAE Advanced Energy Design Guide (1–6 points)
To be eligible for Option 2, projects must use Option 2 in EA Prerequisite Minimum Energy Performance. Implement and document compliance with the applicable recommendations and standards in Chapter 4, Design Strategies and Recommendations by Climate Zone, for the appropriate ASHRAE 50% Advanced

Energy Design Guide and climate zone. For projects outside the U.S., consult ASHRAE/ASHRAE/IESNA Standard 90.1–2010, Appendixes B and D, to determine the appropriate climate zone.

ASHRAE 50% Advanced Energy Design Guide for Small to Medium Office Buildings

- *Building envelope, opaque:* roofs, walls, floors, slabs, doors, and continuous air barriers (1 point)
- *Building envelope, glazing:* vertical fenestration (1 point)
- *Interior lighting,* including daylighting and interior finishes (1 point)
- *Exterior lighting* (1 point)
- *Plug loads,* including equipment and controls (1 point)

ASHRAE 50% Advanced Energy Design Guide for Medium to Large Box Retail Buildings

- *Building envelope, opaque:* roofs, walls, floors, slabs, doors, and vestibules (1 point)
- *Building envelope, glazing:* fenestration - all orientations (1 point)
- *Interior lighting,* excluding lighting power density for sales floor (1 point)
- *Additional interior lighting* for sales floor (1 point)
- *Exterior lighting* (1 point)
- *Plug loads,* including equipment choices and controls (1 point)

ASHRAE 50% Advanced Energy Design Guide for K–12 School Buildings

- *Building envelope, opaque:* roofs, walls, floors, slabs, and doors (1 point)
- *Building envelope, glazing:* vertical fenestration (1 point)
- *Interior lighting,* including daylighting and interior finishes (1 point)
- *Exterior lighting* (1 point)
- *Plug loads,* including equipment choices, controls, and kitchen equipment (1 point)

ASHRAE 50% Advanced Energy Design Guide for Large Hospitals

- *Building envelope, opaque:* roofs, walls, floors, slabs, doors, vestibules, and continuous air barriers (1 point)
- *Building envelope, glazing:* vertical fenestration (1 point)
- *Interior lighting,* including daylighting (form or nonform driven) and interior finishes (1 point)
- *Exterior lighting* (1 point)
- *Plug loads,* including equipment choices, controls, and kitchen equipment (1 point)

Retail only

Meet the requirements of Option 2 and comply with the prescriptive measures in Appendix 3, Tables 1–4, for 90% of total energy consumption for all process equipment.

DATA CENTERS

Whole-Building Energy Simulation
Analyze efficiency measures focused on IT load reduction and HVAC-related strategies (air-side economizers, hot aisle–cold aisle, etc.). Project the potential energy savings and cost implications for all affected systems.

Follow the criteria in EA Prerequisite Minimum Energy Performance to demonstrate a percentage improvement in the proposed performance rating compared with the baseline.

Use energy cost savings from both the building and IT to determine the total percentage reduction.

EA CREDIT: ADVANCED ENERGY METERING

BD&C
1 point
This credit applies to

- New Construction (1 point)
- Core & Shell (1 point)
- Schools (1 point)
- Retail (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Healthcare (1 point)

Intent

To support energy management and identify opportunities for additional energy savings by tracking building-level and system-level energy use.

Requirements

NC, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Install *advanced energy metering* for the following:

- all whole-building energy sources used by the building; and
- any individual energy end uses that represent 10% or more of the total annual consumption of the building.

The advanced energy metering must have the following characteristics.

- Meters must be permanently installed, record at intervals of one hour or less, and transmit data to a remote location.
- Electricity meters must record both consumption and demand. Whole-building electricity meters should record the power factor, if appropriate.
- The data collection system must use a local area network, building automation system, wireless network, or comparable communication infrastructure.
- The system must be capable of storing all meter data for at least 36 months.
- The data must be remotely accessible.
- All meters in the system must be capable of reporting hourly, daily, monthly, and annual energy use.

CS

Install meters for future tenant spaces so that tenants will be capable of independently metering energy consumption (electricity, chilled water, etc.) for all systems dedicated to their space. Provide a sufficient number of meters to capture total tenant energy use with a minimum of one meter per energy source per floor.

Install *advanced energy metering* for all base building energy sources used by the building.
The advanced energy metering must have the following characteristics.

- Meters must be permanently installed, record at intervals of one hour or less, and transmit data to a remote location.
- Electricity meters must record both consumption and demand. Whole-building electricity meters should record the power factor, if appropriate.

- The data collection system must use a local area network, building automation system, wireless network, or comparable communication infrastructure.
- The system must be capable of storing all meter data for at least 36 months.
- The data must be remotely accessible.
- All meters in the system must be capable of reporting hourly, daily, monthly, and annual energy use.

EA CREDIT: DEMAND RESPONSE

BD&C
1–2 points
This credit applies to

- New Construction (1–2 points)
- Core & Shell (1–2 points)
- Schools (1–2 points)
- Retail (1–2 points)
- Data Centers (1–2 points)
- Warehouses & Distribution Centers (1–2 points)
- Hospitality (1–2 points)
- Healthcare (1–2 points)

Intent

To increase participation in demand response technologies and programs that make energy generation and distribution systems more efficient, increase grid reliability, and reduce greenhouse gas emissions.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Design building and equipment for participation in demand response programs through load shedding or shifting. On-site electricity generation does not meet the intent of this credit.

Case 1. Demand Response Program Available (2 points)

- Participate in an existing demand response (DR) program and complete the following activities. Design a system with the capability for real-time, fully-automated DR based on external initiation by a DR Program Provider. Semi-automated DR may be utilized in practice.
- Enroll in a minimum one-year DR participation amount contractual commitment with a qualified DR program provider, with the intention of multiyear renewal, for at least 10% of the estimated peak electricity demand. Peak demand is determined under EA Prerequisite Minimum Energy Performance.
- Develop a comprehensive plan for meeting the contractual commitment during a Demand Response event.
- Include the DR processes in the scope of work for the commissioning authority, including participation in at least one full test of the DR plan.

Case 2. Demand Response Program Not Available (1 point)

Provide infrastructure to take advantage of future demand response programs or dynamic, real-time pricing programs and complete the following activities.

- Install interval recording meters with communications and ability for the building automation system to accept an external price or control signal.
- Develop a comprehensive plan for shedding at least 10% of building estimated peak electricity demand. Peak demand is determined under EA Prerequisite Minimum Energy Performance.
- Include the DR processes in the scope of work for the commissioning authority, including participation in at least one full test of the DR plan.
- Contact local utility representatives to discuss participation in future DR programs.

EA CREDIT: RENEWABLE ENERGY PRODUCTION

BD&C
1–3 points
This credit applies to

- New Construction (1–3 points)
- Core & Shell (1–3 points)
- Schools (1–3 points)
- Retail (1–3 points)
- Data Centers (1–3 points)
- Warehouses & Distribution Centers (1–3 points)
- Hospitality (1–3 points)
- Healthcare (1–3 points)

Intent

To reduce the environmental and economic harms associated with fossil fuel energy by increasing self-supply of renewable energy.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Use renewable energy systems to offset building energy costs. Calculate the percentage of renewable energy with the following equation:

$$\% \text{ renewable energy} = \frac{\text{Equivalent cost of usable energy produced by the renewable energy system}}{\text{Total building annual energy cost}}$$

Use the building's annual energy cost, calculated in EA Prerequisite Minimum Energy Performance, if Option 1 was pursued; otherwise use the U.S. Department of Energy's Commercial Buildings Energy Consumption Survey (CBECS) database to estimate energy use and cost.

The use of solar gardens or community renewable energy systems is allowed if both of the following requirements are met.

- The project owns the system or has signed a lease agreement for a period of at least 10 years.
- The system is located with the same utility service area as the facility claiming the use.

Credit is based on the percentage of ownership or percentage of use assigned in the lease agreement. Points are awarded according to Table 1.

Table 1. Points for renewable energy

Percentage renewable energy	*Points (except CS)*	*Points (CS)*
1%	1	1
3%	—	2
5%	2	3
10%	3	—

EA CREDIT: ENHANCED REFRIGERANT MANAGEMENT

BD&C
1 point
This credit applies to

- New Construction (1 point)
- Core & Shell (1 point)
- Schools (1 point)
- Retail (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Healthcare (1 point)

Intent

To reduce ozone depletion and support early compliance with the Montreal Protocol while minimizing direct contributions to climate change.

Requirements

NC, CS, SCHOOLS, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Option 1. No Refrigerants or Low-Impact Refrigerants (1 point)
Do not use refrigerants, or use only refrigerants (naturally occurring or synthetic) that have an ozone depletion potential (ODP) of zero and a global warming potential (GWP) of less than 50.

OR

Option 2. Calculation of Refrigerant Impact (1 point)
Select refrigerants that are used in heating, ventilating, air-conditioning, and refrigeration (HVAC&R) equipment to minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change. The combination of all new and existing base building and tenant HVAC&R equipment that serve the project must comply with the following formula:

IP units	**SI units**
$\frac{LCGWP}{} + \frac{LCODP}{} \times \frac{10}{5} \leq 100$	$\frac{LCGWP}{} + \frac{LCODP}{} \times \frac{10}{5} \leq 13$
Calculation definitions for LCGWP + LCODP x $10^5 \leq 100$ (IP units)	**Calculation definitions for LCGWP + LCODP x $10^5 \leq 13$ (SI units)**
LCODP = [ODPr x (Lr x Life +Mr) x Rc]/Life	LCODP = [ODPr x (Lr x Life +Mr) x Rc]/Life
LCGWP = [GWPr x (Lr x Life +Mr) x Rc]/Life	LCGWP = [GWPr x (Lr x Life +Mr) x Rc]/Life
LCODP: Lifecycle Ozone Depletion Potential (lb CFC 11/Ton-Year)	LCODP: Lifecycle Ozone Depletion Potential (kg CFC 11/(kW/year))
LCGWP: Lifecycle Direct Global Warming Potential	LCGWP: Lifecycle Direct Global Warming Potential

(lb CO_2/Ton-Year)	(kg CO_2/kW-year)
GWPr: Global Warming Potential of Refrigerant (0 to 12,000 lb CO_2/lbr)	GWPr: Global Warming Potential of Refrigerant (0 to 12,000 kg CO_2/kg r)
ODPr: Ozone Depletion Potential of Refrigerant (0 to 0.2 lb CFC 11/lbr)	ODPr: Ozone Depletion Potential of Refrigerant (0 to 0.2 kg CFC 11/kg r)
Lr: Refrigerant Leakage Rate (2.0%)	Lr: Refrigerant Leakage Rate (2.0%)
Mr: End-of-life Refrigerant Loss (10%)	Mr: End-of-life Refrigerant Loss (10%)
Rc: Refrigerant Charge (0.5 to 5.0 lbs of refrigerant per ton of gross AHRI rated cooling capacity)	Rc: Refrigerant Charge (0.065 to 0.65 kg of refrigerant per kW of AHRI rated or Eurovent Certified cooling capacity)
Life: Equipment Life (10 years; default based on equipment type, unless otherwise demonstrated)	Life: Equipment Life (10 years; default based on equipment type, unless otherwise demonstrated)

For multiple types of equipment, calculate a weighted average of all base building HVAC&R equipment, using the following formula:

IP units	**SI units**
$\frac{[\sum (LCGWP + LCODP \times 10^5) \times Qunit\ ]}{Qtotal} \leq 100$	$\frac{[\sum (LCGWP + LCODP \times 10^5) \times Qunit\ ]}{Qtotal} \leq 13$

Calculation definitions for $[\sum (LCGWP + LCODP \times 10^5) \times Qunit\ ] / Qtotal \leq 100$ (IP units)	**Calculation definitions for $[\sum (LCGWP + LCODP \times 10^5) \times Qunit\ ] / Qtotal \leq 13$ (SI units)**
Qunit = Gross AHRI rated cooling capacity of an individual HVAC or refrigeration unit (Tons)	Qunit = Eurovent Certified cooling capacity of an individual HVAC or refrigeration unit (kW)
Qtotal = Total gross AHRI rated cooling capacity of all HVAC or refrigeration	Qtotal = Total Eurovent Certified cooling capacity of all HVAC or refrigeration (kW)

RETAIL NC

Meet Option 1 or 2 for all HVAC systems.

Stores with commercial refrigeration systems must comply with the following.

- Use only non-ozone-depleting refrigerants.
- Select equipment with an average HFC refrigerant charge of no more than 1.75 pounds of refrigerant per 1,000 Btu/h (2.72 kg of refrigerant per kW) total evaporator cooling load.

- Demonstrate a predicted store-wide annual refrigerant emissions rate of no more than 15%. Conduct leak testing using the procedures in GreenChill's best practices guideline for leak tightness at installation.

Alternatively, stores with commercial refrigeration systems may provide proof of attainment of EPA GreenChill's silver-level store certification for newly constructed stores.

EA CREDIT: GREEN POWER AND CARBON OFFSETS

BD&C
1–2 points
This credit applies to

- New Construction (1–2 points)
- Core & Shell (1–2 points)
- Schools (1–2 points)
- Retail (1–2 points)
- Data Centers (1–2 points)
- Warehouses & Distribution Centers (1–2 points)
- Hospitality (1–2 points)
- Healthcare (1–2 points)

Intent

To encourage the reduction of greenhouse gas emissions through the use of grid-source, renewable energy technologies and carbon mitigation projects.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Engage in a contract for qualified resources that have come online since January 1, 2005, for a minimum of five years, to be delivered at least annually. The contract must specify the provision of at least 50% or 100% of the project's energy from green power, carbon offsets, or renewable energy certificates (RECs).

Green power and RECs must be Green-e Energy certified or the equivalent. RECs can only be used to mitigate the effects of Scope 2, electricity use.

Carbon offsets may be used to mitigate Scope 1 or Scope 2 emissions on a metric ton of carbon dioxide–equivalent basis and must be Green-e Climate certified, or the equivalent.

For U.S. projects, the offsets must be from greenhouse gas emissions reduction projects within the U.S.

Determine the percentage of green power or offsets based on the quantity of energy consumed, not the cost. Points are awarded according to Table 1.

Table 1. Points for energy from green power or carbon offsets

Percentage of total energy addressed by green power, RECs and/or offsets	*Points*
50%	1
100%	2

Use the project's annual energy consumption, calculated in EA Prerequisite Minimum Energy Performance, if Option 1 was pursued; otherwise use the U.S. Department of Energy's Commercial Buildings Energy Consumption Survey (CBECS) database to estimate energy use.

CS Only
A core and shell building's energy is defined as the energy usage of the core and shell floor area as defined by the Building Owners and Managers Association (BOMA) standards, but not less than 15% of the project's floor area.

MATERIALS AND RESOURCES (MR)

MR PREREQUISITE: STORAGE AND COLLECTION OF RECYCLABLES Required

BD&C
This prerequisite applies to

- New Construction
- Core & Shell
- Schools
- Retail
- Data Centers
- Warehouses & Distribution Centers
- Hospitality
- Healthcare

Intent

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

Requirements

NC, CS, SCHOOLS, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY NC, HEALTHCARE

Provide dedicated areas accessible to waste haulers and building occupants for the collection and storage of recyclable materials for the entire building. Collection and storage areas may be separate locations. Recyclable materials must include mixed paper, corrugated cardboard, glass, plastics, and metals. Take appropriate measures for the safe collection, storage, and disposal of two of the following: batteries, mercury-containing lamps, and electronic waste.

RETAIL NC

Conduct a waste stream study to identify the retail project's top five recyclable waste streams, by either weight or volume, using consistent metrics. Based on the waste stream study, list the top four waste streams for which collection and storage space will be provided. If no information is available on waste streams for the project, use data from similar operations to make projections. Retailers with existing stores of similar size and function can use historical information from their other locations.

Provide dedicated areas accessible to waste haulers and building occupants for the separation, collection, and storage of recyclable materials for at least the top four recyclable waste streams identified by the waste study. Locate the collection and storage bins close the source of recyclable waste. If any of the top four waste streams are batteries, mercury-containing lamps, or electronic waste, take appropriate measures for safe collection, storage, and disposal.

MR PREREQUISITE: CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT PLANNING
Required

BD&C
This prerequisite applies to

- New Construction
- Core & Shell
- Schools
- Retail
- Data Centers
- Warehouses & Distribution Centers
- Hospitality
- Healthcare

Intent

To reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials.

Requirements

NC, CS, SCHOOLS, RETAIL NC, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY NC, HEALTHCARE

Develop and implement a construction and demolition waste management plan:

- Establish waste diversion goals for the project by identifying at least five materials (both structural and nonstructural) targeted for diversion. Approximate a percentage of the overall project waste that these materials represent.
- Specify whether materials will be separated or comingled and describe the diversion strategies planned for the project. Describe where the material will be taken and how the recycling facility will process the material.

Provide a final report detailing all major waste streams generated, including disposal and diversion rates.

Alternative daily cover (ADC) does not qualify as material diverted from disposal. Land-clearing debris is not considered construction, demolition, or renovation waste that can contribute to waste diversion.

MR PREREQUISITE: PBT SOURCE REDUCTION—MERCURY
Required

BD&C
This prerequisite applies to
- Healthcare

Intent

To reduce mercury-containing products and devices and mercury release through product substitution, capture, and recycling.

Requirements

HEALTHCARE

As part of the project's recycling collection system, identify the following:
- types of mercury-containing products and devices to be collected;
- criteria governing how they are to be handled by a recycling program; and
- disposal methods for captured mercury.

Applicable mercury-containing products and devices include, but are not limited to, lamps (such as linear and circular fluorescents, integrally ballasted and nonintegrally ballasted compact fluorescents and HIDs) and dental wastes (such as scrap amalgam, chair side traps, and separator wastes).

In facilities delivering dental care, specify and install amalgam separation devices that meet or exceed the ISO-11143 standard.

Comply with the mercury elimination requirements outlined below, from the 2010 FGI Guidelines for Design and Construction of Health Care Facilities, Section A1.3- 4b, Mercury Elimination.
- 4.2.1.1. New construction: healthcare facilities may not use mercury-containing equipment, including thermostats, switching devices, and other building system sources. Lamps are excluded.
- 4.2.1.2. Renovation: healthcare facilities must develop a plan to phase out mercury-containing products and upgrade current mercury-containing lamps to high-efficiency, low-mercury, or mercury-free lamp technology.

Do not specify or install preheat, T-9, T-10, or T-12 fluorescents or mercury vapor high-intensity discharge (HID) lamps in the project. Do not specify probe-start metal halide HID lamps in any interior spaces.

Specify and install illuminated exit signs that do not contain mercury and use less than 5 watts of electricity.

Fluorescent and high-pressure sodium lamps must meet the criteria in Table 1.

Table 1. Maximum mercury content of lamps

Lamp	*Maximum content*
T-8 fluorescent, eight-foot	10 mg mercury
T-8 fluorescent, four-foot	3.5 mg mercury
T-8 fluorescent, U-bent	6 mg mercury
T-5 fluorescent, linear	2.5 mg mercury
T-5 fluorescent, circular	9 mg mercury
Compact fluorescent, nonintegral ballast	3.5 mg mercury

Compact fluorescent, integral ballast	3.5 mg mercury, ENERGY STAR qualified
High-pressure sodium, up to 400 watts	10 mg mercury
High-pressure sodium, above 400 watts	32 mg mercury

mg = milligram

MR CREDIT: BUILDING LIFE-CYCLE IMPACT REDUCTION

BD&C
2–6 points
This credit applies to

- New Construction (2–5 points)
- Core & Shell (2–6 points)
- Schools (2–5 points)
- Retail (2–5 points)
- Data Centers (2–5 points)
- Warehouses & Distribution Centers (2–5 points)
- Hospitality (2–5 points)
- Healthcare (2–5 points)

Intent

To encourage adaptive reuse and optimize the environmental performance of products and materials.

Requirements

NC, CS, SCHOOLS, RETAIL NC, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY NC, HEALTHCARE

Demonstrate reduced environmental effects during initial project decision-making by reusing existing building resources or demonstrating a reduction in materials use through life-cycle assessment. Achieve one of the following options.

Option 1. Historic Building Reuse (5 points BD&C, 6 points Core and Shell)

Maintain the existing building structure, envelope, and interior nonstructural elements of a historic building or contributing building in a historic district. To qualify, the building or historic district must be listed or eligible for listing in the local, state, or national register of historic places. Do not demolish any part of a historic building or contributing building in a historic district unless it is deemed structurally unsound or hazardous. For buildings listed locally, approval of any demolition must be granted by the local historic preservation review board. For buildings listed in a state register or the U.S. National Register of Historic Places (or local equivalent for projects outside the U.S.), approval must appear in a programmatic agreement with the state historic preservation office or National Park Service (or local equivalent for projects outside the U.S.).

Any alteration (preservation, restoration, or rehabilitation) of a historic building or a contributing building in a historic district on the project site must be done in accordance with local or national standards for rehabilitation, whichever are applicable. If building is not subject to historic review, include on the project team a preservation professional who meets U.S. federal qualifications for historic architects (or local equivalent for projects outside the U.S.); the preservation professional must confirm conformance to the Secretary of Interior's Standards for the Treatment of Historic Properties (or local equivalent for projects outside the U.S.).

OR

Option 2. Renovation of Abandoned or Blighted Building (5 points BD&C, 6 points Core and Shell)

Maintain at least 50%, by surface area, of the existing building structure, enclosure, and interior structural elements for buildings that meet local criteria of abandoned or are considered blight. The building must be renovated to a state of productive occupancy. Up to 25% of the building surface area may be excluded from credit calculation because of deterioration or damage.

OR

Option 3. Building and Material Reuse (2–4 points BD&C, 2-5 points Core and Shell)

Reuse or salvage building materials from off site or on site as a percentage of the surface area, as listed in Table 1. Include structural elements (e.g., floors, roof decking), enclosure materials (e.g., skin, framing), and permanently installed interior elements (e.g., walls, doors, floor coverings, ceiling systems). Exclude from the calculation window assemblies and any hazardous materials that are remediated as a part of the project.

Materials contributing toward this credit may not contribute toward MR Credit Material Disclosure and Optimization.

Table 1. Points for reuse of building materials

Percentage of completed project surface area reused	*Points BD&C*	*Points BD&C (Core and Shell)*
25%	2	2
50%	3	3
75%	4	5

OR

Option 4. Whole-Building Life-Cycle Assessment (3 points)

For new construction (buildings or portions of buildings), conduct a life-cycle assessment of the project's structure and enclosure that demonstrates a minimum of 10% reduction, compared with a baseline building, in at least three of the six impact categories listed below, one of which must be global warming potential. No impact category assessed as part of the life-cycle assessment may increase by more than 5% compared with the baseline building.

The baseline and proposed buildings must be of comparable size, function, orientation, and operating energy performance as defined in EA Prerequisite Minimum Energy Performance. The service life of the baseline and proposed buildings must be the same and at least 60 years to fully account for maintenance and replacement. Use the same life-cycle assessment software tools and data sets to evaluate both the baseline building and the proposed building, and report all listed impact categories. Data sets must be compliant with ISO 14044.

Select at least three of the following impact categories for reduction:

- global warming potential (greenhouse gases), in CO_2e;
- depletion of the stratospheric ozone layer, in kg CFC-11;
- acidification of land and water sources, in moles H+ or kg SO_2;
- eutrophication, in kg nitrogen or kg phosphate;
- formation of tropospheric ozone, in kg NOx, kg O3 eq, or kg ethene; and
- depletion of nonrenewable energy resources, in MJ.

Healthcare only

For all options in this credit, building materials demolished to create courtyards to increase daylighting may be counted as retained in calculations, provided the new courtyards meet the requirements of EQ Credits Daylight and Quality Views.

MR CREDIT: BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION—ENVIRONMENTAL PRODUCT DECLARATIONS

BD&C
1–2 points
This credit applies to

- New Construction (1–2 points)
- Core & Shell (1–2 points)
- Schools (1–2 points)
- Retail (1–2 points)
- Data Centers (1–2 points)
- Warehouses & Distribution Centers (1–2 points)
- Hospitality (1–2 points)
- Healthcare (1–2 points)

Intent

To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products from manufacturers who have verified improved environmental life-cycle impacts.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Achieve one or more of the options below, for a maximum of 2 points.

Option 1. Environmental Product Declaration (EPD) (1 point)
Use at least 20 different permanently installed products sourced from at least five different manufacturers that meet one of the disclosure criteria below.

- Product-specific declaration.
    - Products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope are valued as one quarter (1/4) of a product for the purposes of credit achievement calculation.
- Environmental Product Declarations which conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least a cradle to gate scope.
    - Industry-wide (generic) EPD -- Products with third-party certification (Type III), including external verification, in which the manufacturer is explicitly recognized as a participant by the program operator are valued as one half (1/2) of a product for purposes of credit achievement calculation.
    - Product-specific Type III EPD -- Products with third-party certification (Type III), including external verification in which the manufacturer is explicitly recognized as the participant by the program operator are valued as one whole product for purposes of credit achievement calculation.
- USGBC approved program – Products that comply with other USGBC approved environmental product declaration frameworks.

Option 2. Multi-Attribute Optimization (1 point)
Use products that comply with one of the criteria below for 50%, by cost, of the total value of permanently installed products in the project. Products will be valued as below.

- Third party certified products that demonstrate impact reduction below industry average in at least

three of the following categories are valued at 100% of their cost for credit achievement calculations.

- global warming potential (greenhouse gases), in CO_2e;
- depletion of the stratospheric ozone layer, in kg CFC-11;
- acidification of land and water sources, in moles H+ or kg SO_2;
- eutrophication, in kg nitrogen or kg phosphate;
- formation of tropospheric ozone, in kg NOx, kg O3 eq, or kg ethene; and depletion of nonrenewable energy resources, in MJ.

- USGBC approved program -- Products that comply with other USGBC approved multi-attribute frameworks.

For credit achievement calculation, products sourced (extracted, manufactured, purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost.

Structure and enclosure materials may not constitute more than 30% of the value of compliant building products.

MR CREDIT: BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION – SOURCING OF RAW MATERIALS

BD&C
1–2 points
This credit applies to

- New Construction (1–2 points)
- Core & Shell (1–2 points)
- Schools (1–2 points)
- Retail (1–2 points)
- Data Centers (1–2 points)
- Warehouses & Distribution Centers (1–2 points)
- Hospitality (1–2 points)
- Healthcare (1–2 points)

Intent

To encourage the use of products and materials for which life cycle information is available and that have environmentally, economically, and socially preferable life cycle impacts. To reward project teams for selecting products verified to have been extracted or sourced in a responsible manner.

Requirements

NC, CS, SCHOOLS, RETAIL NC, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY NC, HEALTHCARE

Option 1. Raw Material Source and Extraction Reporting (1 point)
Use at least 20 different permanently installed products from at least five different manufacturers that have publicly released a report from their raw material suppliers which include raw material supplier extraction locations, a commitment to long-term ecologically responsible land use, a commitment to reducing environmental harms from extraction and/or manufacturing processes, and a commitment to meeting applicable standards or programs voluntarily that address responsible sourcing criteria

- Products sourced from manufacturers with self-declared reports are valued as one half (1/2) of a product for credit achievement.

- Third-party verified corporate sustainability reports (CSR) which include environmental impacts of extraction operations and activities associated with the manufacturer's product and the product's supply chain, are valued as one whole product for credit achievement calculation. Acceptable CSR frameworks include the following:

    - **Global Reporting Initiative (GRI) Sustainability Report**
    - **Organisation for Economic Co-operation and Develoment (OECD) Guidelines for Multinational Enterprises**
    - **U.N. Global Compact**: Communication of Progress
    - **ISO 26000:** 2010 Guidance on Social Responsibility
    - **USGBC approved program***:* Other USGBC approved programs meeting the CSR criteria.

Option 2. Leadership Extraction Practices (1 point)
Use products that meet at least one of the responsible extraction criteria below for at least 25%, by cost, of the total value of permanently installed building products in the project.

- *Extended producer responsibility.* Products purchased from a manufacturer (producer) that participates in an extended producer responsibility program or is directly responsible for extended

producer responsibility. Products meeting extended producer responsibility criteria are valued at 50% of their cost for the purposes of credit achievement calculation.

- *Bio-based materials.* Bio-based products must meet the Sustainable Agriculture Network's Sustainable Agriculture Standard. Bio-based raw materials must be tested using ASTM Test Method D6866 and be legally harvested, as defined by the exporting and receiving country. Exclude hide products, such as leather and other animal skin material. Products meeting bio-based materials criteria are valued at 100% of their cost for the purposes of credit achievement calculation.

- *Wood products.* Wood products must be certified by the Forest Stewardship Council or USGBC-approved equivalent. Products meeting wood products criteria are valued at 100% of their cost for the purposes of credit achievement calculation.

- *Materials reuse.* Reuse includes salvaged, refurbished, or reused products. Products meeting materials reuse criteria are valued at 100% of their cost for the purposes of credit achievement calculation.

- *Recycled content.* Recycled content is the sum of postconsumer recycled content plus one-half the preconsumer recycled content, based on cost. Products meeting recycled content criteria are valued at 100% of their cost for the purposes of credit achievement calculation

- *USGBC approved program.* Other USGBC approved programs meeting leadership extraction criteria.

For credit achievement calculation, products sourced (extracted, manufactured and purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost. For credit achievement calculation, the base contributing cost of individual products compliant with multiple responsible extraction criteria is not permitted to exceed 100% its total actual cost (before regional multipliers) and double counting of single product components compliant with multiple responsible extraction criteria is not permitted and in no case is a product permitted to contribute more than 200% of its total actual cost.

Structure and enclosure materials may not constitute more than 30% of the value of compliant building products.

MR CREDIT: BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION – MATERIAL INGREDIENTS

BD&C
1-2 points
This credit applies to

- New Construction (1-2 points)
- Core & Shell (1-2 points)
- Schools (1-2 points)
- Retail (1-2 points)
- Data Centers (1-2 points)
- Warehouses & Distribution Centers (1-2 points)
- Hospitality (1-2 points)
- Healthcare (1-2 points)

Intent

To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products for which the chemical ingredients in the product are inventoried using an accepted methodology and for selecting products verified to minimize the use and generation of harmful substances. To reward raw material manufacturers who produce products verified to have improved life-cycle impacts.

Requirements

NC, CS, SCHOOLS, RETAIL NC, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY NC, HEALTHCARE

Option 1. Material Ingredient Reporting (1 point)
Use at least 20 different permanently installed products from at least five different manufacturers that use any of the following programs to demonstrate the chemical inventory of the product to at least 0.1% (1000 ppm).

- *Manufacturer Inventory*. The manufacturer has published complete content inventory for the product following these guidelines:
  - A publicly available inventory of all ingredients identified by name and Chemical Abstract Service Registration Number (CASRN)
  - Materials defined as trade secret or intellectual property may withhold the name and/or CASRN but must disclose role, amount and GreenScreen benchmark, as defined in GreenScreen v1.2.
- *Health Product Declaration.* The end use product has a published, complete Health Product Declaration with full disclosure of known hazards in compliance with the Health Product Declaration open Standard.
- *Cradle to Cradle.* The end use product has been certified at the Cradle to Cradle v2 Basic level or Cradle to Cradle v3 Bronze level.
- *USGBC approved program.* Other USGBC approved programs meeting the material ingredient reporting criteria.

AND/OR

Option 2: Material Ingredient Optimization (1 point)

Use products that document their material ingredient optimization using the paths below for at least 25%, by cost, of the total value of permanently installed products in the project.

- *GreenScreen v1.2 Benchmark***.** Products that have fully inventoried chemical ingredients to 100 ppm that have no Benchmark 1 hazards:
    - If any ingredients are assessed with the GreenScreen List Translator, value these products at 100% of cost.
    - If all ingredients are have undergone a full GreenScreen Assessment, value these products at 150% of cost.
- *Cradle to Cradle Certified***.** End use products are certified Cradle to Cradle. Products will be valued as follows:
    - Cradle to Cradle v2 Gold: 100% of cost
    - Cradle to Cradle v2 Platinum: 150% of cost
    - Cradle to Cradle v3 Silver: 100% of cost
    - Cradle to Cradle v3 Gold or Platinum: 150% of cost
- *International Alternative Compliance Path – REACH Optimization*. End use products and materials that do not contain substances that meet REACH criteria for substances of very high concern. If the product contains no ingredients listed on the REACH Authorization or Candidate list, value at 100% of cost.
- *USGBC approved program.* Products that comply with USGGBC approved building product optimization criteria. #

AND/OR

Option 3: Product Manufacturer Supply Chain Optimization (1 point)
Use building products for at least 25%, by cost, of the total value of permanently installed products in the project that:

- Are sourced from product manufacturers who engage in validated and robust safety, health, hazard, and risk programs which at a minimum document at least 99% (by weight) of the ingredients used to make the building product or building material, and
- Are sourced from product manufacturers with independent third party verification of their supply chain that at a minimum verifies:
    - Processes are in place to communicate and transparently prioritize chemical ingredients along the supply chain according to available hazard, exposure and use information to identify those that require more detailed evaluation
    - Processes are in place to identify, document, and communicate information on health, safety and environmental characteristics of chemical ingredients
    - Processes are in place to implement measures to manage the health, safety and environmental hazard and risk of chemical ingredients
    - Processes are in place to optimize health, safety and environmental impacts when designing and improving chemical ingredients
    - Processes are in place to communicate, receive and evaluate chemical ingredient safety and stewardship information along the supply chain
    - Safety and stewardship information about the chemical ingredients is publicly available from all points along the supply chain

Products meeting Option 3 criteria are valued at 100% of their cost for the purposes of credit achievement calculation.

For credit achievement calculation of options 2 and 3, products sourced (extracted, manufactured, purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost. For credit achievement calculation, the value of individual products compliant with either option 2 or 3 can be combined to reach the 25% threshold but products compliant with both option 2 and 3 may only be counted once.

Structure and enclosure materials may not constitute more than 30% of the value of compliant building products.

MR CREDIT: PBT SOURCE REDUCTION—MERCURY

BD&C
1 point
This credit applies to
- Healthcare

Intent

To reduce the release of persistent, bioaccumulative, and toxic (PBTs) chemicals associated with the life cycle of building materials.

Requirements

HEALTHCARE

Specify and install fluorescent lamps with both low mercury content (MR Prerequisite PBT Source Reduction—Mercury) and long lamp life, as listed in Table 1.

Table 1. Criteria for rated life of low-mercury lamps

Lamp	Maximum content	*Lamp life (hrs)*
T-8 fluorescent, eight-foot	10 mg mercury	Standard output - 24,000 rated hours on instant start ballasts (3-hour starts) High output – 18,000 rated hours on instant start ballasts or program start ballasts (3-hour starts)
T-8 fluorescent, four-foot	3.5 mg mercury	Both standard and high output - 30,000 rated hours on instant start ballasts, or 36,000 rated hours on program start ballasts (3 hour starts)
T-8 fluorescent, two-foot and three-foot	3.5 mg mercury	24,000 rated hours on instant start ballasts or program start ballasts (3-hour starts)
T-8 fluorescent, U-bent	6 mg mercury	18,000 rated hours on instant start ballasts, or 24,000 rated hours on program start ballasts (3-hour starts)
T-5 fluorescent, linear	2.5 mg mercury	Both standard and high-output - 25,000 rated hours on program start ballasts
T-5 fluorescent, circular	9 mg mercury	Both standard and high-output – 25,000 rated hours on program start ballasts
Compact fluorescent, nonintegral ballast	3.5 mg mercury	12,000 rated hours
Compact florescent, integral ballast, bare bulb	3.5 mg mercury, ENERGY STAR qualified	Bare bulb - 10,000 rated hours Covered models such as globes, reflectors, A-19s – 8,000 hours

High-pressure sodium, up to 400 watts	10 mg mercury	Use noncycling type or replace with LED lamps or induction lamps
High-pressure sodium, above 400 watts	32 mg mercury	Use noncycling type or replace with LED lamps or induction lamps

Do not specify or install circular fluorescent lamps or probe start metal halide lamps.

MR CREDIT: PBT SOURCE REDUCTION—LEAD, CADMIUM, AND COPPER

BD&C
2 points
This credit applies to
- Healthcare

Intent

To reduce the release of persistent, bioaccumulative, and toxic (PBT) chemicals associated with the life cycle of building materials.

Requirements

HEALTHCARE

Specify substitutes for materials manufactured with lead and cadmium, as follows.

Lead
- For water intended for human consumption, specify and use solder and flux to connect plumbing pipe on site that meets the California AB1953 standard, which specifies that solder not contain more than 0.2% lead, and flux not more than a weighted average of 0.25% lead for wetted surfaces. The “lead free” label as defined by the Safe Drinking Water Act (SDWA)) does not provide adequate screening for the purposes of this credit because the SDWA defines “lead free” as solders and flux containing 0.2% lead or less.
- For water intended for human consumption, specify and use pipes, pipe fittings, plumbing fittings, and faucets that meet the California law AB1953 of a weighted average lead content of the wetted surface area of not more than 0.25% lead.
- Specify and use lead-free roofing and flashing.
- Specify and use electrical wire and cable with lead content less than 300 parts per million.
- Specify no use of interior or exterior paints containing lead.
- For renovation projects, ensure the removal and appropriate disposal of disconnected wires with lead stabilizers, consistent with the 2002 National Electric Code requirements.

Lead used for radiation shielding and copper used for MRI shielding are exempt.

Cadmium
- Specify no use of interior or exterior paints containing intentionally added cadmium.

Copper
- For copper pipe applications, reduce or eliminate joint-related sources of copper corrosion:
  - use mechanically crimped copper joint systems; or
  - specify that all solder joints comply with ASTM B828 2002, and specify and use ASTM B813 2010 for flux.

MR CREDIT: FURNITURE AND MEDICAL FURNISHINGS

BD&C
1–2 points
This credit applies to
- Healthcare

Intent

To enhance the environmental and human health performance attributes associated with freestanding furniture and medical furnishings.

Requirements

HEALTHCARE

Use at least 30% (1 point) or 40% (2 points), by cost, of all freestanding furniture and medical furnishings (e.g., mattresses, foams, panel fabrics, cubicle curtains, window coverings, other textiles) that meet the criteria in one of the following three options.

Include built-in casework and built-in millwork in the base building calculations, even if manufactured off site. The dollar value of any individual product may be included in the total qualifying value if the product meets the criteria.

Option 1. Minimal Chemical Content

All components that constitute at least 5%, by weight, of a furniture or medical furnishing assembly, including textiles, finishes, and dyes, must contain less than 100 parts per million (ppm) of at least four of the five following chemical groups:
- urea formaldehyde;
- heavy metals, including mercury, cadmium, lead, and antimony;
- hexavalent chromium in plated finishes consistent with the European Union Directive on the Restriction of the Use of Certain Hazardous Substances (EU RoHS);
- stain and nonstick treatments derived from perfluorinated compounds (PFCs), including perfluorooctanoic acid (PFOA); and
- added antimicrobial treatments.

AND/OR

Option 2. Testing and Modeling of Chemical Content

All components of a furniture or medical furnishing assembly, including textiles, finishes, and dyes, must contain less than 100 parts per million (ppm) of at least two of the five chemicals or materials listed in Option 1.

New furniture or medical furnishing assemblies must be in accordance with ANSI/BIFMA Standard Method M7.1–2011. Comply with ANSI/BIFMA e3-2010 Furniture Sustainability Standard, Sections 7.6.1 and 7.6.2, using either the concentration modeling approach or the emissions factor approach. Model the test results using the open plan, private office, or seating scenario in ANSI/BIFMA M7.1, as appropriate. USGBC-approved equivalent testing methodologies and contaminant thresholds are also acceptable. Documentation submitted for furniture must indicate the modeling scenarioused to determine compliance.

Salvaged and reused furniture more than one year old at the time of use is considered compliant, provided it meets the requirements for any site-applied paints, coatings, adhesives, and sealants.

AND/OR

Option 3: Multi-Attribute Assessment of Products

Use products that meet at least one of the criteria below. Each product can receive credit for each criterion met. The scope of any environmental product declaration (EPD) must be at least cradle to gate.

- Product-specific declaration.
  - Products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope are valued as one quarter (1/4) of a product for the purposes of credit achievement calculation.
- Environmental Product Declarations which conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least a cradle to gate scope.
  - Industry-wide (generic) EPD -- Products with third-party certification (Type III), including external verification, in which the manufacturer is explicitly recognized as a participant by the program operator are valued as one half (1/2) of a product for purposes of credit achievement calculation.
  - Product-specific Type III EPD -- Products with third-party certification (Type III), including external verification in which the manufacturer is explicitly recognized as the participant by the program operator are valued as one whole product for purposes of credit achievement calculation.

- *Materials reuse.* Use salvaged, refurbished, or reused products.

- *Recycled content.* Use products with recycled content. Recycled content is the sum of post-consumer recycled content plus one-half the pre-consumer recycled content.

- *Extended producer responsibility.* Products purchased from a manufacturer (producer) that participates in an extended producer responsibility program or is directly responsible for extended producer responsibility.

- *Bio-based materials.* Bio-based products must meet the Sustainable Agriculture Network's Sustainable Agriculture Standard. Bio-based raw materials must be tested using ASTM Test Method D6866 and be legally harvested, as defined by the exporting and receiving country. Exclude hide products, such as leather and other animal skin material.

- *Wood products.* Wood products must be certified by the Forest Stewardship Council or USGBC-approved equivalent.

Products that meet the above criteria are valued according to source location (extraction, manufacture, and purchase point must be within the distances noted below):

For credit achievement calculation, products sourced (extracted, manufactured, purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost.

MR CREDIT: DESIGN FOR FLEXIBILITY

BD&C
1 point
This credit applies to
- Healthcare

Intent

Conserve resources associated with the construction and management of buildings by designing for flexibility and ease of future adaptation and for the service life of components and assemblies.

Requirements

HEALTHCARE

Increase building flexibility and ease of adaptive use over the life of the structure by employing at least three of the following strategies.

- Use *interstitial space*. Design distribution zone utility systems and equipment including HVAC, plumbing, electrical, information technology, medical gases, and life safety systems to serve the occupied zones and have the capacity to control multiple zones in clinical spaces.
- Provide programmed soft space, such as administration or storage, equal to at least 5% of *departmental gross area* (DGA). Locate soft space adjacent to clinical departments that anticipate growth. Determine a strategy for future accommodation of displaced soft space.
- Provide shell space equal to at least 5% of DGA. Locate it such that it can be occupied without displacing occupied space.
- Identify horizontal expansion capacity for diagnostic and treatment or other clinical space equal to at least 30% of existing floor area (excluding inpatient units) without demolition of occupied space (other than at the connection point). Reconfiguration of additional existing occupied space that has been constructed with demountable partition systems is permitted.
- Design for future vertical expansion on at least 75% of the roof, ensuring that existing operations and service systems can continue at or near capacity during the expansion.
- Designate space for future above-grade parking structures equal to 50% of existing on-grade parking capacity, with direct access to the main hospital lobby or circulation. Vertical transportation pathways that lead directly to the main hospital lobby or circulation are acceptable.
- Use demountable partitions for 50% of applicable areas.
- Use movable or modular casework for at least 50% of casework and custom millwork. Base the calculation on the combined value of casework and millwork, as determined by the cost estimator or contractor.

MR CREDIT: CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

BD&C
1–2 points
This credit applies to

- New Construction (1–2 points)
- Core & Shell (1–2 points)
- Schools (1–2 points)
- Retail (1–2 points)
- Data Centers (1–2 points)
- Warehouses & Distribution Centers (1–2 points)
- Hospitality (1–2 points)
- Healthcare (1–2 points)

Intent

To reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials.

Requirements

NC, CS, SCHOOLS, RETAIL NC, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY NC, HEALTHCARE

Recycle and/or salvage nonhazardous construction and demolition materials. Calculations can be by weight or volume but must be consistent throughout.

Exclude excavated soil, land-clearing debris, and alternative daily cover (ADC). Include wood waste converted to fuel (biofuel) in the calculations; other types of waste-to-energy are not considered diversion for this credit.

However, for projects that cannot meet credit requirements using reuse and recycling methods, waste-to-energy systems may be considered waste diversion if the European Commission Waste Framework Directive 2008/98/EC and Waste Incineration Directive 2000/76/EC are followed and Waste to Energy facilities meet applicable European Committee for Standardization (CEN) EN 303 standards.

Option 1. Diversion (1–2 points)

Path 1. Divert 50% and Three Material Streams (1 point)
Divert at least 50% of the total construction and demolition material; diverted materials must include at least three material streams.
OR

Path 2. Divert 75% and Four Material Streams (2 points)
Divert at least 75% of the total construction and demolition material; diverted materials must include at least four material streams.

OR

Option 2. Reduction of Total Waste Material (2 points)

Do not generate more than 2.5 pounds of construction waste per square foot (12.2 kilograms of waste per square meter) of the building's floor area.

INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ PREREQUISITE: MINIMUM INDOOR AIR QUALITY PERFORMANCE Required

BD&C
This prerequisite applies to

- New Construction
- Core & Shell
- Schools
- Retail
- Data Centers
- Warehouses & Distribution Centers
- Hospitality
- Healthcare

Intent

To contribute to the comfort and well-being of building occupants by establishing minimum standards for indoor air quality (IAQ).

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY
Meet the requirements for both ventilation and monitoring.

Ventilation

Mechanically Ventilated Spaces

Option 1. ASHRAE Standard 62.1–2010
For mechanically ventilated spaces (and for mixed-mode systems when the mechanical ventilation is activated), determine the minimum outdoor air intake flow for mechanical ventilation systems using the ventilation rate procedure from ASHRAE 62.1–2010 or a local equivalent, whichever is more stringent.

Meet the minimum requirements of ASHRAE Standard 62.1–2010, Sections 4–7, Ventilation for Acceptable Indoor Air Quality (with errata), or a local equivalent, whichever is more stringent.

Option 2. CEN Standards EN 15251–2007 and EN 13779–2007
Projects outside the U.S. may instead meet the minimum outdoor air requirements of Annex B of Comité Européen de Normalisation (CEN) Standard EN 15251–2007, Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics; and meet the requirements of CEN Standard EN 13779–2007, Ventilation for nonresidential buildings, Performance requirements for ventilation and room conditioning systems, excluding Section 7.3, Thermal environment; 7.6, Acoustic environment; A.16; and A.17.

Naturally Ventilated Spaces
For naturally ventilated spaces (and for mixed-mode systems when the mechanical ventilation is inactivated), determine the minimum outdoor air opening and space configuration requirements using the natural ventilation procedure from ASHRAE Standard 62.1–2010 or a local equivalent, whichever is more stringent. Confirm that natural ventilation is an effective strategy for the project by following the flow

diagram in the Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005, Natural Ventilation in Nondomestic Buildings, Figure 2.8, and meet the requirements of ASHRAE Standard 62.1–2010, Section 4, or a local equivalent, whichever is more stringent.

All Spaces
The indoor air quality procedure defined in ASHRAE Standard 62.1–2010 may not be used to comply with this prerequisite.

Monitoring
Mechanically Ventilated Spaces
For mechanically ventilated spaces (and for mixed-mode systems when the mechanical ventilation is activated), monitor outdoor air intake flow as follows:

- For variable air volume systems, provide a direct outdoor airflow measurement device capable of measuring the minimum outdoor air intake flow. This device must measure the minimum outdoor air intake flow with an accuracy of +/–10% of the design minimum outdoor airflow rate, as defined by the ventilation requirements above. An alarm must indicate when the outdoor airflow value varies by 15% or more from the outdoor airflow setpoint.
- For constant-volume systems, balance outdoor airflow to the design minimum outdoor airflow rate defined by ASHRAE Standard 62.1–2010 (with errata), or higher. Install a current transducer on the supply fan, an airflow switch, or similar monitoring device.

Naturally Ventilated Spaces
For naturally ventilated spaces (and for mixed-mode systems when the mechanical ventilation is inactivated), comply with at least one of the following strategies.

- Provide a direct exhaust airflow measurement device capable of measuring the exhaust airflow. This device must measure the exhaust airflow with an accuracy of +/–10% of the design minimum exhaust airflow rate. An alarm must indicate when airflow values vary by 15% or more from the exhaust airflow setpoint.
- Provide automatic indication devices on all natural ventilation openings intended to meet the minimum opening requirements. An alarm must indicate when any one of the openings is closed during occupied hours.
- Monitor carbon dioxide (CO_2) concentrations within each thermal zone. CO_2 monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor and within the thermal zone. CO_2 monitors must have an audible or visual indicator or alert the building automation system if the sensed CO_2 concentration exceeds the setpoint by more than 10%. Calculate appropriate CO_2 setpoints using the methods in ASHRAE 62.1–2010, Appendix C.

CS only
Mechanical ventilation systems installed during core and shell construction must be capable of meeting projected ventilation levels and monitoring based on the requirements of anticipated future tenants.

Residential only
In addition to the requirements above, if the project building contains residential units, each dwelling unit must meet all of the following requirements.

- Unvented combustion appliances (e.g., decorative logs) are not allowed.
- Carbon monoxide monitors must be installed on each floor of each unit.
- All indoor fireplaces and woodstoves must have solid glass enclosures or doors that seal when closed.
- Any indoor fireplaces and woodstoves that are not closed combustion or power-vented must pass a backdraft potential test to ensure that depressurization of the combustion appliance zone is less than 5 Pa.

- Space- and water-heating equipment that involves combustion must be designed and installed with closed combustion (i.e., sealed supply air and exhaust ducting) or with power-vented exhaust, or located in a detached utility building or open-air facility.

- For projects in high-risk areas for radon, EPA Radon Zone 1 (or local equivalent for projects outside the U.S.), design and construct any dwelling unit on levels one through four above grade with radon-resistant construction techniques. Follow the techniques prescribed in EPA Building Radon Out; NFPA 5000, Chapter 49; International Residential Code, Appendix F; CABO, Appendix F; ASTM E1465; or a local equivalent, whichever is most stringent.

HEALTHCARE

Meet the following requirements for both ventilation and monitoring.

Ventilation

Mechanically Ventilated Spaces

For mechanically ventilated spaces (and for mixed-mode systems when the mechanical ventilation is activated), determine the minimum outdoor air intake flow for mechanical ventilations systems using the ventilation rates in ASHRAE Standard 170–2008, Section 7; the requirements of the 2010 FGI Guidelines for Design and Construction of Health Care Facilities (Table 2.1–2); or a local equivalent, whichever is most stringent. For any area not covered in 170 or the FGI guidelines, follow ASHRAE 62.1 or a local equivalent, whichever is more stringent and meet the minimum requirements of ASHRAE Standard 170–2008, Sections 6–8, Ventilation of Health Care Facilities (with errata) or a USGBC-approved equivalent standard for projects outside the U.S.

Naturally Ventilated Spaces

For naturally ventilated spaces (and for mixed-mode systems when the mechanical ventilation is inactivated), determine the minimum outdoor air opening and space configuration requirements using the natural ventilation procedure of ASHRAE Standard 62.1–2010 (with errata) or a local equivalent, whichever is more stringent. Confirm that natural ventilation is an effective strategy for the project by following the flow diagram in Figure 2.8 of the Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005, Natural Ventilation in Nondomestic Buildings.

Monitoring

Mechanically Ventilated Spaces

For mechanically ventilated spaces (and for mixed-mode systems when the mechanical ventilation is activated), provide a direct outdoor airflow measurement device capable of measuring the minimum outdoor air intake flow. This device must measure the minimum outdoor air intake flow with an accuracy of +/–10% of the design minimum outdoor airflow rate defined by the ventilation requirements above. An alarm must alert staff whenever the outdoor airflow value varies by 15% or more from the outdoor airflow setpoint.

Naturally Ventilated Spaces

For naturally ventilated spaces (and for mixed-mode systems when the mechanical ventilation is inactivated), comply with at least one of the following strategies.

- Provide a direct exhaust airflow measurement device capable of measuring the exhaust airflow with an accuracy of +/–10% of the design minimum exhaust airflow rate. An alarm must indicate when airflow values vary by 15% or more from the exhaust airflow setpoint.
- Provide automatic indication devices on all natural ventilation openings intended to meet the minimum opening requirements. An alarm must indicate when any one of the openings is closed during occupied hours.
- Monitor carbon dioxide (CO_2) concentrations within each thermal zone. CO_2 monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor and within the thermal zone. CO_2 monitors must have an audible or visual indicator or alert the building automation system if

the sensed CO_2 concentration exceeds the setpoint by more than 10%. Calculate appropriate CO_2 setpoints by using the methods in ASHRAE 62.1–2010, Appendix C.

EQ PREREQUISITE: ENVIRONMENTAL TOBACCO SMOKE CONTROL
Required

BD&C
This prerequisite applies to

- New Construction
- Core & Shell
- Schools
- Retail
- Data Centers
- Warehouses & Distribution Centers
- Hospitality
- Healthcare

Intent

To prevent or minimize exposure of building occupants, indoor surfaces, and ventilation air distribution systems to environmental tobacco smoke.

Requirements

NC, CS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Prohibit smoking inside the building.

Prohibit smoking outside the building except in designated smoking areas located at least 25 feet (7.5 meters) from all entries, outdoor air intakes, and operable windows. Also prohibit smoking outside the property line in spaces used for business purposes.

If the requirement to prohibit smoking within 25 feet (7.5 meters) cannot be implemented because of code, provide documentation of these regulations.

Signage must be posted within 10 feet (3 meters) of all building entrances indicating the no-smoking policy.

Residential only

Option 1. No Smoking
Meet the requirements above.

OR

Option 2. Compartmentalization of Smoking Areas
Prohibit smoking inside all common areas of the building. The prohibition must be communicated in building rental or lease agreements or condo or coop association covenants and restrictions. Make provisions for enforcement.

Prohibit smoking outside the building except in designated smoking areas located at least 25 feet (7.5 meters) from all entries, outdoor air intakes, and operable windows. The no-smoking policy also applies to spaces outside the property line used for business purposes.

If the requirement to prohibit smoking within 25 feet (7.5 meters) cannot be implemented because of code, provide documentation of these regulations.

Signage must be posted within 10 feet (3 meters) of all building entrances indicating the no-smoking policy.

Each unit must be compartmentalized to prevent excessive leakage between units:

- Weather-strip all exterior doors and operable windows in the residential units to minimize leakage from outdoors.
- Weather-strip all doors leading from residential units into common hallways.
- Minimize uncontrolled pathways for the transfer of smoke and other indoor air pollutants between residential units by sealing penetrations in the walls, ceilings, and floors and by sealing vertical chases (including utility chases, garbage chutes, mail drops, and elevator shafts) adjacent to the units.
- Demonstrate a maximum leakage of 0.23 cubic feet per minute per square foot (1.17 liters per second per square meter) at 50 Pa of enclosure (i.e., all surfaces enclosing the apartment, including exterior and party walls, floors, and ceilings).

SCHOOLS

Prohibit smoking on site.

Signage must be posted at the property line indicating the no-smoking policy.

EQ PREREQUISITE: MINIMUM ACOUSTIC PERFORMANCE
Required

BD&C
This prerequisite applies to

- Schools

Intent

To provide classrooms that facilitate teacher-to-student and student-to-student communication through effective acoustic design.

Requirements

SCHOOLS

HVAC Background Noise
Achieve a maximum background noise level of 40 dBA from heating, ventilating, and air-conditioning (HVAC) systems in classrooms and other core learning spaces. Follow the recommended methodologies and best practices for mechanical system noise control in ANSI Standard S12.60–2010, Part 1, Annex A.1; the 2011 HVAC Applications ASHRAE Handbook, Chapter 48, Noise and Vibration Control (with errata); AHRI Standard 885–2008; or a local equivalent for projects outside the U.S.

Exterior Noise
For high-noise sites (peak-hour Leq above 60 dBA during school hours), implement acoustic treatment and other measures to minimize noise intrusion from exterior sources and control sound transmission between classrooms and other core learning spaces. Projects at least one-half mile (800 meters) from any significant noise source (e.g., aircraft overflights, highways, trains, industry) are exempt.

Reverberation Time
Adhere to the following reverberation time requirements.

Classrooms and Core Learning Spaces < 20,000 Cubic Feet (566 Cubic Meters)
Design classrooms and other core learning spaces to include sufficient sound-absorptive finishes for compliance with the reverberation time requirements specified in ANSI Standard S12.60–2010, Part 1, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools, or a local equivalent for projects outside the U.S.

Option 1
For each room, confirm that the total surface area of acoustic wall panels, ceiling finishes, and other sound-absorbent finishes equals or exceeds the total ceiling area of the room (excluding lights, diffusers, and grilles). Materials must have an NRC of 0.70 or higher to be included in the calculation.

OR

Option 2
Confirm through calculations described in ANSI Standard S12.60-2010 that rooms are designed to meet reverberation time requirements as specified in that standard.

Classrooms and Core Learning Spaces ≥ 20,000 Cubic Feet (566 Cubic Meters)
Meet the recommended reverberation times for classrooms and core learning spaces described in the NRC-CNRC Construction Technology Update No. 51, Acoustical Design of Rooms for Speech (2002), or a local equivalent for projects outside the U.S.

Exceptions

Exceptions to the requirements because of a limited scope of work or to observe historic preservation requirements will be considered.

EQ CREDIT: ENHANCED INDOOR AIR QUALITY STRATEGIES

BD&C
1–2 points
This credit applies to

- New Construction (1–2 points)
- Core & Shell (1–2 points)
- Schools (1–2 points)
- Retail (1–2 points)
- Data Centers (1–2 points)
- Warehouses & Distribution Centers (1–2 points)
- Hospitality (1–2 points)
- Healthcare (1–2 points)

Intent

To promote occupants' comfort, well-being, and productivity by improving indoor air quality.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Option 1. Enhanced IAQ Strategies (1 point)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces:

A. entryway systems;
B. interior cross-contamination prevention; and
C. filtration.

Naturally ventilated spaces:

A. entryway systems; and
D. natural ventilation design calculations.

Mixed-mode systems:

A. entryway systems;
B. interior cross-contamination prevention;
C. filtration;
D. natural ventilation design calculations; and
E. mixed-mode design calculations.

A. Entryway Systems

Install permanent entryway systems at least 10 feet (3 meters) long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances. Acceptable entryway systems include permanently installed grates, grilles, slotted systems that allow for cleaning underneath, rollout mats, and any other materials manufactured as entryway systems with equivalent or better performance. Maintain all on a weekly basis.

Warehouses & Distribution Centers only
Entryway systems are not required at doors leading from the exterior to the loading dock or garage but must be installed between these spaces and adjacent office areas.

Healthcare only

In addition to the entryway system, provide pressurized entryway vestibules at high-volume building entrances.

B. Interior Cross-Contamination Prevention

Sufficiently exhaust each space where hazardous gases or chemicals may be present or used (e.g., garages, housekeeping and laundry areas, copying and printing rooms), using the exhaust rates determined in EQ Prerequisite Minimum Indoor Air Quality Performance or a minimum of 0.50 cfm per square foot (2.54 l/s per square meter), to create negative pressure with respect to adjacent spaces when the doors to the room are closed. For each of these spaces, provide self-closing doors and deck-to-deck partitions or a hard-lid ceiling.

C. Filtration

Each ventilation system that supplies outdoor air to occupied spaces must have particle filters or air-cleaning devices that meet one of the following filtration media requirements:

- minimum efficiency reporting value (MERV) of 13 or higher, in accordance with ASHRAE Standard 52.2–2007; or
- Class F7 or higher as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance.

Replace all air filtration media after completion of construction and before occupancy.

Data Centers only

The above filtration media requirements are required only for ventilation systems serving regularly occupied spaces.

D. Natural Ventilation Design Calculations

Demonstrate that the system design for occupied spaces employs the appropriate strategies in Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005, Natural Ventilation in Non-Domestic Buildings, Section 2.4.

E. Mixed-Mode Design Calculations

Demonstrate that the system design for occupied spaces complies with CIBSE Applications Manual 13–2000, Mixed Mode Ventilation.

Option 2. Additional Enhanced IAQ Strategies (1 point)

Comply with the following requirements, as applicable.

Mechanically ventilated spaces (select one):

A. exterior contamination prevention;
B. increased ventilation;
C. carbon dioxide monitoring; or
D. additional source control and monitoring.

Naturally ventilated spaces (select one):

A. exterior contamination prevention;
D. additional source control and monitoring; or
E. natural ventilation room by room calculations.

Mixed-mode systems (select one):

A. exterior contamination prevention;
B. increased ventilation;
D. additional source control and monitoring; or
E. natural ventilation room-by-room calculations.

A. Exterior Contamination Prevention

Design the project to minimize and control the entry of pollutants into the building. Ensure through the results of computational fluid dynamics modeling, Gaussian dispersion analyses, wind tunnel

modeling, or tracer gas modeling that outdoor air contaminant concentrations at outdoor air intakes are below the thresholds listed in Table 1 (or local equivalent for projects outside the U.S., whichever is more stringent).

Table 1. Maximum concentrations of pollutants at outdoor air intakes

Pollutants	Maximum concentration	Standard
Those regulated by National Ambient Air Quality Standards (NAAQS)	Allowable annual average OR 8-hour or 24-hour average where an annual standard does not exist OR Rolling 3-month average	National Ambient Air Quality Standards (NAAQS)

B. Increased Ventilation

Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates as determined in EQ Prerequisite Minimum Indoor Air Quality Performance.

C. Carbon Dioxide Monitoring

Monitor CO_2 concentrations within all densely occupied spaces. CO_2 monitors must be between 3 and 6 feet (900 and 1 800 millimeters) above the floor. CO_2 monitors must have an audible or visual indicator or alert the building automation system if the sensed CO_2 concentration exceeds the setpoint by more than 10%. Calculate appropriate CO_2 setpoints using methods in ASHRAE 62.1–2010, Appendix C.

D. Additional Source Control and Monitoring

For spaces where air contaminants are likely, evaluate potential sources of additional air contaminants besides CO_2. Develop and implement a materials-handling plan to reduce the likelihood of contaminant release. Install monitoring systems with sensors designed to detect the specific contaminants. An alarm must indicate any unusual or unsafe conditions.

E. Natural Ventilation Room-by-Room Calculations

Follow CIBSE AM10, Section 4, Design Calculations, to predict that room-by-room airflows will provide effective natural ventilation.

EQ CREDIT: LOW-EMITTING MATERIALS

BD&C
1–3 points
This credit applies to

- New Construction (1–3 points)
- Core & Shell (1–3 points)
- Schools (1–3 points)
- Retail (1–3 points)
- Data Centers (1–3 points)
- Warehouses & Distribution Centers (1–3 points)
- Hospitality (1–3 points)
- Healthcare (1–3 points)

Intent

To reduce concentrations of chemical contaminants that can damage air quality, human health, productivity, and the environment.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

This credit includes requirements for product manufacturing as well as project teams. It covers volatile organic compound (VOC) emissions into indoor air and the VOC content of materials, as well as the testing methods by which indoor VOC emissions are determined. Different materials must meet different requirements to be considered compliant for this credit. The building interior and exterior are organized in seven categories, each with different thresholds of compliance. The building interior is defined as everything within the waterproofing membrane. The building exterior is defined as everything outside and inclusive of the primary and secondary weatherproofing system, such as waterproofing membranes and air- and water-resistive barrier materials.

Option 1. Product Category Calculations
Achieve the threshold level of compliance with emissions and content standards for the number of product categories listed in Table 2.

Table 1. Thresholds of compliance with emissions and content standards for 7 categories of materials

Category	Threshold	Emissions and content requirements
Interior paints and coatings applied on site	At least 90%, by volume, for emissions; 100% for VOC content	• General Emissions Evaluation for paints and coatings applied to walls, floors, and ceilings • VOC content requirements for wet applied products
Interior adhesives and sealants applied on site (including flooring adhesive)	At least 90%, by volume, for emissions; 100% for VOC content	• General Emissions Evaluation • VOC content requirements for wet applied products
Flooring	100%	General Emissions Evaluation
Composite wood	100% not covered by other categories	Composite Wood Evaluation

Ceilings, walls, thermal, and acoustic insulation	100%	• General Emissions Evaluation • **Healthcare, Schools only** Additional insulation requirements
Furniture (include in calculations if part of scope of work)	At least 90%, by cost	Furniture Evaluation
Healthcare and Schools Projects only: Exterior applied products	At least 90%, by volume	Exterior Applied Products

Table 2. Points for number of compliant categories of products

Compliant categories	Points
New Construction, Core Shell, Retail, Data Centers, Warehouse and Distribution Centers, Hospitality projects without furniture	
2	1
4	2
5	3
New Construction, Core Shell, Retail, Data Centers, Warehouse and Distribution Centers, Hospitality projects with furniture	
3	1
5	2
6	3
Schools, Healthcare without furniture	
3	1
5	2
6	3
Schools, Healthcare with furniture	
4	1
6	2
7	3

Option 2. Budget Calculation Method

If some products in a category do not meet the criteria, project teams may use the budget calculation method (Table 3).

Table 3. Points for percentage compliance, under budget calculation method

Percentage of total	Points
≥ 50% and < 70%	1
≥ 70% and < 90%	2
≥ 90%	3

The budget method organizes the building interior into six assemblies:

- flooring;
- ceilings;
- walls;
- thermal and acoustic insulation;
- furniture; and
- **Healthcare, Schools only:** exterior applied products.

Include furniture in the calculations if it is part of the scope of work. Walls, ceilings, and flooring are defined as building interior products; each layer of the assembly, including paints, coatings, adhesives, and sealants, must be evaluated for compliance. Insulation is tracked separately.

Determine the total percentage of compliant materials according to Equation 1.

Equation 1. Total percentage compliance

Total % compliant for projects without furniture =	(% compliant walls + % compliant ceilings + % compliant flooring + % compliant insulation) / 4
Total % compliant for projects with furniture =	(% compliant walls + % compliant ceilings + % compliant flooring + % compliant insulation) + (% compliant furniture) / 5

Equation 2. System percentage compliant

Flooring, walls, ceilings, insulation % compliant =	(compliant surface area of layer 1 + compliant surface area of layer 2 + compliant surface area of layer 3 + …) / (total surface area of layer 1 + total surface area of layer 2 + total surface area of layer 3 + …)	X 100

Equation 3. Furniture systems compliant, using ANSI/BIFMA evaluation

% compliant for furniture =	0.5 x cost compliant with §7.6.1 of ANSI/BIFMA e3-2011 + cost compliant with §7.6.2 of ANSI/BIFMA e3-2011 / total furniture cost	X 100

Calculate surface area of assembly layers based on the manufacturer's documentation for application.

If 90% of an assembly meets the criteria, the system counts as 100% compliant. If less than 50% of an assembly meets the criteria, the assembly counts as 0% compliant.

Manufacturers' claims. Both first-party and third-party statements of product compliance must follow the guidelines in CDPH SM V1.1–2010, Section 8. Organizations that certify manufacturers' claims must be accredited under ISO Guide 65.

Laboratory requirements. Laboratories that conduct the tests specified in this credit must be accredited under ISO/IEC 17025 for the test methods they use.

Emissions and Content Requirements

To demonstrate compliance, a product or layer must meet all of the following requirements, as applicable.

Inherently nonemitting sources. Products that are inherently nonemitting sources of VOCs (stone, ceramic, powder-coated metals, plated or anodized metal, glass, concrete, clay brick, and unfinished or untreated solid wood flooring) are considered fully compliant without any VOC emissions testing if they do not include integral organic-based surface coatings, binders, or sealants.

General emissions evaluation. Building products must be tested and determined compliant in accordance with California Department of Public Health (CDPH) Standard Method v1.1–2010, using the applicable exposure scenario. The default scenario is the private office scenario. The manufacturer's or third-party certification must state the exposure scenario used to determine compliance. Claims of compliance for wet-applied products must state the amount applied in mass per surface area.

Manufacturers' claims of compliance with the above requirements must also state the range of total VOCs after 14 days (336 hours), measured as specified in the CDPH Standard Method v1.1:

- 0.5 mg/m^3 or less;
- between 0.5 and 5.0 mg/m^3; or
- 5.0 mg/m^3 or more.

Projects outside the U.S. may use products tested and deemed compliant in accordance with either (1) the CDPH standard method (2010) or (2) the German AgBB Testing and Evaluation Scheme (2010). Test products either with (1) the CDPH Standard Method (2010), (2) the German AgBB Testing and Evaluation Scheme (2010), (3) ISO 16000-3: 2010, ISO 16000-6: 2011, ISO 16000-9: 2006, ISO 16000-11:2006 either in conjunction with AgBB, or with French legislation on VOC emission class labeling, or (4) the DIBt testing method (2010). If the applied testing method does not specify testing details for a product group for which the CDPH standard method does provide details, use the specifications in the CDPH standard method. U.S. projects must follow the CDPH standard method.

Additional VOC content requirements for wet-applied products. In addition to meeting the general requirements for VOC emissions (above), on-site wet-applied products must not contain excessive levels of VOCs, for the health of the installers and other tradesworkers who are exposed to these products. To demonstrate compliance, a product or layer must meet the following requirements, as applicable. Disclosure of VOC content must be made by the manufacturer. Any testing must follow the test method specified in the applicable regulation.

- All paints and coatings wet-applied on site must meet the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3, 2011.
- All adhesives and sealants wet-applied on site must meet the applicable chemical content requirements of SCAQMD Rule 1168, July 1, 2005, Adhesive and Sealant Applications, as analyzed by the methods specified in Rule 1168. The provisions of SCAQMD Rule 1168 do not apply to adhesives and sealants subject to state or federal consumer product VOC regulations.
- For projects outside the U.S., all paints, coatings, adhesives, and sealants wet-applied on site must either meet the technical requirements of the above regulations, or comply with applicable national VOC control regulations, such as the European Decopaint Directive (2004/42/EC), the Canadian VOC Concentration Limits for Architectural Coatings, or the Hong Kong Air Pollution Control (VOC) Regulation.
- If the applicable regulation requires subtraction of exempt compounds, any content of intentionally added exempt compounds larger than 1% weight by mass (total exempt compounds) must be disclosed.
- If a product cannot reasonably be tested as specified above, testing of VOC content must comply with ASTM D2369-10; ISO 11890, part 1; ASTM D6886-03; or ISO 11890-2.
- For projects in North America, methylene chloride and perchloroethylene may not be intentionally added in paints, coatings, adhesives, or sealants.

Composite Wood Evaluation. Composite wood, as defined by the California Air Resources Board, Airborne Toxic Measure to Reduce Formaldehyde Emissions from Composite Wood Products Regulation, must be documented to have low formaldehyde emissions that meet the California Air Resources Board ATCM for formaldehyde requirements for ultra-low-emitting formaldehyde (ULEF) resins or no added formaldehyde resins.

Salvaged and reused architectural millwork more than one year old at the time of occupancy is considered compliant, provided it meets the requirements for any site-applied paints, coatings, adhesives, and sealants.

Furniture evaluation. New furniture and furnishing items must be tested in accordance with ANSI/BIFMA Standard Method M7.1–2011. Comply with ANSI/BIFMA e3-2011 Furniture Sustainability Standard,

Sections 7.6.1 and 7.6.2, using either the concentration modeling approach or the emissions factor approach. Model the test results using the open plan, private office, or seating scenario in ANSI/BIFMA M7.1, as appropriate. USGBC-approved equivalent testing methodologies and contaminant thresholds are also acceptable. For classroom furniture, use the standard school classroom model in CDPH Standard Method v1.1. Documentation submitted for furniture must indicate the modeling scenario used to determine compliance.

Salvaged and reused furniture more than one year old at the time of use is considered compliant, provided it meets the requirements for any site-applied paints, coatings, adhesives, and sealants.

Healthcare, Schools only
Additional insulation requirements. Batt insulation products may contain no added formaldehyde, including urea formaldehyde, phenol formaldehyde, and urea-extended phenol formaldehyde.

Exterior applied products. Adhesives, sealants, coatings, roofing, and waterproofing materials applied on site must meet the VOC limits of California Air Resources Board (CARB) 2007 Suggested Control Measure (SCM) for Architectural Coatings, and South Coast Air Quality Management District (SCAQMD), Rule 1168, effective July 1, 2005. Small containers of adhesives and sealants subject to state or federal consumer product VOC regulations are exempt.

Projects outside North America may use either the jurisdictional VOC content requirements or comply with the European Decopaint Directive (2004/42/EC, to be updated to most current version when available) Phase II, for water-borne coatings, as analyzed according to ISO 11890 parts 1 and 2, instead of the CARB and SCAQMD regulatory standards.

Two materials are prohibited and do not count toward total percentage compliance: hot-mopped asphalt for roofing, and coal tar sealants for parking lots and other paved surfaces.

EQ CREDIT: CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT PLAN

BD&C
1 point
This credit applies to

- New Construction (1 point)
- Core & Shell (1 point)
- Schools (1 point)
- Retail (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Healthcare (1 point)

Intent

To promote the well-being of construction workers and building occupants by minimizing indoor air quality problems associated with construction and renovation.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY

Develop and implement an indoor air quality (IAQ) management plan for the construction and preoccupancy phases of the building. The plan must address all of the following.

During construction, meet or exceed all applicable recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd edition, 2007, ANSI/SMACNA 008–2008, Chapter 3.

Protect absorptive materials stored on-site and installed from moisture damage.

Do not operate permanently installed air-handling equipment during construction unless filtration media with a minimum efficiency reporting value (MERV) of 8, as determined by ASHRAE 52.2–2007, with errata (or equivalent filtration media class of F5 or higher, as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance), are installed at each return air grille and return or transfer duct inlet opening such that there is no bypass around the filtration media. Immediately before occupancy, replace all filtration media with the final design filtration media, installed in accordance with the manufacturer's recommendations.

Prohibit the use of tobacco products inside the building and within 25 feet (7.5 meters) of the building entrance during construction.

HEALTHCARE
Moisture. Develop and implement a moisture control plan to protect stored on-site and installed absorptive materials from moisture damage. Immediately remove from site and properly dispose of any materials susceptible to microbial growth and replace with new, undamaged materials. Also include strategies for protecting the building from moisture intrusion and preventing occupants' exposure to mold spores.

Particulates. Do not operate permanently installed air-handling equipment during construction unless filtration media with a minimum efficiency reporting value (MERV) of 8, as determined by ASHRAE 52.2–2007, with errata (or equivalent filtration media class of F5 or higher, as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance), are installed at each return air grille and return or transfer duct inlet opening such that there is no bypass

around the filtration media. Immediately before occupancy, replace all filtration media with the final design filtration media, installed in accordance with the manufacturer's recommendations.

VOCs. Schedule construction procedures to minimize exposure of absorbent materials to VOC emissions. Complete painting and sealing before storing or installing "dry" materials, which may accumulate pollutants and release them over time. Store fuels, solvents, and other sources of VOCs separately from absorbent materials.

Outdoor emissions. For renovation projects involving waterproofing, repairing asphalt roofing, sealing parking lots, or other outdoor activities that generate high VOC emissions, develop a plan to manage fumes and avoid infiltration to occupied spaces. Comply with the procedures established by NIOSH, Asphalt Fume Exposures during the Application of Hot Asphalt to Roofs (Publication 2003–112).

Tobacco. Prohibit the use of tobacco products inside the building and within 25 feet (7.5 meters) of the building entrance during construction.

Noise and vibration. Develop a plan based on the British Standard (BS 5228) to reduce noise emissions and vibrations from construction equipment and other nonroad engines by specifying low-noise emission design or the lowest decibel level available that meets performance requirements in the British Standard. Construction crews must wear ear protection in areas where sound levels exceed 85 dB for extended periods.

Infection control. For renovations and additions adjacent to occupied facilities or phased occupancy in new construction, follow the FGI 2010 Guidelines for Design and Construction of Health Care Facilities and the Joint Commission on Standards to establish an integrative infection control team comprising the owner, designer, and contractor to evaluate infection control risk and document the required precautions in a project-specific plan. Use the infection control risk assessment standard published by the American Society of Healthcare Engineering and the U.S. Centers for Disease Control and Prevention (CDC) as a guideline to assess risk and to select mitigation procedures for construction activities.

EQ CREDIT: INDOOR AIR QUALITY ASSESSMENT

BD&C
1–2 points
This credit applies to

- New Construction (1–2 points)
- Schools (1–2 points)
- Retail (1–2 points)
- Data Centers (1–2 points)
- Warehouses & Distribution Centers (1–2 points)
- Hospitality (1–2 points)
- Healthcare (1–2 points)

Intent

To establish better quality indoor air in the building after construction and during occupancy.

Requirements

NC, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE
Select one of the following two options, to be implemented after construction ends and the building has been completely cleaned. All interior finishes, such as millwork, doors, paint, carpet, acoustic tiles, and movable furnishings (e.g., workstations, partitions), must be installed, and major VOC punch list items must be finished. The options cannot be combined.

Option 1. Flush-Out (1 point)
Path 1. Before Occupancy
Install new filtration media and perform a building flush-out by supplying a total air volume of 14,000 cubic feet of outdoor air per square foot (4 267 140 liters of outdoor air per square meter) of gross floor area while maintaining an internal temperature of at least 60°F (15°C) and no higher than 80°F (27°C) and relative humidity no higher than 60%.

OR

Path 2. During Occupancy
If occupancy is desired before the flush-out is completed, the space may be occupied only after delivery of a minimum of 3,500 cubic feet of outdoor air per square foot (1 066 260 liters of outdoor air per square meter) of gross floor area while maintaining an internal temperature of at least 60°F (15°C) and no higher than 80°F (27°C) and relative humidity no higher than 60%..

Once the space is occupied, it must be ventilated at a minimum rate of 0.30 cubic foot per minute (cfm) per square foot of outdoor air (1.5 liters per second per square meter of outside air) or the design minimum outdoor air rate determined in EQ Prerequisite Minimum Indoor Air Quality Performance, whichever is greater. During each day of the flush-out period, ventilation must begin at least three hours before occupancy and continue during occupancy. These conditions must be maintained until a total of 14,000 cubic feet per square foot of outdoor air (4 270 liters of outdoor air per square meter) has been delivered to the space.

OR

Option 2. Air Testing (2 points)
After construction ends and before occupancy, but under ventilation conditions typical for occupancy, conduct baseline IAQ testing using protocols consistent with the methods listed in Table 1 for all occupied spaces. Use current versions of ASTM standard methods, EPA compendium methods, or ISO methods, as indicated. Laboratories that conduct the tests for chemical analysis of formaldehyde and volatile

organic compounds must be accredited under ISO/IEC 17025 for the test methods they use. Retail projects may conduct the testing within 14 days of occupancy.

Demonstrate that contaminants do not exceed the concentration levels listed in Table 1.

Table 1. Maximum concentration levels, by contaminant and testing method

Contaminant	*Maximum concentration*	*Maximum concentration (Healthcare only)*	*ASTM and U.S. EPA methods*	*ISO method*
Formaldehyde	27 ppb	16.3 ppb	ASTM D5197; EPA TO-11 or EPA Compendium Method IP-6	ISO 16000-3
Particulates (PM10 for all buildings; PM2.5 for buildings in EPA nonattainment areas, or local equivalent)	PM10: 50 micrograms per cubic meter PM2.5: 15 micrograms per cubic meter	20 micrograms per cubic meter	EPA Compendium Method IP-10	ISO 7708
Ozone (for buildings in EPA nonattainment areas)	0.075 ppm	0.075 ppm	ASTM D5149 - 02	ISO 13964
Total volatile organic compounds (TVOCs)	500 micrograms per cubic meter	200 micrograms per cubic meter	EPA TO-1, TO-15, TO-17, or EPA Compendium Method IP-1	ISO 16000-6
Target chemicals listed in CDPH Standard Method v1.1, Table 4-1, except formaldehyde	CDPH Standard Method v1.1–2010, Allowable Concentrations, Table 4-1	CDPH Standard Method v1.1–2010, Allowable Concentrations, Table 4-1	ASTM D5197; EPA TO-1, TO-15, TO-17	ISO 16000-3, 16000-6
Carbon monoxide (CO)	9 ppm; no more than 2 ppm above outdoor levels	9 ppm; no more than 2 ppm above outdoor levels	EPA Compendium Method IP-3	ISO 4224

ppb = parts per billion; ppm = parts per million; µg/cm = micrograms per cubic meter

Conduct all measurements before occupancy but during normal occupied hours, with the building ventilation system started at the normal daily start time and operated at the minimum outdoor airflow rate for the occupied mode throughout the test.

For each sampling point where the concentration exceeds the limit, take corrective action and retest for the noncompliant contaminants at the same sampling points. Repeat until all requirements are met.

EQ CREDIT: THERMAL COMFORT

BD&C
1 point
This credit applies to

- New Construction (1 point)
- Schools (1 point)
- Retail (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Healthcare (1 point)

Intent

To promote occupants' productivity, comfort, and well-being by providing quality thermal comfort.

Requirements

Meet the requirements for both thermal comfort design and thermal comfort control.

Thermal Comfort Design

NC, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY, HEALTHCARE

Option 1. ASHRAE Standard 55-2010
Design heating, ventilating, and air-conditioning (HVAC) systems and the building envelope to meet the requirements of ASHRAE Standard 55–2010, Thermal Comfort Conditions for Human Occupancy with errata or a local equivalent.

For natatoriums, demonstrate compliance with ASHRAE HVAC Applications Handbook, 2011 edition, Chapter 5, Places of Assembly, Typical Natatorium Design Conditions, with errata.

OR

Option 2. ISO and CEN Standards
Design HVAC systems and the building envelope to meet the requirements of the applicable standard:

- ISO 7730:2005, Ergonomics of the Thermal Environment, analytical determination and interpretation of thermal comfort, using calculation of the PMV and PPD indices and local thermal comfort criteria; and
- CEN Standard EN 15251:2007, Indoor Environmental Input Parameters for Design and Assessment of Energy Performance of Buildings, addressing indoor air quality, thermal environment, lighting, and acoustics, Section A2.

Data Centers only
Meet the above requirements for regularly occupied spaces.

WAREHOUSES & DISTRIBUTION CENTERS
Meet the above requirements for office portions of the building.

In regularly occupied areas of the building's bulk storage, sorting, and distribution areas, include one or more of the following design alternatives:

- radiant flooring;
- circulating fans;

- passive systems, such as nighttime air, heat venting, or wind flow;
- localized active cooling (refrigerant or evaporative-based systems) or heating systems; and
- localized, hard-wired fans that provide air movement for occupants' comfort.
- other equivalent thermal comfort strategy.#

Thermal Comfort Control

NC, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY

Provide individual thermal comfort controls for at least 50% of individual occupant spaces. Provide group thermal comfort controls for all shared multioccupant spaces.

Thermal comfort controls allow occupants, whether in individual spaces or shared multioccupant spaces, to adjust at least one of the following in their local environment: air temperature, radiant temperature, air speed, and humidity.

Hospitality only
Guest rooms are assumed to provide adequate thermal comfort controls and are therefore not included in the credit calculations.

Retail only
Meet the above requirements for at least 50% of the individual occupant spaces in office and administrative areas.

HEALTHCARE

Provide individual thermal comfort controls for every patient room and at least 50% of the remaining individual occupant spaces. Provide group thermal comfort controls for all shared multioccupant spaces.

Thermal comfort controls allow occupants, whether in individual spaces or shared multioccupant spaces, to adjust at least one of the following in their local environment: air temperature, radiant temperature, air speed, and humidity.

EQ CREDIT: INTERIOR LIGHTING

BD&C
1–2 points
This credit applies to

- New Construction (1–2 points)
- Schools (1–2 points)
- Retail (2 points)
- Data Centers (1–2 points)
- Warehouses & Distribution Centers (1–2 points)
- Hospitality (1–2 points)
- Healthcare (1 point)

Intent

To promote occupants' productivity, comfort, and well-being by providing high-quality lighting.

Requirements

NC, SCHOOLS, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY
Select one or both of the following two options.

Option 1. Lighting Control (1 point)
For at least 90% of individual occupant spaces, provide individual lighting controls that enable occupants to adjust the lighting to suit their individual tasks and preferences, with at least three lighting levels or scenes (on, off, midlevel). Midlevel is 30% to 70% of the maximum illumination level (not including daylight contributions).

For all shared multioccupant spaces, meet all of the following requirements.

- Have in place multizone control systems that enable occupants to adjust the lighting to meet group needs and preferences, with at least three lighting levels or scenes (on, off, midlevel).
- Lighting for any presentation or projection wall must be separately controlled.
- Switches or manual controls must be located in the same space as the controlled luminaires. A person operating the controls must have a direct line of sight to the controlled luminaires.

Hospitality only
Guest rooms are assumed to provide adequate lighting controls and are therefore not included in the credit calculations.

AND/OR

Option 2. Lighting Quality (1 point)
Choose four of the following strategies.

A. For all regularly occupied spaces, use light fixtures with a luminance of less than 2,500 cd/m^2 between 45 and 90 degrees from nadir.
   Exceptions include wallwash fixtures properly aimed at walls, as specified by manufacturer's data, indirect uplighting fixtures, provided there is no view down into these uplights from a regularly occupied space above, and any other specific applications (i.e. adjustable fixtures).
B. For the entire project, use light sources with a CRI of 80 or higher. Exceptions include lamps or fixtures specifically designed to provide colored lighting for effect, site lighting, or other special use.
C. For at least 75% of the total connected lighting load, use light sources that have a rated life (or L70 for LED sources) of at least 24,000 hours (at 3-hour per start, if applicable).

D. Use direct-only overhead lighting for 25% or less of the total connected lighting load for all regularly occupied spaces.
E. For at least 90% of the regularly occupied floor area, meet or exceed the following thresholds for area-weighted average surface reflectance: 85% for ceilings, 60% for walls, and 25% for floors.
F. If furniture is included in the scope of work, select furniture finishes to meet or exceed the following thresholds for area-weighted average surface reflectance: 45% for work surfaces, and 50% for movable partitions.
G. For at least 75% of the regularly occupied floor area, meet a ratio of average wall surface illuminance (excluding fenestration) to average work plane (or surface, if defined) illuminance that does not exceed 1:10. Must also meet strategy E, strategy F, or demonstrate area-weighted surface reflectance of at least 60% for walls.
H. For at least 75% of the regularly occupied floor area, meet a ratio of average ceiling illuminance (excluding fenestration) to work surface illuminance that does not exceed 1:10. Must also meet strategy E, strategy F, or demonstrate area-weighted surface reflectance of at least 85% for ceilings.

RETAIL NC

For at least 90% of the individual occupant spaces in office and administrative areas, provide individual lighting controls.

In sales areas, provide controls that can reduce the ambient light levels to a midlevel (30% to 70% of the maximum illumination level not including daylight contributions).

HEALTHCARE

Provide individual lighting controls for at least 90% of individual occupant spaces in staff areas.

For at least 90% of patient positions, provide lighting controls that are readily accessible from the patient's bed. In multioccupant patient spaces, the controls must be individual lighting controls. In private rooms, also provide exterior window shades, blinds, or curtain controls that are readily accessible from the patient's bed. Exceptions include in-patient critical care, pediatric, and psychiatric patient rooms.

For all shared multioccupant spaces, provide multizone control systems that enable occupants to adjust the lighting to meet group needs and preferences, with at least three lighting levels or scenes (on, off, midlevel). Midlevel is 30% to 70% of the maximum illumination level (not including daylight contributions).

EQ CREDIT: DAYLIGHT

BD&C
1–3 points
This credit applies to

- New Construction (1–3 points)
- Core & Shell (1–3 points)
- Schools (1–3 points)
- Retail (1–3 points)
- Data Centers (1–3 points)
- Warehouses & Distribution Centers (1–3 points)
- Hospitality (1–3 points)
- Healthcare (1–2 points)

Intent

To connect building occupants with the outdoors, reinforce circadian rhythms, and reduce the use of electrical lighting by introducing daylight into the space.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Provide manual or automatic (with manual override) glare-control devices for all regularly occupied spaces.

Select one of the following three options.

Option 1. Simulation: Spatial Daylight Autonomy and Annual Sunlight Exposure (2–3 points, 1-2 points Healthcare)

Demonstrate through annual computer simulations that spatial daylight autonomy$_{300/50\%}$ (sDA$_{300/50\%}$) of at least 55%, 75%, or 90% is achieved. Use regularly occupied floor area. Healthcare projects should use the perimeter area determined under EQ Credit Quality Views. Points are awarded according to Table 1.

Table 1. Points for daylit floor area: Spatial daylight autonomy

New Construction, Core and Shell, Schools, Retail, Data Centers, Warehouses and Distribution Centers, Hospitality		*Healthcare*	
sDA (for regularly occupied floor area)	*Points*	*sDA (for perimeter floor area)*	*Points*
55%	2	75%	1
75%	3	90%	2

AND

Demonstrate through annual computer simulations that annual sunlight exposure$_{1000,250}$ (ASE$_{1000,250}$) of no more than 10% is achieved. Use the regularly occupied floor area that is daylit per the sDA$_{300/50\%}$ simulations.

The sDA and ASE calculation grids should be no more than 2 feet (600 millimeters) square and laid out across the regularly occupied area at a work plane height of 30 inches (76 millimeters) above finished floor (unless otherwise defined). Use an hourly time-step analysis based on typical meteorological year

Updated to reflect the April 1, 2015 LEED v4 Building Design and Construction Addenda

data, or an equivalent, for the nearest available weather station. Include any permanent interior obstructions. Moveable furniture and partitions may be excluded.

CS only
If the finishes in the space will not be completed, use the following default surface reflectances: 80% for ceilings, 20% for floors, and 50% for walls. Assume that the entire floor plate, except for the core, will be regularly occupied space.

OR

Option 2. Simulation: Illuminance Calculations (1–2 points)

Demonstrate through computer modeling that illuminance levels will be between 300 lux and 3,000 lux for 9 a.m. and 3 p.m., both on a clear-sky day at the equinox, for the floor area indicated in Table 2. Use regularly occupied floor area. Healthcare projects should use the perimeter area determined under EQ Credit Quality Views.

Table 2. Points for daylit floor area: Illuminance calculation

New Construction, Core and Shell, Schools, Retail, Data Centers, Warehouses and Distribution Centers, Hospitality		*Healthcare*	
Percentage of regularly occupied floor area	*Points*	*Percentage of perimeter floor area*	*Points*
75%	1	75%	1
90%	2	90%	2

Calculate illuminance intensity for sun (direct component) and sky (diffuse component) for clear-sky conditions as follows:

- Use typical meteorological year data, or an equivalent, for the nearest available weather station.
- Select one day within 15 days of September 21 and one day within 15 days of March 21 that represent the clearest sky condition.
- Use the average of the hourly value for the two selected days.

Exclude blinds or shades from the model. Include any permanent interior obstructions. Moveable furniture and partitions may be excluded.

CS only
Assume the following default surface reflectances if the finishes in the space will not be completed: 80% for ceilings, 20% for floors, and 50% for walls. Assume that the entire floor plate, except for the core, will be regularly occupied space.

OR

Option 3. Measurement (2-3 points, 1-2 points Healthcare)

Achieve illuminance levels between 300 lux and 3,000 lux for the floor area indicated in Table 3.

Table 3. Points for daylit floor area: Measurement

New Construction, Core and Schools, Schools, Retail, Data Centers, Warehouses and Distribution Centers, Hospitality		*Healthcare*	
Percentage of regularly occupied floor area	*Points*	*Percentage of perimeter floor area*	
75	2	75	1
90	3	90	2

With furniture, fixtures, and equipment in place, measure illuminance levels as follows:

- Measure at appropriate work plane height during any hour between 9 a.m. and 3 p.m.
- Take one measurement in any regularly occupied month, and take a second as indicated in Table 4.
- For spaces larger than 150 square feet (14 square meters), take measurements on a maximum 10 foot (3 meter) square grid.
- For spaces 150 square feet (14 square meters) or smaller, take measurements on a maximum 3 foot (900 millimeters) square grid.

Table 4. Timing of measurements for illuminance

If first measurement is taken in …	*take second measurement in …*
January	May-September
February	June-October
March	June-July, November-December
April	August-December
May	September-January
June	October-February
July	November-March
August	December-April
September	December-January, May-June
October	February-June
November	March-July
December	April-August

EQ CREDIT: QUALITY VIEWS

BD&C
1–2 points
This credit applies to

- New Construction (1 point)
- Core & Shell (1 point)
- Schools (1 point)
- Retail (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Healthcare (1-2 points)

Intent

To give building occupants a connection to the natural outdoor environment by providing quality views.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY
Achieve a direct line of sight to the outdoors via vision glazing for 75% of all regularly occupied floor area. View glazing in the contributing area must provide a clear image of the exterior, not obstructed by frits, fibers, patterned glazing, or added tints that distort color balance.

Additionally, 75% of all regularly occupied floor area must have at least two of the following four kinds of views:

- multiple lines of sight to vision glazing in different directions at least 90 degrees apart;
- views that include at least two of the following: (1) flora, fauna, or sky; (2) movement; and (3) objects at least 25 feet (7.5 meters) from the exterior of the glazing;
- unobstructed views located within the distance of three times the head height of the vision glazing; and
- views with a view factor of 3 or greater, as defined in “Windows and Offices; A Study of Office Worker Performance and the Indoor Environment.”

Include in the calculations any permanent interior obstructions. Movable furniture and partitions may be excluded.

Views into interior atria may be used to meet up to 30% of the required area.

WAREHOUSES & DISTRIBUTION CENTERS

For the office portion of the building, meet the requirements above.

For the bulk storage, sorting, and distribution portions of the building, meet the requirements above for 25% of the regularly occupied floor area.

HEALTHCARE

For inpatient units (IPUs), meet the requirements above (1 point).

For other areas, configure the building floor plates such that the floor area within 15 feet (4.5 meters) of the perimeter exceeds the perimeter area requirement (Table 1), and meet the requirements above for the perimeter area (1 point).

Table 1. Minimum compliant perimeter area, by floor plate area

Floor plate area		Perimeter area	
(square feet)	**(square meters)**	**(square feet)**	**(square meters)**
Up to 15,000	Up to 1 400	7,348	682
20,000	1 800	8,785	816
25,000	2 300	10,087	937
30,000	2 800	11,292	1 049
35,000	3 300	12,425	1 154
40,000	3 700	13,500	1 254
45,000	4 200	14,528	1 349
50,000 and larger	4 600 and larger	15,516	1 441

EQ CREDIT: ACOUSTIC PERFORMANCE

BD&C
1–2 points
This credit applies to

- New Construction (1 point)
- Schools (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Healthcare (1–2 points)

Intent

To provide workspaces and classrooms that promote occupants' well-being, productivity, and communications through effective acoustic design.

Requirements

NC, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY

For all occupied spaces, meet the following requirements, as applicable, for HVAC background noise, sound isolation, reverberation time, and sound reinforcement and masking.

HVAC Background Noise
Achieve maximum background noise levels from heating, ventilating, and air conditioning (HVAC) systems per 2011 ASHRAE Handbook, HVAC Applications, Chapter 48, Table 1; AHRI Standard 885-2008, Table 15; or a local equivalent. Calculate or measure sound levels.

For measurements, use a sound level meter that conforms to ANSI S1.4 for type 1 (precision) or type 2 (general purpose) sound measurement instrumentation, or a local equivalent.

Comply with design criteria for HVAC noise levels resulting from the sound transmission paths listed in ASHRAE 2011 Applications Handbook, Table 6; or a local equivalent.

Sound Transmission
Meet the composite sound transmission class (STC_C) ratings listed in Table 1, or local building code, whichever is more stringent.

Table 1. Minimum composite sound transmission class ratings for adjacent spaces

Adjacency combinations		**STC_C**
Residence (within a multifamily residence), hotel or motel room	Residence, hotel or motel room	55
Residence, hotel or motel room	Common hallway, stairway	50
Residence, hotel or motel room	Retail	60
Retail	Retail	50
Standard office	Standard office	45
Executive office	Executive office	50
Conference room	Conference room	50
Office, conference room	Hallway, stairway	50
Mechanical equipment room	Occupied area	60

Reverberation Time

Meet the reverberation time requirements in Table 2 (adapted from Table 9.1 in the Performance Measurement Protocols for Commercial Buildings[3]).

Table 2. Reverberation time requirements

Room type	Application	T60 (sec), at 500 Hz, 1000 Hz, and 2000 Hz
Apartment and condominium	—	< 0.6
Hotel/motel	Individual room or suite	< 0.6
	Meeting or banquet room	< 0.8
Office building	Executive or private office	< 0.6
	Conference room	< 0.6
	Teleconference room	< 0.6
	Open-plan office without sound masking	< 0.8
	Open-plan office with sound masking	0.8
Courtroom	Unamplified speech	< 0.7
	Amplified speech	< 1.0
Performing arts space	Drama theaters, concert and recital halls	Varies by application
Laboratories	Testing or research with minimal speech communication	< 1.0
	Extensive phone use and speech communication	< 0.6
Church, mosque, synagogue	General assembly with critical music program	Varies by application
Library		< 1.0
Indoor stadium, gymnasium	Gymnasium and natatorium	< 2.0
	Large-capacity space with speech amplification	< 1.5
Classroom	—	< 0.6

Sound Reinforcement and Masking Systems

Sound Reinforcement
For all large conference rooms and auditoriums seating more than 50 persons, evaluate whether sound reinforcement and AV playback capabilities are needed.

If needed, the sound reinforcement systems must meet the following criteria:

- Achieve a speech transmission index (STI) of at least 0.60 or common intelligibility scale (CIS) rating of at least 0.77 at representative points within the area of coverage to provide acceptable intelligibility.
- Have a minimum sound level of 70 dBA.
- Maintain sound-level coverage within +/–3 dB at the 2000 Hz octave band throughout the space.

Masking Systems
For projects that use masking systems, the design levels must not exceed 48 dBA. Ensure that loudspeaker coverage provides uniformity of +/–2 dBA and that speech spectra are effectively masked.

SCHOOLS

[3] Adapted from ASHRAE (2007d), ASA (2008), ANSI (2002), and CEN (2007)

HVAC Background noise
Achieve a background noise level of 35 dBA or less from heating, ventilating, and air-conditioning (HVAC) systems in classrooms and other core learning spaces. Follow the recommended methodologies and best practices for mechanical system noise control in ANSI Standard S12.60–2010, Part 1, Annex A.1; the 2011 HVAC Applications ASHRAE Handbook, Chapter 48, Sound and Vibration Control, with errata; AHRI Standard 885–2008; or a local equivalent.

Sound Transmission
Design classrooms and other core learning spaces to meet the sound transmission class (STC) requirements of ANSI S12.60–2010 Part 1, or a local equivalent. Exterior windows must have an STC rating of at least 35, unless outdoor and indoor noise levels can be verified to justify a lower rating.

HEALTHCARE

Design the facility to meet or exceed the sound and vibration criteria outlined below, which are adapted from the 2010 FGI Guidelines for Design and Construction of Health Care Facilities ("2010 FGI Guidelines") and the reference document on which it is based, Sound and Vibration Design Guidelines for Health Care Facilities ("2010 SV Guidelines").

Option 1. Speech Privacy, Sound Isolation, and Background Noise (1 point)

Speech Privacy and Sound Isolation
Design sound isolation to achieve speech privacy, acoustical comfort, and minimal annoyance from noise-producing sources. Consider sound levels at both source and receiver locations, the background sound at receiver locations, and the occupants' acoustical privacy and acoustical comfort needs. Speech privacy is defined as "techniques … to render speech unintelligible to casual listeners" (ANSI T1.523-2001, Telecom Glossary 2007).
Design the facility to meet the criteria outlined in the sections of Table 1.2-3, Design Criteria for Minimum Sound Isolation Performance between Enclosed Rooms, and Table 1.2-4 Speech Privacy for Enclosed Room and Open-Plan Spaces (in the 2010 FGI Guidelines and 2010 SV Guidelines).
Calculate or measure sound isolation and speech privacy descriptors achieved for representative adjacencies as necessary to confirm compliance with the criteria in the 2010 FGI Guidelines, Sections1.2-6.1.5 and 1.2-6.1.6, and the 2010 SV Guidelines (including the appendix).

Background Noise
Consider background noise levels generated by all building mechanical-electrical-plumbing systems, air distribution systems and other facility noise sources under the purview of the project building design-construction team.

Design the facility to meet the 2010 FGI Guidelines, Table 1.2-2 Minimum-Maximum Design Criteria for Noise in representative interior rooms and spaces.

Calculate or measure sound levels in representative rooms and spaces of each type to confirm compliance with criteria in the above-referenced table using a sound level meter that conforms to ANSI S1.4 for type 1 (precision) or type 2 (general purpose) sound measurement instrumentation. For spaces not listed in Table 1.2-2, refer to ASHRAE 2011 Handbook, Chapter 48, Sound and Vibration Control, Table 1.

Option 2. Acoustical Finishes and Site Exterior Noise (1 point)
Meet the requirements for acoustical finishes and site exterior noise.

Acoustical Finishes
Specify materials, products systems installation details, and other design features to meet the 2010 FGI Guidelines, Table 1.2-1, Design Room Sound Absorption Coefficients (including associated sections of the appendix) and the 2010 SV Guidelines.

Calculate or measure the average sound absorption coefficients for representative unoccupied rooms of each type in the building to confirm conformance with the requirements.

Site Exterior Noise
Minimize the effect on building occupants of site exterior noise produced by road traffic, aircraft flyovers, railroads, on-site heliports, emergency power generators during maintenance testing, outdoor facility MEP and building services equipment, etc. Also minimize effects on the surrounding community from all facility MEP equipment and activities as required to meet (1) local applicable codes or (2) Table 1.2-1 of the 2010 FGI Guidelines, Table 1.2-1, and the 2010 SV Guidelines, Table 1.3-1, whichever is more stringent. Comply with the 2010 FGI Guidelines for the following noise sources:

- heliports, A1.3-3.6.2.2;
- generators, 2.1-8.3.3.1;
- mechanical equipment, 2.1-8.2.1.1; and
- building services, A2.2-5.3

Measure and analyze data to determine the exterior noise classification (A, B, C, or D) of the facility site. See the 2010 FGI Guidelines, Categorization of Health Care Facility Sites by Exterior Ambient Sound, Table A1.2a, and the 2010 SV Guidelines, Table 1.3-1.
Design the building envelope composite STC rating based on the 2010 FGI Guidelines, Categorization of Health Care Facility Sites by Exterior Ambient Sound, and show conformance with requirements.
For exterior site exposure categories B, C, or D, calculate or measure the sound isolation performance of representative elements of the exterior building envelope to determine the composite sound transmission class (STCc) rating for representative façade sections. Measurements should generally conform to ASTM E966, Standard Guide for Field Measurements of Airborne Sound Insulation of Building Façades and Façade Elements, current edition.

INNOVATION (IN)

IN CREDIT: INNOVATION

BD&C
1–5 points
This credit applies to

- New Construction (1–5 points)
- Core & Shell (1–5 points)
- Schools (1–5 points)
- Retail (1–5 points)
- Data Centers (1–5 points)
- Warehouses & Distribution Centers (1–5 points)
- Hospitality (1–5 points)
- Healthcare (1–5 points)

Intent

To encourage projects to achieve exceptional or innovative performance.

Requirements

NC, CS, SCHOOLS, RETAIL, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Project teams can use any combination of innovation, pilot, and exemplary performance strategies.

Option 1. Innovation (1 point)
Achieve significant, measurable environmental performance using a strategy not addressed in the LEED green building rating system.

Identify the following:

- the intent of the proposed innovation credit;
- proposed requirements for compliance;
- proposed submittals to demonstrate compliance; and
- the design approach or strategies used to meet the requirements.

AND/OR

Option 2. Pilot (1 point)
Achieve one pilot credit from USGBC's LEED Pilot Credit Library.

AND/OR

Option 3. Additional Strategies

- **Innovation (1-3 points)**
  Defined in Option 1 above.
- **Pilot (1-3 points)**
  Meet the requirements of Option 2.
- **Exemplary Performance (1–2 points)**
  Achieve exemplary performance in an existing LEED v4 prerequisite or credit that allows exemplary performance, as specified in the LEED Reference Guide, v4 edition. An exemplary

performance point is typically earned for achieving double the credit requirements or the next incremental percentage threshold.

IN CREDIT: LEED ACCREDITED PROFESSIONAL

BD&C
1 point
This credit applies to

- New Construction (1 point)
- Core & Shell (1 point)
- Schools (1 point)
- Retail (1 point)
- Data Centers (1 point)
- Warehouses & Distribution Centers (1 point)
- Hospitality (1 point)
- Healthcare (1 point)

Intent

To encourage the team integration required by a LEED project and to streamline the application and certification process.

Requirements

NC, CS, SCHOOLS, RETAIL NC, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

At least one principal participant of the project team must be a LEED Accredited Professional (AP) with a specialty appropriate for the project.

REGIONAL PRIORITY (RP)

RP CREDIT: REGIONAL PRIORITY

BD&C
4 points
This credit applies to

- New Construction (1-4 points)
- Core & Shell (1-4 points)
- Schools (1-4 points)
- Retail (1-4 points)
- Data Centers (1-4 points)
- Warehouses & Distribution Centers (1-4 points)
- Hospitality (1-4 points)
- Healthcare (1-4 points)

Intent

To provide an incentive for the achievement of credits that address geographically specific environmental, social equity, and public health priorities.

Requirements

NC, CS, SCHOOLS, RETAIL NC, DATA CENTERS, WAREHOUSES & DISTRIBUTION CENTERS, HOSPITALITY, HEALTHCARE

Earn up to four of the six Regional Priority credits. These credits have been identified by the USGBC regional councils and chapters as having additional regional importance for the project's region. A database of Regional Priority credits and their geographic applicability is available on the USGBC website, http://www.usgbc.org.

One point is awarded for each Regional Priority credit achieved, up to a maximum of four.

APPENDICES

APPENDIX 1. USE TYPES AND CATEGORIES

Table 1. Use Types and Categories

Category	Use type
Food retail	Supermarket
	Grocery with produce section
Community-serving retail	Convenience store
	Farmers market
	Hardware store
	Pharmacy
	Other retail
Services	Bank
	Family entertainment venue (e.g., theater, sports)
	Gym, health club, exercise studio
	Hair care
	Laundry, dry cleaner
	Restaurant, café, diner (excluding those with only drive-thru service)
Civic and community facilities	Adult or senior care (licensed)
	Child care (licensed)
	Community or recreation center
	Cultural arts facility (museum, performing arts)
	Education facility (e.g., K—12 school, university, adult education center, vocational school, community college)
	Government office that serves public on-site
	Medical clinic or office that treats patients
	Place of worship
	Police or fire station
	Post office
	Public library
	Public park
	Social services center
Community anchor uses (BD&C and ID&C only)	Commercial office (100 or more full-time equivalent jobs)
	Housing (100 or more dwelling units)

Adapted from Criterion Planners, INDEX neighborhood completeness indicator, 2005.

APPENDIX 2. DEFAULT OCCUPANCY COUNTS

Use Table 1 to calculate default occupancy counts. Only use the occupancy estimates if occupancy is unknown.

For the calculation, use gross floor area, not net or leasable floor area. Gross floor area is defined as the sum of all areas on all floors of a building included within the outside faces of the exterior wall, including common areas, mechanical spaces, circulation areas, and all floor penetrations that connect one floor to another. To determine gross floor area, multiply the building footprint (in square feet or square meters) by the number of floors in the building. Exclude underground or structured parking from the calculation.

Table 1. Default Occupancy Numbers

	Gross square feet per occupant		Gross square meters per occupant	
	Employees	Transients	Employees	Transients
General office	250	0	23	0
Retail, general	550	130	51	12
Retail or service (e.g., financial, auto)	600	130	56	12
Restaurant	435	95	40	9
Grocery store	550	115	51	11
Medical office	225	330	21	31
R&D or laboratory	400	0	37	0
Warehouse, distribution	2,500	0	232	0
Warehouse, storage	20,000	0	1860	0
Hotel	1,500	700	139	65
Educational, daycare	630	105	59	10
Educational, K–12	1,300	140	121	13
Educational, postsecondary	2,100	150	195	14

Sources:
ANSI/ASHRAE/IESNA Standard 90.1–2004 (Atlanta, GA, 2004).
2001 Uniform Plumbing Code (Los Angeles, CA)
California Public Utilities Commission, 2004–2005 Database for Energy Efficiency Resources (DEER) Update Study (2008).
California State University, Capital Planning, Design and Construction Section VI, Standards for Campus Development Programs (Long Beach, CA, 2002).
City of Boulder Planning Department, Projecting Future Employment—How Much Space per Person (Boulder, 2002).
Metro, 1999 Employment Density Study (Portland, OR 1999).
American Hotel and Lodging Association, Lodging Industry Profile Washington, DC, 2008.
LEED for Core & Shell Core Committee, personal communication (2003 - 2006).
LEED for Retail Core Committee, personal communication (2007)
OWP/P, Medical Office Building Project Averages (Chicago, 2008).
OWP/P, University Master Plan Projects (Chicago, 2008).
U.S. General Services Administration, Childcare Center Design Guide (Washington, DC,2003).

APPENDIX 3. RETAIL PROCESS LOAD BASELINES

Table 1a. Commercial kitchen appliance prescriptive measures and baseline for energy cost budget (IP units)

	Baseline energy usage for energy modeling path				Levels for prescriptive path	
Appliance type	Fuel	Function	Baseline efficiency	Baseline idle rate	Prescriptive efficiency	Prescriptive idle rate
Broiler, underfired	Gas	Cooking	30%	16,000 Btu/h/ft^2 peak input	35%	12,000 Btu/h/ft^2 peak input
Combination ovens, steam mode (P = pan capacity)	Elec	Cooking	40% steam mode	0.37P+4.5 kW	50% steam mode	0.133P+0.6400 kW
Combination ovens, steam mode	Gas	Cooking	20% steam mode	1,210P+35,810 Btu/h	38% steam mode	200P+6,511 Btu/h
Combination ovens, convection mode	Elec	Cooking	65% convection mode	0.1P+1.5 kW	70% convection mode	0.080P+0.4989 kW
Combination ovens, convection mode	Gas	Cooking	35% convection mode	322P+13,563 Btu/h	44% convection mode	150P+5,425 Btu/h
Convection oven, full-size	Elec	Cooking	65%	2.0 kW	71%	1.6 kW
Convection oven, full-size	Gas	Cooking	30%	18,000 Btu/h	46%	12,000 Btu/h
Convection oven, half-size	Elec	Cooking	65%	1.5 kW	71%	1.0 kW
Conveyor oven, > 25-inch belt	Gas	Cooking	20%	70,000 Btu/h	42%	57,000 Btu/h
Conveyor oven, ≤ 25-inch belt	Gas	Cooking	20%	45,000 Btu/h	42%	29,000 Btu/h
Fryer	Elec	Cooking	75%	1.05 kW	80%	1.0 kW
Fryer	Gas	Cooking	35%	14,000 Btu/h	50%	9,000 Btu/h
Griddle (based on 3 ft model)	Elec	Cooking	60%	400 W/ft^2	70%	320 W/ft^2
Griddle (based on 3 ft model)	Gas	Cooking	30%	3,500 Btu/h/ft^2	38%	2,650 Btu/h/ft^2
Hot food holding	Elec	Cooking	na	40 W/ft^3	Na	21.5V Watts

cabinets (excluding drawer warmers and heated display), 0 < V < 13 ft³ (V = volume)						
Hot food holding cabinets (excluding drawer warmers and heated display), 13 ≤ V < 28 ft³	Elec	Cooking	na	40 W/ft^3	Na	2.0V + 254 Watts
Hot food holding cabinets (excluding drawer warmers and heated display), 28 ft³ ≤ V	Elec	Cooking	na	40 W/ft^3	Na	3.8V + 203.5 Watts
Large vat fryer	Elec	Cooking	75%	1.35 kW	80%	1.1 kW
Large vat fryer	Gas	Cooking	35%	20,000 Btu/h	50%	12,000 Btu/h
Rack oven, double	Gas	Cooking	30%	65,000 Btu/h	50%	35,000 Btu/h
Rack oven, single	Gas	Cooking	30%	43,000 Btu/h	50%	29,000 Btu/h
Range	Elec	Cooking	70%		80%	
Range	Gas	Cooking	35%	na	40% and no standing pilots	na
Steam cooker, batch cooking	Elec	Cooking	26%	200 W/pan	50%	135 W/pan
Steam cooker, batch cooking	Gas	Cooking	15%	2,500 Btu/h/pan	38%	2,100 Btu/h/pan
Steam cooker, high production or cook to order	Elec	Cooking	26%	330 W/pan	50%	275 W/pan
Steam cooker, high production	Gas	Cooking	15%	5,000 Btu/h/pan	38%	4,300 Btu/h/pan

or cook to order						
Toaster	Elec	Cooking	—	1.8 kW average operating energy rate	Na	1.2 kW average operating energy rate
Ice machine, IMH (ice-making head, H = ice harvest), H ≥ 450 lb/day	Elec	Ice	6.89 - 0.0011H kWh/100 lb ice	na	$37.72*H^{-0.298}$ kWh/100 lb ice	na
Ice machine, IMH (ice-making head), H ≤ 450 lb/day	Elec	Ice	10.26 – 0.0086H kWh/100 lb ice	na	$37.72*H^{-0.298}$ kWh/100 lb ice	na
Ice machine, RCU (remote condensing unit, w/o remote compressor, H < 1,000 lb/day	Elec	Ice	8.85 - 0.0038H kWh/100lb ice	na	$22.95*H^{-0.258}$ + 1.00 kWh/100 lb ice	na
Ice machine, RCU (remote condensing unit), 1600 > H ≥ 1000 lb/day	Elec	ice	5.10 kWh/100 lb ice	Na	$22.95*H^{-0.258}$ + 1.00 kWh/100 lb ice	na
Ice machine, RCU (remote condensing unit), H ≥ 1600 lb/day	Elec	Ice	5.10 kWh/100lb ice	Na	-0.00011*H + 4.60 kWh/100 lb ice	na
Ice machine, SCU (self-contained unit), H < 175 lb/day	Elec	Ice	18.0 - 0.0469H kWh/100lb ice	Na	$48.66*H^{-0.326}$ + 0.08 kWh/100 lb ice	na
Ice machine self-contained unit, H ≥ 175 lb/day	Elec	Ice	9.80 kWh/100 lb ice	Na	$48.66*H^{-0.326}$ + 0.08 kWh/100 lb ice	na

Ice machine, water-cooled ice-making head, H ≥ 1436 lb/day (must be on chilled loop)	Elec	Ice	4.0 kWh/100 lb ice	Na	3.68 kWh/100 lb ice	na
Ice machine, water-cooled ice-making head, 500 lb/day < H < 1436 (must be on chilled loop)	Elec	Ice	5.58 – 0.0011H kWh/100 lb ice	Na	5.13 - 0.001H kWh/100 lb ice	na
Ice machine, water-cooled ice-making head, H < 500 lb/day (must be on chilled loop)	Elec	Ice	7.80 – 0.0055H kWh/100 lb ice	Na	7.02 - 0.0049H kWh/100 lb ice	na
Ice machine, water-cooled once-through (open loop)	Elec	Ice	Banned	Banned	Banned	Banned
Ice machine, water-cooled SCU (self-contained unit), H < 200 lb/day (must be on chilled loop)	Elec	Ice	11.4 – 0.0190H kWh/100 lb ice	Na	10.6 - 0.177H kWh/100 lb ice	na
Ice machine, water-cooled self-contained unit, H ≥ 200 lb/day (must be on chilled loop)	Elec	Ice	7.6 kWh/100 lb ice	Na	7.07 kWh/100 lb ice	na

Chest freezer, solid or glass door	Elec	Refrig	0.45V + 0.943 kWh/day	Na	≤ 0.270V + 0.130 kWh/day	na
Chest refrigerator, solid or glass door	Elec	Refrig	0.1V + 2.04 kWh/day	Na	≤ 0.125V + 0.475 kWh/day	na
Glass-door reach-in freezer, 0 < V < 15 ft³	Elec	Refrig	0.75V + 4.10 kWh/day	Na	≤ 0.607V + 0.893 kWh/day	na
Glass-door reach-in freezer, 15 ≤ V < 30 ft³	Elec	Refrig	.75V + 4.10 kWh/day	Na	≤ 0.733V – 1.00 kWh/day	na
Glass-door reach-in freezer, 30 ≤ V < 50 ft³	Elec	Refrig	.75V + 4.10 kWh/day	Na	≤ 0.250V + 13.50 kWh/day	na
Glass-door reach-in freezer, 50 ≤ V ft³	Elec	Refrig	0.75V + 4.10 kWh/day	Na	≤ 0.450V + 3.50 kWh/day	na
Glass-door reach-in refrigerator, 0 < V < 15 ft³	Elec	Refrig	0.12V + 3.34 kWh/day	Na	≤ 0.118V + 1.382 kWh/day	na
Glass-door reach-in refrigerator, 15 ≤ V < 30 ft³	Elec	Refrig	0.12V + 3.34 kWh/day	Na	≤ 0.140V + 1.050 kWh/day	na
Glass-door reach-in refrigerator, 30 ≤ V < 50 ft³	Elec	Refrig	0.12V + 3.34 kWh/day	Na	≤ 0.088V + 2.625 kWh/day	na
Glass-door reach-in refrigerator, 50 ≤ V ft³	Elec	Refrig	0.12V + 3.34 kWh/day	Na	≤ 0.110V + 1.500 kWh/day	na
Solid-door reach-in freezer, 0 < V < 15 ft³	Elec	Refrig	0.4V + 1.38 kWh/day	Na	≤ 0.250V + 1.25 kWh/day	na
Solid-door reach-in freezer, 15 ≤ V < 30 ft³	Elec	Refrig	0.4V + 1.38 kWh/day	Na	≤ 0.400V – 1.000 kWh/day	na

Solid-door reach-in freezer, 30 ≤ V < 50 ft³	Elec	Refrig	0.4V + 1.38 kWh/day	Na	≤ 0.163V + 6.125 kWh/day	na
Solid-door reach-in freezer, 50 ≤ V ft³	Elec	Refrig	0.4V + 1.38 kWh/day	Na	≤ 0.158V + 6.333 kWh/day	na
Solid-door reach-in refrigerator, 0 < V < 15 ft³	Elec	Refrig	0.1V + 2.04 kWh/day	Na	≤ 0.089V + 1.411 kWh/day	na
Solid-door reach-in refrigerator, 15 ≤ V < 30 ft³	Elec	Refrig	0.1V + 2.04 kWh/day	Na	≤ 0.037V + 2.200 kWh/day	na
Solid-door reach-in refrigerator, 30 ≤ V < 50 ft³	Elec	Refrig	0.1V + 2.04 kWh/day	Na	≤ 0.056V + 1.635 kWh/day	na
Solid-door reach-in refrigerator, 50 ≤ V ft³	Elec	Refrig	0.1V + 2.04 kWh/day	Na	≤ 0.060V + 1.416 kWh/day	na
Clothes washer	Gas	Sanitation	1.72 MEF	Na	2.00 MEF	na
Door-type dish machine, high temp	Elec	Sanitation	na	1.0 kW	Na	0.70 kW
Door-type dish machine, low temp	Elec	Sanitation	na	0.6 kW	Na	0.6 kW
Multitank rack conveyor dish machine, high temp	Elec	Sanitation	na	2.6 kW	Na	2.25 kW
Multitank rack conveyor dish machine, low temp	Elec	Sanitation	na	2.0 kW	Na	2.0 kW
Single-tank rack conveyor dish machine, high temp	Elec	Sanitation	na	2.0 kW	Na	1.5 kW

Single-tank rack conveyor dish machine, low temp	Elec	Sanitation	na	1.6 kW	Na	1.5 kW
Undercounter dish machine, high temp	Elec	Sanitation	na	0.9 kW	Na	0.5 kW
Undercounter dish machine, low temp	Elec	Sanitation	na	0.5 kW	Na	0.5 kW

The energy efficiency, idle energy rates, and water use requirements, where applicable, are based on the following test methods:
ASTM F1275 Standard Test Method for Performance of Griddles
ASTM F1361 Standard Test Method for Performance of Open Deep Fat Fryers
ASTM F1484 Standard Test Methods for Performance of Steam Cookers
ASTM F1496 Standard Test Method for Performance of Convection Ovens
ASTM F1521 Standard Test Methods for Performance of Range Tops
ASTM F1605 Standard Test Method for Performance of Double-Sided Griddles
ASTM F1639 Standard Test Method for Performance of Combination Ovens
ASTM F1695 Standard Test Method for Performance of Underfired Broilers
ASTM F1696 Standard Test Method for Energy Performance of Single-Rack Hot Water Sanitizing, ASTM Door-Type Commercial Dishwashing Machines
ASTM F1704 Standard Test Method for Capture and Containment Performance of Commercial Kitchen Exhaust Ventilation Systems
ASTM F1817 Standard Test Method for Performance of Conveyor Ovens
ASTM F1920 Standard Test Method for Energy Performance of Rack Conveyor, Hot Water Sanitizing, Commercial Dishwashing Machines
ASTM F2093 Standard Test Method for Performance of Rack Ovens
ASTM F2140 Standard Test Method for Performance of Hot Food Holding Cabinets
ASTM F2144 Standard Test Method for Performance of Large Open Vat Fryers
ASTM F2324 Standard Test Method for Prerinse Spray Valves
ASTM F2380 Standard Test Method for Performance of Conveyor Toasters
ARI 810-2007: Performance Rating of Automatic Commercial Ice Makers
ANSI/ASHRAE Standard 72–2005: Method of Testing Commercial Refrigerators and Freezers with temperature setpoints at 38°F for medium-temp refrigerators, 0°F for low-temp freezers, and -15°F for ice cream freezers

Table 1b. Commercial Kitchen Appliance Prescriptive Measures and Baseline for Energy Cost Budget (SI units)

	Baseline energy usage for energy modeling path				**Levels for prescriptive path**	
Appliance type	Fuel	Function	Baseline efficiency	Baseline idle rate	Prescriptive efficiency	Prescriptive idle rate
Broiler, underfired	Gas	Cooking	30%	50.5 kW/m^2	35%	37.9 kW/m^2

Updated to reflect the April 1, 2015 LEED v4 Building Design and Construction Addenda

Combination oven, steam mode (P = pan capacity)	Elec	Cooking	40% steam mode	0.37P+4.5 kW	50% steam mode	0.133P+0.6400 kW
Combination oven, steam mode	Gas	Cooking	20% steam mode	(1 210P+ 35 810)/3 412 kW	38% steam mode	(200P+6 511)/ 3 412 kW
Combination oven, convection mode	Elec	Cooking	65% convection mode	0.1P+1.5 kW	70% convection mode	0.080P+0.4989 kW
Combination oven, convection mode	Gas	Cooking	35% convection mode	(322P+ 13 563)/ 3412 kW	44% convection mode	(150P+5 425)/ 3412 kW
Convection oven, full-size	Elec	Cooking	65%	2.0 kW	71%	1.6 kW
Convection oven, full-size	Gas	Cooking	30%	5.3 kW	46%	3.5 kW
Convection oven, half-size	Elec	Cooking	65%	1.5 kW	71%	1.0 kW
Conveyor oven, > 63.5 cm belt	Gas	Cooking	20%	20.5 kW	42%	16.7 kW
Conveyor oven, < 63.5 cm belt	Gas	Cooking	20%	13.2 kW	42%	8.5 kW
Fryer	Elec	Cooking	75%	1,05 kW	80%	1.0 kW
Fryer	Gas	Cooking	35%	4.1 kW	50%	2.64 kW
Griddle (based on 90-cm model)	Elec	Cooking	60%	4.3 kW/m^2	70%	3 .45 kW/m^2
Griddle (based on 90-cm model)	Gas	Cooking	30%	11 kW/m^2	33%	8.35 kW/m^2
Hot food holding cabinets (excluding drawer warmers and heated display) 0 < V < 0.368 m^3 (V = volume)	Elec	Cooking	na	1.4 kW/m^3	Na	(21.5*V)/0.0283 kW/m^3
Hot food holding cabinets (excluding drawer warmers and heated display),	Elec	Cooking	na	1.4 kW/m^3	Na	(2.0*V + 254)/0.0283 kW/m^3

0.368 ≤ V < 0.793 m^3						
Hot food holding cabinets (excluding drawer warmers and heated display), 0.793 m^3 ≤ V	Elec	Cooking	na	1.4 kW/m^3	Na	(3.8*V + 203.5)/0.0283 kW/m^3
Large vat fryer	Elec	Cooking	75%	1.35 kW	80%	1.1 kW
Large vat fryer	Gas	Cooking	35%	5.86 kW	50%	3.5 kW
Rack oven, double	Gas	Cooking	30%	19 kW	50%	10.25 kW
Rack oven, single	Gas	Cooking	30%	12.6 kW	50%	8.5 kW
Range	Elec	Cooking	70%	na	80%	na
Range	Gas	Cooking	35%	na	40% and no standing pilots	**na**
Steam cooker, batch cooking	Elec	Cooking	26%	200 W/pan	50%	135 W/pan
Steam cooker, batch cooking	Gas	Cooking	15%	733 W/pan	38%	615 W/pan
Steam cooker, high production or cook to order	Elec	Cooking	26%	330 W/pan	50%	275 W/pan
Steam cooker, high production or cook to order	Gas	Cooking	15%	1.47 kW/pan	38%	1.26 kW/pan
Toaster	Elec	Cooking	**na**	1.8 kW average operating energy rate	**Na**	1.2 kW average operating energy rate
Ice machine, IMH (ice making head, H = ice harvest) H ≥ 204 kg/day	Elec	Ice	0.0015 - 5.3464E^{-07} kWh/kg ice	na	≤ 13.52*H$^{-0.298}$ kWh/100 kg ice	na
Ice machine, IMH (ice making head), H < 204 kg/day	Elec	Ice	0.2262 - 4.18E^{-04} kWh/kg ice	na	≤ 13.52*H$^{-0.298}$ kWh/100 kg ice	na
Ice machine, RCU (remote condensing	Elec	Ice	0.1951 - 1.85E^{-04} kWh/kg ice	na	≤ 111.5835H$^{-0.258}$) + 2.205 kWh/100 kg ice	na

unit, w/o remote compressor) H < 454 kg/day						
Ice machine, RCU (remote condensing unit) 726 > H ≥ 454 kg/day	Elec	Ice	0.1124 kWh/kg ice	na	≤ 111.5835H$^{-0.258}$) + 2.205 kWh/100 kg ice	na
Ice machine, RCU (remote condensing unit), H ≥ 726kg/day	Elec	Ice	0.1124 kWh/kg ice	na	≤ -0.00024H + 4.60 kWh/100 kg ice	na
Ice machine, SCU (self contained unit), H < 79 kg/day	Elec	Ice	0.3968 - 2.28E^{-03} kWh/kg ice	na	236.59H$^{-0.326}$ +0.176 kWh/100 kg ice	na
Ice machine, SCU (self contained unit), H ≥ 79 kg/day	Elec	Ice	0.2161 kWh/kg ice	na	236.59H$^{-0.326}$ +0.176 kWh/100 kg ice	na
Ice machine, water-cooled ice-making head, H ≥ 651 kg/day(must be on a chilled loop)	Elec	Ice	0.0882 kWh/kg ice	na	≤ 8.11 kWh/100 kg ice	na
Ice machine, water-cooled ice-making head, 227 ≤ H < 651 kg/day (must be on a chilled loop)	Elec	Ice	0.1230 - 5.35E^{-05} kWh/kg ice	na	≤ 11.31 - 0.065H kWh/100 kg ice	na
Ice machine, water-cooled ice-making head, H < 227 kg/day(must be on a chilled loop)	Elec	Ice	0.1720 - 2.67E^{-04} kWh/kg ice	na	≤ 15.48 - 0.0238H kWh/100 kg ice	na
Ice machine, water-cooled once-through (open loop)	Elec	Ice	Banned	Banned	Banned	Banned
Ice machine, water cooled SCU (self-	Elec	Ice	0.2513 - 9.23E^{-04} kWh/kg ice	na	≤ 23.37- 0.086H	na

contained unit) H < 91 kg/day (must be on a chilled loop)					kWh/100 kg ice	
Ice machine, water cooled SCU (self-contained unit) H ≥ 91 kg/day (must be on a chilled loop)	Elec	Ice	0.1676 kWh/kg ice	na	15.57 kWh/100 kg ice	na
Chest freezer, solid or glass door	Elec	Refrig	15.90V + 0.943 kWh/day	na	9.541V + 0.130 kWh/day	na
Chest refrigerator, solid or glass door	Elec	Refrig	3.53V + 2.04 kWh/day	na	≤ 4.417 V + 0.475 kWh/day	na
Glass-door reach-in freezer, 0 < V < 0.42 m^3	Elec	Refrig	26.50V + 4.1 kWh/day	na	≤ 21.449V + 0.893 kWh/day	na
Glass-door reach-in freezer, 0.42 ≤ V < 0.85 m^3	Elec	Refrig	26.50V + 4.1 kWh/day	na	≤ 25.901V – 1.00 kWh/day	na
Glass-door reach-in freezer, 0.85 ≤ V < 1.42 m^3	Elec	Refrig	26.50V + 4.1 kWh/day	na	≤ 8.834V + 13.50 kWh/day	na
Glass-door reach-in freezer, 1.42 ≤ V m^3	Elec	Refrig	26.50V + 4.1 kWh/day	na	≤ 15.90V + 3.50 kWh/day	na
Glass-door reach-in refrigerator, 0 < V < 0.42m^3	Elec	Refrig	4.24V + 3.34 kWh/day	na	≤ 4.169V + 1.382 kWh/day	na
Glass-door reach-in refrigerator, 0.42 ≤ V < 0.85 m^3	Elec	Refrig	4.24V + 3.34 kWh/day	na	≤ 4.947V + 1.050 kWh/day	na
Glass-door reach-in refrigerator, 0.85 ≤ V < 1.42 m^3	Elec	Refrig	4.24V + 3.34 kWh/day	na	≤ 3.109V + 2.625 kWh/day	na
Glass-door reach-in refrigerator, 1.42 ≤ V m^3	Elec	Refrig	4.24V + 3.34 kWh/day	na	≤ 3.887V + 1.500 kWh/day	na

Solid-door reach-in freezer, 0 < V < 0.42 m^3	Elec	Refrig	14.13V + 1.38 kWh/day	na	≤ 8.834V + 1.25 kWh/day	na
Solid-door reach-in freezer, 0.42 ≤ V < 0.85 m^3	Elec	Refrig	14.13V + 1.38 kWh/day	na	≤ 4.819V – 1.000 kWh/day	na
Solid-door reach-in freezer, 0.85 ≤ V < 1.42 m^3	Elec	Refrig	14.13V + 1.38 kWh/day	na	≤ 5.760V + 6.125 kWh/day	na
Solid-door reach-in freezer, 1.42 ≤ V m^3	Elec	Refrig	14.13V + 1.38 kWh/day	na	≤ 5.583V + 6.333 kWh/day	na
Solid-door reach-in refrigerator, 0 < V < 0.42m^3	Elec	Refrig	3.53V + 2.04 kWh/day	na	≤ 3.145V + 1.411 kWh/day	na
Solid-door reach-in refrigerator, 0.42 ≤ V < 0.85 m^3	Elec	Refrig	3.53V + 2.04 kWh/day	na	≤ 1.307V + 2.200 kWh/day	na
Solid-door reach-in refrigerator, 0.85 ≤ V < 1.42 m^3	Elec	Refrig	3.53V + 2.04 kWh/day	na	≤ 1.979V + 1.635 kWh/day	na
Solid-door reach-in refrigerator, 1.42 ≤ V m^3	Elec	Refrig	3.53V + 2.04 kWh/day	na	≤ 2.120V + 1.416 kWh/day	na
Clothes washer	Gas	Sanitation	1.72 MEF		2.00 MEF	
Door-type dish machine, high temp	Elec	Sanitation	na	1.0 kW	Na	0.70 kW
Door-type dish machine, low temp	Elec	Sanitation	na	0.6 kW	Na	0.6 kW
Multitank rack conveyor dish machine, high temp	Elec	Sanitation	na	2.6 kW	Na	2.25 kW
Multitank rack conveyor dish	Elec	Sanitation	na	2.0 kW	Na	2.0 kW

machine, low temp						
Single-tank rack conveyor dish machine, high temp	Elec	Sanitation	**na**	2.0 kW	Na	1.5 kW
Single-tank rack conveyor dish machine, low temp	Elec	Sanitation	na	1.6 kW	Na	1.5 kW
Undercounter dish machine, high temp	Elec	Sanitation	na	0.9 kW	Na	0.5 kW
Undercounter dish machine, low temp	Elec	Sanitation	na	0.5 kW	Na	0.5 kW

The energy efficiency, idle energy rates, and water use requirements, where applicable, are based on the following test methods:

ASTM F1275 Standard Test Method for Performance of Griddles
ASTM F1361 Standard Test Method for Performance of Open Deep Fat Fryers
ASTM F1484 Standard Test Methods for Performance of Steam Cookers
ASTM F1496 Standard Test Method for Performance of Convection Ovens
ASTM F1521 Standard Test Methods for Performance of Range Tops
ASTM F1605 Standard Test Method for Performance of Double-Sided Griddles
ASTM F1639 Standard Test Method for Performance of Combination Ovens
ASTM F1695 Standard Test Method for Performance of Underfired Broilers
ASTM F1696 Standard Test Method for Energy Performance of Single-Rack Hot Water Sanitizing, ASTM Door-Type Commercial Dishwashing Machines
ASTM F1704 Standard Test Method for Capture and Containment Performance of Commercial Kitchen Exhaust Ventilation Systems
ASTM F1817 Standard Test Method for Performance of Conveyor Ovens
ASTM F1920 Standard Test Method for Energy Performance of Rack Conveyor, Hot Water Sanitizing, Commercial Dishwashing Machines
ASTM F2093 Standard Test Method for Performance of Rack Ovens
ASTM F2140 Standard Test Method for Performance of Hot Food Holding Cabinets
ASTM F2144 Standard Test Method for Performance of Large Open Vat Fryers
ASTM F2324 Standard Test Method for Prerinse Spray Valves
ASTM F2380 Standard Test Method for Performance of Conveyor Toasters
ARI 810-2007: Performance Rating of Automatic Commercial Ice Makers
ANSI/ASHRAE Standard 72–2005: Method of Testing Commercial Refrigerators and Freezers with temperature setpoints at 38°F (3°C) for mediumtemp refrigerators, -18°C for low-temp freezers, and -26°C for ice cream freezers.

Table 2. Supermarket refrigeration prescriptive measures and baseline for energy cost budget

Item	Attribute	Prescriptive measure	Baseline for energy modeling path
Commercial Refrigerator and Freezers	Energy Use Limits	ASHRAE 90.1-2010 Addendum g. Table 6.8.1L	ASHRAE 90.1-2010 Addendum g. Table 6.8.1L
Commercial Refrigeration Equipment	Energy Use Limits	ASHRAE 90.1-2010 Addendum g. Table 6.8.1M	ASHRAE 90.1-2010 Addendum g. Table 6.8.1M

Table 3. Walk-in coolers and freezers prescriptive measures and baseline for energy cost budget

Item	Attribute	Prescriptive measure	Baseline for energy modeling path
Envelope	Freezer insulation	R-46	R-36
	Cooler insulation	R-36	R-20
	Automatic closer doors	Yes	No
	High-efficiency low- or no-heat reach-in doors	40W/ft (130W/m) of door frame (low temperature), 17W/ft (55W/m) of door frame (medium temperature)	40W/ft (130W/m) of door frame (low temperature), 17W/ft (55W/m) of door frame (medium temperature)
Evaporator	Evaporator fan motor and control	Shaded pole and split phase motors prohibited; use PSC or EMC motors	Constant-speed fan
	Hot gas defrost	No electric defrosting.	Electric defrosting
Condenser	Air-cooled condenser fan motor and control	Shaded pole and split phase motors prohibited; use PSC or EMC motors; add condenser fan controllers	Cycling one-speed fan
	Air Cooled condenser design approach	Floating head pressure controls or ambient subcooling	10°F (-12°C) to 15°F (-9°C) dependent on suction temperature
Lighting	Lighting power density (W/sq.ft.)	0.6 W/sq.ft. (6.5 W/sq. meter)	0.6 W/sq.ft. (6.5 W/sq. meter)
Commercial Refrigerator and Freezers	Energy Use Limits	N/A	Use an Exceptional Calculation Method if attempting to take savings
Commercial Refrigerator and Freezers	Energy Use Limits	N/A	Use an Exceptional Calculation Method if attempting to take savings

Table 4. Commercial kitchen ventilation prescriptive measures and baseline for energy cost budget

Strategies	Prescriptive measure	Baseline
Kitchen hood control	ASHRAE 90.1-2010 Section 6.5.7.1, except that Section 6.5.7.1.3 and Section 6.5.7.1.4	ASHRAE 90.1-2010 Section 6.5.7.1 and Section G3.1.1 Exception (d) where applicable

	shall apply if the total kitchen exhaust airflow rate exceeds 2,000 cfm (960 L/s) (as opposed to 5,000 cfm (2,400 L/s) noted in the ASHRAE 90.1-2010 requirements)	

MINIMUM PROGRAM REQUIREMENTS

LAST UPDATED:
January 2011

USGBC
2101 L STREET, NW
SUITE 500
WASHINGTON, DC 20037
202 828-7422
USGBC.ORG

LEED 2009
Minimum Program Requirements

Apply to

LEED 2009 for New Construction and Major Renovations, LEED 2009 for Core & Shell development, LEED 2009 for Schools, LEED 2009 for Commercial Interiors, and LEED 2009 for Existing Buildings: Operations & Maintenance, LEED for Retail – New Construction, LEED for Retail – Commercial Interiors, LEED for Healthcare

Do not apply to LEED for Homes, LEED for Neighborhood Development, or any LEED rating system adopted prior to 2009

Version January 2011

The only change made in this version is the indication that the MPRs apply to recently launched rating systems. These rating systems include: LEED for Retail – New Construction, LEED for Retail – Commercial Interiors, and LEED for Healthcare

INTRODUCTION

This document identifies the MPRs, or minimum characteristics that a project must possess in order to be eligible for LEED Certification. These requirements define the types of buildings that the LEED Green Building Rating Systems were designed to evaluate, and taken together serve three goals: to give clear guidance to customers, to protect the integrity of the LEED program, and to reduce complications that occur during the LEED certification process. The requirements in this document will apply to all those, and only those projects seeking to demonstrate conformance with the rating systems listed above.

Definitions, exceptions, and more extensive guidance relating to these MPRs are available in a separate document titled: *LEED 2009 MPR Supplemental Guidance*. Terms that are *italicized and underlined* here are defined in the Supplemental Guidance document (they are marked as such only the first time that they appear).

At this time U.S. Green Building Council, Inc. has authorized the Green Building Certification Institute (GBCI) to confer LEED Certification. GBCI has agreed to consider requests for exceptions to MPRs that are not already defined in the LEED 2009 MPR Supplemental Guidance document on a case-by-case basis for special circumstances.

In addition to complying with the MPRs, a project must also demonstrate compliance with all rating system requirements in order to achieve LEED Certification.

1. MUST COMPLY WITH ENVIRONMENTAL LAWS

New Construction, Core & Shell, Schools, Commercial Interiors, Retail – New Construction, Retail – Commercial Interiors, Healthcare

The *LEED project building or space*, all other *real property* within the *LEED project boundary*, and all *project work* must comply with applicable federal, state, and local building-related environmental laws and regulations in place where the project is located. This condition must be satisfied from the date of *LEED project registration* or the commencement of *schematic design*, whichever comes first, up and until the date that the building receives a *certificate of occupancy* or similar official indication that it is fit and ready for use.

Existing Buildings: O&M

The LEED project building, all other real property within the LEED project boundary, any project work, and all *normal building operations* occurring within the LEED project building and the LEED project boundary must comply with applicable federal, state, and local building-related environmental laws and regulations in place where the project is located. This condition must be satisfied from the commencement of the LEED project's initial LEED-EB: O&M *performance period* through the expiration date of the LEED Certification.

All Rating Systems

A lapse in a project's compliance with a building-related environmental law or regulation that results from an unforeseen and unavoidable circumstance shall not necessarily result in non-compliance with this MPR. Such lapses shall be excused so long as they are remediated as soon as feasibly possible.

2. MUST BE A COMPLETE, PERMANENT BUILDING OR SPACE

All Rating Systems

All LEED projects must be designed for, constructed on, and operated on a permanent location on already existing *land*. LEED projects shall not consist of mobile structures, equipment, or vehicles. No building or space that is designed to move at any point in its lifetime may pursue LEED Certification.

New Construction, Core & Shell, Schools, Retail – New Construction, Healthcare

LEED projects must include the new, ground-up design and construction, or *major renovation*, of at least one commercial, institutional, or high-rise residential building in its *entirety*.

Commercial Interiors, Retail – Commercial Interiors,

The LEED project scope must include a *complete interior space* distinct from other spaces within the same building with regards to at least one of the following characteristics: ownership, management, lease, or party wall separation.

Existing Buildings: O&M

LEED projects must include at least one existing commercial, institutional, or high-rise residential building in its entirety.

3. MUST USE A REASONABLE SITE BOUNDARY

New Construction, Core and Shell, Schools, Existing Buildings: O&M, Retail – New Construction, Healthcare

1. The LEED project boundary must include all contiguous land that is associated with and supports normal building operations for the LEED project building, including all land that was or will be disturbed for the purpose of *undertaking the LEED project*.
2. The LEED project boundary may not include land that is owned by a party other than that which owns the LEED project unless that land is associated with and supports normal building operations for the LEED project building.
3. LEED projects located on a campus must have project boundaries such that if all the buildings on campus become LEED certified, then 100% of the gross land area on the campus would be included within a LEED boundary. If this requirement is in conflict with MPR #7, Must Comply with Minimum Building Area to Site Area Ratio, then MPR #7 will take precedence.
4. Any given parcel of real property may only be attributed to a single LEED project building.
5. *Gerrymandering* of a LEED project boundary is prohibited: the boundary may not unreasonably exclude sections of land to create boundaries in unreasonable shapes for the sole purpose of complying with prerequisites or credits.

Commercial Interiors, Retail – Commercial Interiors

If any land was or will be disturbed for the purpose of undertaking the LEED project, then that land must be included within the LEED project boundary.

4. MUST COMPLY WITH MINIMUM FLOOR AREA REQUIREMENTS

New Construction, Core and Shell, Schools, Existing Buildings: O&M, Retail – New Construction, Healthcare

The LEED project must include a minimum of 1,000 square feet (93 square meters) of gross floor area.

Commercial Interiors, Retail – Commercial Interiors

The LEED project must include a minimum of 250 square feet (22 square meters) of gross floor area.

5. MUST COMPLY WITH MINIMUM OCCUPANCY RATES

New Construction, Core & Shell, Schools, Commercial Interiors, Retail – New Construction, Retail – Commercial Interiors, Healthcare

Full Time Equivalent Occupancy

The LEED project must serve 1 or more *Full Time Equivalent* (FTE) occupant(s), calculated as an annual average in order to use LEED in its entirety. If the project serves less than 1 annualized FTE, optional credits from the Indoor Environmental Quality category may not be earned (the prerequisites must still be earned).

Existing Buildings: O&M

Full Time Equivalent Occupancy

The LEED project must serve 1 or more Full Time Equivalent (FTE) occupant(s), calculated as an annual average in order to use LEED in its entirety. If the project serves less than 1 annualized FTE, optional credits from the Indoor Environmental Quality category may not be earned (the prerequisites must still be earned).

Minimum Occupancy Rate

The LEED project must be in a state of *typical physical occupancy*, and all building systems must be operating at a capacity necessary to serve the current occupants, for a period that includes all performance periods as well as at least the 12 continuous months immediately preceding the first submission for a review.

6. MUST COMMIT TO SHARING WHOLE-BUILDING ENERGY AND WATER USAGE DATA

All Rating Systems

All certified projects must commit to sharing with USGBC and/or GBCI all available actual whole-project energy and water usage data for a period of at least 5 years. This period starts on the date that the LEED project begins typical physical occupancy if certifying under New Construction, Core & Shell, Schools, or Commercial Interiors, or the date that the building is awarded certification if certifying under Existing Buildings: Operations & Maintenance. Sharing this data includes supplying information on a regular basis in a free, accessible, and secure online tool or, if necessary, taking any action to authorize the collection of information directly from service or utility providers. This commitment must carry forward if the building or space changes ownership or lessee.

7. MUST COMPLY WITH A MINIMUM BUILDING AREA TO SITE AREA RATIO

All Rating Systems

The gross floor area of the LEED project building must be no less than 2% of the gross land area within the LEED project boundary.

Guide to LEED Certification: Commercial

BD+C, ID+C, O+M

DOWNLOAD PDF

Congratulations on your decision to pursue LEED certification for your project!

You're on your way to increasing the value and environmental integrity of your project. This guide will lead you through the process.

LEED certification involves four main steps:

1. **Register** your project by completing key forms and submitting payment.
2. **Apply** for LEED certification by submitting your completed certification application through LEED Online and paying a certification review fee.
3. **Review.** Your LEED application is reviewed by GBCI.
4. **Certify.** Receive the certification decision. If you've earned LEED certification: congratulations!

If you need assistance at any time, please call or email us.

Note: Are you working on projects within the LEED Volume Program? Check out our LEED Volume Program supplement, which works in conjunction with this guide to give you a full picture of the LEED Volume Program.

REGISTER

Registration is an important step in the LEED certification process, signifying your intent to pursue LEED certification.

Before you begin, you'll want to make sure that your project meets all of the LEED Minimum Program Requirements, the minimum characteristics that make a project appropriate for pursuing LEED. Your building must:

- Be in a permanent location on existing land
- Use reasonable LEED boundaries
- Comply with project size requirements

Visit the LEED Credit Library to read the specifics on Minimum Program Requirements.

Next up: select the appropriate LEED rating system for your project using our Rating System Selection Guidance.

The content in this guide applies to:

- LEED for Building Design and Construction (LEED BD+C) rating systems (please note that there is a separate guide for Homes and Mid-Rise rating systems)
- LEED for Interior Design and Construction (LEED ID+C) rating systems
- LEED for Operations and Maintenance (LEED O+M) rating systems

Now, onward to registration: visit LEED Online, the online portal through which you will submit your application for certification, as well as access a variety of tools and resources, to complete the registration information related to your project, submit payment and sign the certification agreement (the project owner must do this last one). Once you've finished, your project application will be accessible in LEED Online.

From here, you can assemble your project team and the documentation process begins!

Project Team Roles

Individuals on your project team will be called on to fill certain roles throughout the LEED certification process. Here's a rundown of who's who so you can select your team wisely:

Owner: The owner of the project is the person (or entity) who has the authority to hold and control the real and personal property associated with your project, and accepts (or authorizes the acceptance of) the certification agreement. While there may be multiple owners for a particular project (if so, please submit a Confirmation of Primary Owner's Authority Form), we ask that you identify a single individual to administer the certification process. Big takeaway: the owner has ultimate control over the LEED certification application, meaning that the Green Building Certification Institute (GBCI: the organization responsible for administering LEED certification) will respond to the owner regarding the administration of the project over any other member of the project team.

Agent: The agent is the person (or entity) who is granted actual authority by the owner to register the project and accept the certification agreement. If you are using this option, remember to upload a signed Confirmation of Agent's Authority Form.

Project Administrator: This team member acts as a project manager, overseeing the LEED project as well as which project team members are responsible for certain tasks, credits or prerequisites. The project administrator plays a key quality role by checking that the LEED submission is complete and accurate before submitting the project to GBCI for review, and accepting the review results once the review is complete. Note:

the individual who initially registers the project will automatically be granted the role of the project administrator, but the owner may transfer this role to another team member at any time.

Important considerations

Deadline for registration

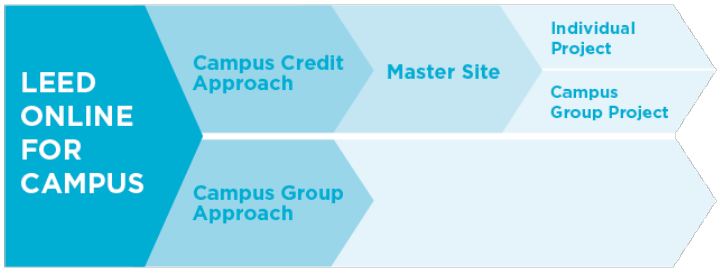
In order to optimize an integrated design process, which is a core part of LEED, we encourage you to register as early as possible – ideally, during the design phase for LEED BD+C and LEED ID+C rating systems, and early in the planning and facility assessment phase for LEED O+M projects. Note that registration for each version of the rating system closes one year after the next subsequent rating system version launches, so please make sure to register your project within this window of time.

Recertification (LEED O+M only)

If your project has already been certified under LEED O+M, in order for your certification to remain current, we require you to recertify your project within five years of the previous certification. Your project is eligible for recertification after 12 months and every 12 months thereafter, and we encourage you to register for recertification as soon as possible. For more information, view the Recertification Guidance.

Campus projects

If you are planning to bring more than one building located on a single shared site and under the control of a single entity (for example, a corporate or educational campus, government installation or commercial development) through certification, you may register your project as a campus or group project to streamline the documentation you'll need to submit for review. Please note, however, that individual building registration and certification fees apply to campus and group projects. Depending on the campus approach you select, you will pursue a slightly modified registration process, as compared to one-off project registration.



- **Campus credit approach:** This approach enables you to streamline the amount of documentation by earning "campus credits" – prerequisites and credits that can be applied to all LEED projects on the master site. You will need to register a "master site," which includes a general narrative of the overall campus projects and a schematic site plan, in addition to registering each individual project on the site.
- **Campus group project approach:** In this approach, you'll register the group of projects on the site as a single LEED project that will then receive a single LEED rating and certification. To be eligible for this approach, LEED BD+C and LEED ID+C projects must be under the same construction contract and be constructed at the same time, and LEED O+M projects must be under the same ownership and management, share the same performance period and have substantially similar space types. For this approach, your team's campus project documentation must demonstrate that the group of projects collectively meets the credit requirements using a "group credit." You may use a campus group project certification independently or in combination with campus credits documented under a master site review, through the campus credit approach above.

APPLY

Now comes the fun part: you're ready to collect and submit the appropriate documentation via LEED Online so that GBCI may review your project. Working with your project team, you will identify LEED credits to pursue and assign them to project team members. Your team will then collect information, perform calculations and analysis, and prepare documentation demonstrating your achievement of the prerequisites and your selected credits.

Once your application is prepared, upload your completed materials into LEED Online and make sure to perform a rigorous quality check of your entire application before submitting for review. We suggest that you open each form and check that you have included all required information, and open each file upload to verify that you have uploaded the correct document. Cross-check credits and prerequisites to make sure that you have reported common data points, such as gross square footage, occupancy and total material cost consistently. Want more tips? Here are some characteristics common among high quality submissions:

- Relevant prerequisite/credit information is clearly highlighted within the submission
- File attachments are clearly and intuitively labeled
- Only required documentation is submitted (if only a few pages are needed to provide the required credit/prerequisite information, no need to submit more!)
- Concise narratives are used to describe project-specific circumstances (these are really helpful for the GBCI reviewer)

All finished? Ready, set, submit! Don't forget to pay your certification review fee - and remember, your review will commence once your payment has cleared our system.

Important considerations

LEED O+M projects

Prior to applying for certification or recertification through the LEED O+M rating system, you'll need to collect performance data for both the building and the site over the performance period. For initial LEED O+M certification, the performance period is the most recent period of operations preceding the date you apply for certification. It needs to span a minimum of three months for all prerequisites and credits, except Energy and

Atmosphere Prerequisite 2 and Credit 1, which have longer minimum performance durations of one year. You may choose to extend the performance period for any prerequisite or credit to a maximum of 24 months preceding your certification application, in case you need more time to establish performance. All performance periods must overlap and come to a conclusion within one month of each other. Please be sure to submit your completed application for review within 60 days of the conclusion of the performance period.

The recertification performance period includes the entire time since the previous certification and must be at least a year in length, but may be up to five years in length. You'll need to track and record building performance data throughout the entire recertification performance period.

Campus Projects

Campus credit approach: If your team is pursuing this approach, be sure to document all campus credit information within the master site.

Campus group project approach: For this approach, your team's group project documentation must demonstrate that the group of projects collectively meets the credit requirements using a "group credit." You may use our group project certification independently or in combination with campus credits documented under a master site review, through the campus credit approach above.

REVIEW

After you've submitted your application and paid the review fee, GBCI will conduct a thorough technical review. But don't kick back yet – you'll need to be an active participant throughout the process.

While the type of review you'll undergo will vary depending on the specific needs of your project and the rating system under which you are certifying (more on that below), the process is the same:

Part 1: Preliminary Review

- You will first submit your application for a preliminary review. GBCI will check your application for completeness and compliance with the selected rating system and attempted credits.
- GBCI will respond with its preliminary review within 20-25 business days, indicating which prerequisites and credits are anticipated to be awarded during final review, pending further information or denied.
- Your team can accept the preliminary review results as final if you are satisfied, submit new or revised documentation, or attempt additional credits before submitting for final review.

Part 2: Final Review (optional)

- The final review stage allows you to submit supplementary information or amend the application. GBCI suggests you submit these clarifications within 25 business days after receiving the preliminary review results. GBCI will then review revised or newly submitted prerequisites and credits, and reconsider any anticipated credits or prerequisites for which information has changed since the return of the preliminary review.
- GBCI will respond with a final LEED certification review report within 20-25 business days, marking prerequisites and attempted credits as either awarded or denied.
- Like the preliminary review, you can either accept the review results as final, or revise your application and resubmit, this time as an appeal.

Part 3: Appeal Review (optional, appeal fees apply)

- The appeal review stage provides one additional round of review and allows you to submit supplementary information, amend the application or add new credits not previously attempted. GBCI will review the pending or newly submitted prerequisites and credits, and reconsider any anticipated credits or prerequisites for which information has changed since the return of the final review. The fee associated with appeals varies depending on the level of complexity of the credits or prerequisites involved in the appeal.
- GBCI will respond with an appeal LEED certification review report within 20-25 business days, marking prerequisites and attempted credits as either awarded or denied.
- Like the final review, you can either accept the appeal review results as final, or submit a further appeal. There is no cap on the number of appeals you may submit.

Standard review (all rating systems)

Through the standard review path, you will submit your entire application (all credits and prerequisites) once you've completed your project.

Split review (LEED BD+C and LEED ID+C rating systems)

You may choose to pursue split review if you are certifying under a design and construction rating system. To do this, you'll submit part of your application at the conclusion of your project's design phase (design credits and prerequisites), and the rest at the conclusion of construction (construction credits and prerequisites), completing two rounds of reviews. The split review is designed to help your team determine if your project is on track to achieve LEED certification at its preferred level. Please note that only credits and prerequisites identified as design credits can be submitted during the design review, and that your application must be submitted before your project is substantially completed.

Precertification review (LEED for BD+C: Core & Shell projects only)

This is an optional review pathway available for a fee for LEED BD+C: Core & Shell projects that is focused on your intended design and construction strategies. We offer precertification to help your project attract tenants and help you determine which credits and prerequisites your project is likely to achieve during the full review.

Expedited review

In a time crunch? Contact GBCI at least five business days (please allow longer if you are paying by check) prior to submitting an application to request an expedited review to cut your review time in half (reduced from 20-25 business days to10-12 business days per review phase). Please note that there is an additional charge for this service, and GBCI's ability to fulfill your request depends on their current review capacity. If GBCI can accommodate your request, they will confirm availability and provide a custom review schedule for your project.

Submitting an inquiry

Having difficulty fulfilling a rating system prerequisite or credit? Have you thought of an alternative way to

interpret a credit or path to fulfill it? We've established inquiries so that you can gain clarification before you register your project or as you're working through your LEED application. All inquiries are filed through LEED Online (unless you haven't registered yet – in which case, please reach out to GBCI) and should address only one credit or prerequisite. Here are your options:

Credit Interpretation Ruling (CIR): A CIR allows you to obtain technical guidance related to a particular credit or facet of the LEED rating system. Our review team will let you know if your interpretation of a particular credit or prerequisite is consistent with published rating system requirements. When it comes time to submit your application for review, you will need to provide documentation demonstrating fulfillment of the CIR and indicate the approved CIR within your application for certification. You may file an appeal if you are not satisfied with the result of your CIR using the process above. Keep in mind, also, that CIRs are not precedent setting; your project team can only utilize the ruling for the project under which the CIR was submitted.

LEED Interpretation: Similar to CIRs, LEED Interpretations differ in that they are precedent-setting. They may be utilized by any project certifying under an applicable rating system. For that reason, they are addressed by the LEED Technical Advisory Groups (volunteer technical experts). LEED Interpretations represent an opportunity to contribute to the LEED conversation in a significant way. You can access published LEED Interpretations online in our searchable addenda database.

Important considerations

Deadline for submitting for review

For LEED BD+C and LEED ID+C rating systems, you will need to submit for your construction phase review (preliminary standard review or preliminary construction review) no later than two years after your project is substantially completed (the date on which your building receives a certificate of occupancy or similar official indication that it is fit and ready for use). LEED O+M projects are required to submit for review within 60 days of the end of their performance period. If you decide you no longer want to pursue LEED certification for your project, we understand. Please contact GBCI so that they can close your application and maintain accurate records.

Campus projects

Campus credit approach: We recommend that you complete the master site review prior to submitting any associated, individual or group projects for review, since the campus credits earned through the master site review will then become available to your individual or group projects associated with it. Review processes for the master site and the individual or group projects proceed as outlined above. You have the option to select standard or split reviews for design and construction rating systems.

Appeals

If you feel that the results of a review appeal or a CIR appeal are incorrect and wish to challenge those results, you may do so by contacting GBCI.

Upgrading your version of LEED Online

We're constantly working to improve the LEED certification experience for you, and upgrades to LEED Online that provide a smoother user experience are a key part of those efforts. Check below to see which upgrades are available.

> We recently launched LEED Online for Campus, created specifically for campus projects. If you're currently registered as such a project and utilizing LEED Online version 3, please contact GBCI and they will guide you through the process of re-registering in LEED Online for Campus. Once the upgrade has been completed, GBCI will issue a refund of the registration fee associated with the project that was cancelled out in LEED Online version 3. Unfortunately, if you've already submitted your campus project for review, you'll need to stick with the version of LEED Online that you registered with – your project cannot be transferred.

CERTIFY

You've made it to the finish line: accepting your certification is the final step in the LEED review process. Once your final application review is complete, your project team can either accept or appeal GBCI's final certification report. If you've achieved certification: congratulations from all of us at USGBC and GBCI!

Once you've accepted the final certification report, the project will be deemed "closed out" –meaning that you will no longer be able to appeal the certification level or review decisions for specific credits or prerequisites, so please double (or triple) check that you have achieved all prerequisites and targeted credits before accepting the final certification.

Certification Levels

While all LEED-certified projects are a cut above the rest, each is assigned one of four levels of certification to acknowledge the degree of achievement. The number of points that your project earns determines the level of LEED certification that your project will receive.

LEED Certified™: 40-49 points earned
LEED Silver®: 50-59 points earned
LEED Gold®: 60-79 points earned
LEED Platinum®: 80+ points earned

Promote your project

Once you've earned certification, it's likely that you'll want to tell the world. You should. LEED certification benefits your business's bottom line and underscores your sustainability efforts. It's a cause for celebration!

Our public relations guide for LEED-certified projects can help you do that. You'll also receive a formal certificate of recognition, and can choose to order LEED plaques and certificates. Learn more.

(Psst... did you know that USGBC Platinum-level members receive 20 hours of dedicated public relations support from USGBC's in-house communications team? Learn more about Platinum membership.)

Project information: How USGBC handles your data

Your work with LEED is something to be celebrated – and communicated to the world at large. Achieving LEED certification gives you the opportunity to share your project strategies, photos and insight, and play a pivotal role in educating other project teams.

How is USGBC utilizing your project data?

We use your project data for the greater good: to educate and provide resources for LEED project teams and others around the world, showcase your strategies, and share the size and power of the green building movement.

LEED-registered and certified projects are, by default, considered "public" projects, and thereby included in USGBC's public LEED project directory. A listing in this directory allows the general public and members of the media to look up your project listing and its related details.

Here's a full list of the data and project elements that may be listed in the project directory:

Project directory information

- Project name
- Project ID
- Physical address
- Date of registration
- Date of certification
- Certification level
- Total points earned
- Project scorecard
- ACP (Alternative Compliance Path) selection
- Rating system and version
- Owner type
- Owner name
- Owner organization
- Gross square footage
- Total property area
- Project type

All "public" projects also benefit from publicity opportunities: we may utilize your project data to create case studies highlighting your project's features, reference your project on our website or to the media, or create other derivative works.

Information that may be used for articles, project profiles, other features:

- Service providers
- Project team members
- Promotional or other project photographs
- Project strategies for certification
- Quotations from team members

You are free to opt-out of the LEED project directory and publicity opportunities as a "private project" at the time of registration: specific instructions on how to do so are available in LEED Online. All private projects that earn certification will be prompted once more to transition to public status (we can't help ourselves, we love sharing good news!). You will need to re-confirm your "private" status at that time, if you wish to retain it.

Important considerations

Deadline for achieving certification

Each version of the rating system is open and available for 10 years after the rating system launch date. We require projects to register and complete the LEED certification process (accept the certification decision) within that 10-year period. If you have difficulty meeting this deadline, please reach out to GBCI – they'll work with you on a solution for your project.

Expiration of LEED certification

If you've earned certification for your LEED O+M project, you must recertify within five years of the previous certification.

Revocation of LEED certification

In rare situations, LEED certification may be revoked. We've created the Certification Challenge Policy to ensure that all LEED project submittals and subsequent reviews by GBCI team members are done so with integrity, accuracy and truthfulness. A certification challenge may be initiated by GBCI or by any third party within 18 months of a project's certification. In line with the policy, you'll need to retain all project documentation related to your certification, and the achievement of prerequisites and credits, on-site at your certified project for two years after receiving certification, to ensure that this information is available in case of a challenge.

This Certification Challenge Policy has been put in place to protect the integrity of the LEED certification program as a credible, accurate, and industry-recognized system for evaluating the design and construction of sustainable buildings. GBCI intends this policy to function as both a quality check on GBCI LEED reviews, as well as an instrument designed to detect and remedy incidents of intentional or inadvertent misrepresentation which result in the inappropriate award of LEED certification. This policy is not meant to serve as a vehicle for the adjudication of disputes between outside parties. Accordingly, this policy and the certification challenge process detailed herein do not replace any applicable judicial or other alternative dispute resolution processes that third parties may have available to resolve such disputes between themselves. Complaints that might warrant initiation of the Certification Challenge Process should be submitted to legal@gbci.org.

1.1 Certification Challenge Overview: All persons participating in the submission of information in applying for an award of LEED certification must be truthful, forthcoming, and cooperative in their dealings with GBCI; however, it is the responsibility of the project owner to confirm and represent the veracity and accuracy of the documentation submitted. To the extent the veracity or accuracy of such documentation, or GBCI's evaluation of the same, is called into question, GBCI may initiate a certification challenge thereby revisiting its determination that the submitted documentation properly demonstrates that the project satisfied all credits, prerequisites, and MPRs necessary to achieve the awarded level of LEED certification. A project owner may defend against such certification challenge by electing to participate in the process described below. Based on the final determination of such a challenge, GBCI retains the right to reduce the level of LEED certification awarded or revoke an award of LEED certification altogether.

1.2 Basis for an Initiation of a Certification Challenge: GBCI reserves the right to institute investigations and review documentation for any reason or for no reason at all. In addition, GBCI encourages third parties who wish to make a complaint, or bring to light information affecting the grant of LEED certification to do so in the following manner. Parties seeking to submit a complaint or report information affecting the grant of LEED certification must have specific personal knowledge of an event or condition that would prevent a project from satisfying a particular credit, prerequisite, or MPR. Complainants must indicate the credit, prerequisite, or MPR that is affected. Further, such persons must indicate to the fullest extent possible, in the form of a written statement, details of such event or condition including the following: i) the alleged offending conduct or condition; ii) the persons involved; iii) other persons who may have knowledge of the facts and circumstances concerning the allegation, including contact information for such persons; and iv) the identity of the person presenting the complaint including such person's full name, address, email, and telephone number.

Complaints must be submitted to GBCI within eighteen (18) months of the award of LEED certification for a project. GBCI cannot guarantee anonymity to persons submitting complaints. If GBCI determines that the complaint is frivolous or irrelevant to the credits, prerequisites and MPRs required for LEED certification, no further action will be taken.

1.3 Basis for an Initiation of a Certification Challenge: GBCI reserves the right to institute investigations and review documentation for any reason or for no reason at all. In addition, GBCI encourages third parties who wish to make a complaint, or bring to light information affecting the grant of LEED certification to do so in the following manner. Parties seeking to submit a complaint or report information affecting the grant of LEED certification must have specific personal knowledge of an event or condition that would prevent a project from satisfying a particular credit, prerequisite, or MPR. Complainants must indicate the credit, prerequisite, or MPR that is affected. Further, such persons must indicate to the fullest extent possible, in the form of a written statement, details of such event or condition including the following: i) the alleged offending conduct or condition; ii) the persons involved; iii) other persons who may have knowledge of the facts and circumstances concerning the allegation, including contact information for such persons; and iv) the identity of the person presenting the complaint including such person's full name, address, email, and telephone number. Complaints must be submitted to GBCI within eighteen (18) months of the award of LEED certification for a project. GBCI cannot guarantee anonymity to persons submitting complaints. If GBCI determines that the complaint is frivolous or irrelevant to the credits, prerequisites and MPRs required for LEED certification, no further action will be taken.

1.4 Certification Challenge Investigation Process: In performing a formal investigation, GBCI will review any or all of the project's documentation that GBCI, in its sole discretion, deems relevant. GBCI may request supplemental information from the person(s) making the complaint and may require the complainant to provide a statement in the form of an affidavit attested to under penalty of perjury. GBCI may request information from the project team, project owner, and/or others involved in the project.

If GBCI determines that a site visit may be useful, GBCI, with the assistance of one or more technical consultants, may, but is not required to, conduct an on-site inspection of a project. GBCI shall notify the project owner of the necessity of the site visit in writing. GBCI representatives including staff members and/or technical consultants shall make the arrangements for the site visit.
No staff or technical consultant may: i) investigate any matter regarding a project he or she previously reviewed; ii) investigate any matter in which his or her impartiality might reasonably be questioned; or iii) investigate any matter which presents an actual, apparent, or potential conflict of interest. GBCI representatives who are tasked with conducting a site visit must sign an engagement agreement and abide by GBCI requirements regarding conflicts of interest and confidentiality.

1.5 GBCI Preliminary Staff Findings: Upon the conclusion of an investigation, if GBCI determines in its sole discretion that the project owner submitted truthful and accurate documentation when applying for certification and that sufficient evidence exists to demonstrate that (i) all prerequisites and MPRs were properly completed at the time certification was conferred and (ii) the minimum number of credits were properly completed at the time certification was conferred such that the project obtained the requisite number of points necessary to achieve LEED certification at the level awarded, no further action will be taken. The project owner and any persons submitting complaints will be notified of this decision. If GBCI determines that the documentation submitted was not completely truthful and accurate, or that insufficient evidence exists to demonstrate the project properly achieved LEED certification at the level awarded, GBCI shall transmit a statement of its findings to the project owner by email via verifiable method of delivery, setting forth the affected credits, prerequisites, and/or MPRs, and including a written statement:

1. of the facts constituting the inaccurate grant of credit, prerequisite, minimum program requirement, or falsely submitted documentation and the credits/prerequisites/minimum program requirements affected;
2. that the project owner has thirty (30) calendar days after receipt of such statement;
3. identifying the proposed sanctions determined by GBCI potentially including revocation of LEED certification, or reduction of the level of LEED certification awarded.

1.6 Stage 1: Contesting GBCI Preliminary Staff Findings: If the project owner seeks to contest the findings, or is unwilling to accept the determined sanctions, such owner must submit a written response addressing the Preliminary GBCI Staff Findings and/or the determined sanctions within thirty (30) calendar days after the owner's receipt of such statement. The project owner may also submit additional information related to the challenged LEED program requirement(s). If the project owner accepts, or fails to timely respond to such statement and underlying findings, GBCI shall enact the determined sanctions and close the matter. Such acceptance, or failure to respond, shall constitute a waiver of the right to a review or hearing and appeal of the same.

Upon receiving a response to this statement, GBCI staff shall make a determination as to the disposition of the challenge and identify the sanctions to be imposed. GBCI shall provide notice of such determination and sanctions to the project owner along with a statement:

1. that the owner or representative thereof may request an oral hearing (in person or by phone) or a review by written briefing for the disposition of the matter, with the owner bearing its own expenses;
2. that the owner or representative may appear in person, may examine and cross-examine any witness under oath, and may produce evidence on its behalf;
3. that if the owner disputes the findings, or requests a review or hearing, the owner thereby consents to the formation of a Review Panel for the purpose of rendering a decision on the evidence before it, and further agrees to comply with any applicable sanctions subject to an appeal; and
4. those certain administrative fees, as detailed in Pricing Appendix A, apply if the project team requests a written review or hearing.

1.7 Stage 2: Written Review or Hearing of a GBCI Staff Determination: If a project owner seeks to contest the determination or sanctions issued by GBCI staff, the project owner may submit a request for either a hearing or review by written briefing. The fees outlined in Pricing Appendix A must be provided to GBCI within thirty (30) calendar days following the date the owner's written request was received by GBCI.

If the project owner requests a hearing or written review, the GBCI Chair in consultation with the GBCI President shall appoint three persons to serve on a Review Panel, each of whom shall be qualified by virtue of training and experience to have the appropriate technical knowledge in the relevant LEED program requirements. No member of such Review Panel may: i) review any matter regarding a project he or she previously reviewed; ii) review any matter in which his or her impartiality might reasonably be questioned; or iii) review any matter which presents an actual or apparent conflict of interest relating to the project.

If the project owner requests a written review, GBCI will forward its findings and the response of the project owner to the Review Panel. Written briefing may be submitted within thirty (30) calendar days following receipt of the request for such written review.

If the project owner requests a hearing, GBCI shall forward its findings and the response of the project owner to the Review Panel and shall designate one staff member to present the findings and any substantiating evidence, to examine and cross-examine witnesses, and to present the matter during the hearing. The Review Panel will schedule a hearing after the request is received, allowing for a period of at least thirty (30) days to prepare for such hearing, and will send by email and via verifiable means of delivery, a Notice of Hearing to the project owner. The Notice of Hearing will include a statement of the time and place selected by the Review Panel. The project owner may request modification of the time and place for good cause.

The Review Panel, GBCI, and the project owner may consult with and be represented by counsel, make opening statements, present documents and testimony, examine and cross-examine witnesses under oath, make closing statements and present written briefs as scheduled by the Review Panel. To the extent a project owner or representative fails to attend the hearing in person or by phone, such hearing shall commence as scheduled without representation by the owner. The Review Panel will determine all matters related to the hearing. Formal rules of evidence will not apply. Relevant evidence may be admitted. Disputed questions will be determined by the Review Panel.

GBCI will meet its burden of proof if it is able to demonstrate by a preponderance of the evidence, and the

project owner is unable to refute either that the project owner failed to submit truthful, and accurate documentation when applying for certification, or that insufficient evidence exists to demonstrate that (i) all prerequisites and MPRs were properly completed at the time certification was conferred and (ii) that the minimum number of credits were properly completed at the time certification was conferred such that the project obtained the requisite number of points necessary to achieve LEED certification at the level awarded. Upon the conclusion of a review or hearing, if the Review Panel determines that GBCI has not met this burden of proof no adverse action will be advised and the matter shall be closed. If the Review Panel determines that GBCI has met this burden of proof it shall identify the appropriate sanctions to be carried out by GBCI.
The Review Panel will issue a written decision following the review or hearing. This decision will contain factual findings, conclusions, and any sanctions if appropriate. Such written decision shall be sent promptly by email via verifiable means of delivery to the project owner and any persons submitting complaints.

1.8 Stage 3: Appeal of a Review Panel Decision Before GBCI Board of Directors: If a project owner seeks to contest the decision of the Review Panel, such owner may submit a request for an appeal to the GBCI Board of Directors. All requests for appeals must be submitted in writing and sent to GBCI by verified and traceable email, U.S. Postal Service mail, personal delivery, or private courier (such as Federal Express, United Parcel Service, etc), within thirty (30) calendar days after the owner's receipt of the Review Panel's decision. Requests for appeals must be accompanied by written briefing setting forth the basis for the appeal. If the project owner requests an appeal in accordance with this section, the fees outlined in pricing Appendix A must be provided to GBCI within thirty (30) calendar days of GBCI's receipt of such request.

In order to overturn a certification challenge decision by the Review Panel, it shall be the burden of the project owner to demonstrate to the satisfaction of the GBCI Board of Directors that such decision was arbitrary or capricious.
The GBCI Board of Directors will render a written decision based on the record below and written briefs (if any); there will be no oral hearing. The decision of the GBCI Board of Directors will be mailed promptly by certified mail, return receipt requested, to the project owner. Decisions rendered by the GBCI Board of Directors shall be final. Persons submitting complaints shall be notified of the decision of the GBCI Board of Directors.

1.9 Revocation of LEED certification: Based on the final determination of a Certification Challenge, GBCI retains the right to reduce the level of LEED certification awarded, or to revoke an award of LEED certification.

GBCI retains the right, in its sole discretion, to revoke LEED certification from any project where it is denied access to a project for the purposes of performing an audit or site visit, or it is prevented from examining documentation related to the project's design, construction, and/or operations pertaining to LEED certification, as a result of a project owner being unwilling or unable to provide such access or documentation.

GBCI retains the right, in its reasonable discretion, to revoke LEED certification from any project where it is denied access to, or for which it is not provided with, energy and water use data on an ongoing basis after LEED certification is conferred, as is required.

To the extent a project is subject to revocation of LEED certification, such project will be removed from the LEED certified project database and may no longer be referred to as a LEED certified project. GBCI shall identify the project's certification as having been revoked. Additionally, if GBCI revokes certification of any project for which a Platinum-level certification was previously awarded, and for which the project owner received a rebate of any or all certification fees, the owner of such project shall be liable for refunding all monies so received to GBCI. Further, the owner of such project shall immediately terminate all use and display of any LEED trademarks, associated logos, and other intellectual property licensed by GBCI.

FEES

LEED certification provides an exceptional value for your money: So, how much will it cost to certify your project?

Registration fee: There is a flat registration fee calculated on a per-project (building) basis that you'll pay up front at the time of registration. If we haven't received your payment within 60 days of your registration, we'll assume you changed your mind and go ahead and cancel the registration.

Certification fee: The certification fee is charged on a per-project (building) basis and based on the size of the project and the rating system under which the project is registered. Certification fees are due when you submit your application for review. After all that work you did to submit your documentation, don't forget to send your payment! Remember, GBCI will not begin your review until payment in full has been received and cleared our system (thank you!). Also, please note that certification fees are based on the fees published at the time the project is submitted for review.

Other fees: Other fees related to expedited reviews, appeals, and other optional aspects of the LEED certification process may apply, should you pursue these avenues.

Member discounts: USGBC Silver, Gold and Platinum level member organizations benefit from discounted LEED registration and certification fees. Discounts are available based on the membership status of either the owner or the project administrator for a given LEED project. Visit the fee charts page below for more information on available discounts.

View all of the fee charts »

RESOURCES & TOOLS

USGBC offers a number of resources and tools to support you during the process of LEED certification.

General resources

Credit Library
Addenda database
Pilot Credit library

Regional Priority Credit lookup
LEED Online: v4, v3
Legal agreements: LEED Certification Agreement, Confirmation of Agent's Authority, Comfirmation of Primary Owner's Authority, Change of Owner Agreement

BD+C specific

LEED v4

Reference Guide
Rating System Document
Checklist

LEED 2009

Reference Guide
Supplements: Healthcare, Retail
Rating System Document: New Construction, Retail, Healthcare, Schools, Core & Shell
Checklist: New Construction, Core & Shell, Schools, Healthcare

LEED v2.2

Reference Guide (New Construction)
Rating System Document
Checklist

LEED v2.1

Rating System Document
Checklist

LEED v2.0

Reference Guide (New Construction)
Reference Guide (Schools)
Reference Guide (Core and Shell)
Rating System Document
Checklist

ID+C specific

LEED v4

Reference Guide
Rating System Document
Checklist

LEED 2009

Reference Guide
Retail Supplement
Rating System Document: Commercial Interiors, Retail
Checklist: Commercial Interiors, Retail

LEED v2

Reference Guide
Rating System Document
Checklist

O+M specific

LEED v4

Reference Guide
Rating System Document
Checklist

LEED 2009

Reference Guide
Rating System Document
Checklist

LEED v2

Reference Guide
Rating System Document
Checklist

LEED Certification Fees

DOWNLOAD PDF

Registration and Certification Fees

Registration is a flat fee paid up front at the time of registration; rates are based on the date of registration. The certification fee is based your project's rating system and size; it is calculated and paid when the project team submits documentation for review in LEED Online. The fees for either the standard and split review cover both the preliminary and final reviews.

Please note: Registration and certification fees are subject to change and are calculated on the dates of registration and certification submission.

Choose from the rating systems and programs in the tabs below to review registration and certification fees.

You'll notice discounted pricing options for USGBC members. Discounts are available based on the membership status of either the owner or the project administrator for a given LEED project.

Visit our payment help section to search for frequently asked questions. If you need assistance at any time, please call, email, or live chat with us.

Building Design and Construction Fees

Building Design and Construction Fees	ORGANIZATIONAL LEVEL OR NON-MEMBERS	SILVER, GOLD AND PLATINUM LEVEL MEMBERS	MEMBER SAVINGS
REGISTRATION	$1,200	$900	$300
PRECERTIFICATION REVIEW (optional, LEED CS only)			
Flat fee (per building)	$4,250	$3,250	**$1,000**
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$5,000		
COMBINED REVIEW: DESIGN & CONSTRUCTION			
Project gross floor area (excluding parking): less than 50,000 sq ft	$2,750	$2,250	**$500**
Project gross floor area (excluding parking): 50,000-500,000 sq ft	$0.055/sf	$0.045/sf	**$0.01/sf**
Project gross floor area (excluding parking): more than 500,000 sq ft	$27,500	$22,500	**$5,000**
Expedited review (reduce from 20-25 business days to 10-12, available	+ $10,000		

based on GBCI review capacity)			
SPLIT REVIEW: DESIGN			
Project gross floor area (excluding parking): less than 50,000 sq ft	$2,250	$2,000	**$250**
Project gross floor area (excluding parking): 50,000-500,000 sq ft	$0.045/sf	$0.04/sf	**$0.005/sf**
Project gross floor area (excluding parking): more than 500,000 sq ft	$22,500	$20,000	**$2,500**
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$5,000		
SPLIT REVIEW: CONSTRUCTION			
Project gross floor area (excluding parking): less than 50,000 sq ft	$750	$500	**$250**
Project gross floor area (excluding parking): 50,000-500,000 sq ft	$0.015/sf	$0.01/sf	**$0.005/sf**
Project gross floor area (excluding parking): more than 500,000 sq ft	$7,500	$5,000	**$2,500**
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$5,000		
APPEALS			
Complex credits	$800/credit		
All other credits	$500/credit		
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	+ $500/credit		
FORMAL INQUIRIES			
Project CIRs	$220/credit		

Interior Design and Construction Fees

Interior Design and Construction Fees	ORGANIZATIONAL LEVEL OR NON-MEMBERS	SILVER, GOLD AND PLATINUM LEVEL MEMBERS	MEMBER SAVINGS
REGISTRATION	**$1,200**	**$900**	**$300**
COMBINED REVIEW: DESIGN & CONSTRUCTION			
Project gross floor area (excluding parking): less than 50,000 sq ft	$2,750	$2,250	**$500**
Project gross floor area (excluding parking): 50,000-500,000 sq ft	$0.055/sf	$0.045/sf	**$0.01/sf**
Project gross floor area (excluding parking): more than 500,000 sq ft	$27,500	$22,500	**$5,000**
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$10,000		
SPLIT REVIEW: DESIGN			
Project gross floor area (excluding parking): less than 50,000 sq ft	$2,250	$2,000	**$250**

Project gross floor area (excluding parking): 50,000-500,000 sq ft	$0.045/sf	$0.04/sf	**$0.005/sf**
Project gross floor area (excluding parking): more than 500,000 sq ft	$22,500	$20,000	**$2,500**
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$5,000		
SPLIT REVIEW: CONSTRUCTION			
Project gross floor area (excluding parking): less than 50,000 sq ft	$750	$500	**$250**
Project gross floor area (excluding parking): 50,000-500,000 sq ft	$0.015/sf	$0.01/sf	**$0.005/sf**
Project gross floor area (excluding parking): more than 500,000 sq ft	$7,500	$5,000	**$2,500**
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$5,000		
APPEALS			
Complex credits	$800/credit		
All other credits	$500/credit		
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	+ $500/credit		
FORMAL INQUIRIES			
Project CIRs	$220/credit		

Building Operations and Maintenance Fees

Operations and Maintenance Fees	ORGANIZATIONAL LEVEL OR NON-MEMBERS	SILVER, GOLD AND PLATINUM LEVEL MEMBERS	MEMBER SAVINGS
REGISTRATION	**$1,200**	**$900**	**$300**
Recertification registration (recertification is required within five years of LEED O+M certification)	Free		
INITIAL REVIEW			
Project gross floor area (excluding parking): less than 50,000 sq ft	$2,000	$1,500	**$500**
Project gross floor area (excluding parking): 50,000-500,000 sq ft	$0.04/sf	$0.03/sf	**$0.01/sf**
Project gross floor area (excluding parking): more than 500,000 sq ft	$20,000	$15,000	**$5,000**
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$10,000		

RECERTIFICATION REVIEW			
Project gross floor area (excluding parking): less than 50,000 sq ft	$2,000	$1,500	**$500**
Project gross floor area (excluding parking): 50,000-500,000 sq ft	$0.04/sf	$0.03/sf	**$0.01/sf**
Project gross floor area (excluding parking): more than 500,000 sq ft	$20,000	$15,000	**$5,000**
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$10,000		
APPEALS			
Complex credits	$800/credit		
All other credits	$500/credit		
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	+ $500/credit		
FORMAL INQUIRIES			
Project CIRs	$220/credit		

Neighborhood Development Fees

Neighborhood Development Fees	FIRST 20 ACRES	PER ACRE OVER 20
REGISTRATION	**$1,500/PROJECT**	
Smart Location and Linkage (SLL) Prerequisite Review (optional)	$2,250	
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$5,000	
Initial Stage Review	$18,000	$350/acre
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$25,000	
Subsequent Stage Review	$10,000	$350/acre
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$15,000	
APPEALS		
All credits	$500 per credit	
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	+ $500 per credit	

All LEED-ND projects larger than 320 acres must contact GBCI about pricing.

Homes Fees

Note: Additional fees will be charged by the verification team – contact your team for more information.

Homes Fees	ORGANIZATIONAL LEVEL OR NON-MEMBERS	SILVER, GOLD AND PLATINUM LEVEL MEMBERS	MEMBER SAVINGS
SINGLE FAMILY HOUSING (COST PER HOME)			
Registration (1-9 homes)	$225	$150	**$75**
Registration (10-24 homes)	$200	$125	**$75**
Registration (25-49 homes)	$175	$100	**$75**
Registration (50-99 homes)	$150	$75	**$75**
Registration (100 or more homes)	$125	$50	**$75**
Certification (1 home)	$300	$225	**$75**
Certification (per batch submittal)	$225 per batch	$175 per batch	**$50**
	+ $75 per home	+ $50 per home	**$25 per home**
LOW-RISE MULTI-FAMILY HOUSING (COST PER BUILDING)			
Registration	$900	$750	**$150**
Certification (less than 50 units)	$0.045 psf	$0.035 psf	**$0.010 psf**
Certification (50 or more units)	$0.040 psf	$0.030 psf	**$0.010 psf**
MID-RISE MULTI-FAMILY HOUSING (COST PER BUILDING)			
Registration	$1,050	$900	**$150**
Certification (less than 50 units)	$0.045 psf	$0.035 psf	**$0.010 psf**
Certification (50 or more units)	$0.040 psf	$0.030 psf	**$0.010 psf**

Campus Fees

Campus Fees	ORGANIZATIONAL LEVEL OR NON-MEMBERS	SILVER, GOLD AND PLATINUM LEVEL MEMBERS	MEMBER SAVINGS
CAMPUS APPROACH (MASTER SITE)			
Master Site registration	$1,200	$900	**$300**
Each individual on-campus project registration	$1,200 per building or space	$900 per building or space	**$300 per building or space**
PRECERTIFICATION REVIEW (optional, LEED CS only)			
Master Site	$2,000	$1,500	**$500**
Each individual on-campus project	20% off standard certification fees*		
COMBINED REVIEW: DESIGN AND CONSTRUCTION & OPERATIONS AND MAINTENANCE			
Master Site	$2,000	$1,500	**$500**
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$10,000		
Each individual on-campus project	20% off standard certification fees*		
SPLIT REVIEW: DESIGN			
Master Site	$1,500	$1,200	**$300**
Expedited review (reduce from 20-25 business days to 10-12			

available based on GBCI review capacity)	$5,000		
Each individual on-campus project	20% off standard certification fees*		
SPLIT REVIEW: CONSTRUCTION			
Master Site	$750	$500	**$250**
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$5,000		
Each individual on-campus project	20% off standard certification fees*		

**Please note that Group projects are not eligible for the 20% discount on certification fees even if they are utilizing campus credits from a Master Site.*

GROUP CERTIFICATION APPROACH			
Registration*	$1,200 per building or space within group	$900 per building or space within group	**$300 per building**
PRECERTIFICATION REVIEW (LEED CS only)			
Group project certification*	Standard certification fees as calculated per building or space within the group project		

**Registration, precertification review (CS only) and certification review fees for group projects are equivalent to what would be charged if each building or space within the group were registered and reviewed as a separate LEED project. However, fees for appeals and formal inquiries are assessed per group project, not per building or space within the group.*

ALL PROJECTS (CAMPUS AND GROUP)	
APPEALS	
Complex credits	$800 per credit
All other credits	$500 per credit
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	+ $500/credit

Volume Program Fees

Volume Fees	GOLD AND PLATINUM LEVEL MEMBERS*
PROGRAM ADMISSION FEE	$10,000
PROTOTYPE FEE	$30,000
VOLUME PROJECTS FEE	
Projects 1-3	$2,000 per project
Projects 4+	$2,000 maximum per project**
ADDITIONAL FEES OR SERVICES	
Additional credit, re-precertified credit, additional credit approach, appeal, or CIR Review (prototype)	$1,000
Individual credit, appeal, or CIR Review (volume project)	$500
Additional or customized training	$5,000 per training
Remediation plan (if required)	$5,000

**Contact us for pricing for organizational or silver level members, or for non-members*
***Volume project fees for projects 4+ varies by average project size and quantity. Contact us with details about your portfolio for a fee estimate.*

USGBC

Project tools

Addenda database

Pilot credit library

Pilot credit registration

Regional priority credit lookup

Sample forms

Reference guide

BD+C

ID+C

O+M

Homes

ND

LEED v4

Building Design + Construction Guide

Applies to buildings that are being newly constructed or going through a major

New Construction | Core and Shell | Schools | Retail | Healthcare | Data Centers | Hospit
Distribution Centers

Getting Started

How to use this reference guide

This reference guide is designed to elaborate upon and work in conjunction with the rat
expert users of LEED, it serves as a roadmap, describing the steps for meeting and do
requirements and offering advice on best practices.

Within each section, information is organized to flow from general guidance to more spe
supporting references and other information. Sections have been designed with a paral
way finding and minimize repetition.

Each credit category begins with an overview that discusses sustainability and market f
category. For each prerequisite and credit, readers will then find the following sections:

- *Intent & Requirements* outlines the rating system requirements for achieving the prerequisite or cr
through the rating system development process and can also be found on the USGBC website.
- *Behind the Intent* connects credit achievement with larger sustainability issues and provides inform
requirements meet the intent stated in the rating system.
- *Step-by-Step Guidance* suggests the implementation and documentation steps that can be used
as generally applicable tips and examples.
- *Further Explanation* provides guidance for lengthy calculations or for special project situations, su
project types or different credit approaches. It includes a Campus section and, sometimes, an Int
- *Required Documentation* lists the items that must be submitted for certification review.
- *Related Credit Tips* identifies other credits that may affect a project team's decisions and strategi
question; the relationships between credits may imply synergies or trade-offs.

Changes from LEED 2009 is a quick reference of changes from the previous version of LEED.

- *Referenced Standards* lists the technical standards related to the credit and offers weblinks to fin
- *Exemplary Performance* identifies the threshold that must be met to earn an exemplary performa
- *Definitions* gives the meaning of terms used in the credit.

More about the Further Explanation section

Further Explanation contains varied subsections depending on the credit; two of the co elaborated upon here.

Campus Projects

Campus refers to the Campus Program for Projects on a Shared Site multiple buildings and under the control of a single entity. Examples include buildings on a corporate or e and structures in a commercial development. Only project teams using the Campus Pro the guidance in the Campus section; the guidance is not applicable to projects that are are part of a multitenant complex but not pursuing certification using the Campus Progr

There are two approaches to certifying multiple buildings under the Campus Program:

- **Group Approach** allows buildings that are substantially similar and are in a single location to cer shares a single certification.
- **Campus Approach** allows buildings that share a single location and site attributes to achieve se for each project, building space, or group on the master site.

For each approach, the reference guide gives any credit-specific information and notes scenarios:

- **Group Approach**
  - All buildings in the group may be documented as one. The buildings may meet the credit requir by, for example, pooling resources or purchasing, and then submitting a single set of document
  - Submit separate documentation for each building. Each building in the group project must meet individually for the project to earn the credit.
- **Campus Approach**
  - "Eligible." This credit may be documented once at the level of the master site, and then individu master site boundary earn the credit without submitting additional documentation.
  - "Ineligible. Each LEED project may pursue the credit individually." Each project within the camp credit but each project must document compliance separately.

Projects Outside the U.S.

The International Tips section offers advice on determining equivalency to U.S. standar standards referenced in the rating system. It is meant to complement, not replace, the c credit. Helpful advice for projects outside the U.S. may also appear in the *Step-by-Step* each credit. When no tips are needed or available, the International Tips heading does

Units of measurement are given in both Inch-Pound (IP) and International System of U the system of measurements based on the inch, pound, and gallon, historically derived system and commonly used in the U.S. SI is the modern metric system used in most ot

and defined by the General Conference on Weights and Measures.

Where “local equivalent” is specified, it means an alternative to a LEED referenced sta a project’s locality. This standard must be widely used and accepted by industry expert must meet the credit’s intent leading to similar or better outcomes.

Where “USGBC-approved local equivalent” is specified, it means a local standard deer listed standard by the U.S. Green Building Council through its process for establishing in LEED.

Taking an Integrative Approach to Design and Construction

The realization of benefits associated with LEED starts with a transformation of the des Success in LEED and green building design is best accomplished through an integrativ prioritizes cost-effectiveness over both the short and long terms and engages all projec discovering beneficial interrelationships and synergies between systems and compone technical and living systems, the team can achieve high levels of building performance and environmental benefits.

Conventionally, the design and construction disciplines work separately, and their solut construction challenges are fragmented. These “solutions” often create unintended con positive, but mostly negative. The corollary is that when areas of practice are integrated to significantly improve building performance and achieve synergies that yield economi human health benefits.

In the conventional design process, each discipline’s practitioner is expected to design system components under his or her control for the most benefit and the least cost. In a an entire team—client, designers, builders, and operators—identifies overlapping relati redundancies among systems so that interdependencies and benefits (which otherwise unnoticed) can be exploited, thereby increasing performance and reducing costs.

To work this way requires that project teams, whose members represent various discip so that the knowledge, analyses, and ideas from each discipline can inform and link wit components of all other disciplines. In this way, LEED credits become aspects of a wh separate components, and the entire design and construction team can identify the inte linked benefits across multiple LEED credits.

The coordination of building and site systems should be addressed early, preferably be The Integrative Process credit formally introduces this way of working into LEED so tha expertise in building and site systems can inform the performance, efficiency, and effec system.

The strategies in the Integrative Process credit are recommended for all LEED projects encourage integration during early design stages, when it will be the most effective. Th integrative process by focusing on engaging energy- and water-related research and a design decisions through high levels of collaboration among all project team members.

Approaching certification using an integrative process gives the project team the greate The process includes three phases:

- Discovery. The most important phase of the integrative process, discovery can be thought of as a

what is conventionally called predesign. A project is unlikely to meets its environmental goals cos discrete phase. Discovery work should take place before schematic design begins.

- Design and construction (implementation). This phase begins with what is conventionally called s resembles conventional practice but integrates all the work and collective understanding of syster during the discovery phase.
- Occupancy, operations, and performance feedback. This third stage focuses on preparing to mea creating feedback mechanisms. Assessing performance against targets is critical for informing bui identifying the need for any corrective action.

Achieving economic and environmental performance requires that every issue and all t designers, engineers, constructors, operators) be brought into the project at the earlies is yet designed. The structure to manage this flow of people, information, and analysis

- All project team members, representing all design and construction disciplines, gather information project.
- Team members analyze their information.
- Team members participate in workshops to compare notes and identify opportunities for synergy.

This process of research, analysis, and workshops is done in an iterative cycle that refi solutions. In the best scenario, the research and workshops continue until the project s all reasonable synergies are identified, and the related strategies associated with all LE documented and implemented.

Devising a LEED Work Plan

It is recommended that LEED applicants follow a series of steps to certification.

Step 1. Initiate discovery phase

Begin initial research and analysis (see Integrative Process Credit). When sufficient inf gathered, hold a goal-setting workshop to discuss findings.

Step 2. Select LEED rating system

The LEED system comprises 21 adaptations designed to accommodate the needs of a sectors (see Rating System Selection Guidance). For many credits, Further Explanatio system and project type variations to help teams develop a successful approach.

Step 3. Check minimum program requirements

All projects seeking certification are required to comply with the minimum program requ the applicable rating system, found in this reference guide and on the USGBC website.

Step 4. Establish project goals

Prioritize strategies for certification that align with the project's context and the values c owner, or organization. Once these values are articulated, project teams will be able to strategies and associated LEED credits to meet the goals.

The recommended method for establishing project goals is to convene a goal-setting w Integrative Process Credit) for the project team members and the owner. Understandin budget, schedule, functional programmatic requirements, scope, quality, performance t expectations will promote creative problem solving and encourage fruitful interaction.

To capture the most opportunities, the workshop should occur before any design work representation from the design and construction disciplines.

Step 5. Define LEED project scope

Review the project's program and initial findings from the goal-setting workshop to iden Special considerations include off-site or campus amenities or shared facilities that ma occupants.

Next, map the LEED project boundary along property lines. If the project boundary is n ownership by multiple entities, partial renovations, or other issues, see the minimum pr Share the final project boundary decision with the entire team, since this site definition prerequisites and credits. Finally, investigate any special certification programs that ma project's scope, such as the Volume Program or the Campus Program. If the project ow multiple similar buildings in different locations, Volume may be a useful program to stre the project includes multiple buildings in a single location, Campus may be appropriate

Step 6. Develop LEED scorecard

Use the project goals to identify the credits and options that should be attempted by the Intent sections offer insight into what each credit is intended to achieve and may help t credits that bring value to the owner, environment, and community of the project.

This process should focus the team on those credits with the highest value for the proje Once the high-priority credits have been selected, identify related credits that reinforce and provide synergistic benefits.

Finally, establish the target LEED certification level (Certified, Silver, Gold, or Platinum) credits needed to achieve it. Make sure that all prerequisites can be met and include a points above the minimum in case of changes during design and construction.

Step 7. Continue discovery phase

Project team members should perform additional research and analysis as the project analysis, testing alternatives, comparing notes, generating ideas in small meetings, and Examples of research and analysis for energy- and water-related systems are outlined Process credit.

The project team should reassemble occasionally to discuss overlapping benefits and best to use the waste products from one system to benefit other systems). This approa discovery of new opportunities, raises new questions, and facilitates testing across disc

Step 8. Continue iterative process

The above pattern of research and analysis followed by team workshops should contin satisfy the project team and owner.

Step 9. Assign roles and responsibilities

Select one team member to take primary responsibility for leading the group through th and documentation process. This leadership role may change from the design to the co both the design and the construction leaders should be involved throughout the proces consistency, clarity, and an integrative approach.

Cross-disciplinary team ownership of LEED credit compliance can help foster integrativ ensuring consistent documentation across credits. On a credit-by-credit basis, assign p

roles to appropriate team members for credit achievement and documentation. Clarify r
ensuring that design decisions are accurately represented in drawings and specificatio
construction details match design documentation.

Establish regular meeting dates and develop clear communication channels to streamli
resolve issues quickly.

Step 10. Develop consistent documentation

Consistent documentation is critical to achieving LEED certification.

Data accumulated throughout the construction process, such as construction materials
gathered and assessed at regular intervals to allow the team to track ongoing progress
achievement and ensure that information is not misplaced or omitted. Maintaining Cons
Application, below, and the credit category overviews discuss the numeric values and r
affect achievement of multiple credits within a credit category.

Step 11. Perform quality assurance review and submit for certification

A quality assurance review is an essential part of the work program. A thorough quality
improve clarity and consistency of the project's LEED documentation, thereby avoiding
time and expense to correct later in the certification process. The submission should be
and checked for completeness. In particular, numeric values that appear throughout the
area) must be consistent across credits.

Maintaining Consistency in the Application

Certain issues recur across multiple credits and credit categories and must be treated c
the submission.

Special Project Situations

Projects with a combination of space types or unusual space types should pay particula
these characteristics influence credit achievement. Common project programs that requ
consideration include the following:

Mixed-Use

Projects with a mix of uses may find it helpful to consult the Project Type Variations an
Variations sections in the reference guide for advice. For example, if an office building c
New Construction includes a small data center, the team should follow the data center
credits; these guidelines are not limited to BD+C: Data Centers projects. Another comm
project certifying under BD+C: Hospitality; in designing the retail spaces on the hotel's
could benefit from guidance for BD+C: Retail projects.

Multitenant Complex

Some projects may be part of a large complex of buildings or a master planned develop
follow the multitenant complex approach if it is part of a master plan development, rega
project is using the LEED Campus approach.

Incomplete Spaces

Buildings and spaces that earn LEED certification should be completed by the time the

final application for LEED certification. *Complete* means that no further work is needed ready for occupancy. No more than 40% of the certifying gross floor area of a LEED pr incomplete space unless the project is using the LEED BD+C: Core and Shell rating sy projects that include incomplete spaces must use Appendix 2 Default Occupancy Cour occupant counts for incomplete spaces.

For incomplete spaces in projects using a rating system other than LEED BD+C: Core team must provide supplemental documentation.

- Submit a letter of commitment, signed by the owner, indicating that the remaining incomplete spa requirements of each prerequisite and credit achieved by this project if and when completed by th cover the commitment in general terms and need not address each prerequisite or credit individu
- For incomplete spaces intended to be finished by tenants (i.e., parties other than the owner), sub tenant design and construction guidelines, with a brief explanation of the project circumstances.

For prerequisites with established baselines (e.g., WE Prerequisite Indoor Water Use, E Minimum Energy Performance) and the credits dependent on the calculations in the pre proposed design must be equivalent to the baseline for the incomplete spaces. Project claim environmental performance or benefit beyond the baseline for incomplete spaces Tenant Lease and Sales Agreement section.

Projects with Several Physically Distinct Structures

Primary and secondary school projects, hospitals (general medical and surgical), hotels properties, as defined for ENERGY STAR building rating purposes, are eligible to inclu physically distinct structure in a single LEED project certification application without hav Program, subject to the following conditions.

- The buildings to be certified must be a part of the same identity. For example, the buildings are a elementary school, not a mix of elementary school and high school buildings.
- The project must be analyzed as a whole (i.e., in aggregate) for all minimum program requiremer and credits in the LEED rating system.
- All the land area and all building floor areas within the LEED project boundary must be included credit submitted for certification.
- There is no specific limit on the number of structures, but the aggregate gross floor area included not exceed 1 million square feet (92 905 square meters).

Any single structure that is larger than 25,000 square feet (2 320 square meters) must separate project or treated as a separate building in a group certification approach.

Renovations and Additions

Refer to the minimum program requirements for information on how boundaries should renovation and addition projects. Additionally, use the following guidance for treating er project with mechanical systems.

- Separate systems. Mechanical systems are completely separate from those in the existing buildin excepted) and can be modeled separately.
- Shared central systems located outside the project building or space. Each prerequisite and credi modeling offers specific guidance on how to handle this situation; in particular, see the guidance Minimum Energy Performance.

Tenant Sales and Lease Agreement

LEED BD+C: Core and Shell is designed to address the speculatively driven developm

project teams routinely do not control all aspects of the building's construction. The sco
limited to those elements of the project under the direct control of the owner/developer.
scope includes the core and the shell of the base building but can vary significantly fro

Given that Core and Shell is limited in its ability to control the design and construction c
outs, project teams should pursue credits that address parts of the building within the L
Only portions of the building within the LEED project scope should be used in credit ca
team wishes to pursue additional credits or thresholds beyond the construction scope c
binding tenant sales and lease agreement must be provided as documentation. This m
future tenant and include terms related to how the technical credit requirements will be
tenant. An unsigned or sample lease agreement is not acceptable. Please note that lea
required in order to pursue Core and Shell. They are only used if a project is aiming to
considered outside of the project design and construction scope that will be fit-out by a

Previous Development

Several credits require the assessment of a piece of land to determine whether it has b
developed, defined as follows:

> ***previously developed*** *altered by paving, construction, and/or land use that would ty
> regulatory permitting to have been initiated (alterations may exist now or in the past).
> previously developed and landscapes altered by current or historical clearing or fillin
> forestry use, or preserved natural area use are considered undeveloped land. The da
> development permit issuance constitutes the date of previous development, but perm
> does not constitute previous development.*

Tricky lands to assess include those with few buildings present. If the land previously h
considered previously developed even if those buildings have since been torn down. A
confusing situation is parkland. Pay careful attention to the type of parkland. Improved
landscaping and constructed features like playgrounds (e.g., a city park) are considere
developed. Land that has only been cleared or graded, with no additional improvement
previously developed. Land maintained in a natural state (e.g., a forest preserve) is not
developed, even if minor features like walking paths are present.

Development Footprint

A project's development footprint is all of its impervious surfaces.

> ***development footprint*** *the total land area of a project site covered by buildings, stre
> and other typically impermeable surfaces constructed as part of the project*

Surfaces paved with permeable pavement (at least 50% permeable) are excluded from
footprint.

Density

Density can be calculated separately for residential and nonresidential elements or as a
following definitions apply:

> ***density*** *a ratio of building coverage on a given parcel of land to the size of that parce
> measured using floor area ratio (FAR); dwelling units per acre (DU/acre) or dwelling
> (DU/hectare); square feet of building area per acre of buildable land; or square mete
> hectare of buildable land. It does not include structured parking.*
>
> ***buildable land*** *the portion of the site where construction can occur, including land vo*

not constructed on. When used in density calculations, buildable land excludes publi land excluded from development by codified law.

Land voluntarily set aside and not built on, such as open space, is considered buildable available for construction but set aside voluntarily. For example, 5 acres (2 hectares) of by local government code would be considered nonbuildable, but if a developer volunta additional 3 acres (1.2 hectares) for more park space, those 3 acres (1.2 hectares) mus buildable land.

After determining buildable land, calculate residential or nonresidential density or a com calculate residential density, divide the number of dwelling units by the amount of resid calculate nonresidential density, use floor area ratio (FAR):

floor-area ratio (FAR) *the density of nonresidential land use, exclusive of structured the total nonresidential building floor area divided by the total buildable land area ava nonresidential buildings.*

For example, on a site with 10,000 square feet (930 square meters) of buildable nonres building of 10,000 square feet (930 square meters) of floor area would have a FAR of 1 a building of 5,000 square feet (465 square meters) would have a FAR of 0.5; a buildin (1395 square meters) would have a FAR of 1.5; and a building of 20,000 square feet (1 would have a FAR of 2.0.

To calculate the combined density for residential and nonresidential areas, use FAR.

Occupancy

Many kinds of people use a typical LEED building, and the mix varies by project type. C sometimes referred to in a general sense; for example, “Provide places of respite that a patients and visitors.” In other instances, occupants must be counted for calculations. D types are general guidelines that may be modified or superseded in a particular credit v changes are noted in each credit’s reference guide section). Most credits group users in regular building occupants and visitors.

Regular Building Occupants

Regular building occupants are habitual users of a building. All of the following are cons occupants.

Employees include part-time and full-time employees, and totals are calculated using fu (FTE).

A typical project can count FTE employees by adding full-time employees and part-time for their hours of work.

Equation 1. FTE employees = Full-time employees + (Σ daily part-time employee hours) / 8

For buildings with more unusual occupancy patterns, calculate the FTE building occupa standard eight-hour occupancy period.

Equation 2. FTE employees = (Σ all employee hours) / 8

Staff *is synonymous with employees for the purpose of LEED calculations.*

Volunteers *who regularly use a building are synonymous with employees for the pur calculations.*

***Residents** of a project are considered regular building occupants. This includes resi actual resident count is not known, use a default equal to the number of bedrooms in one, multiplied by the number of such dwelling units.*

***Primary and secondary school students** are typically regular building occupants (s Credit Bicycle Facilities).*

***Hotel guests** are typically considered regular building occupants, with some credit-sp Calculate the number of overnight hotel guests based on the number and size of unit Assume 1.5 occupants per guest room and multiply the resulting total by 60% (avera Alternatively, the number of hotel guest occupants may be derived from actual or hist*

***Inpatients** are medical, surgical, maternity, specialty, and intensive-care unit patients exceeds 23 hours. **Peak inpatients** are the highest number of inpatients at a given p hour period.*

Visitors

Visitors (also “transients”) intermittently use a LEED building. All of the following are co

***Retail customers** are considered visitors. In Water Efficiency credits, retail customer separately from other kinds of visitors and should not be included in the total average*

***Outpatients** visit a hospital, clinic, or associated health care facility for diagnosis or t hours or less (see SS Credit Direct Exterior Access for credit-specific exceptions).*

***Peak outpatients** are the highest number of outpatients at a given point in a typical 2*

***Volunteers** who periodically use a building (e.g., once per week) are considered visi*

***Higher-education students** are considered visitors to most buildings, except when t dorm, in which case they are residents.*

In calculations, occupant types are typically counted in two ways:

***Daily averages** take into account all the occupants of a given type for a typical 24-h*

***Peak totals** are measured at the moment in a typical 24-hour period when the highe occupant type is present.*

Whenever possible, use actual or predicted occupancies. If occupancy cannot be accu the following resources to estimate occupancy:

a. Default occupant density from ASHRAE 62.1-2010, Table 6-1
b. Default occupant density from CEN Standard EN 15251, Table B.2
c. Appendix 2 Default Occupancy Counts
d. Results from applicable studies.

If numbers vary seasonally, use occupancy numbers that are a representative daily ave operating season of the building.

If occupancy patterns are atypical (shift overlap, significant seasonal variation), explain submitting documentation for certification.

Table 1 lists prerequisites and credits that require specific occupancy counts for calcula

TABLE 1. Occupancy types for calculations, by project type variation

PREREQUISITE, CREDIT	REGULAR BUILDING OCCUPANTS	AVERAGE DAILY VISITORS	PEAK VISITORS	OTHER	NOTES
LT CREDIT BICYCLE FACILITIES					
New Construction, Core and Shell, Data Centers, Warehouses and Distribution Centers, Hospitality	X		X		
Schools	X				Students grade 3 (age 8) and younger are not included in regular building occupants for this credit.
Retail	X				
Healthcare	X		X		Exclude patients.
LT CREDIT ACCESS TO QUALITY TRANSIT					
Schools				X	Count primary and secondary students only.
SS CREDIT DIRECT EXTERIOR ACCESS					
Healthcare				X	Count only peak inpatients and peak outpatients. For this credit, outpatients with clinical length of stay greater than 4 hours are included with inpatients.
WE PREREQUISITE AND CREDIT INDOOR WATER USE					
New Construction, Core and Shell, Data Centers, Warehouses and Distribution Centers, Hospitality, Retail, Healthcare	X	X			Retail customers are considered separately and not included in average daily visitors.
Schools	X	X			See credit-specific occupancy guidance.

Quick Reference

Table 2. Credit attributes

TABLE 2. Credit Attributes

					Points						
Category	Prerequisite/ Credit	Credit Name	Design/Construction	Exemplary Performance	New Construction	Core and Shell	Schools	Retail	Data Centers	Warehouses and Distribution Centers	Hospitality
n/a	P	Integrated Project Planning and Design	D	no	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	C	Integrative Process	D	no	1	1	1	1	1	1	1
LT Location and Transportation											
LT	C	LEED for Neighborhood Development Location	D	no	16	20	15	16	16	16	16
LT	C	Sensitive Land Protection	D	no	1	2	1	1	1	1	1
LT	C	High Priority Site	D	yes	2	3	2	2	2	2	2
LT	C	Surrounding Density and Diverse Uses	D	yes, except IWDC	5	6	5	5	5	5	5
LT	C	Access to Quality Transit	D	yes	5	6	4	5	5	5	5
LT	C	Bicycle Facilities	D	no	1	1	1	1	1	1	1
LT	C	Reduced Parking Footprint	D	yes	1	1	1	1	1	1	1
LT	C	Green Vehicles	D	no	1	1	1	1	1	1	1
SS Sustainable Sites											
SS	P	Construction Activity Pollution Prevention	C	no	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
SS	P	Environmental Site Assessment	D	no	n/a	n/a	Req'd	n/a	n/a	n/a	n/a
SS	C	Site Assessment	D	no	1	1	1	1	1	1	1
SS	C	Site Development—Protect or Restore Habitat	D	yes	2	2	2	2	2	2	2
SS	C	Open Space	D	no	1	1	1	1	1	1	1
SS	C	Rainwater Management	D	yes	3	3	3	3	3	3	3
SS	C	Heat Island Reduction	D	yes	2	2	2	2	2	2	2
SS	C	Light Pollution Reduction	D	no	1	1	1	1	1	1	1
SS	C	Site Master Plan	D	no	n/a	n/a	1	n/a	n/a	n/a	n/a
SS	C	Tenant Design and Construction Guidelines	D	no	n/a	1	n/a	n/a	n/a	n/a	n/a
SS	C	Places of Respite	D	yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SS	C	Direct Exterior Access	D	no	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SS	C	Joint Use of Facilities	D	no	n/a	n/a	1	n/a	n/a	n/a	n/a
WE Water Efficiency											
WE	P	Outdoor Water Use Reduction	D	no	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
WE	P	Indoor Water Use Reduction	D	no	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
WE	P	Building-Level Water Metering	D	no	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
WE	C	Outdoor Water Use Reduction	D	no	2	2	2	2	2	2	2
WE	C	Indoor Water Use Reduction	D	yes	6	6	7	7	6	6	6
WE	C	Cooling Tower Water Use	D	no	2	2	2	2	2	2	2
WE	C	Water Metering	D	no	1	1	1	1	1	1	1
EA Energy and Atmosphere											
EA	P	Fundamental Commissioning and Verification	C	no	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
EA	P	Minimum Energy Performance	D	no	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
EA	P	Building-Level Energy Metering	D	no	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
EA	P	Fundamental Refrigerant Management	D	no	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
EA	C	Enhanced Commissioning	C	no	6	6	6	6	6	6	6
EA	C	Optimize Energy Performance	D	yes	18	18	16	18	18	18	18
EA	C	Advanced Energy Metering	D	no	1	1	1	1	1	1	1
EA	C	Demand Response	C	no	2	2	2	2	2	2	2
EA	C	Renewable Energy Production	D	yes	3	3	3	3	3	3	3
EA	C	Enhanced Refrigerant Management	D	no	1	1	1	1	1	1	1
EA	C	Green Power and Carbon Offsets	C	no	2	2	2	2	2	2	2
MR Materials and Resources											
MR	P	Storage and Collection of Recyclables	D	no	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
MR	P	Construction and Demolition Waste Management Planning	C	no	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
MR	P	PBT Source Reduction—Mercury	D	no	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MR	C	Building Life-Cycle Impact Reduction	C	yes	5	6	5	5	5	5	5
MR	C	Building Product Disclosure and Optimization—Environmental Product Declarations	C	yes	2	2	2	2	2	2	2
MR	C	Building Product Disclosure and Optimization—Sourcing of Raw Materials	C	yes	2	2	2	2	2	2	2
MR	C	Building Product Disclosure and Optimization—Material Ingredients	C	yes	2	2	2	2	2	2	2
MR	C	PBT Source Reduction—Mercury	D	no	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MR	C	PBT Source Reduction—Lead, Cadmium, and Copper	C	no	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MR	C	Furniture and Medical Furnishings	C	yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MR	C	Design for Flexibility	D	no	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MR	C	Construction and Demolition Waste Management	C	yes	2	2	2	2	2	2	2
EQ Indoor Environmental Quality											
EQ	P	Minimum Indoor Air Quality Performance	D	no	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
EQ	P	Environmental Tobacco Smoke Control	D	no	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
EQ	P	Minimum Acoustic Performance	D	no	n/a	n/a	Req'd	n/a	n/a	n/a	n/a
EQ	C	Enhanced Indoor Air Quality Strategies	D	yes	2	2	2	2	2	2	2
EQ	C	Low-Emitting Materials	C	yes	3	3	3	3	3	3	3
EQ	C	Construction Indoor Air Quality Management Plan	C	no	1	1	1	1	1	1	1
EQ	C	Indoor Air Quality Assessment	C	no	2	n/a	2	2	2	2	2
EQ	C	Thermal Comfort	D	no	1	n/a	1	1	1	1	1
EQ	C	Interior Lighting	D	no	2	n/a	2	2	2	2	2
EQ	C	Daylight	D	no	3	3	3	3	3	3	3
EQ	C	Quality Views	D	yes	1	1	1	1	1	1	1
EQ	C	Acoustic Performance	D	no	1	n/a	1	n/a	1	1	1
IN Innovation											
IN	C	Innovation	D/C	no	5	5	5	5	5	5	5
IN	C	LEED Accredited Professional	D/C	no	1	1	1	1	1	1	1
RP Regional Priority											
RP	C	Regional Priority	D/C	no	4	4	4	4	4	4	4

GS2_Credit attributes BDC

Minimum Program Requirements

Minimum Program Requirements

The Minimum Program Requirements (MPRs) are the minimum characteristics or condi
project appropriate to pursue LEED certification. These requirements are foundational t
and define the types of buildings, spaces, and neighborhoods that the LEED rating sys
evaluate. View the Minimum Program Requirements

Rating System Selection Guidance

Rating System Selection Guidance

Projects are required to use the rating system that is most appropriate. However, when
clear, it is the responsibility of the project team to make a reasonable decision in select
before registering their project. This guidance helps project teams select a LEED rating
Rating System Selection Guidance

Credit Category Overviews

LT Overview

The Location and Transportation (LT) category rewards thoughtful decisions about build
credits that encourage compact development, alternative transportation, and connectio
as restaurants and parks. The LT category is an outgrowth of the Sustainable Sites cat
covered location-related topics. Whereas the SS category now specifically addresses c
services, the LT category considers the existing features of the surrounding community
infrastructure affects occupants' behavior and environmental performance.

Well-located buildings take advantage of existing infrastructure—public transit, street n

paths, bicycle networks, services and amenities, and existing utilities, such as electricity sewage. By recognizing existing patterns of development and land density, project tean the environment from the material and ecological costs that accompany the creation of hardscape. In addition, the compact communities promoted by the LT credits encourag alternatives to private automobile use, such as walking, biking, vehicle shares, and pub incremental steps can have significant benefits: a 2009 Urban Land Institute study conc improvements in land-use patterns and investments in public transportation infrastructu greenhouse gas emissions from transportation in the U.S. by 9% to 15% by 2050; globa sector is responsible for about one-quarter of energy-related greenhouse gas emission

If integrated into the surrounding community, a building can offer distinct advantages to users. For owners, proximity to existing utility lines and street networks avoids the cost infrastructure to the project site. For occupants, walkable and bikeable locations can en encouraging daily physical activity, and proximity to services and amenities can increas productivity. Locating in a vibrant, livable community makes the building a destination fo employees, customers, and visitors, and the building's occupants will contribute to the a activity, creating a good model for future development. Reusing previously developed l brownfield sites, and investing in disadvantaged areas conserve undeveloped land and delivery of services and infrastructure.

Design strategies that complement the building's location are also rewarded in the LT s by limiting parking, a project can encourage building users to take alternative transporta bicycle storage, alternative-fuel facilities, and preferred parking for green vehicles, a pr users seeking transportation options.

Consistent Documentation

Walking and Bicycling Distance

Walking and bicycling distances are measurements of how far a pedestrian and bicycli point of origin to a destination, such as the nearest bus stop. This distance, also known analysis, replaces the simple straight-line radius used in LEED 2009 and better reflects bicyclists' access to amenities, taking into account safety, convenience, and obstructio in turn better predicts the use of these amenities.

Walking distances must be measured along infrastructure that is safe and comfortable sidewalks, all-weather-surface footpaths, crosswalks, or equivalent pedestrian facilities

Bicycling distances must be measured along infrastructure that is safe and comfortable street bicycle lanes, off-street bicycle paths or trails, and streets with low target vehicle may use bicycling distance instead of walking distance to measure the proximity of bicy bicycle network in LT Credit Bicycle Facilities.

When calculating the walking or bicycling distance, sum the continuous segments of th route to determine the distance from origin to destination. A straight-line radius from the follow pedestrian and bicyclist infrastructure will not be accepted.

Refer to specific credits to select the appropriate origin and destination points. In all cas accessible to all building users, and the walking or bicycling distance must not exceed in the credit requirements.

Total Vehicle Parking Capacity

When determining total parking capacity, include all the off-street spaces available to th

users. This may include spaces both inside and outside the project boundary.

If parking spaces are shared among two or more buildings (“pooled” parking), determin parking allocated to the project. Include this number of spaces in the total parking capa rationale for the parking distribution, if necessary.

If no off-street parking is allocated to the project building’s users, the team is eligible to Reduced Parking Footprint but is not eligible for LT Credit Green Vehicles.

The following parking spaces must be included in total parking capacity:

- New and existing surface parking spaces
- New and existing garage or multilevel parking spaces
- Any off-street parking spaces outside the project boundary that are available to the building’s use

The following parking spaces should not be included in total parking capacity:

- On-street (parallel or pull-in) parking spaces on public rights of way
- Parking spaces for fleet and inventory vehicles, unless these vehicles are regularly used by empl well as business purposes
- Motorbike or bicycle spaces

Preferred Parking

Preferred parking spaces have the shortest walking distance to the main entrance of th spaces designated for people with disabilities.

If parking is provided on multiple levels of a facility, locate preferred spaces on the leve entrance to the building.

If the parking area is subdivided for different kinds of building users (e.g., customers ar and students, ranking military officials), a project may distribute the required preferred p proportionally across each parking area. This also applies to the provision of fueling sta Green Vehicles.

Alternatively, a project that subdivides its parking area may provide one general prefer enough spaces for all user types (based on total parking capacity). In this case, parking preferred parking zone would still be separated by user type. This also applies to the pr stations in LT Credit Green Vehicles.

The reservation of preferred parking spaces is required both for carpool and vanpool ve Reduced Parking Footprint and for green vehicles in LT Credit Green Vehicles. Project will need to reserve a higher proportion of preferred parking spaces.

Carpool and vanpool spaces and green vehicle spaces may be placed at the discretion (i.e., green vehicle spaces can be closer to the main entrance than carpool and vanpoo versa), provided the number of spaces reserved for each type meets credit requirement

Although not encouraged, preferred parking areas and signage for carpool and vanpoo vehicles may be combined if 10% of total parking capacity is reserved with this signage Parking Footprint and Green Vehicles credits are achieved.

SS Overview

The Sustainable Sites (SS) category rewards decisions about the environment surrounc credits that emphasize the vital relationships among buildings, ecosystems, and ecosys focuses on restoring project site elements, integrating the site with local and regional e preserving the biodiversity that natural systems rely on.

Earth's systems depend on biologically diverse forests, wetlands, coral reefs, and othe are often referred to as "natural capital" because they provide regenerative services. A indicates that of the ecosystem services that have been assessed worldwide, about 60 degraded or used unsustainably[1]. The results are deforestation, soil erosion, a drop in extinction of species, and rivers that no longer run to the sea. Recent trends like exurba sprawl encroach on the remaining natural landscapes and farmlands, fragmenting and dispersed hardscapes surrounded by nonnative vegetation. Between 1982 and 2001 in 34 million acres (13 759 hectares) of open space (an area the size of Illinois) was lost t approximately 4 acres per minute, or 6,000 acres a day[2]. The rainwater runoff from the frequently overloads the capacity of natural infiltration systems, increasing both the qua site runoff. Rainwater runoff carries such pollutants as oil, sediment, chemicals, and lav streams and rivers, where they contribute to eutrophication and harm aquatic ecosyste Washington State Department of Ecology study noted that rainwater runoff from roads, hardscapes carries some 200,000 barrels of petroleum into the Puget Sound every yea what was spilled in the 1989 Exxon Valdez accident in Alaska[3].

Project teams that comply with the prerequisites and credits in the SS category protect by completing an early site assessment and planning the locations of buildings and har harming habitat, open space, and water bodies. They use low-impact development me construction pollution, reduce heat island effects and light pollution, and mimic natural manage rainwater runoff. They also remediate areas on the project site that are already

In LEED v4, the SS category combines traditional approaches with several new strateg backlight-uplight-glare (BUG) method (Light Pollution Reduction credit), working with co organizations to target financial support for off-site habitat protection (Site Developmen Habitat credit), replicating natural site hydrology (Rainwater Management credit), and u SRI values for roofs and SR values for nonroof hardscape (Heat Island Reduction cred

[1] UN Environment Programme, State and Trends of the Environment 1987–2001, Sect .unep.org/geo/geo4/report/05_Biodiversity.pdf.

[2] U.S. Forest Service, Quick Facts, fs.fed.us/projects/four-threats/facts/open-space.shtr September 11, 2012).

[3] Cornwall, W., Stormwater's Damage to Puget Sound Huge, Seattle Times (Decembe

seattletimes.com/html/localnews/2004045940_ecology01m.html (accessed September 14, 2012).

WE Overview

The Water Efficiency (WE) section addresses water holistically, looking at indoor use, c specialized uses, and metering. The section is based on an "efficiency first" approach t As a result, each prerequisite looks at water efficiency and reductions in potable water

WE credits additionally recognize the use of nonpotable and alternative sources of wat

The conservation and creative reuse of water are important because only 3% of Earth's and of that, slightly over two-thirds is trapped in glaciers[1]. Typically, most of a building's the building and then flows off-site as wastewater. In developed nations, potable water public water supply system far from the building site, and wastewater leaving the site m processing plant, after which it is discharged into a distant water body. This pass-throu streamflow in rivers and depletes freshwater aquifers, causing water tables to drop and 60% of European cities with more than 100,000 people, groundwater is being used fas replenished[2].

In addition, the energy required to treat water for drinking, transport it to and from a bui disposal represents a significant amount of energy use not captured by a building's utili California shows that roughly 19% of all energy used in this U.S. state is consumed by pumping[3].

In the U.S., buildings account for 13.6% of potable water use[4], the third-largest catego thermoelectric power and irrigation. Designers and builders can construct green buildin significantly less water than conventional construction by incorporating native landscap need for irrigation, installing water-efficient fixtures, and reusing wastewater for nonpota Green Building Market Impact Report 2009 found that LEED projects were responsible aggregate 1.2 trillion gallons (4.54 trillion liters) of water[5]. LEED's WE credits encourag take advantage of every opportunity to significantly reduce total water use.

Cross-Cutting Issues

The WE category comprises three major components: indoor water (used by fixtures, a processes, such as cooling), irrigation water, and water metering. Several kinds of docu components, depending on the project's specific water-saving strategies.

Site plans. Plans are used to document the location and size of vegetated areas and and submeters. Within the building, floorplans show the location of fixtures, appliance equipment (e.g., cooling towers, evaporative condensers), as well as indoor submete documentation can be used in credits in the Sustainable Sites category.

Fixture cutsheets. Projects must document their fixtures (and appliances as applicabl cutsheets or manufacturers' literature. This documentation is used in the Indoor Wate prerequisite and credit.

Alternative water sources. A project that includes graywater reuse, rainwater harvest supplied wastewater (purple pipe water), or other reused sources is eligible to earn c Outdoor Water Use Reduction, WE Credit Indoor Water Use Reduction, WE Credit C Use, and WE Credit Water Metering. But the team cannot apply the same water to m the water source has sufficient volume to cover the demand of all the uses (e.g., irrig flushing demand).

Occupancy calculations. The Indoor Water Use Reduction prerequisite and credit rec on occupants' usage. The Location and Transportation and Sustainable Sites catego occupancy calculations. Review the occupancy section in Getting Started to understa classified and counted. Also see WE Prerequisite Indoor Water Use Reduction for ad specific to the WE section.

[1] U.S. Environmental Protection Agency, Water Trivia Facts, water.epa.gov/learn/kids/drinkingwater/water_trivia_facts.cfm (accessed September 12

[2] Statistics: Graphs & Maps, UN Water, http://www.unwater.org/statistics/en/ (accessed

[3] energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF

[4] USGBC, Green Building Facts, http://www.usgbc.org/articles/green-building-facts.

[5] Green Outlook 2011, Green Trends Driving Growth (McGraw-Hill Construction, 2010) content/uploads/2011/06/greenoutlook2011.pdf (accessed on September 12, 2012).

EA Overview

The Energy and Atmosphere (EA) category approaches energy from a holistic perspect use reduction, energy-efficient design strategies, and renewable energy sources.

The current worldwide mix of energy resources is weighted heavily toward oil, coal, and addition to emitting greenhouse gases, these resources are nonrenewable: their quanti cannot be replaced as fast as they are consumed[2]. Though estimates regarding the re these resources vary, it is clear that the current reliance on nonrenewable energy sourc and involves increasingly destructive extraction processes, uncertain supplies, escalati national security vulnerability. Accounting for approximately 40% of the total energy use are significant contributors to these problems.

Energy efficiency in a green building starts with a focus on design that reduces overall building orientation and glazing selection, and the choice of climate-appropriate buildin such as passive heating and cooling, natural ventilation, and high-efficiency HVAC syst smart controls further reduce a building's energy use. The generation of renewable ene or the purchase of green power allows portions of the remaining energy consumption to fossil fuel energy, lowering the demand for traditional sources.

The commissioning process is critical to ensuring high-performing buildings. Early invol commissioning authority helps prevent long-term maintenance issues and wasted ener design meets the owner's project requirements and functions as intended. In an operat efficient building, the staff understands what systems are installed and how they functio training and be receptive to learning new methods for optimizing system performance s is carried through to efficient performance.

The EA category recognizes that the reduction of fossil fuel use extends far beyond the Projects can contribute to increasing the electricity grid's efficiency by enrolling in a der program. Demand response allows utilities to call on buildings to decrease their electric times, reducing the strain on the grid and the need to operate more power plants, thus costs of constructing new plants. Similarly, on-site renewable energy not only moves th dependence on fossil fuels but may also be a dependable local electricity source that a losses and strain on the grid.

The American Physical Society has found that if current and emerging cost-effective er measures are employed in new buildings and in existing buildings as their heating, coo

equipment is replaced, the growth in energy demand from the building sector could fall increase to zero between now and 2030. The EA section supports the goal of reduced through credits related to reducing usage, designing for efficiency, and supplementing t renewables.

[1] iea.org/publications/freepublications/publication/kwes.pdf

[2] cnx.org/content/m16730/latest/

[3] unep.org/sbci/pdfs/SBCI-BCCSummary.pdf

MR Overview

The Materials and Resources (MR) credit category focuses on minimizing the embodied impacts associated with the extraction, processing, transport, maintenance, and dispos The requirements are designed to support a life-cycle approach that improves performa resource efficiency. Each requirement identifies a specific action that fits into the larger approach to embodied impact reduction.

The Waste Hierarchy

Construction and demolition waste constitutes about 40 percent of the total solid waste States and about 25% of the total waste stream in the European Union. In its solid was hierarchy, the U.S. Environmental Protection Agency (EPA) ranks source reduction, reu waste to energy as the four preferred strategies for reducing waste. The MR section dir of these recommended strategies.

Source reduction appears at the top of the hierarchy because it avoids environmental h material's life cycle, from supply chain and use to recycling and waste disposal. Source the use of innovative construction strategies, such as prefabrication and designing to di materials, thereby minimizing material cutoffs and inefficiencies.

Building and material reuse is the next most effective strategy because reusing existing environmental burden of the manufacturing process. Replacing existing materials with r production and transportation of new materials, and it would take many years to offset greenhouse gases through increased efficiency of the building. LEED has consistently materials. LEED v4 now offers more flexibility and rewards all material reuse achieved situ, as part of a building reuse strategy, and from off site, as part of a salvaging strateg

Recycling is the most common way to divert waste from landfills. In conventional practi landfilled—an increasingly unsustainable solution. In urban areas landfill space is reach the conversion of more land elsewhere and raising the transportation costs of waste. In technology improve sorting and processing to supply raw material to secondary market materials in the production stream longer.

Because secondary markets do not exist for every material, however, the next most ben materials is conversion to energy. Many countries are lessening the burden on landfills energy solution. In countries such as Sweden and Saudi Arabia, waste-to-energy facilit common than landfills. When strict air quality control measures are enforced, waste-to- alternative to extracting fossil fuels to produce energy.

In aggregate, LEED projects are responsible for diverting more than 80 million tons (72 waste from landfills, and this volume is expected to grow to 540 million tons (489.9 mill From 2000 to 2011, LEED projects in Seattle diverted an average of 90 percent of their from the landfill, resulting in 175,000 tons (158,757.3 tonnes) of waste diverted. If all ne buildings achieved the 90 percent diversion rate demonstrated by Seattle's 102 LEED p would be staggering. Construction debris is no longer waste, it is a resource.

Life-Cycle Assessment in LEED

Through credits in the MR category, LEED has instigated market transformation of build creating a cycle of consumer demand and industry delivery of environmentally preferab project teams have created demand for increasingly sustainable products, and supplier manufacturers are responding. From responsibly harvested wood to increased recycled materials, the increased supply of sustainable materials has been measurable over the Several MR credits reward use of products that perform well on specific criteria. It is dif compare two products that have different sustainable attributes—for example, cabinets sourced from all over the country and bound together in resin versus solid wood cabine timber. Life-cycle assessment (LCA) provides a more comprehensive picture of materia enabling project teams to make more informed decisions that will have greater overall b environmental, human health, and communities, while encouraging manufacturers to in through innovation.

LCA is a "compilation and evaluation of the inputs and outputs and the potential enviro product system throughout its life cycle." The entire life cycle of a product (or building) i processes and constituents identified, and their environmental effects assessed—both point of manufacture or raw materials extraction, and downstream, including transporta maintenance, and end of life. This approach is sometimes called "cradle to grave." Goi to cradle" emphasizes recycling and reuse at the end of life rather than disposal.

Life-cycle approaches to materials assessment began in the 1960s with carbon accoun then, LCA standards and practices have been developed and refined. In Europe and a world, manufacturers, regulators, specifiers, and consumers in many fields have been u information to improve their product selections and product environmental profiles. Unt however, the data and tools that support LCA were lacking in the U.S. Now a growing n manufacturers are ready to document and publicly disclose the environmental profiles o programs that assist this effort and help users understand the results are available.

LEED aims to accelerate the use of LCA tools and LCA-based decision making, thereb transformation and improving the quality of databases. Recognizing the limitations of th for addressing human health and the ecosystem consequences of raw material extracti alternative, complementary approaches to LCA in the credits that address those topics.

Cross-Cutting Issues

Required Products and Materials

The scope of the MR credit category includes the building or portions of the building tha constructed or renovated. Portions of an existing building that are not part of the constr excluded from MR documentation unless otherwise noted. For guidance on the treatme minimum program requirements.

Qualifying Products and Exclusions

The MR section addresses "permanently installed building products," which as defined

products and materials that create the building or are attached to it. Examples include s elements, installed finishes, framing, interior walls, cabinets and casework, doors, and materials fall into Construction Specifications Institute (CSI) 2012 MasterFormat Divisio Some products addressed by MR credits fall outside these divisions.

Furniture is not required to be included in credit calculations. However, if furniture is inc calculations, all furniture must be included consistently in all cost-based credits.

In past versions of LEED, all mechanical, plumbing, and electrical equipment (MEP), c MasterFormat divisions 11, 21-28, and other specialty divisions, was excluded from MR of LEED some specific products that are part of these systems but are “passive” (mean active portions of the system) may be included in credit calculations. This allows flexibil assessment of piping, pipe insulation, ducts, duct insulation, conduit, plumbing fixtures, showerheads, and lamp housings. If they are included in credit calculations, they must consistently across relevant MR credits. However, unlike furniture, if some of these pro credit calculations, not all products of that type must be included. For example, if the co in the MR calculations for recycled content, the cost of ducts that do not meet the credit need to be included in the numerator or denominator of the credit calculation. However cost-based credits (all Building Product Disclosure and Optimization credits) calculatior

Special equipment, such as elevators, escalators, process equipment, and fire suppres excluded from the credit calculations. Also excluded are products purchased for tempo like formwork for concrete.

For Healthcare projects, the scope of MR Credit Medical Furniture and Furnishings incl furniture and medical furnishings. Freestanding furniture items included in this credit ca Building Product Disclosure and Optimization credits, to avoid double-counting. Perma such as casework and built-in millwork should be included in the Building Product Discl Optimization credits, not MR Credit Medical Furniture and Furnishings.

Defining a Product

Several credits in this category calculate achievement on the basis of number of produ cost. For these credits, a “product” or a “permanently installed building product” is defin the project. A product includes the physical components and services needed to serve If there are similar products within a specification, each contributes as a separate produ scenarios.

Products that arrive at the project site ready for installation:

- Metal studs, wallboard, and concrete masonry units are all separate products.
- For wallboard, the gypsum, binder, and backing are all required for the product to function, so ea count as a separate product.

Products that arrive as an ingredient or component used in a site-assembled product:

- Concrete admixtures are considered separate products because each component (admixture, agg serves a different function; each component is therefore a separate product.

Similar products from the same manufacturer with distinct formulations versus similar p manufacturer with aesthetic variations or reconfigurations:

- Paints of different gloss levels are separate products because each paint type is specified to serv such as water resistance. Different colors of the same paint are not separate products because th

function.

- Carpets of different pile heights are separate products because they are used for different kinds c carpet in a different color is not a separate product.
- Desk chairs and side chairs in the same product line are different products because they serve di chairs differing only in aesthetic aspects, such as the presence of arms, are not different products

Determining Product Cost

Product and materials cost includes all taxes and expenses to deliver the material to th by the contractor but excludes any cost for labor and equipment required for installatior delivered to the site.

To calculate the total materials cost of a project, use either the actual materials cost or cost.

Actual materials cost. This is the cost of all materials being used on the project site, exc including delivery and taxes.

Default materials cost. The alternative way to determine the total materials cost is to ca construction costs. This default materials cost can replace the actual cost for most mat specified above. If the project team is including optional products and materials, such a items, add the actual value of those items to the default value for all other products and

Location Valuation Factor

Several credits in the MR section include a location valuation factor, which adds value t products and materials. The intent is to incentivize the purchase of products that suppo Products and materials that are extracted, manufactured, and purchased within 100 mi the project are valued at 200% of their cost (i.e., the valuation factor is 2).

For a product to qualify for the location valuation factor, it must meet two conditions: all manufacture, and purchase (including distribution) of the product and its materials mus radius (Figure 1), and the product (or portion of an assembled product) must meet at le sustainable criteria (e.g., FSC certification, recycled content) specified in the credit. Pro that do not meet the location criteria but do meet at least one of the sustainability criteri their cost (i.e., the valuation factor is 1).

The distance must be measured as the crow flies, not by actual travel distance. The poi considered the location of the purchase transaction. For online or other transactions tha person, the point of purchase is considered the location of product distribution. For the factor of salvaged and reused materials, see MR Credit Building Product Disclosure an Sourcing of Raw Materials, Further Explanation, Material Reuse Considerations.

Figure 1. Example material radius

Determining Material Contributions of an Assembly

Many sustainability criteria in the MR category apply to the entire product, as is the cas certifications and programs. However, some criteria apply to only a portion of the produ product that contributes to the credit could be either a percentage of a homogeneous n percentage of qualifying components that are mechanically or permanently fastened to the contributing value is based on weight. Examples of homogeneous materials include ceiling tiles, and rubber wall base. Examples of assemblies (parts mechanically or perm together) include office chairs, demountable partition walls, premade window assemblie

Calculate the value that contributes toward credit compliance as the percentage, by we component that meets the criteria, multiplied by the total product cost.

product value ($) = Total product cost ($) x (%) product component by weight x (%) meeting sustai

Figure 2. Sustainably produced components of $500 office chair

Table 1. Example calculation for $500 office chair

TABLE 1. Example calculation for $500 office chair

Chair component	Percentage of product, by weight	Value of component	Percentage of component meeting sustainability criteria	Value of sustainability criteria
Fastening hardware	2%	$10	25% preconsumer recycled content	$2.50
Cotton fabric	5%	$25	100% certified by Rainforest Alliance	$25.00
Plastic component	25%	$125	10% postconsumer recycled content	$12.50
Armrest	5%	$25	10% postconsumer recycled content	$2.50
Metal base	20%	$100	25% preconsumer recycled content	$25.00
Steel post	8%	$40	40% preconsumer recycled content	$16.00
Wheels	5%	$25	5% postconsumer recycled content	$1.25
Total value contributing to credit				$84.75

EQ Overview

The Indoor Environmental Quality (EQ) category rewards decisions made by project tea quality and thermal, visual, and acoustic comfort. Green buildings with good indoor env protect the health and comfort of building occupants. High-quality indoor environments productivity, decrease absenteeism, improve the building's value, and reduce liability fo and owners[1]. This category addresses the myriad design strategies and environmenta lighting quality, acoustic design, control over one's surroundings—that influence the wa and live.

The relationship between the indoor environment and the health and comfort of building and still not fully understood. Local customs and expectations, occupants' activities, an design, and construction are just a few of the variables that make it difficult to quantify effect of a building on its occupants[2]. Therefore, the EQ section balances the need for with more performance-oriented credit requirements. For example, source control is ad prerequisite, and a later credit then specifies an indoor air quality assessment to measu of those strategies.

The EQ category combines traditional approaches, such as ventilation and thermal con design strategies, including a holistic, emissions- based approach (Low-Emitting Mater control and monitoring for user-determined contaminants (Enhanced Indoor Air Quality requirements for lighting quality (Interior Lighting credit), and advanced lighting metrics new credit covering acoustics is now available for all projects using a BD+C rating syst

[1] U.S. Environmental Protection Agency, Health Buildings Healthy People: A Vision for epa.gov/iaq/pubs/hbhp.html (October 2001) (accessed July 25, 2013).

[2] Mitchell, Clifford S., Junfeng Zhang, Torben Sigsgaard, Matti Jantunen, Palu J. Lioy, Meryl H. Karol, Current State of the Science: Health Effects and Indoor Environmental Health Perspectives 115(6) (June 2007).

Cross-Cutting Issues

Floor Area Calculations and Floor Plans

For many of the credits in the EQ category, compliance is based on the percentage of f the credit requirements. In general, floor areas and space categorization should be con credits. Any excluded spaces or discrepancies in floor area values should be explained documentation. See Space Categorization, below, for additional information on which fl included in which credits.

Space Categorization

The EQ category focuses on the interaction between the occupants of the building and which they spend their time. For this reason, it is important to identify which spaces are occupants, including any visitors (transients), and what activities they perform in each s the space categorization, the credit requirements may or may not apply (Table 1).

Occupied versus unoccupied space

All spaces in a building must be categorized as either occupied or unoccupied. Occupie areas intended for human activities. Unoccupied spaces are places intended primarily f are occupied only occasionally and for short periods of time—in other words, they are i Examples of spaces that are typically unoccupied include the following:

- Mechanical and electrical rooms
- Egress stairway or dedicated emergency exit corridor
- Closets in a residence (but a walk-in closet is occupied)
- Data center floor area, including a raised floor area
- Inactive storage area in a warehouse or distribution center

For areas with equipment retrieval, the space is unoccupied only if the retrieval is occas

Regularly versus nonregularly occupied spaces

Occupied spaces are further classified as regularly occupied or nonregularly occupied, of the occupancy. Regularly occupied spaces are enclosed areas where people normal as more than one hour of continuous occupancy per person per day, on average; the o seated or standing as they work, study, or perform other activities. For spaces that are classification should be based on the time a typical occupant spends in the space wher example, a computer workstation may be largely vacant throughout the month, but whe worker spends one to five hours there. It would then be considered regularly occupied time is sufficient to affect the person's well-being, and he or she would have an expecta comfort and control over the environment.

Occupied spaces that do not meet the definition of regularly occupied are nonregularly areas that people pass through or areas used an average of less than one hour per pe

Examples of regularly occupied spaces include the following:

Airplane hangar	Hospital operating room	Private office
Auditorium	Hospital patient room	Reception desk
Auto service bay	Hospital recovery area	Residential bedroom
Bank teller station	Hospital staff room	Residential dining roor

Conference room	Hospital surgical suite	Residential kitchen
Correctional facility cell or day room	Hospital waiting room	Residential living room
Data center network operations center	Hospital diagnostic and treatment area	Residential office, den
Data center security operations center	Hospital laboratory	Retail merchandise are circulation
Dorm room	Hospital nursing station	Retail sales transactio
Exhibition hall	Hospital solarium	School classroom
Facilities staff office	Hospital waiting room	School media center
Facilities staff workstation	Hotel front desk	School student activity
Food service facility dining area	Hotel guest room	School study hall
Food service facility kitchen area	Hotel housekeeping area	Shipping and receiving
Gymnasium	Hotel lobby	Study carrel
Hospital autopsy and morgue	Information desk	Warehouse materials-l
Hospital critical-care area	Meeting room	
Hospital dialysis and infusion area	Natatorium	
Hospital exam room	Open-office workstation	

Examples of nonregularly occupied spaces include the following:

Break room
Circulation space
Copy room
Corridor
Fire station apparatus bay
Hospital linen area
Hospital medical record area
Hospital patient room bathroom
Hospital short-term charting space
Hospital prep and cleanup area in surgical suite
Interrogation room
Lobby (except hotel lobby)*
Locker room
Residential bathroom
Residential laundry area
Residential walk-in closet
Restroom
Retail fitting area
Retail stock room
Shooting range
Stairway

*Hotel lobbies are considered regularly occupied because people often congregate, wo spend more time there than they do in an office building lobby.

Occupied space subcategories

Occupied spaces, or portions of an occupied space, are further categorized as individu
multioccupant, based on the number of occupants and their activities. An individual occ
where someone performs distinct tasks. A shared multioccupant space is a place of co
where people pursue overlapping or collaborative tasks. Occupied spaces that are not
not used for distinct or collaborative tasks are neither individual occupant nor shared m

Examples of individual occupant spaces include the following:

Bank teller station
Correctional facility cell or day room
Data center staff workstation
Hospital nursing station
Hospital patient room
Hotel guest room
Medical office
Military barracks with personal workspaces
Open-office workstation
Private office
Reception desk
Residential bedroom
Study carrel

Examples of shared multioccupant spaces include the following:

Active warehouse and storage
Airplane hangar
Auditorium
Auto service bay
Conference room
Correctional facility cell or day room
Data center network operations center
Data center security operations center
Exhibition hall
Facilities staff office
Food service facility dining area
Food service facility kitchen area
Gymnasium
Hospital autopsy and morgue
Hospital critical-care area
Hospital dialysis and infusion area
Hospital exam room
Hospital operating room
Hospital surgical suite
Hospital waiting room
Hospital diagnostic and treatment area
Hospital laboratory
Hospital solarium
Hotel front desk
Hotel housekeeping area
Hotel lobby

Meeting room
Natatorium
Retail merchandise area and associated circulation
Retail sales transaction area
School classroom
School media center
School student activity room
School study hall
Shipping and receiving office
Warehouse materials-handling area

Occupied spaces can also be classified as densely or nondensely occupied, based on t occupants in the space. A densely occupied space has a design occupant density of 25 1,000 square feet (93 square meters), or 40 square feet (3.7 square meters) or less per spaces with a lower density are nondensely occupied.

Table 1 outlines the relationship between the EQ credits and the space categorization t listed, the space must meet the requirements of the credit.

Table 1. Space types in EQ credits

TABLE 1. Space types in EQ credits

Space Category	Prerequisite or credit
Occupied space	• Minimum Indoor Air Quality Performance, ventilation rate procedure and natural ventilation procedure • Minimum Indoor Air Quality Performance, monitoring requirements • Enhanced Indoor Air Quality Strategies, Option 1 C • Enhanced Indoor Air Quality Strategies, Option 1 D • Enhanced Indoor Air Quality Strategies, Option 1 E • Enhanced Indoor Air Quality Strategies, Option 2 B • Enhanced Indoor Air Quality Strategies, Option 2 E • Indoor Air Quality Assessment, Option 2, Air Testing (sampling must be representative of all occupied spaces) • Thermal Comfort (New Construction, Schools, Retail, Hospitality), design requirements • Acoustic Performance (New Construction, Data Centers, Warehouses and Distribution Centers, Hospitality)
Regularly occupied space	• Thermal Comfort, design requirements (Data Centers) • Interior Lighting, Option 2, strategy A • Interior Lighting, Option 2, strategy D • Interior Lighting, Option 2, strategy E • Interior Lighting, Option 2, strategy G • Interior Lighting, Option 2, strategy H • Daylight • Quality Views
Individual occupant space	• Thermal Comfort, control requirements • Interior Lighting, Option 1
Shared multioccupant space	• Thermal Comfort, control requirements • Interior Lighting, Option 1
Densely occupied space	• Enhanced Indoor Air Quality Strategies, Option 2 C

Table 2 outlines the relationship between the EQ credits and the space categorization t rating system (see Definitions). Unless otherwise stated, if the credit is listed, the space requirements of the credit.

Table 2. Rating system–specific space classifications

TABLE 2. Rating system–specific space classifications

Rating system	Space type	Prerequisite or credit
Schools	Classroom and core learning spaces	• Minimum Acoustic Performance • Acoustic Performance (Schools)
Hospitality	Guest rooms	• Interior Lighting* • Thermal Comfort, control requirements*
Healthcare	Patient rooms	• Thermal Comfort, control requirements • Interior Lighting, Option 2, Lighting Quality
Healthcare	Staff areas	• Interior Lighting, Option 2, Lighting Quality
Healthcare	Perimeter area	• Daylight • Quality Views
Healthcare	Inpatient units	• Quality Views
Warehouses & Distribution Centers	Office areas	• Thermal Comfort, design requirements • Quality Views
Warehouses & Distribution Centers	Areas of bulk storage, sorting, and distribution	• Thermal Comfort, design requirements • Quality Views
Retail	Office and administrative areas	• Thermal Comfort, control requirements • Interior Lighting, Option 2, Lighting Quality
Retail	Sales areas	• Interior Lighting, Option 2, Lighting Quality

*Hotel guest rooms are excluded from the credit requirements.

*Hotel guest rooms are excluded from the credit requirements.

The following credits are not affected by space classifications:

- Environmental Tobacco Smoke Control
- Enhanced Indoor Air Quality Strategies, Option 1 A
- Enhanced Indoor Air Quality Strategies, Option 1 B
- Enhanced Indoor Air Quality Strategies, Option 2 A
- Enhanced Indoor Air Quality Strategies, Option 2 D (no specific spaces; applicable spaces are de team)
- Low-Emitting Materials
- Construction Indoor Air Quality Management Plan
- Indoor Air Quality Assessment, Option 1, Flush-Out (the floor area from all spaces must be includ air volume; the flush-out must be demonstrated at the system level.)
- Interior Lighting, Option 2, strategy B
- Interior Lighting, Option 2, strategy C
- Interior Lighting, Option 2, strategy F
- Acoustic Performance (Healthcare)

Tricky Spaces

Pay extra attention to how the following types of spaces are classified in specific credits

Residential

- Minimum Indoor Air Quality Performance and Environmental Tobacco Smoke have specific requir considerations for residential projects.
- See the Project Type Variations sections in Thermal Comfort and Interior Lighting for guidance or controllability in residential buildings.

Auditoriums

- Exceptions to Daylight and Quality Views are permitted. See the Project Type Variations sections Views.

Gymnasiums

- See the Project Type Variations section in Thermal Comfort for guidance on dealing with high lev
- Exceptions to Quality Views are permitted. See the Project Type Variations section in Quality Vie

Transportation Terminals

- For Thermal Comfort and Interior Lighting, Option 1, Lighting Control, most of the areas in a trans considered shared multioccupant. Most areas in transportation terminals are also regularly occupi

Dormitories and Military Barracks

- These spaces fall in-between a work space and residence.
- Dorm rooms or military barracks with personal workspaces are considered individual occupant sp without personal workspaces are considered shared multioccupant.

Industrial Facilities

- For Thermal Comfort and Interior Lighting, Option 1, Lighting Control, most of the active warehou considered multioccupant.
- Most areas in industrial facilities are also regularly occupied.

IN Overview

Sustainable design strategies and measures are constantly evolving and improving. Ne continually introduced to the marketplace, and up- to-date scientific research influences strategies. The purpose of this LEED category is to recognize projects for innovative bu sustainable building practices and strategies.

Occasionally, a strategy results in building performance that greatly exceeds what is re LEED credit. Other strategies may not be addressed by any LEED prerequisite or cred consideration for their sustainability benefits. In addition, LEED is most effectively imple cohesive team, and this category addresses the role of a LEED Accredited Professiona process.

RP Overview

Because some environmental issues are particular to a locale, volunteers from USGBC LEED International Roundtable have identified distinct environmental priorities within th credits that address those issues. These Regional Priority credits encourage project tea local environmental priorities.

USGBC established a process that identified six RP credits for every location and ever chapter or country boundaries. Participants were asked to determine which environmer salient in their chapter area or country. The issues could be naturally occurring (e.g., w man-made (e.g., polluted watersheds) and could reflect environmental concerns (e.g., v environmental assets (e.g., abundant sunlight). The areas, or zones, were defined by a

issues—for example, an urban area with an impaired watershed versus an urban area watershed.

The participants then prioritized credits to address the important issues of given locatio LEED project type (e.g., a data center) may be associated with different environmental system has its own RP credits.

The ultimate goal of RP credits is to enhance the ability of LEED project teams to addre environmental issues across the country and around the world.

TABLE 1. Occupancy types for calculations, by project type variation

PREREQUISITE, CREDIT	REGULAR BUILDING OCCUPANTS	AVERAGE DAILY VISITORS	PEAK VISITORS	OTHER	NOTES
LT CREDIT BICYCLE FACILITIES					
New Construction, Core and Shell, Data Centers, Warehouses and Distribution Centers, Hospitality	X		X		
Schools	X				Students grade 3 (age 8) and younger are not included in regular building occupants for this credit.
Retail	X				
Healthcare	X		X		Exclude patients.
LT CREDIT ACCESS TO QUALITY TRANSIT					
Schools				X	Count primary and secondary students only.
SS CREDIT DIRECT EXTERIOR ACCESS					
Healthcare				X	Count only peak inpatients and peak outpatients. For this credit, outpatients with clinical length of stay greater than 4 hours are included with inpatients.
WE PREREQUISITE AND CREDIT INDOOR WATER USE					
New Construction, Core and Shell, Data Centers, Warehouses and Distribution Centers, Hospitality, Retail, Healthcare	X	X			Retail customers are considered separately and not included in average daily visitors.
Schools	X	X			See credit-specific occupancy guidance.

QUICK REFERENCE

TABLE 2. Credit Attributes

Category	Prerequisite/ Credit	Credit Name	Design/Construction	Exemplary Performance
n/a	P	Integrated Project Planning and Design	D	no
n/a	C	Integrative Process	D	no
LT Location and Transportation				
LT	C	LEED for Neighborhood Development Location	D	no
LT	C	Sensitive Land Protection	D	no
LT	C	High Priority Site	D	yes
LT	C	Surrounding Density and Diverse Uses	D	no
LT	C	Access to Quality Transit	D	yes
LT	C	Bicycle Facilities	D	no
LT	C	Reduced Parking Footprint	D	yes
LT	C	Green Vehicles	D	no
SS Sustainable Sites				
SS	P	Construction Activity Pollution Prevention	C	no
SS	P	Environmental Site Assessment	D	no
SS	C	Site Assessment	D	no
SS	C	Site Development—Protect or Restore Habitat	D	yes
SS	C	Open Space	D	no
SS	C	Rainwater Management	D	yes
SS	C	Heat Island Reduction	D	yes
SS	C	Light Pollution Reduction	D	no
SS	C	Site Master Plan	D	no
SS	C	Tenant Design and Construction Guidelines	D	no
SS	C	Places of Respite	D	yes
SS	C	Direct Exterior Access	D	no
SS	C	Joint Use of Facilities	D	no

Points							
New Construction	**Core and Shell**	**Schools**	**Retail**	**Data Centers**	**Warehouses and Distribution Centers**	**Hospitality**	**Healthcare**
n/a	n/a	n/a	n/a	n/a	n/a	n/a	Req'd
1	1	1	1	1	1	1	1
16	20	15	16	16	16	16	9
1	2	1	1	1	1	1	1
2	3	2	2	2	2	2	2
5	6	5	5	5	5	5	1
5	6	4	5	5	5	5	2
1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1
Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
n/a	n/a	Req'd	n/a	n/a	n/a	n/a	Req'd
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	1
1	1	1	1	1	1	1	1
3	3	3	3	3	3	3	2
2	2	2	2	2	2	2	1
1	1	1	1	1	1	1	1
n/a	n/a	1	n/a	n/a	n/a	n/a	n/a
n/a	1	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
n/a	n/a	1	n/a	n/a	n/a	n/a	n/a

TABLE 2 Credit Attributes

Category	Prerequisite/ Credit	Credit Name	Design/Construction	Exemplary Performance
WE Water Efficiency				
WE	P	Outdoor Water Use Reduction	D	no
WE	P	Indoor Water Use Reduction	D	no
WE	P	Building-Level Water Metering	D	no
WE	C	Outdoor Water Use Reduction	D	no
WE	C	Indoor Water Use Reduction	D	no
WE	C	Cooling Tower Water Use	D	no
WE	C	Water Metering	D	no
EA Energy and Atmosphere				
EA	P	Fundamental Commissioning and Verification	C	no
EA	P	Minimum Energy Performance	D	no
EA	P	Building-Level Energy Metering	D	no
EA	P	Fundamental Refrigerant Management	D	no
EA	C	Enhanced Commissioning	C	no
EA	C	Optimize Energy Performance	D	yes
EA	C	Advanced Energy Metering	D	no
EA	C	Demand Response	C	no
EA	C	Renewable Energy Production	D	Yes, except Core and Shell
EA	C	Enhanced Refrigerant Management	D	no
EA	C	Green Power and Carbon Offsets	C	no
MR Materials and Resources				
MR	P	Storage and Collection of Recyclables	D	no
MR	P	Construction and Demolition Waste Management Planning	C	no
MR	P	PBT Source Reduction--Mercury	D	no
MR	C	Building Life-Cycle Impact Reduction	C	yes
MR	C	Building Product Dislosure and Optimization--Environmental Product Declarations	C	yes
MR	C	Building Product Disclosure and Optimization--Sourcing of Raw Materials	C	yes
MR	C	Building Product Disclosure and Optimization--Material Ingredients	C	yes
MR	C	PBT Source Reduction--Mercury	D	no
MR	C	PBT Source Reduction--Lead, Cadmium, and Copper	C	no
MR	C	Furniture and Medical Furnishings	C	yes
MR	C	Design for Flexibility	D	no
MR	C	Construction and Demolition Waste Management	C	yes

Points							
New Construction	Core and Shell	Schools	Retail	Data Centers	Warehouses and Distribution Centers	Hospitality	Healthcare
Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
6	6	6	6	6	6	6	6
18	18	16	18	18	18	18	20
1	1	1	1	1	1	1	1
Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
n/a	n/a	n/a	n/a	n/a	n/a	n/a	Req'd
5	6	5	5	5	5	5	5
2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2
n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
n/a	n/a	n/a	n/a	n/a	n/a	n/a	Req'd
5	6	5	5	5	5	5	5
2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2
n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
2	2	2	2	2	2	2	2

TABLE 2. Credit Attributes

Category	Prerequisite/ Credit	Credit Name	Design/Construction	Exemplary Performance
EQ Indoor Environmental Quality				
EQ	P	Minimum Indoor Air Quality Performance	D	no
EQ	P	Environmental Tobacco Smoke Control	D	no
EQ	P	Minimum Acoustic Performance	D	no
EQ	C	Enhanced Indoor Air Quality Strategies	D	yes
EQ	C	Low-Emitting Materials	C	yes
EQ	C	Construction Indoor Air Quality Management Plan	C	no
EQ	C	Indoor Air Quality Assessment	C	no
EQ	C	Thermal Comfort	D	no
EQ	C	Interior Lighting	D	no
EQ	C	Daylight	D	no
EQ	C	Quality Views	D	yes
EQ	C	Acoustic Performance	D	no
IN Innovation				
IN		Innovation	D/C	n/a
IN		LEED Accredited Professional	D/C	n/a
RP Regional Priority				
RP		Regional Priority	D/C	n/a

Points							
New Construction	Core and Shell	Schools	Retail	Data Centers	Warehouses and Distribution Centers	Hospitality	Healthcare
Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd	Req'd
n/a	n/a	Req'd	n/a	n/a	n/a	n/a	n/a
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
1	1	1	1	1	1	1	1
2	n/a	2	2	2	2	2	2
1	n/a	1	1	1	1	1	1
2	n/a	2	2	2	2	2	1
3	3	3	3	3	3	3	2
1	1	1	1	1	1	1	2
1	n/a	1	n/a	1	1	1	2
5	5	5	5	5	5	5	5
1	1	1	1	1	1	1	1
4	4	4	4	4	4	4	4

U.S. GREEN BUILDING COUNCIL®

TRADEMARK POLICY

AND BRANDING GUIDELINES

TABLE OF CONTENTS

USING THE TRADEMARKS

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Member logo guidelines on page 11.

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USGBC®

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ON-SCREEN/WEB:

- Use lower-resolution, web-optimized JPEG or GIF file formats.
- The height and width of the mark must be constrained to its original proportions.
- Do not reduce the mark to less than a 50-pixel height, and do not enlarge the mark to more than a 200-pixel height.

When designing with our brand assets:

DO:

- Include the following acknowledgement when applying USGBC branding: *USGBC® and the related logo is a trademark owned by the U.S. Green Building Council® and is used with permission.*
- When using the logo on websites, link it to usgbc.org. Linking to sites other than usgbc.org, other pages on websites belonging to USGBC, the owner or any other third-party websites is

prohibited.

- Contact the USGBC Marketing Department to request permission to use the USGBC logo, marketing@usgbc.org.

DON'T:

- Alter the logo in any way. Do not animate, color, rotate, skew, or apply any effects to the logo.
- Wrap additional text around the mark. See page 4 for examples of unacceptable uses.
- Use the mark as the most prominent visual element on the materials. The user's name and logo must be significantly larger than the mark. This does not apply to use of the USGBC Chapter logo by official chapters.
- Integrate the mark into other logos. The mark is intended to stand-alone.

USING USGBC® IN TEXT

The official organization name is the U.S. Green Building Council® and USGBC® is the official acronym. Use the complete name on first references, and acronym on subsequent references.

When using USGBC in text:

DO:

- Precede with articles such as "the" or "a" when using USGBC as an adjective. For example: *Contact the USGBC® Marketing Department.*
- Omit articles when using USGBC as a noun or in the possessive. For example:

  USGBC is headquartered in Washington, D.C.

  USGBC's headquarters.

USGBC® CHAPTERS

The USGBC Chapter Logo is designed as a stand-alone logo to represent an approved chapter's affiliation with the USGBC community. It identifies an entity as a fully chartered chapter of USGBC. The Chapter logo, in conjunction with the approved chapter name, creates the unique identifier for each chapter.

USING THE USGBC® CHAPTER LOGO

Only officially recognized USGBC Chapters are permitted to use the USGBC Chapter logo. For Chapters with an additional, unique name and/or logo, the USGBC Chapter logo must appear as the primary and foremost logo in any graphical representation of that chapter. All USGBC Chapter logos should be created in accordance with the *USGBC Chapter Design Template* shared with chapters when creating their identity.

Use of the USGBC Chapter logo is authorized by USGBC upon execution of the provisional chapter license agreement for provisional chapters, or the Chapter Charter for full chapters. Only recognized provisional and full chapters may use the USGBC Chapter logo. The logo must always be used in conjunction with the name of the chapter for all marketing and communications efforts, including but not limited to web presence, e-communications, digital materials, print collateral, print and electronic advertising, publicity, news items, tradeshow exhibit materials and fundraising literature. Chapters are encouraged to seek USGBC marketing review and input prior to committing significant resources to design and production. Contact marketing@usgbc.org.

USING USGBC® CHAPTERS IN TEXT

Chapters should be identified as USGBC Chapters in all communications including but not limited to written, electronic, and verbal communications. If a chapter has a unique chapter name (other than a geographical description), affiliation with USGBC must be represented in the communication. For example, *USGBC Arizona, a chapter of the U.S. Green Building Council* or *Urban Green, a New York chapter of USGBC.*

USGBC® MEMBERS

The member logo, based on the USGBC logo, incorporates the word member within its circular band. It's available for use by members with active standing to promote their membership with USGBC. If USGBC membership is terminated or lapsed, members are no longer permitted to use the logo.

The logo is available for download in the user account section of the USGBC website, usgbc.org/account.

USING THE USGBC® MEMBER LOGO

The USGBC member logo must always appear in the following colors:

Black

PMS 424U (Uncoated) or 60% black

White

DO:

- Use the logo in connection with the member's business and marketing materials including but not limited to stationery, letterhead, business cards, print ads, brochures, flyers, tradeshow exhibit materials and signage.
- Link to usgbc.org when using the USGBC member logo online. Linking to other pages on USGBC's website or to any other third party website is prohibited.

DON'T:

- Make the USGBC member logo the most prominent mark on the business and marketing materials.
- Use the mark on official or legal documents (i.e. sales contracts, official disclosure documents, etc.).

LEED®

The LEED logo, based on the USGBC logo, is a globally recognized symbol of excellence in green building. It is a powerful marketing tool and its usage is governed by policies designed to ensure this mark retains its value.

USING THE LEED® LOGO

The LEED logo must always appear in its standard colors:

60% and 50% black

DO:

- Include the following acknowledgement when using the LEED logo: *LEED®, and its related logo, is a trademark owned by the U.S. Green Building Council® and is used with permission.*
- Include descriptive copy about LEED when using the logo in editorial and literature. For example: *LEED® is the preeminent program for the design, construction, maintenance and operations of high-performance green buildings.*
- Link to usgbc.org/LEED when using the LEED logo online. Linking to other pages on USGBC's website or to any other third party website is prohibited.
- Original print size is set in the EPS file. Do not reduce the logo to more than 20% or enlarge it to more than 380% of its original print size.
- For temporary signage posted at construction sites, do not resize the logo to larger than 12" diameter. All other printed materials must follow the size guideline above.

DON'T:

- Resize the logo smaller than 1.5" diameter.
- Place the LEED logo on product packaging, advertisements, or as a visual reference to LEED claims in product literature. For guidelines on how to promote products and services related to LEED, see page 13.

LEED® CERTIFICATION

Once a project has been certified, the LEED Certification logo appropriate to the year and level of certification achieved may be used to represent the associated project's achievement. These logos may be included in collateral and other marketing materials, and on physical installations such as LEED plaques, decals and banners. Confidential, or private LEED-certified projects are *not* authorized to use the LEED Certification logos.

USING THE LEED® CERTIFICATION LOGOS

The LEED Certification logos must appear in 50% or 60% black.

DO:

- Include the following acknowledgement: *The LEED® Certification trademark owned by the U.S. Green Building Council and is used with permission.*
- Use only the LEED Certification logo appropriate to the level of certification and the year certified on marketing materials associated with a particular LEED-certified project.
- When designing a physical installation using the LEED certification logo, ensure that the image appears tone-on-tone in the color of the natural material (for example, stone or glass) without additional or contrasting colors. Plaques must be 12″ or larger.
- Only display a physical installation of the LEED Certification logo at the site of the LEED-certified project, and make the project's LEED scorecard available publicly*.
- Contact the USGBC Marketing Department at marketing@usgbc.org for additional guidance and permission regarding uses of the logo or trademarks, and to request permission to use the logo.

DON'T:

- Use the LEED Certification logo to represent LEED-registered projects.
- Use the LEED Certification logo on anything other than promoting a LEED-certified project.

* The LEED scorecard is generated for all LEED-certified projects on LEED Online and on USGBC's Project Directory (usgbc.org/projects).

USING LEED® IN TEXT

LEED®—an acronym for Leadership in Energy and Environmental Design™—is a registered trademark of the U.S. Green Building Council®. When referencing LEED in text:

DO:

- Refer to the full title, *LEED® green building program* on first reference.
- When describing LEED, include descriptive text. For example: *The U.S. Green Building Council's LEED® green building program is the preeminent program for the design, construction, maintenance and operations of high-performance green buildings. Learn more at usgbc.org/LEED.*

REFERENCING LEED®-CERTIFIED PROJECTS

When a project achieves certification it should be referred to as a LEED-certified project, and not, for example, LEED for New Construction certified or LEED for Commercial Interiors v2.0 certified. If appropriate, supporting text may be written that gives additional detail about the specific rating system under which the project was certified.

LEED certification with lowercase "c" is used to describe the certification process. LEED-certified with lowercase "c" is used to describe a project that has been certified. LEED Certified with capital "C" and no hyphen is used to describe a project that has been certified to the base level.

DO SAY:

- Project is *LEED® Certified™, LEED Silver®, LEED Gold®, LEED Platinum®*; or
- Project is *LEED® Certified™, Silver, Gold, Platinum*; or
- Project is LEED® certified to the *Silver, Gold, Platinum level*; or
- Project, a LEED-certified project, achieved *Silver, Gold, Platinum* level certification.

DON'T SAY:

- Project is LEED Certified certified.

REFERENCING LEED®-REGISTERED PROJECTS

LEED-registered projects have been registered with the intent of earning LEED certification for their project once its complete. A project that's registered can only be referred to as LEED® registered. When describing LEED-registered projects:

DO SAY:

- Registered with the certification goal of LEED® Certified, LEED® Silver, LEED® Gold, LEED® Platinum;

- Upon completion, this project will apply to become LEED® certified.
- Project is registered under the LEED® green building program.

DON'T SAY:

- This project is LEED® Gold Registered. *Note: Projects cannot register to achieve a specific level of certification.*
- This project is LEED Qualified, Compliant, Reviewed, Enrolled, Verified, Designed, Certifiable, etc.

The LEED logo can be placed on temporary signage at the building site to reference a LEED-registered project, only when accompanied by the following text: *This project is registered under the LEED® green building program.*

LEED-registered projects may not use the LEED logo on any other marketing materials.

REFERENCING PRECERTIFIED CORE AND SHELL PROJECTS

Precertified projects can use the LEED® program logo on project materials, marketing collateral and signage when accompanied by the following text: *This project has achieved LEED® for Building Design and Construction: Core and Shell Development (LEED® BD+C: Core and Shell) precertification at the Certified, Silver, Gold, Platinum level.*

Precertified projects should not use the specific LEED certification logo until achieving full certification.

CONFIDENTIAL PROJECTS

If a project chooses to remain confidential, or private, it must not be marketed or represented to the general public as LEED-registered or LEED-certified. These projects aren't entitled to use or display any intellectual property, including the LEED certification trademarks and logos.

These projects may communicate their LEED-registered or LEED-certified status to government entities for the limited purposes of complying with building and tax laws, and administrative proceedings related to land use entitlements.

LOGOS ON PRODUCT PACKAGING

USGBC does not review, certify, or endorse products. As such, trademarked logos may not be used to indicate any kind of endorsement by USGBC of any product or service, to indicate that any official status for any product or service has been conferred by, or is otherwise associated with USGBC.

Logos may not be placed on product packaging under any circumstances.

REFERENCING LEED® IN PRODUCT LITERATURE

Manufacturers may reference LEED in their product literature providing that the language doesn't states or imply endorsement by USGBC or the LEED green building program. The language must clearly acknowledge that LEED credit requirements cover the performance of materials, not the performance of the individual products or brands. Products that meet the LEED performance criteria can only contribute toward earning points needed for LEED certification; they cannot be said to earn points toward LEED certification on their own.

DO SAY:

- Product 'A' contributes toward satisfying Credit 'X' under LEED®.

DON'T SAY:

- "Product 'A' is LEED® certified, qualified, compliant, accredited, approved.
- "LEED® Product"
- "Product 'A' meets, satisfies, fulfills, complies with Credit 'X'".

REFERENCING LEED® RATING SYSTEMS

The LEED green building program refers to the full suite of rating systems. There are four LEED® rating systems that address multiple project types:

RATING SYSTEM	SHORTENED NAME
LEED® for Building Design and Construction	LEED® BD+C
LEED® for Interior Design and Construction	LEED® ID+C
LEED® for Building Operations and Maintenance	LEED® O+M
LEED® for Neighborhood Development	LEED® ND

The official rating system names with adaptations are listed below, along with a shortened name, which can after the first reference:

RATING SYSTEM + ADAPTATION	SHORTENED NAME
LEED® for Building Design and Construction: New Construction and Major Renovations	LEED® BD+C: New Construction
LEED® for Building Design and Construction: Core and Shell Development	LEED® BD+C: Core and Shell
LEED® for Building Design and Construction: Schools	LEED® BD+C: Schools
LEED® for Building Design and Construction: Retail	LEED® BD+C: Retail
LEED® for Building Design and Construction: Healthcare	LEED® BD+C: Healthcare
LEED® for Building Design and Construction: Data Centers	LEED® BD+C: Data Centers
LEED® for Building Design and Construction: Hospitality	LEED® BD+C: Hospitality
LEED® for Building Design and Construction: Warehouses and Distribution Centers	LEED® BD+C: Warehouses and Distribution Centers
LEED® for Building Design and Construction: Homes and Multifamily Lowrise	LEED® BD+C: Homes
LEED® for Building Design and Construction: Multifamily Midrise	LEED® BD+C: Multifamily Midrise
LEED® for Interior Design and Construction: Commercial Interiors	LEED® ID+C: Commercial Interiors
LEED® for Interior Design and Construction: Retail	LEED® ID+C: Retail
LEED® for Interior Design and Construction: Hospitality	LEED® ID+C: Hospitality
LEED® for Building Operations and Maintenance: Existing Buildings	LEED® O+M: Existing Buildings
LEED® for Building Operations and Maintenance: Data Centers	LEED® O+M: Data Centers
LEED® for Building Operations and Maintenance: Warehouses and Distribution Centers	LEED® O+M: Warehouses and Distribution Centers
LEED® for Building Operations and Maintenance: Hospitality	LEED® O+M: Hospitality
LEED® for Building Operations and Maintenance: Schools	LEED® O+M: Schools
LEED® for Building Operations and Maintenance: Retail	LEED® O+M: Retail
LEED® for Neighborhood Development: Plan	LEED® ND: Plan
LEED® for Neighborhood Development: Built Project	LEED® ND: Project

LEED® CREDITS

LEED Credits address:

- Integrative Process
- Sustainable Sites
- Energy and Atmosphere
- Indoor Environmental Quality
- Regional Priority
- Location and Transportation
- Water Efficiency
- Materials & Resources
- Innovation

LEED® for Neighborhood Development

- Smart Location & Linkage
- Green Infrastructure & Buildings
- Neighborhood Pattern & Design

LEED® PROFESSIONAL CREDENTIALS

The LEED AP® logos signify a depth of knowledge in green building practices and specialization in a particular field.

USING THE LEED AP® LOGOS

The LEED AP logos must always appear in the following colors:

Cool Grey: PMS 11U Yellow: PMS 109	Cool Grey: PMS 11U Orange: PMS 159U	Cool Grey: PMS 11U Green: PMS 564U	Cool Grey: PMS 11U Blue: PMS 298U	Cool Grey: PMS 11U Green: PMS 583U	Cool Grey: PMS 11U Green: PMS 375C

Black	Black	Black	Black	Black	Black

DO:

- Include the following acknowledgement when representing your LEED professional credential on marketing materials: *LEED AP® and the LEED AP logos are trademarks owned by the U.S. Green Building Council® and are used with permission.*
- Contact USGBC's Marketing Department for permission, marketing@usgbc.org.

DON'T:

- Reduce the logos less than 40 pixels, or enlarge the logos more than 100 pixels.

USING THE LEGACY LEED AP® LOGO

™ The legacy LEED AP logo is a mark intended for LEED APs who completed their LEED credentials prior to the implementation of the LEED 2009 Credentialing Program. All LEED APs who hold this credential may continue to display the mark.

The legacy LEED AP logo must always appear in the following colors:

PMS 11U

Black

White

DO:

- Include the following acknowledgement when using the legacy LEED AP logo to represent your LEED professional credential on marketing materials*: *Legacy LEED AP® and the LEED AP logos are trademarks owned by the U.S. Green Building Council®.*
- Contact USGBC's Marketing Department for permission, marketing@usgbc.org.

DON'T:

- Reduce the logos less than 40 pixels, or enlarge more than 100 pixels.

* This acknowledgment isn't required on business cards or other materials with similar space limitations.

LEED® GREEN ASSOCIATE™ LOGO

The LEED Green Associate logo represents a credential awarded by GBCI® on those professionals who have demonstrated knowledge and skill in practicing green design, construction, and operations by passing the LEED Green Associate exam.

USING THE LEED® GREEN ASSOCIATE™ LOGO

The LEED Green Associate logo must always appear in the following colors:

PMS 11U and PMS 370U

Black

White

DO:

- Include the following acknowledgement when using the LEED Green Associate logo to represent your LEED professional credentials on marketing materials*: *LEED® Green Associate™ and the LEED Green Associate logos are trademarks owned by the U.S. Green Building Council® and are used with permission.*
- Contact USGBC's Marketing Department for permission, marketing@usgbc.org.

DON'T:

- Reduce the logos less than 40 pixels, or enlarge to more than 100 pixels.

* This acknowledgment isn't required on business cards or other materials with similar space limitations.

LEED FELLOW® LOGO

The LEED® Fellow™ logo signifies an elite class of leading professionals who are distinguished by their years of experience with the LEED green building certification program. The mark represents those who have contributed to the standards of practice and body of knowledge for achieving continuous improvement in the green building field. The logo is comprised of the LEED mark in the traditional LEED AP® font, surrounded by a circle of USGBC's trademark oak leaves accompanied by the word "Fellow."

USING THE LEED FELLOW® LOGO

The LEED® Fellow™ logo must always appear in the following colors:

PMS 11U and PMS 370U

Black

White

DO:

- Include the following acknowledgement on marketing materials when using the LEED Fellow logo to represent your LEED professional credential*: *LEED® Fellow™ and the LEED Fellow logos are trademarks owned by the U.S. Green Building Council® and are used with permission.*
- Use the appropriate trademark symbol when capitalized (LEED FELLOW®) and when lowercase (LEED® Fellow™.).
- Contact USGBC's Marketing Department for permission, marketing@usgbc.org.

DON'T:

- Reduce the logos less than 40 pixels, or enlarge more than 100 pixels.

* This acknowledgment isn't required on business cards or other materials with similar space limitations.

REFERENCING LEED® PROFESSIONAL CREDENTIALS IN TEXT

- LEED AP® (*not* LEED Accredited Professional)
- LEEP AP® with specialty
- LEED AP® Building Design + Construction *or* LEED AP BD+C
- LEED AP® Interior Design + Construction *or* LEED AP ID+C
- LEED AP® Operations + Maintenance *or* LEED AP O+M
- LEED AP® Homes (*not* LEED AP H)
- LEED AP® Neighborhood Development *or* LEED AP ND

When referencing LEED professional credentials in promotional materials for test preparation products, prominently include the following descriptive text: *Company X is not affiliated with USGBC® or GBCI®, and does not administer the LEED AP® program. USGBC and GBCI do not endorse or recommend the products or services offered by company X.*

CENTER FOR GREEN SCHOOLS AT USGBC®

The logo representing the Center for Green Schools at USGBC® incorporates the main USGBC logo along with descriptive text to represent this sub-center of USGBC. The mark is intended to stand-alone.

USING THE CENTER FOR GREEN SCHOOLS AT USGBC® LOGO

The Center for Green Schools at USGBC® logo must always appear in the following colors:

PMS 390U and PMS 424U

Black

White

DO

- Include the following acknowledgement when using the logo: *The Center for Green Schools at USGBC and related logo are trademarks owned by the U.S. Green Building Council® and are used with permission.*
- Include descriptive copy about the Center for Green Schools at USGBC when using the logo in editorial and marketing materials. For example: *The Center for Green Schools at the U.S. Green Building Council works directly with teachers, students, administrators, elected officials and communities to create programs, resources and partnerships that transform all schools into healthy learning environments.*
- When using the logo on websites, link it to centerforgreenschools.org. Linking to other pages on websites belonging to USGBC, the owner or any other third-party is prohibited.
- Contact the USGBC Marketing Department to request permission to use the logo, marketing@usgbc.org.

USGBC® STUDENTS™

The USGBC Students logo is designed for use as a stand-alone logo to represent an approved student group's affiliation with USGBC. The Students logo, in conjunction with the college or university name, creates the unique identifier for each group.

The USGBC Students logo must always appear in the following colors:

PMS 424U or 60% black

Black

White

USING THE USGBC® STUDENTS™ LOGO

Use of the USGBC Students logo is authorized by permission of the USGBC Students Group Manager, and all students group must follow USGBC Students brand guidelines when representing the group and the organization. Contact studentgroups@usgbc.org for more information.