LEED Rating System Draft
November 2010

INTERIOR DESIGN & CONSTRUCTION

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Commercial Interiors
Retail
Hospitality

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INTEGRATED PROCESS (IP)

IP CREDIT: INTEGRATED PROCESS

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

Develop an early understanding of the relationships between technical systems, natural systems and occupants within a building project, its site, its context, and its intended use. Engage all key project team members for the purpose of making cost- and environmentally-effective integrated decisions throughout the design and construction process.

Requirements

CI, RETAIL, HOSPITALITY

Demonstrate that key building and site conditions and systems interactions are explored and analyzed in a way that informs and ensures alignment with interior design, construction and operations decisions that improve the human condition in interior spaces by implementing the following:

Discovery: Iterative Analysis during Conceptual Design (x point)

OPTION 1: Pre-site selection – Analyze and compare potential project sites (x point)
(Available to projects that initiate this process prior to site selection)
Initiate integrated decision-making with interiors expertise and skill sets prior to site selection to test the suitability of potential tenant spaces to ensure that they have in place the characteristics for improving human condition. This analysis must identify and document interactions between 5 key building characteristics and performance benefits relative to occupant performance that facilitate healthier and more productive lives such as ergonomics, privacy, acoustics, toxicology, connectivity to site, indoor air quality, thermal comfort, and lighting satisfaction, and must include:

- Location Assessment – Complete an assessment of the tenant occupants transportation needs for commuting and business travel. Prepare a comprehensive transportation management plan in alignment with needs that can be used to measure the reduction of transportation impacts. Establish criteria for convenient access to transportation alternatives and local amenities that can be used to determine preferred tenant locations.
- Building Features – Prioritize preferred building and site characteristics that align with LEED-CI SSc1 criteria to be used in the evaluation of proposed real estate alternatives

OPTION 2: Post site selection – Conduct analyses to optimize project site (x points)

Prior to the schematic design phase, perform an energy analysis and *at least two systems' analyses* that demonstrate systems synergies, and document how these analyses shaped and/or informed the project design relative to occupant performance spaces that facilitate healthier and more productive lives such as ergonomics, privacy, acoustics, toxicology, desirable, connectivity to site, indoor air quality, thermal comfort, and lighting satisfaction,

- Energy Evaluation (required) Perform an Initial Energy Evaluation to assess the potential for synergies among daylighting, lighting and controls, HVAC systems, and equipment and appliance specifications.
- Perform at least two additional analysis from the list below:
  - Indoor Environmental Quality – Complete an assessment of the tenant occupants operational profile and determine alignment of the project's design with appropriate features such as Daylight and Views, indoor Air Quality, Acoustics, Ergonomics, Health and Wellness amenities, etc.
  - Water Balancing/ Budgeting – Perform a preliminary analysis that quantifies all water input and output as appropriate to the scope of the tenant building and space. Analyze the potential to work with building owners to optimize interior fixture efficiencies and explore the possibilities for collected water reuse for non-potable purposes.
  - Materials Assessment – Perform a preliminary materials analysis of:
    - The reuse of materials and products and the reduction and diversion of construction and occupant waste to renewable cycles AND
    - Products and materials that have multi-attribute Life Cycle based assessment and rating methodologies that can be used to inform design decisions.
  - Daylight Modeling and Views – Perform a preliminary daylighting analysis including shading studies, quantitative analysis (possible metrics may include daylight factor, illuminance levels, luminance factors, etc.), qualitative analysis, and observational recommendations. The analysis should demonstrate a systemic comparison of optional elements and features that optimize effective daylighting strategies for occupant spaces. Assess the location of interior enclosures to maximize daylight penetration and views to the outdoors. .

Concept Design Integrated Workshop (x points):
Prior to the schematic design phase, conduct at least one full-day (or two half-day) integrated design workshop(s) with the project team for the purpose of integrating green strategies across all aspects of the building and site design, drawing on the expertise of all key participants. The purpose of this workshop is to identify synergies between building and interior elements/systems and align project team members around integrated design strategies. Expertise of attendees at the workshop must include at least four of the following skill sets, along with at least one key Owner/ Client representative:

- Interior design
- Architecture
- Mechanical, Electrical, Plumbing (MEP) engineering
- Acoustical engineering
- Energy analysis
- Green building or sustainable design
- operations and maintenance
- construction
- Occupants
- Real Estate Leasing agent/broker

Tasks and activities during this workshop should include:

- Introduce participants to the fundamentals of integrated design and systems thinking.
- Align project team around project purpose and goals.
- Establish initial metrics, benchmarks, and performance targets for the LEED credits being pursued.
- Generate potential strategies for achieving identified LEED performance targets.

- Develop a Process Road Map that identifies initial responsibilities, deliverables, and dates for managing the project scope by defining: what, when, and by whom outputs need to be produced.
- Initiate documentation of the Owner's Project Requirements (OPR) for Commissioning.

Outcomes should include:
Demonstration of how initial project design decisions were informed by preliminary analyses.
Initial Commissioning Owner's Project Requirements (OPR) narrative that can be utilized to demonstrate the development of the project's performance targets and potential solutions as the design progresses.

Design Phase Integrated Workshop(s) (x points):
In addition to the Conceptual Design Integrated Workshop above, conduct at least one full-day (or two half-day) integrated design workshop(s) with the project team no later than the end of the schematic design phase, for the purpose of identifying increasing opportunities for synergies between green strategies and systems across all aspects of the building interiors, drawing on the expertise of all participants. Expertise of attendees at the workshop must include at least four of the following skill sets, along with at least one key Owner/Client representative:
(same changes to this list)

- Interior design
- Architecture
- Mechanical, Electrical, Plumbing (MEP) engineering
- Acoustical engineering
- Energy analysis
- Green building or sustainable design
- operations and maintenance
- construction
- Occupants
- Real Estate Leasing agent

Tasks and activities during this workshop should include:

- Present conceptual design analyses and subsequent research findings
- Identify and assess opportunities for synergies between all key systems based upon the above research and analysis.
- Identify additional analysis tasks that are needed to improve and refine systems performance and synergies.
- Confirm metrics, benchmarks, and performance targets for the LEED credits being pursued.
- Review and adjust the Process Road Map that identifies responsibilities, deliverables, and dates for managing the next stages of the project design by defining: what, when, and by whom outputs need to be produced.
- Review and adjust the Owner's Project Requirements (OPR) for Commissioning.

Outcomes should include:

- Integrated Project Cost Estimating (showing how total project cost was informed by bundling interrelated systems costs).
- Demonstration of how the project design improvements were based on preliminary analyses.
- Updated Commissioning Owner's Project Requirements (OPR) narrative that continues to document the development of the project's performance targets and potential solutions as the design progresses.

Construction & Operations: Trades and Building Operations Team Training (x points):
During the initial stage of the Construction Administration phase, but prior to work commencing by construction trades on site, conduct training with critical trades related to the LEED credits being pursued. This training should focus on the green and LEED aspects of the project, including all relevant LEED-related specifications, credit and prerequisite requirements, contractors' roles, and documentation necessary to ensure achievement of targeted LEED credits. Include at least the following trades:

- Plumbing Systems
- Mechanical Systems
- Electrical and Lighting Systems
- Building Controls Systems
- Building Envelope
- Landscape and Civil infrastructure (if appropriate)
- Building Operations & Maintenance
- Commissioning
- Construction Superintendent and Project Manager

IP CREDIT: LEED ACCREDITED PROFESSIONAL

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, RETAIL CI, HOSPITALITY

At least one (1) principal participant of the project team shall be a LEED Accredited Professional (AP) with a specialty most appropriate for the project.

In addition, two (2) individuals representing primary disciplines on the project are required to be LEED APs (any specialty) or Green Associates.

LOCATION AND TRANSPORTATION (LT)

LT CREDIT: SITE SELECTION

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To encourage tenants to select buildings that employ best practices and green strategies.

Requirements

CI, RETAIL, HOSPITALITY

Locate the tenant space in a building certified under a LEED Building Design and Construction rating system, a LEED for Existing Buildings rating system, or a LEED for Neighborhood Development rating system.

LT CREDIT: DEVELOPMENT DENSITY AND COMMUNITY ACCESS

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, RETAIL, HOSPITALITY

OPTION 1. DEVELOPMENT DENSITY

Construct or renovate a building or space on a previously developed site with an average *density* per acre of *buildable land* within a ¼-mile radius of the project site as indicated in following table.

Residential density (DU/acre)	Non-residential density (FAR)	Points
7	0.5	
12	0.8	

DU = dwelling unit; FAR = floor-area ratio

For LEED Schools projects: 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.

OR

OPTION 2. COMMUNITY ACCESS

Construct or renovate a building on a site that meets the following criteria:

a. The building is located on an *infill* site.

b. The building's main entrance is within 1/2 mile *walk distance* from the building entrance of the following number of diverse uses (listed in Appendix 1)

Number of diverse uses	Points
4-6	
7-10	

c. The building has pedestrian access between the building and the services.

The following restrictions apply to counting diverse uses:

a. A single establishment may not be counted in two categories (e.g., a place of worship may be counted only once even if it also contains a daycare facility, and a retail store may be counted only once even if it sells products in several categories).
b. Establishments in a mixed-use building may each count if they are distinctly operated enterprises with separate exterior entrances, but no more than half of the minimum number of diverse uses can be situated in a single building or under a common roof.
c. If the project is mixed-use and open to the public, no more than half of the diverse uses may be within the project boundary. The diverse uses outside the project boundary must be in place upon occupation of the project.

OPTION 3. DENSE AND ACCESSIBLE LOCATION

Earn at least 1 point each in Options 1 and 2.

OPTION 4. LEED FOR NEIGHBORHOOD DEVELOPMENT LOCATION

Locate the project in a Stage 2 Pre-certified LEED for Neighborhood Development plan or a Stage 3 LEED-ND Certified Neighborhood Development. Points are awarded according to the following table.

Certification level	Points
Certified	
Silver	
Gold	

LT CREDIT: REDUCED AUTOMOBILE DEPENDENCE

This credit is available in the Pilot Credit Library.

This credit applies to:

- Commercial Interiors
- Hospitality

Intent

To reduce pollution and land development impacts from automobile use.

Requirements

CI, HOSPITALITY

OPTION 1. TRANSIT-SERVED LOCATION

Locate the main building entrance of the project within a ¼-mile *walk distance* of existing or planned bus or streetcar stops, or within a ½-mile walk distance of existing or planned *bus rapid transit* stops, light or heavy rail stations, or ferry terminals. The transit service at those stops in aggregate must meet the minimums listed in Tables 1 and 2. Planned stops may count if they are sited, funded, and under construction upon project occupancy and are complete within 24 months of project occupancy.

Both weekday and weekend trip minimums must be met.

Count trips as follows:

a. Trips in opposite directions are counted separately
b. Trips are counted only if they are a part of a route with service in opposite directions
c. Inbound and outbound trips at a stop that is the beginning and end of a route are counted separately.
d. Trips that stop beyond the ¼-mile walk distance may count if the average building-to-stop walk distance of that stop and the stop for the opposite direction is no more than ¼ mile.
e. Weekend trips must include service on both Saturday and Sunday. To determine weekend trips, average Saturday and Sunday service.

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

Weekday trips	Weekend trips	Points
60	40	
76	50	
100	65	
132	85	
180	130	

246	150	

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

Weekday trips	Weekend trips	Points
24	6	
40	8	
60	12	

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 X 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. METROPOLITAN PLANNING ORGANIZATION LOCATION WITH LOW VMT

Locate the project:

1. within a region served by a *metropolitan planning organization* (MPO;) and
2. within a *traffic analysis zone (TAZ)* where either
   a. the current annual home-based *vehicle miles traveled* (VMT) per capita (if the TAZ is 100% residential); or
   b. the annual non-home-based VMT per employee (if the TAZ is 100% non-residential) does not exceed 90% of the average equivalent of the metropolitan region value.

The research must be derived from household or employment transportation surveys conducted by the MPO within 10 years of the date of submission for LEED certification. Additional credit may be awarded for increasing levels of performance, as indicated in Table 3.

Mixed-use TAZs must use whichever VMT is greater, either residential per capita or non-residential per employee.

Table 3. Points for low-VMT location

Percentage of average regional VMT per capita	Points
81–90%	
71–80%	
61–70%	
51–60%	
41–50%	
40% or less	
VMT = vehicle miles traveled	

ALL OPTIONS

For all options, provide dedicated walking or

bicycling lanes to the transit lines that extend from the school building at least to the end of the school property in two or more directions without any barriers (e.g., fences).

LT CREDIT: BICYCLE NETWORK, STORAGE AND CHANGING ROOMS

This credit is available in the Pilot Credit Library.

This credit applies to:

- Commercial Interiors
- Hospitality

Intent

To reduce pollution and land development impacts from automobile use.

Requirements

CI, HOSPITALITY

BICYCLE NETWORK

Locate the space in a building such that the building entrance and/or bicycle storage is within a 200-yard walk distance from at least one of the following:

a. an *existing bicycle network* of at least 5 continuous miles in length; or
b. an *existing bicycle network* that connects to at least 10 diverse uses (see Appendix 1) within 3 miles bicycling distance from the project boundary.

If the requirements border the building site boundary, a safe, all-weather route must exist between the bicycle network and the bicycle storage and/or main entrance.

Planned and funded bicycle trails or lanes may be counted if they are funded and designated for completion within the fiscal year that the constructing organization finalizes the plans.

AND

BICYCLE STORAGE

Provide secure, enclosed bicycle storage space for 5% of all tenant occupants (measured at peak periods). Provide at least one on-site shower with changing facility for the first 100 full-time equivalent (FTE) occupants and one additional shower for every 200 FTE occupants thereafter.

Bicycle storage areas must be locked, located inside or within 100 feet of a building entry, and easily accessible to employees, residents, and/or visitors. All storage must be safe, clearly visible from a main entry, served with night lighting, and protected from damage by nearby vehicles. Bicycle racks must not block the pedestrian path of travel or inhibit universal accessibility.

Provide informational signage on using the storage facilities.

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

LT CREDIT: PARKING REDUCTION

This credit is available in the Pilot Credit Library.

This credit applies to:

- Commercial Interiors
- Hospitality

Intent

To reduce pollution and land development impacts from automobile use.

Requirements

CI, HOSPITALITY

Size parking capacity to not exceed minimum local zoning requirements.

AND

Provide parking capacity that provides a percent reduction from the base ratios recommended by the Parking Consultants Council (PCC), as shown in Tables 18-2 through 18-4 in the Institute of Transportation Engineers' *Transportation Planning Handbook, 3rd Edition*.

CASE 1. BASELINE LOCATION

Points for projects that have not earned points for density and transit service are awarded according to Table 1.

Percentage reduction	Points
20	
40	

CASE 2. DENSE AND/OR TRANSIT-SERVED LOCATION

This option is for projects earning 1 or more points in either LT Credit 2: Development Density and Community Access or LT Credit 3: Reduced Automobile Dependence.

Percentage reduction	Points
40	

60	

BOTH CASES.

Provide preferred parking for carpools or vanpools for 5% of the total parking spaces after reductions are made from the base ratios.

Mixed-use projects may determine the percentage reduction by aggregating the spaces provided for each use.

LT CREDIT: ALTERNATIVE TRANSPORTATION

This credit applies to:

- Retail

Intent

To reduce pollution and land development impacts from automobile use.

Requirements

RETAIL

OPTION 1. REDUCED AUTOMOBILE DEPENDENCE

This option is available in the Pilot Credit Library.

PATH 1. TRANSIT-SERVED LOCATION

Locate the main building entrance of the project within a ¼-mile *walk distance* of existing or planned bus or streetcar stops, or within a ½-mile walk distance of existing or planned *bus rapid transit* stops, light or heavy rail stations, or ferry terminals. The transit service at those stops in aggregate must meet the minimums listed in Tables 1 and 2. Planned stops may count if they are sited, funded, and under construction upon project occupancy and are complete within 24 months of project occupancy.

Both weekday and weekend trip minimums must be met.

Count trips as follows:

- Trips in opposite directions are counted separately
- Trips are counted only if they are a part of a route with service in opposite directions
- Inbound and outbound trips at a stop that is the beginning and end of a route are counted separately.
- Trips that stop beyond the ¼-mile walk distance may count if the average building-to-stop walk distance of that stop and the stop for the opposite direction is no more than ¼ mile.
- Weekend trips must include service on both Saturday and Sunday. To determine weekend trips, average Saturday and Sunday service.

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

Weekday trips	Weekend trips	Points
60	40	
76	50	
100	65	
132	85	
180	130	
246	150	

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

Weekday trips	Weekend trips	Points
24	6	
40	8	
60	12	

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 X 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

PATH 2. METROPOLITAN PLANNING ORGANIZATION LOCATION WITH LOW VMT

Locate the project:

1. within a region served by a *metropolitan planning organization* (MPO;) and
2. within a *traffic analysis zone (TAZ)* where either
   (a) the current annual home-based *vehicle miles traveled* (VMT) per capita (if the TAZ is 100% residential); or
   (b) the annual non-home-based VMT per employee (if the TAZ is 100% non-residential) does not exceed 90% of the average equivalent of the metropolitan region value.

The research must be derived from household or employment transportation surveys conducted by the MPO within 10 years of the date of submission for LEED certification. Additional credit may be awarded for increasing levels of performance, as indicated in Table 3.

Mixed-use TAZs must use whichever VMT is greater, either residential per capita or non-residential per employee.

Table 3. Points for low-VMT location

Percentage of average regional VMT per capita	Points
81–90%	
71–80%	
61–70%	
51–60%	
41–50%	
40% or less	
VMT = vehicle miles traveled	

OPTION 2: BICYCLE COMMUTING

This option is available in the Pilot Credit Library.

BICYCLE NETWORK

Design or locate the *project* such that the building entrance and/or bicycle storage is within a 200-yard walking distance from at least one of the following:

a. an *existing bicycle network* of at least 5 continuous miles in length;
b. if the project is 100% residential, an *existing bicycle network* that connects to a *school* or *employment center* within 3 miles' bicycling distance; and
c. an *existing bicycle network* that connects to at least 10 diverse uses (see Appendix) within 3 miles' bicycling distance from the project boundary.

If the requirements border the project, a safe, all-weather route must exist between the bicycle network and the bicycle storage and/or main entrance.

Planned and funded bicycle trails or lanes may be counted if they are funded and designated for completion within the fiscal year that the constructing organization finalizes the plans.

AND

BICYCLE STORAGE

Provide at least one secure, enclosed bicycle storage space for 5% of full-time equivalent (FTE) retail employees. Provide at least one on-site shower with changing facility for the first 100 FTE occupants and one additional shower for every 200 FTE occupants thereafter.

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

AND

Provide a bicycle maintenance program or route assistance. Any maintenance program must be intended for employees and may include coupons for yearly bicycle tune-ups for those who ride to work or on-site supplies for basic self-repairs (e.g., tire pump, patch kit). Route assistance must be intended for employees and customers and may include a map indentifying bicycle routes to the project site, posted on the property in a location that is easily accessible to employees and customers; the map could also be posted online.

FOR PROJECTS THAT ARE PART OF A MASTER PLAN DEVELOPMENT

If bicycle racks or storage has been provided by the development in which the project is located, determine the number of bicycle storage spaces that may be attributed to the project by dividing the square footage of the retail project by the total square footage of the development (buildings only), and multiplying the percentage result by the total number of bicycle storage spaces. If this number does not meet the credit requirement, the project must add additional spaces.

OPTION 3. PARKING REDUCTION

This option is available in the Pilot Credit Library.

Parking capacity must not exceed minimum local zoning requirements.

AND

Provide parking capacity that provides a percent reduction from the base ratios recommended by the Parking Consultants Council, as shown in Tables 18-2 through 18-4 in the Institute of Transportation Engineers' *Transportation Planning Handbook, 3rd Edition*.

CASE 1. BASELINE LOCATION

Points for projects that have not earned points for density and transit service are awarded according to Table 1.

Percentage reduction	Points
20	
40	

CASE 2. DENSE AND/OR TRANSIT-SERVED LOCATION

This option is for projects earning 1 or more points in either Option 1 or LT Credit 2: Development Density and Community Access.

Percentage reduction	Points
40	
60	

BOTH CASES.

Provide *preferred parking* for carpools or vanpools for 5% of the total parking spaces provided for employees.

OPTION 4. LOW-EMITTING AND FUEL-EFFICIENT VEHICLES

PATH 1

Provide *low-emitting and fuel-efficient vehicles* for 3% of the full-time equivalent (FTE) occupants.

Provide *preferred parking* for these vehicles.

OR

PATH 2.

Provide building occupants access to a *low-emitting or fuel-efficient vehicle*-sharing program. The following requirements must be met:

- One *low-emitting or fuel-efficient vehicle* must be provided for a minimum 3% of employee FTE occupants. Assuming that 1 shared vehicle can carry 8 persons, 1 vehicle per 267 employee FTE occupants is required. For buildings with fewer than 267 employee FTE occupants, at least 1 *low-emitting or fuel-efficient vehicle* must be provided.
- A two-year vehicle-sharing contract must be in place.
- Parking for *low-emitting and fuel-efficient vehicles* must be located in the nearest available spaces in the nearest available parking area.

OPTION 5. DELIVERY SERVICE

Provide a delivery service for purchases made from the retail project seeking LEED certification. It is not required that the delivery service be free of charge.

OPTION 6. INCENTIVES AND INFORMATION

Provide a comprehensive incentives program for employees who carpool or use alternative transportation to get to work. Offer at least three of the following incentives to all staff upon hire:

- transit pass subsidies;
- purchase of public transportation passes on a pre-tax basis;
- preferential on work shift scheduling for employees who carpool (with the proviso that although shifts cannot be guaranteed, a reasonable effort will be made to accommodate employees' schedules).
- an emergency ride home program so that employees are not penalized for not having a vehicle if they, a family member, or a member of their car- or vanpool needs to leave work for an emergency;
- preferred parking for carpools or vanpools; and
- discounts on bicycle accessories and maintenance at local bicycle shops.

In addition to incentives, provide a board or computer in the retail project, accessible to both employees and customers, that provides the following information:

- information on carpooling programs;
- transit trip planning assistance;
- transit maps;
- maps of preferred bicycle routes and the location(s) of secure bicycle parking, lockers and showers;
- summary of the company's Transportation Management Plan; and
- contacts for more information.

APPENDIX 1: DIVERSE USES

Food Retail
Supermarket
Other food store with produce

Community-Serving Retail
Clothing store or department store selling clothes
Convenience store
Farmer's market
Hardware store
Pharmacy
Other retail

Services
Bank
Gym, health club, exercise studio
Hair care
Laundry, dry cleaner
Restaurant, café, diner (excluding establishments with only drive-throughs)

Civic and Community Facilities
Adult or senior care (licensed)
Child care (licensed)
Community or recreation center
Cultural arts facility (museum, performing arts)
Educational facility (including K–12 school, university, adult education center, vocational school, community college)
Family entertainment venue (theater, sports)
Government office that serves public on-site
Place of worship
Medical clinic or office that treats patients
Police or fire station
Post office
Public library
Public park
Social services center

Adapted from Criterion Planners, INDEX neighborhood completeness indicator, 2005.

APPENDIX 2: DEFAULT OCCUPANCY COUNTS

Because of the speculative nature of core and shell construction, a project team may not know the final occupant count during the LEED certification process. Determining and demonstrating compliance with some LEED credits can prove challenging and complex. For projects that do not know the final occupant count, a default table has been developed.

Core & Shell projects that do not have final occupancy counts must utilize the default occupancy counts provided in this appendix. Projects that know the tenant occupancy must use the actual numbers, as long as the gross square foot per employee is not greater than that in the default occupancy count table. If code requirements is required gross square foot per occupant is less than those in the table, this is also acceptable. Default occupancy counts are provided for typical core and shell project types. If the buildings and circumstances are not covered in this appendix, provide documentation for comparable buildings demonstrating average gross square foot per occupant when estimating the core and shell's building occupancy.

Table 1. Default Occupancy Numbers

	Gross Square Feet per Occupant	
	Employees	Transients
General office	250	0
Retail, general	550	130
Retail or service (e.g., financial, auto)	600	130
Restaurant	435	95
Grocery store	550	115
Medical office	225	330
R&D or laboratory	400	0
Warehouse, distribution	2,500	0
Warehouse, storage	20,000	0
Hotel	1,500	700
Educational, daycare	630	105
Educational, K–12	1,300	140

Educational, postsecondary	2,100	150

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).

The figures above may be used to determine occupancy for the following credits:

- SS Credit 4.2: Alternative Transportation, Bicycle Storage and Changing Rooms
- SS Credit 4.4: Alternative Transportation—Parking Capacity
- WE Prerequisite 1: Water Use Reduction
- WE Credit 2: Innovative Wastewater Technologies
- WE Credit 3: Water Use Reduction
- EA Prerequisite 2: Minimum Energy Performance
- EA Credit 1: Optimized Energy Performance
- IEQ Prerequisite 1: Minimum Indoor Air Quality Performance
- IEQ Credit 1: Outdoor Air Delivery Monitoring
- IEQ Credit 2: Increased Ventilation
- IEQ Credit 6: Controllability of Systems—Thermal Comfort
- IEQ Credit 7: Thermal Comfort—Design
- IEQ Credit 8: Daylight and Views

The defaults provided above are based on gross square foot per occupant and not net or leasable square foot per occupant. Gross square footage is defined as the sum of all areas on all floors of a building included within the outside faces of the exterior wall including all floor penetrations that connect one floor to another. This can be determined by taking the building foot print and multiplying it by the number of floors in the building. Projects which contain underground and/or structured parking, may exclude that area from the gross square footage used for the calculation. Other spaces such as common areas, mechanical spaces, and circulation should be included in the gross square footage of the building.

GLOSSARY

accessory dwelling unit a subordinate *dwelling unit* that is attached to a principal building or contained in a separate structure on the same property as the principal unit.

adjacent site a site having at least 25% of its boundary bordering parcels that are each at least 75% *previously developed*. A *street* or other right-of-way does not constitute previously developed land; instead, it is the status of the property on the other side of the street or right-of-way that matters. Any fraction of the boundary that borders waterfront other than a stream is excluded from the calculation. A site is still considered adjacent if the 25% adjacent portion of its boundary is separated from previously developed parcels by undeveloped, permanently protected land averaging no more than 400 feet in width and no more than 500 feet in any one place. The undeveloped land must be permanently preserved as natural area, riparian corridor, *park*, greenway, agricultural land, or designated *cultural landscape*. Permanent pedestrian paths connecting the *project* through the protected parcels to the bordering site may be counted to meet the requirement of SLL Prerequisite 1, Option 2 (that the project be connected to the adjacent parcel by a through-street or nonmotorized right-of-way every 600 feet on average, provided the path or paths traverse the undeveloped land at no more than a 10% grade for walking by persons of all ages and physical abilities).

alley a publicly accessible right-of-way, generally located midblock, that can accommodate slow-speed motor vehicles, as well as bicycles and pedestrians. An alley provides access to the side or rear of abutting properties for loading, parking, and other service functions, minimizing the need for these functions to be located along streets. It may be publicly dedicated or privately owned and deeded in perpetuity for general public use.

applicant the entity that prepares the LEED-ND *project* submission and is responsible for project implementation. An applicant may be the *developer* or another cooperating entity.

area median income the median income of a county as determined by the U.S. Department of Housing and Urban Development.

bicycle network a continuous network consisting of any combination of

- physically designated on-*street* bicycle lanes at least 5 feet wide
- off-street bicycle paths or trails constructed before 2010 that are at least 8 feet wide for a two-way path and at least 5 feet wide for a one-way path
- off-street bicycle paths or trails constructed in or after 2010 that are at least 10 feet wide for a two-way path and at least 5 feet wide for a one-way path
- residential streets designed for a target speed of 25 miles per hour or slower
- commercial or mixed-use streets designed for a target speed of 30 miles per hour or slower.

block land bounded by the *project boundary*, transportation or utility rights-of-way that may be publicly dedicated or privately owned and deeded in perpetuity for general public use, waterfront, and/or comparable land division features.

brownfield real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or possible presence of a hazardous substance, pollutant, or contaminate.

build-out the time at which all *habitable buildings* on the *project* are complete and ready for occupancy.

buildable land the portion of the site where construction can occur, including land voluntarily set aside and not constructed upon. When used in *density* calculations, buildable land excludes public rights-of-way and land excluded from development by codified law or LEED for Neighborhood Development

prerequisites. An *applicant* may exclude additional land not exceeding 15% of the buildable land base defined above, provided the following conditions are present:

a. The land is protected from residential and nonresidential construction by easement, deed restriction, or other enforceable legal instrument.
   AND
b. Either 25% or more of the boundary of each contiguous parcel proposed for exclusion borders a *water body* or areas outside the *project boundary* that are protected by codified law; or ownership of, or management authority over, the exclusion area is transferred to a public entity.

bus rapid transit an enhanced bus system that operates on exclusive bus lanes or other transit rights-of-way; it is designed to combine the flexibility of buses with the efficiency of rail.

community-supported agriculture (CSA) a farm operation for which a community of individuals pledges support so that the farmland becomes, either legally or informally, the community's farm. The growers and consumers provide mutual support, sharing the risks and benefits of food production. Consumers receive portions of the farm's harvest throughout the growing season.

connectivity the number of publicly accessible *street* intersections per square mile, including intersections of streets with dedicated *alleys* and transit rights-of-way, and intersections of streets with nonmotorized rights-of-way (up to 20% of total intersections). If one must both enter and exit an area through the same intersection, such an intersection and any intersections beyond that point are not counted; intersections leading only to *culs-de-sac* are also not counted. The calculation of square mileage excludes *water bodies*, *parks* larger than 1/2 acre, public facility campuses, airports, rail yards, slopes over 15%, and areas nonbuildable under codified law or the rating system. Street rights-of-way may not be excluded.

construction impact zone the *project's development footprint* plus the areas around the improvement where construction crews, equipment, and/or materials are staged and moved during construction.

covenants, conditions, and restrictions limitations that may be placed on a property and its use and are made a condition of holding title or lease.

cul-de-sac a *street* segment that terminates without intersecting another street segment.

cultural landscape an officially designated geographic area that includes both cultural and natural resources associated with a historic event, activity, or person or that exhibits other significant cultural or aesthetic values.

density the amount of building structures constructed on the *project* site, measured for residential buildings as *dwelling units* per acre of *buildable land* available for residential uses, and for non-residential buildings as the *floor-area ratio* of buildable land area available for nonresidential uses. In both cases, structured parking is excluded.

developer a public and/or private entity that controls a majority of the *project's buildable land* and is committed to making a majority of the investments required for the project implementation described in the LEED-ND submission.

development footprint the total land area of a *project* site covered by buildings, *streets*, parking areas, and other typically impermeable surfaces constructed as part of the project.

dwelling unit living quarters intended for long-term occupancy that provide facilities for cooking, sleeping, and sanitation. This does not include hotel rooms.

employment center a nonresidential area of at least 5 acres with a job density of at least 50 employees per net acre.

existing present on the date of submission of LEED-ND certification documents; similarly, an element or condition that **exists** is present on the date that LEED-ND certification documents are submitted.

floor-area ratio (FAR) the *density* of nonresidential land use, exclusive of parking, measured as the total nonresidential building floor area divided by the total *buildable land* area available for nonresidential structures. For example, on a site with 10,000 square feet of buildable land area, an FAR of 1.0 would be 10,000 square feet of building floor area. On the same site, an FAR of 1.5 would be 15,000 square feet of built floor area; an FAR of 2.0 would be 20,000 built square feet and an FAR of 0.5 would be 5,000 built square feet.

freight village a cluster of freight-related businesses located inside a secure perimeter operated under single management structure. Freight Villages usually offer intermodal transfer options, logistics services, integrated distribution, warehousing capabilities, showrooms, and support services. Such support services might include: security, maintenance, mail, banking, customs and import management assistance, cafeterias, restaurants, office space, conference rooms, hotels, and public or activity-center transportation. (Houston-Galvenston Area Council)

functional entry a building opening designed to be used by pedestrians and open during regular business hours. This does not include any door exclusively designated as an emergency exit, or a garage door not designed as a pedestrian entrance.

habitable building a structure intended for living, working, or other types of occupancy. Habitable structures do not include stand-alone garages and utility structures such as pump stations.

historic district a group of buildings, structures, objects, and sites, of varying sizes, that have been designated as historically and architecturally significant and categorized as either contributing or noncontributing.

infill site (LEED Building Design & Construction and Interior Design & Construction rating systems) a site where at least 75% of the land area, exclusive of rights-of-way, within a ½ mile distance from the *project boundary* is previously developed. A *street* or other right-of-way does not constitute *previously deve*loped land; it is the status of property on the other side or right-of-way of the street that matters.

infill site (LEED for Neighborhood Development) a site that meets any of the following four conditions:

a. At least 75% of its boundary borders parcels that individually are at least 50% *previously developed*, and that in aggregate are at least 75% previously developed.
b. The site, in combination with bordering parcels, forms an aggregate parcel whose boundary is 75% bounded by parcels that individually are at least 50% previously developed, and that in aggregate are at least 75% previously developed.
c. At least 75% of the land area, exclusive of rights-of-way, within a ½ mile distance from the *project boundary* is previously developed.
d. The lands within a ½ mile distance from the project boundary have a *preproject connectivity* of at least 140 intersections per square mile.

A *street* or other right-of-way does not constitute *previously deve*loped land; it is the status of property on the other side or right-of-way of the street that matters. For conditions (a) and (b) above, any fraction of the perimeter that borders waterfront other than a stream is excluded from the calculation.

intermodal facility a venue that includes the movement of goods in one and the same loading unit or road vehicle, using successively two or more modes of transportation without handling the goods themselves in changing modes. (Source: International Union of Railways, http://www.railfreightportal.com/spip.php?article4)

Low-emitting and fuel-efficient vehicle vehicles that are either classified as Zero Emission Vehicles (ZEV) by the California Air Resources Board or have achieved a minimum green score of 45 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide.

metropolitan (metro) and **micropolitan (micro) statistical area** a geographic entity defined by the U.S. Office of Management and Budget for use by federal statistical agencies in collecting, tabulating, and publishing federal statistics. A metro area contains a core urban area with a population of 50,000 or more, and a micro area contains an urban core with a population between 10,000 and 50,000. Each metro or micro area consists of one or more counties and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core. “Core-based statistical area” (CBSA) encompasses both metro and micro areas.

multiunit residential consisting of four or more residential units sharing a common entry.

park a publicly accessible area that is permanently maintained in a seminatural condition for human recreation and relaxation; it has soil, grass, water, flora, and/or recreation improvements.

paseo a publicly accessible pedestrian path, at least 4 feet wide and no more than 12 feet wide, that provides shortcuts between buildings and through the block, connecting *street* frontages to rear parking areas, midblock courtyards, *alleys*, or other streets. A paseo may be roofed for up to 50% of its length and may be privately owned or publicly dedicated.

planned diverse use a shop, service, or facility outside the *project boundary* that has received a building permit and is under construction at the time of the first certificate of occupancy is issued for any building in the LEED-ND *project*.

planned occupancy the highest estimate of building occupants based on planned use(s) and industry standards for square foot requirements per employee. The minimum planned occupancy for *multiunit residential* buildings is 1 person for a studio unit, 1.5 persons for a one-bedroom unit, and 1.25 persons per bedroom for a two- bedroom or larger unit.

plaza a publicly accessible gathering space that is integrated into the street network and allows vehicular, bicycle, and/or pedestrian travel. A plaza is generally paved, is spatially defined by building fronts paralleling at least two-thirds of its perimeter, and may be privately owned or publicly dedicated.

predevelopment before any development occurred on the site. Predevelopment conditions describe the natural conditions of the site prior to any human alteration, such as development of roads or buildings.

preferred parking the parking spots that are closest to the main entrance of the project (exclusive of spaces designated for handicapped persons). For employee parking, “preferred parking” refers to the spots that are closest to the entrance used by employees.

previously developed altered by paving, construction, and/or land use that would typically have required regulatory permitting to have been initiated (alterations may exist now or in the past). Previously developed land includes a platted lot on which a building was constructed if the lot is no more than 1 acre; previous development on lots larger than 1 acre is defined as the *development footprint* and land alterations associated with the footprint. Land that is not previously developed and altered landscapes resulting from current or historical clearing or filling, agricultural or forestry use, or preserved natural area use are considered undeveloped land. The date of previous development permit issuance constitutes the date of previous development, but permit issuance in itself does not constitute previous development.

previously developed site a site that, *preproject*, consisted of at least 75% *previously developed* land.

preproject before the LEED-ND *project* was initiated, but not necessarily before any development or disturbance took place. Preproject conditions describe the state of the project site on the date the *developer* acquired rights to a majority of its *buildable land* through purchase or option to purchase.

prime soil earth with chemical, hydrographic, and topological properties that make it especially suited to the production of crops, as defined by the U.S. Natural Resources Conservation Service.

project the land, water, and construction that constitutes the project application. A project *applicant* does not have to own or control all land or water within a *project boundary*, but all the area within the project boundary must comply with prerequisites and attempted credits.

project boundary the platted property line of the *project* defining land and water within it. Projects located on publicly owned campuses that do not have internal property lines must delineate a sphere-of-influence line to be used instead. *Project sit*e is equivalent to the land and water inside the project boundary. The project must not contain noncontiguous parcels, but parcels can be separated by public rights-of-way. Projects may also have enclaves of nonproject properties that are not subject to the rating system, but such enclaves cannot exceed 2% of the total project area and cannot be described as certified.

retail project a space or building dedicated to the sale of goods or commodities directly to consumers who come onto the premise for the purpose of obtaining those goods or commodities. Includes (but not limited to) banking, restaurants, stores of any kind, spas, shopping centers (open air and enclosed), etc. Includes both direct customer service areas (showroom) and preparation or storage areas that support the customer service. Circulation spaces shared with other building uses must be attributed to the separate spaces proportionally.

school a kindergarten, elementary, or secondary institution for the academic instruction of children.

single-family residential any residential unit other than *multiunit residential*, including single, duplex, triplex, row house, townhouse and semiattached residential building types.

street a dedicated right-of-way that can accommodate one or more modes of travel, excluding *alleys* and *paseos*. A street is suitable for primary entrances and provides access to the front and/or sides of buildings and lots. A street may be privately owned as long as it is deeded in perpetuity for general public use. A street must be an addressable thoroughfare (for mail purposes) under the standards of the applicable regulating authority.

square (also **green**) a publicly accessible open area for gatherings that is wholly or partially bounded by segments of the *street* network. A square can be landscaped or landscaped and paved, is spatially defined by building fronts paralleling at least 45% of its perimeter, and may be privately owned or publicly dedicated.

traffic analysis zone a statistical entity delineated by state and/or local transportation officials for tabulating traffic-related data (especially journey-to-work and place-of-work statistics) from a decennial census. A TAZ usually consists of one or more census blocks, block groups, or census tracts. (U.S Census Bureau)

unique soil earth with chemical, hydrographic, and topological properties that make it especially suited to specific crops, as defined by the U.S. Natural Resources Conservation Service.

walk distance the distance that a pedestrian must travel between origins and destinations without obstruction, in a safe and comfortable environment on a continuous network of sidewalks, all-weather-surface footpaths, crosswalks, *woonerfs*, or equivalent pedestrian facilities.

water body the surface water of a stream (first-order and higher, including intermittent streams), arroyo, river, canal, lake, estuary, bay, or ocean, excluding irrigation ditches

water and wastewater infrastructure publicly owned water and wastewater infrastructure; this excludes septic and mound wastewater treatment systems.

wetland an area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas, but exclude irrigation ditches unless delineated as part of an adjacent wetland.

woonerf a *street*, also known as a home zone, shared zone, or living street, where pedestrians have priority over vehicles and the posted speed limit is no greater than 10 miles per hour. Physical elements within the roadway, such as shared surfaces, plantings, street furniture, parking, and play areas, slow traffic and invite pedestrians to use the entire right-of-way.

vehicle miles traveled (VMT) the number of miles driven by motorists in a specified time period, such as a day or a year, in absolute or per capita terms.

yard jockey a vehicle used primarily on the site to facilitate the movement of truck trailers and other types of large shipping containers from one area of the site to another. Fork lift trucks are not considered a type of yard jockey.

SUSTAINABLE SITES

SS CREDIT: LIGHT POLLUTION REDUCTION

This credit is available in the Pilot Credit Library.

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To increase night sky access, improve nighttime visibility, and reduce development impacts on wildlife environments by reducing uplight (skyglow) and light trespass (glare).

Requirements

CI, RETAIL, HOSPITALITY

All interior lighting (including for parking garages) shall be in compliance with the lighting control requirements of Section 9 of the ANSI/ASHRAE/IES Standard 90.1-2010 (with errata but without addenda).

WATER EFFICIENCY

WE PREREQUISITE: MINIMUM FIXTURE AND FITTING WATER USE REDUCTION Required

This prerequisite applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To reduce the burden on water supply and wastewater systems by increasing the water efficiency of fixtures and fittings.

Requirements

CI, RETAIL, HOSPITALITY

Reduce aggregate water consumption by fixtures and fittings (not including irrigation) by 20% from the baseline calculated for the tenant space while meeting the minimum performance requirements of the referenced standards.

Water consumption baseline is calculated using estimated occupant usage and the volumes and flow rates shown in Table 1.[1] Include only the following fixtures and fittings located within the tenant space: toilets (water closets), urinals, lavatory faucets, showers and kitchen sink faucets.

Table 1. Baseline water consumption of fixtures and fittings

Fixtures and Fittings	Current Baseline
Toilets (water closets)	1.6 gpf*
Urinals	1.0 gpf
Public lavatory (restroom) faucets	2.2 gpm at 60 psi, private applications only (hotel or motel guest rooms, hospital patient rooms) 0.5 gpm at 60 psi** all others except private applications 0.25 gallons per cycle for metering faucets
Residential lavatory (bathroom) faucets	2.2 gpm at 60 psi
Residential kitchen faucet	

[1] Tables adapted from information developed and summarized by the U.S. Environmental Protection Agency (EPA) Office of Water based on requirements of the Energy Policy Act (EPAct) of 1992 and subsequent rulings by the Department of Energy, requirements of the EPAct of 2005, and the plumbing code requirements as stated in the 2009 editions of the Uniform Plumbing Code or International Plumbing Code and Uniform Plumbing Code pertaining to fixture performance.

Showerheads	2.5 gpm at 80 (psi) per shower stall****

* EPAct 1992 standard for toilets (water closets) applies to both commercial and residential models.

** In addition to EPAct requirements, the American Society of Mechanical Engineers ANSI national standard for public lavatory faucets is 0.5 gpm at 60 psi (ASME A112.18.1/CSA B125.1–2005). This maximum has been incorporated into the 2009 editions of the International Plumbing Code and Uniform Plumbing Code.

*** EPAct 1992 standard for toilets (water closets) applies to both commercial and residential models.

**** The total allowable flow rate from all flowing showerheads at any given time, including rain systems, waterfalls, bodysprays, bodyspas, and jets, must be limited to the allowable showerhead flow rate specified above (2.5 gpm) per shower compartment (stall), where the floor area of the shower compartment is less than 1,500 square inches. For each floor area of 1,500 square inches, assume an additional showerhead with total allowable flow rate from all flowing devices equal to or less than the allowable flow rate as specified above. Exception: Showers that emit recirculated nonpotable water originating from within the shower compartment while operating may exceed the maximum, provided the total potable water flow does not exceed the flow rate specified above.

gpf = gallons per flush

gpm = gallons per minute

psi = pounds per square inch

AND

Reduce total water use (potable and nonpotable) by 20% or more from the baseline (above). Calculate the water reduction for the proposed project based on the same occupant usage and the same fixtures and fittings used in determining the baseline.

Where the following fixtures and fittings are selected as part of the strategy to reduce water consumption, they must meet the following prescriptive requirements. Toilets (water closets), faucets, showerheads, and urinal types not listed below are not subject to any additional prescriptive requirements.

- Toilets (water closets). All water-consuming tank-type toilets with an effective flush volume of 1.28 gpf or less must meet the current WaterSense Tank-Type High-Efficiency Toilet Specification, as applicable.
- Residential lavatory (bathroom) faucets. All residential bathroom lavatory faucets using 1.5 gpm or less must meet the current WaterSense High-Efficiency Lavatory Faucet Specification.
- Showerheads. All residential showerheads, including hotel and motel guest room showerheads, using 2.0 gpm or less must meet the current WaterSense Specification for Showerheads.
- Urinals. All water-consuming urinals using 0.5 gpf or less must meet the current WaterSense Specification for Flushing Urinals, as applicable.

WE PREREQUISITE: APPLIANCE AND PROCESS WATER USE REDUCTION Required

This prerequisite is available in the Pilot Credit Library.

This prerequisite applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To reduce the burden on water supply and wastewater systems by increasing the water efficiency of appliances and water-consuming processes.

Requirements

CI, RETAIL CI, HOSPITALITY

Water-consuming appliances, equipment, and processes used within the building (for CI and Retail CI, within the tenant space) must meet the prescriptive minimum performance requirements listed in Tables 1 and 2. Appliances and water-consuming processes not listed below are not subject to any additional prescriptive requirements.

Table 1. Minimum performance requirements for water-consuming appliances

Appliance	Minimum Performance Requirement
Residential clothes washers	ENERGY STAR and Water Factor ≤ 5.5 gal/cycle/ft^3
Commercial (family-sized) clothes washers	CEE Tier 3A
Residential dishwashers (standard and compact)	ENERGY STAR
Prerinse spray valves	≤ 1.3 gpm

gpm = gallons per minute

Processes: Table 2. Minimum performance requirements for water-consuming processes

Process	Minimum Performance Requirement
Heat rejection and cooling	No water use for once-through cooling* for any equipment or appliances that reject heat.
Water temperature tempering	A holding or mixing tank must be provided for mixing hot fluid discharge with cold water. Cold water supply must be controlled by tempering device that limits flow based on temperature of water leaving tank, to meet mandated temperature limits.

Venturi-type flow-through vacuum generators or aspirators	No device may be used that generates vacuum by means of water flow through device into drain.

*Once-through cooling, also known as single-pass cooling, is defined as using water from any source to transfer heat from equipment or processes, then discarding the water from the site via the sewer or other discharge. For purposes of this prerequisite, once-through cooling is allowed only when 100% of the cooling water is used to meet another water demand of the project. This water may not be considered an alternative site water source if it originates as a potable or municipally supplied water source.

WE CREDIT: ADDITIONAL FIXTURE AND FITTING WATER USE REDUCTION

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To reduce the burden on water supply and wastewater systems by increasing the water efficiency of fixtures and fittings and encouraging alternative on-site sources and municipally supplied reuse water.

Requirements

CI, RETAIL, HOSPITALITY

Employ strategies that in aggregate, use less water than the water use baseline, as calculated for Prerequisite X, Fixture and Fitting Water Use Reduction (not including irrigation).Points are awarded according to Table 1.

Table 1. Points for percentage reduction in water use

Percentage	Points
30%	
35%	
40%	

Calculate the commercial and/or residential baseline water consumption using estimated occupant usage and the volumes and flow rater show in Table 2 below.[2] Include only toilets (water closets), urinals, lavatory faucets, showers, and kitchen sink faucets necessary to meet the needs of the occupants. Some of these fittings and fixtures may be outside the tenant space.

Plumbing designers should consider in their designs potential water quality impacts on fixture and fitting performance and durability from the use of alternate (non-potable) sources of water. It is also recommended that water-consuming fixtures such as lavatories be placed upstream of high-efficiency toilets (water closets) and urinals and provisions for drain line slopes of greater than 1 percent be provided for drain line carry in long lengths (100ft) of horizontal runs.

Where the following fixtures and fittings are selected as part of the strategy to reduce water consumption, they must meet the following prescriptive requirements. Toilets (water closets), faucets, showerheads, and urinal types not listed below are not subject to any additional prescriptive requirements.

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[2] Tables adapted from information developed and summarized by the U.S. Environmental Protection Agency (EPA) Office of Water based on requirements of the Energy Policy Act (EPAct) of 1992 and subsequent rulings by the Department of Energy, requirements of the EPAct of 2005, and the plumbing code requirements as stated in the 2009 editions of the Uniform Plumbing Code or International Plumbing Code pertaining to fixture performance.

- Toilets (water closets). All water-consuming tank-type toilets with an effective flush volume of 1.28 gpf or less must meet the current WaterSense Tank-Type High-Efficiency Toilet Specification, as applicable.
- Residential lavatory (bathroom) faucets. All residential bathroom lavatory faucets using 1.5 gpm or less must meet the current WaterSense High-Efficiency Lavatory Faucet Specification.
- Showerheads. All residential showerheads, including hotel and motel guest room showerheads, using 2.0 gpm or less must meet the current WaterSense Specification for Showerheads.
- Urinals. All water-consuming urinals using 0.5 gpf or less must meet the current WaterSense Specification for Flushing Urinals, as applicable.

WE CREDIT: SUSTAINABLE WASTEWATER MANAGEMENT

This credit is available in the Pilot Credit Library.

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To reduce pollution from wastewater by encourage water reuse.

Requirements

CI, RETAIL, HOSPITALITY

OPTION 1. Source Reduction

Minimize the need for water-based sewage conveyance by 50% by using alternative technologies (e.g., composting toilets).

OR

OPTION 2. Reuse

Recycle 25% of wastewater. 100% of reclaimed water must meet the applicable NSF 350 standard or local code, whichever is more stringent, for its intended use (e.g., on-site irrigation, toilet flushing, cooling tower).

OR

OPTION 3. Nutrient Recovery

Implement resource recovery and reuse for 25% of the baseline nitrogen or organic carbon loading from building occupants.

WE CREDIT: COOLING TOWER MAKEUP WATER

This credit is available in the Pilot Credit Library.

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, RETAIL, HOSPITALITY

Conduct a potable water analysis, measuring at least the following five control parameters, in ppm or mg/l:

- calcium (Ca);
- total alkalinity;
- silica (Si);
- chloride (Cl); and
- conductivity

Install side-stream filtration system of the condenser water and a system to monitor and control microbiological growth.

Meter the potable makeup water to the cooling tower and blowdown from the cooling tower. Blowdown must be controlled with a conductivity meter.

Report monthly results of the amount of potable water used, microbiological levels, blowdown, and corrosion.

On cooling towers, install drift eliminators that achieve minimum efficiencies of 0.2% for counter-flow systems or 0.5% for cross-flow systems.

Calculate the number of cooling tower cycles by dividing the amount of each parameter in the condenser water by the amount in the potable makeup water. The maximum acceptable levels of the parameters in the condenser water are shown in Table 1. Limit cooling tower cycles to avoid exceeding maximum values for any of these parameters.

Table 1. Maximum concentrations for parameters in condenser water

Parameter	Maximum level
Ca (as $CaCO_3$)	1,000 ppm
Total alkalinity	1,000 ppm

SiO_2	100 ppm
Cl	250 ppm
Conductivity	3,500 µS/ml

Demonstrate that the number of cooling tower cycles will be equal to or double the maximum number of cycles that can be achieved without exceeding any of the above levels (or affecting the operation of the condenser water system), to a maximum of 10 cycles (beyond which the savings are negligible and microbiological growth can be problematic).

WE CREDIT: ADDITIONAL APPLIANCE AND PROCESS WATER USE REDUCTION

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To reduce or eliminate use of process water in building systems .

Requirements

CI, RETAIL, HOSPITALITY

Install water-using equipment that meets the minimum standards in Tables 1 through 5. Points are awarded by equipment category, up to a maximum of X points. All equipment in the category must meet the standard; that is, all the project's washing machines, regardless of type, must be in compliance.

Table 1. Points for compliant commercial washing machines

DESCRIPTION *Washing machine*	*METRIC* *Standard*	*CREDIT VALUE* *Points*
On-premise, minimum capacity 2,400 lbs per 8-hour shift	Less than or equal to Maximum 2.25 gals per pound *	
On-premise, minimum capacity 2,400 lbs per 8-hour shift	Less than or equal to Maximum 1.8 gals per pound *	
On-premise, minimum capacity 2,400 lbs per 8-hour shift	Less than or equal to Maximum 1.0 gals per pound *	

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

Table 2. Points for compliant commercial kitchen equipment

DESCRIPTION *Kitchen equipment*	*METRIC* *Standard*	*CREDIT VALUE* *Points*
Dishwasher, under counter	0.7 gals/rack	
Dishwasher, door	0.7 gals/rack	
Dishwasher, conveyor	0.4 gals/rack	
Dishwasher, flight machine	Less than 1 gal/100 9" dishes	

Dishwasher, flight machines	Less than 1 gal/120 9" dishes	
Food steamer, connectionless	US EPA Energy Star	
Combination oven, connectionless	US EPA Energy Star	
Ice machine*	US EPA Energy Star	
Food waste disposer, grinder	1 gpm, no-load condition; 3–8 gpm, full load condition; 10-minute automatic shutoff	
Food waste disposer, scrap collector	Maximum 2 gpm makeup water	
Food waste disposer, pulper	Maximum 2 gpm makeup water	
Food waste disposer, strainer basket	No additional water usage	

gpm = gallons per minute

Ice machines must use either air-cooled or closed-loop cooling, such as a chilled or condenser water system.

Table 3. Points for compliant laboratory and medical equipment

DESCRIPTION *Lab equipment*	*METRIC* *Standard*	*CREDIT VALUE* *Points*
Reverse osmosis water purifier	75% recovery	
Reverse osmosis water purifier	100% recovery and reuse	
Cooling of sterilizer Sterilizer whose steam condensate is discharged to drainage system with expansion tank, heat recovery system, or reclaimed water		
Sterile process washer	0.35 gals per U.S. tray; 0.20 gals per U.S. tray	
X-ray processor, 150 mm or more in any dimension	Film processor water recycling unit	
Digital imager, all sizes	No water use	

Table 4. Points for compliant vehicle washing machines

Vehicle washer	*Standard*	*Points*
Conveyor	Recycling system in place or maximum 35 gals per car	
In-bay automatic	Recycling system in place or maximum 35 gals per car	

Table 5. Points for compliant municipal steam systems*

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

* No condensate return, collection systems.

ENERGY AND ATMOSPHERE

EA PREREQUISITE: MINIMUM ENERGY PERFORMANCE
Required

This prerequisite applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, RETAIL, HOSPITALITY

OPTION 1. Tenant-Level Energy Simulation

Portions of the building within the tenant's scope of work must comply with ANSI/ASHRAE/IESNA Standard 90.1-2010 (with errata but without addenda[3]).

Note: The project's total reductions are based on 50% energy cost and source EUI reductions, respectively.

Cost savings. Demonstrate a percentage improvement in the proposed tenant project performance rating compared with the baseline tenant project performance rating. Calculate the baseline tenant project performance according to ANSI/ASHRAE/IESNA Standard 90.1-2010, Appendix G (with errata but without addenda[4]), using a computer simulation model for all tenant project energy use.

Source energy use intensity (EUI) reduction. Demonstrate a percentage improvement in the proposed tenant project source energy compared with the baseline building performance. Calculate the tenant project source energy for both cases by converting the energy consumption for each energy type to source energy, using national average source energy conversion factors.

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[3] Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

[4] Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

The total percentage improvement is the average of the project's energy cost savings and source EUI reduction.

Appendix G of Standard 90.1-2010 requires that the energy analysis done for the project performance rating method include all the energy costs associated with the project. To achieve points under this credit, the proposed design must meet the following criteria:

- compliance with the mandatory provisions of ANSI/ASHRAE/IESNA Standard 90.1-2010 (with errata but without addenda);
- inclusion of all the energy consumption and cost within and associated with the tenant project; and
- comparison against a baseline tenant project that complies with Standard 90.1-2010, Appendix G (with errata but without addenda).

Exception: the baseline project envelope must be modeled according to Table G3.1 (5) (baseline), Sections a-e, and must not be modeled according to Section f.

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

Typically, unregulated loads must be identical for both the baseline and the proposed performance ratings. However, project teams may follow the exceptional calculation method (ANSI/ASHRAE/IESNA Standard 90.1-2010, G2.5) to document measures that reduce unregulated loads. Documentation of unregulated load energy savings must include a list of the assumptions made for both the baseline and the proposed design, and theoretical or empirical information supporting these assumptions.

Projects that are connected to district energy systems must follow LEED's DES requirements and modeling guidelines.

In addition, projects teams using Option 1 must record the source EUI of their proposed and baseline case buildings. The source EUI for both models must be recorded on an efficiency ratio scale where 100 equals the average adjusted source energy consumption and 0 equals net zero source energy consumption.

O PTION 2. ASHRAE Advanced Energy Design Guide Prescriptive Compliance Path

Comply with the mandatory provisions of ANSI/ASHRAE/IESNA Standard 90.1-2010 (with errata but without addenda[5]).

AND

Comply with the HVAC requirements, including equipment efficiency, economizers, ventilation, ducts and dampers, ASHRAE 50% Advanced Energy Design Guide applicable to the project and its scope as follows:

Small or medium office buildings (2009)

- less than 20,000 square feet
- at least 80%, office occupancy
- unitary HVAC systems

[5] Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

Small retail buildings

- less than 20,000 square feet
- at least 80%, retail occupancy
- unitary HVAC systems

Small hospital and healthcare facilities

- less than 90,000 square feet
- at least 80%, healthcare and medical office occupancy

Highway lodging (2009)

- less than 80 rooms
- four stories or fewer
- unitary HVAC systems

Medium box retail

Grocery or supermarket

K-12 schools

Small warehouses and self-storage buildings (6/11/08)

- less than 50,000 square feet
- at least 80%, warehouse or self –storage occupancy
- unitary HVAC systems

OPTION 3. Advanced Buildings™ Core Performance™ Guide Prescriptive Compliance Path

Comply with Section 1: Design Process Strategies, and
Comply with Section 2: Core Performance Requirements

EA CREDIT: OPTIMIZE ENERGY PERFORMANCE

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, RETAIL, HOSPITALITY

Establish an energy performance target no later than the schematic design phase. The target must be established as kBTU per square foot-year of source energy use. This target must be mapped on the same scale as the baseline and proposed buildings, if the project follows Option 1.

AND select one of the options below:

OPTION 1. Tenant-Level Energy Simulation

Analyze a minimum of at least nine efficiency measures during the design process and account for the results in design decision-making. Analysis can include energy simulation of efficiency opportunities, application of past energy simulation analyses for similar projects to the project, or application of published data from energy analyses performed for similar projects to the project (such as AEDGs).

A minimum of six energy efficiency measures focused on load reduction strategies appropriate for the facility must be analyzed. This analysis must be performed during the schematic design phase.

A minimum of three energy efficiency measures focused on HVAC related strategies must be analyzed (passive measures are acceptable). This analysis must be performed before the conclusion of the design development phase.

The results of the analysis must be summarized in a brief report or memorandum.

Follow the criteria detailed in EA Prerequisite 1 to demonstrate a percentage improvement in the proposed tenant project performance rating compared with the baseline tenant project performance rating.

Interior Construction	Points
8%	
10%	
12%	
14%	

16%	
18%	
20%	
22%	
24%	
26%	
28%	
30%	
32%	
34%	
36%	
38%	
40%	
42%	
44%	
46%	

Note: The project's total reductions are based on 50% energy cost and source EUI reductions, respectively.

OPTION 2. Prescriptive Compliance Path (X – XX points)

The tenant project should only address portions of the building that relate to their scope of work.

Analyze a minimum of at least nine efficiency measures during the design process and account for the results in design decision-making. Analysis can include energy simulation of efficiency opportunities, application of past energy simulation analyses for similar projects to the project, or application of published data from energy analyses performed for similar projects to the project (such as AEDGs).

A minimum of six energy efficiency measures focused on load reduction strategies appropriate for the facility must be analyzed. This analysis must be performed during the schematic design phase.

A minimum of three energy efficiency measures focused on HVAC related strategies must be analyzed (passive measures are acceptable). This analysis must be performed before the conclusion of the design development phase.

The results of the analysis must be summarized in a brief report or memorandum.

AND

PATH 1: BASE BUILDING SYSTEMS

Base building systems that serve the project, as well as any applicable improvements that are part of the Project, must comply with some or all of the recommended measures of the ASHRAE 50% Advanced Energy Design Guide or the Advanced Buildings™ Core Performance™ Guide appropriate to the project, as outlined in EA Prerequisite 1 and below, subject to the stated scope of each of the guides.

Advanced Buildings™ Core Performance™ Guide

Other Projects
Less than 100,000 sf
Health care, warehouse or laboratory uses are excluded;

Document base building and project compliance with all applicable recommendations and standards contained in “Chapter 3: Recommendations by Climate” for the appropriate ASHRAE Advanced Energy Design Guide or “Section 2: Core Performance Requirements” of the Advanced Buildings™ Core Performance™ Guide and for the climate zone in which the building is located:

PATH 1.1: Building Envelope, Opaque: Roofs, Walls, Floors, Slabs, and Doors - (X points)

PATH 1.2: Building Envelope, Glazing: Vertical Fenestration and Skylights - (X points)

PATH 2. HVAC SYSTEMS

PATH 2.1: HVAC Equipment Efficiency (X points):

Base building HVAC systems that serve the project and any HVAC systems installed as part of the Project must comply with either the recommendations of the ASHRAE Advanced Energy Design Guide applicable to the project or the efficiency requirements outlined in Advanced Buildings™ Core Performance™ Guide sections 1.4, 2.9 & 3.10

PATH 2.2: HVAC Zoning and Controls (X points):

Project fit out of spaces to meet the following requirements:

Every Solar Exposure must have a separate control zone, interior spaces must be separately zoned, and private offices and other enclosed occupancies (eg conference rooms, classrooms) must have controls capable of sensing space conditions and modulating HVAC system in response to space demand.

PATH 3. INTERIOR LIGHTING POWER

Lighting Power Density:

Reduce connected lighting power density below that allowed by ASHRAE/IESNA Standard 90.1-2010 using either the Space-by-Space Method or by applying the whole building lighting power allowance to the entire tenant space.

Project LPD Percent below Standard LPD	Points

10%	
15%	
20%	
25%	

PATH 4. INTERIOR LIGHTING CONTROLS

PATH 4.1: Daylighting Controls (X points)
Install daylight responsive controls in all regularly occupied daylit spaces within 15 feet of windows and under skylights and not less than 25% of the connected lighting load. Daylight controls must switch or dim electric lights in response to the presence or absence of daylight illumination in the space.

PATH 4.2: Occupancy Sensor Lighting Controls (X points)
Install occupancy sensors for at least 75% of the connected lighting load.

PATH 5. EQUIPMENT AND APPLIANCES

EnergyStar Equipment and Appliances (X - X points)

For all ENERGYSTAR® eligible equipment and appliances installed in the project:

Percent of Total Eligible Equipment, by rated power, that is ENERY STAR Complaint	Points
70%	
90%	

*Includes appliances, office equipment, electronics, and commercial food service equipment. Excludes HVAC, lighting, and building envelope products

EA CREDIT: DEMAND RESPONSE

This credit is available in the Pilot Credit Library.

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To reduce regional carbon emissions and improve and enhance the optimization of electric generation, transmission and distribution resources.

Requirements

CI, RETAIL, HOSPITALITY

Meet the requirements of one of the options below:

OPTION 1. Demand Response Program

Incorporate the capability to participate in a demand response program by a local utility, Independent System Operator, Curtailment Service Provider, or other recognized entity that provides, manages or services a demand response program into the design of the project.

Demonstrate that the design measures implemented qualify the project for participation in an active Demand Response program.

OPTION 2. Permanent Peak Load Shifting

Implement electrical load shifting measures that permanently transfer regulated electricity demand from daytime hours to off-peak hours. Demand shifting measures must result in a reduction of 10% below the simulated peak demand of the Budget Building (using methodologies as defined under EA Credit 1 for Whole Building simulation), in the peak simulated electrical demand of the proposed design.

Onsite generation sources (if utilized) for load response must meet all applicable regulatory requirements and be appropriately permitted (as required).

EA CREDIT: ON-SITE RENEWABLE ENERGY

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To encourage and recognize increasing levels of on-site renewable energy self-supply to reduce environmental and economic impacts associated with fossil fuel energy use.

Requirements

CI, RETAIL, HOSPITALITY

Use tenant on-site renewable energy systems to offset project energy cost. Calculate project performance by expressing the energy produced by the renewable systems as a percentage of the building annual energy cost and using the table below to determine the number of points achieved.

Use the project annual energy cost calculated in EA Credit 1, Optimize Energy Performance, or use the Department of Energy's Commercial Buildings Energy Consumption Survey (CBECS) database to determine the estimated energy use and cost.

The table below describes the minimum percent renewable energy for each point threshold:

Percentage Renewable Energy	Points
1%	
3%	

Projects that are connected to district energy systems (DES) must follow LEED's DES requirements.

EA CREDIT: REFRIGERANT MANAGEMENT

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, RETAIL, HOSPITALITY

OPTION 1

Do not use refrigerants or use only naturally-occurring and synthetic refrigerants that have OPD = 0 and GWP < 50.

OPTION 2

Select refrigerants that are used in heating, ventilation, 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. The formula sets a maximum threshold for the combined contributions to ozone depletion and global warming potential:

$$LCGWP + LCODP \times 10^5 \leq 100$$

Calculation definitions for LCGWP + LCODP x 10^5 ≤ 100
LCODP = [ODPr 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)
LCGWP: Lifecycle Direct Global Warming Potential (lb CO_2/Ton-Year)
GWPr: Global Warming Potential of Refrigerant (0 to 12,000 lb CO_2/lbr)

ODPr: Ozone Depletion Potential of Refrigerant (0 to 0.2 lb CFC 11/lbr)
Lr: Refrigerant Leakage Rate (2.0%)
Mr: End-of-life Refrigerant Loss (2% to 10%; default of 10% unless otherwise demonstrated)
Rc: Refrigerant Charge (0.5 to 5.0 lbs of refrigerant per ton of gross ARI rated cooling capacity)
Life: Equipment Life (10 years; default based on equipment type, unless otherwise demonstrated)

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

$$\frac{\sum \left(LCGWP + LCODP \times 10^5 \right) \times Qunit}{Qtotal} \leq 100$$

Calculation definitions for [∑ (LCGWP + LCODP x 10^5) x Qunit] / Qtotal ≤ 100
Qunit = Gross ARI rated cooling capacity of an individual HVAC or refrigeration unit (Tons)
Qtotal = Total gross ARI rated cooling capacity of all HVAC or refrigeration

Meet Option 1 or 2 for the base building HVAC systems.

AND

Achieve U.S. EPA GreenChill's Gold-Level Store Certification for Fully Operational Food Retail Stores.

All Options: Projects that are connected to district energy systems (DES) must follow LEED's DES requirements.

EA CREDIT: GREEN POWER

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, RETAIL, HOSPITALITY

Engage in a contract for Green-e eligible resources that came online after January 1, 2005, for a minimum of 5 years. The contract must specify the provision of at least 33%, 67% or 100% of the project's electricity from renewable sources.

All purchases of green power shall be based on the quantity of energy consumed, not the cost.

Percent of Electricity from renewable sources	Possible Points
33%	
67%	
100%	

Projects that are connected to district energy systems (DES) must follow LEED's DES requirements.

CI, RETAIL, HOSPITALITY

Determine Baseline Electricity Use

Use the annual electricity consumption from the results of EA Credit 1: Optimize Energy Performance.

MATERIALS AND RESOURCES

MR PREREQUISITE: STORAGE AND COLLECTION OF RECYCLABLES Required

This prerequisite applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, HOSPITALITY

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. Collection and storage areas may be in separate locations. Recyclable materials must include, at a minimum: paper, corrugated cardboard, glass, plastics and metals.

RETAIL

Conduct a waste stream study to identify the retail project's top 5 recyclable waste streams, by either weight or volume. The waste study shall categorize all waste streams consistently by either weight or volume, identify which waste streams are recyclable, and list the top 3 waste streams for which collection and storage space will be provided. If no information is available on typical waste streams for the project, projects should make projections based on the types of waste the operations will produce and data from similar operations. 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 3 recyclable waste streams identified by the waste study. Locate the collection and storage bins close the source of recyclable waste. Examples of potential recyclable waste streams include: plastic film, plastics, hanger metals, paper, cardboard, food waste, glass or special waste as defined by local code.

MR PREREQUISITE: MINIMUM RECYCLED CONTENT Required

This prerequisite applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To avoid the environmental consequences of extracting and processing virgin materials and increase demand for buildings products that incorporate recycled content.

Requirements

CI, RETAIL, HOSPITALITY

Use building products that contain the minimum percentages of recycled material specified below.

The recycled content value of a material assembly is determined by weight. The recycled fraction of the assembly is then multiplied by the cost of the assembly to determine the recycled content value. Include only materials permanently installed in the project. Furniture may be included if it is included consistently in Materials and Resources credits. Exclude mechanical, electrical, and plumbing components and specialty items, such as elevators.

CI, RETAIL, HOSPITALITY

Use materials with recycled content[6] such that the sum of the postconsumer[2] recycled content plus the preconsumer[3] (post-industrial) recycled content constitutes at least 10% of the total materials cost.

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[6] Recycled content is defined in accordance with the International Organization of Standards document, ISO 14021 — Environmental labels and declarations — Self-declared environmental claims (Type II environmental labeling).

[2] Postconsumer material is defined as waste material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose.

[3] Pre-consumer material is defined as material diverted from the waste stream during the manufacturing process. Reutilization of materials (i.e. rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it) is excluded.

MR PREREQUISITE: CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT PLANNING
Required

This prerequisite applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To reduce construction, renovation, and demolition waste; divert debris from disposal in landfills and incineration facilities; and recover and recycle reusable materials.

Requirements

CI, RETAIL, HOSPITALITY

Develop and implement a Construction Waste Management Plan that, at a minimum, determines the materials to be diverted from disposal, identifies responsible waste and recycling haulers, and specifies a process for sorting waste.

ADC (Alternative Daily Cover) does not qualify as material diverted from disposal. Land clearing debris is not considered construction, demolition, or renovation waste and may not be included in the Waste Management Plan.

MR CREDIT: TENANT SPACE—LONG-TERM COMMITMENT

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To encourage choices that will conserve resources, reduce environmental harm from materials manufacturing and transport for tenants' relocation.

Requirements

CI, RETAIL, HOSPITALITY

The occupant or tenant must commit to remain in the same location for at least 10 years.

MR CREDIT: BUILDING REUSE—MAINTAIN INTERIOR NONSTRUCTURAL ELEMENTS

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To extend the lifecycle of existing buildings, conserve resources, retain cultural resources, reduce waste and reduce environmental harm from materials manufacturing and transport for new buildings.

Requirements

CI, RETAIL, HOSPITALITY

Use existing interior nonstructural elements (e.g., interior walls, doors, floor coverings and ceiling systems) in at least 50% (by area) of the completed building, including additions. Hazardous materials that are remediated as a part of the project must be excluded from the calculation of the percentage maintained.

MR CREDIT: CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To divert construction, renovation and demolition debris from disposal in landfills and incinerators and recover recyclable and reusable materials.

Requirements

CI, RETAIL, HOSPITALITY

OPTION 1. WASTE DIVERSION

CASE 1: Project Scope includes Demolition in project space

If the scope of the project includes demolition, large portions of the total debris may be heavy materials (asphalt, brick, concrete). Reused or recycled heavy materials can account for a maximum of 50% of the diverted total. Points for recycling or salvaging debris are awarded according to Table 3.

Table 3. Points for percentage of diverted debris, including demolition

Recycled or Salvaged	Points
50%	
75%	

CASE 2: Project Scope is Exclusively Construction Within project space

If no debris is generated by demolition, reused or recycled heavy materials (asphalt, brick, concrete) can be counted. Points for reusing or recycling debris from new construction are awarded according to Table 4.

Table 4. Points for percentage of diverted debris, no demolition

Recycled or Salvaged	Points
40%	
60%	

OR

OPTION 2. Reduction of Total Debris

Do not generate more than 1.5 pounds per square foot of total waste from the project.

MR CREDIT: MATERIALS REUSE

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To decrease extraction and processing of virgin materials by reusing building materials and products.

Requirements

CI, RETAIL, HOSPITALITY

Use salvaged, refurbished or reused materials that constitute at least 5% or 10%, based on cost, of building (construction) materials, excluding furniture and furnishings Points are awarded according to Table 2.

Table 2. Points for percentage of reused materials

Reused Materials	Points
5%	
10%	

MR CREDIT: MATERIALS REUSE—FURNITURE AND FURNISHINGS

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To avoid the environmental consequences of extracting and processing virgin materials by reusing building materials and products.

Requirements

CI, RETAIL, HOSPITALITY

Use salvaged, refurbished or reused furniture and furnishings that constitute 30% of the total furniture and furnishings budget.

MR CREDIT: RECYCLED CONTENT

This credit is available in the Pilot Credit Library

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To avoid the environmental consequences of extracting and processing virgin materials and increase demand for building products that incorporate recycled content, thereby reducing impacts resulting from extraction and processing of virgin materials.

Requirements

CI, RETAIL, HOSPITALITY

Use building products that contain recycled material as a percentage of total non-structural building costs as specified below.

The recycled content value of a material assembly is determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

Include only materials permanently installed in the project. Furniture may be included if it is included consistently in relevant Materials and Resources credits Exclude mechanical, electrical, and plumbing components and specialty items, such as elevators

OPTION 1. Nonstructural Materials

Use non-structural materials with recycled content[7] such that the sum of postconsumer[8] recycled content plus one-half of the preconsumer[9] (post-industrial) content based on cost, of the total value of the non-structural materials in the project Points are awarded according to Table 1.

Table 1. Points for percentage of recycled content, non-structural

Recycled Content	Points
10%	
20%	

OR

OPTION 2. Closed Loop manufacturing

Meet the requirements of Option 1 and demonstrate that at least 5% of the materials qualifying for MR Credit: Recycled Content for Non-Structural Materials are purchased from a manufacturer that has a closed-loop product recycling and take-back program.

MR CREDIT: REGIONAL MATERIALS

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To support local communities by increasing demand for building materials and products that are extracted and manufactured within the region. .

Requirements

CI, RETAIL, HOSPITALITY

OPTION 1.

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

OR

OPTION 2.

Meet the requirements for Option 1.

Use a minimum of 10% of the combined value of construction and CSI Division 12 (furniture) materials and products that were both manufactured and extracted, harvested or recovered, within 500 miles of the project. Points are awarded according to Table 2.

Table 2. Points for percentage of regional materials

Regional Materials	Points
20%	
10%	

MR CREDIT: BIO-BASED MATERIALS

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To reduce the use and depletion of non-renewable materials by substituting bio-based materials.

Requirements

CI, RETAIL, HOSPITALITY

OPTION 1.

Use non-structural bio-based materials and products for 10% of the total value of all materials and products used in the project.

Bio-based materials are defined by the Farm Security and Rural Investment Act of 2002 (FSRIA), Section 9001. Acceptable animal-based products are those whose harvesting does not kill, abuse, or cause harm to the animals. Materials must also be harvested in a legal manner.

The bio-based content of a material assembly is determined by weight. Multiply the bio-based fraction of the assembly by the cost of assembly to calculate the bio-based content value.

Wood products purchased for temporary use on the project (e.g. formwork, bracing, scaffolding, sidewalk protection, and guardrails) may be included in the calculation at the project team's discretion. If any such materials are included, all such materials must be included in the calculation.

OR

OPTION 2.

Meet the requirement of Option 1.

All materials included in Option 1 must have third-party certifications, as defined by the LEED Standard for Standards.

MR CREDIT: CERTIFIED WOOD

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To encourage environmentally responsible forest management.

Requirements

CI, RETAIL, HOSPITALITY

When using new wood-based products and materials, use a minimum of 50% that are certified in accordance with

> (NOTE TO PUBLIC COMMENTORS: This requirement of LEED 2012 is a placeholder. Concurrent with the development of LEED 2012, USGBC is engaged in a reevaluation of the appropriateness of LEED's historic FSC-only policy related to certified forest products. The process for development of Forest Certification Benchmark is, as of the release of the first public comment draft of LEED 2012 still ongoing and thus, the outcome is pending. USGBC action related to this vitally important but extraordinarily complicated issue will be complete prior to second public comment of LEED 2012. The second public comment draft of LEED 2012 will reflect the outcome of USGBC member ballot on this critical issue.)

Division 12 (Furniture) material value is included in the determination of the certified wood content.

Furniture is defined as any retail display fixtures, such as shelving, tables, storage units, chairs, desks or cabinets, required for use in the retail project and purchased as a free standing or modular unit, regardless of where the assembly takes place. Please note that casework and built-in millwork items must be included in the base building calculations.

INDOOR ENVIRONMENTAL QUALITY

EQ PREREQUISITE: MINIMUM INDOOR AIR QUALITY PERFORMANCE Required

This prerequisite applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, RETAIL, HOSPITALITY

Meet the minimum requirements of ASHRAE Standard 62.1-2010, Ventilation for Acceptable Indoor Air Quality (with errata but without addenda[1]).

Use the Ventilation Rate Procedure or the Natural Ventilation Rate Procedure (or a combination) or the applicable local code, whichever is more stringent. The Indoor Air Quality Procedure as defined in ASHRAE Standard 62.1-2010 shall not be used to comply with this prerequisite.
If the project team cannot meet the outside air requirements of ASHRAE Standard 62.1-2010 (with errata but without addenda[1]) document the space and system constraints which prevent compliance, and complete an engineering assessment of the system's maximum outside air delivery rate in cubic feet per minute (cfm). Projects must supply the maximum possible outside air given documented space and system constraints but must supply a minimum of 10 cfm of outside air per person. All other requirements must be met.

EQ PREREQUISITE: ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL Required

This prerequisite applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, RETAIL, HOSPITALITY

Locate the project in a building that prohibits smoking by all occupants and users both inside the building and within 25 feet of entries, outdoor air intakes and operable windows.

If outdoor space, public or private, is used for business purposes, including zero lot line, this space needs to follow the no smoking regulation outlined in this credit. Examples of such space include sidewalk seating, patios or decks, and/or stands for purchasing goods.

All projects must install signage within 10 feet of building entrance indicating the no smoking policy.

EQ PREREQUISITE: CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT PLAN—DURING CONSTRUCTION

Required

This prerequisite applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, RETAIL, HOSPITALITY

Develop and implement an IAQ management plan for the construction and preoccupancy phases of the building as follows:

During construction, meet or exceed the 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 stored on-site and installed absorptive materials from moisture damage.

Prohibit operation of central air handlers during construction. Exception: if permanently installed air handlers operate during construction, filtration media with a minimum efficiency reporting value (MERV) of 8, as determined by ASHRAE 52.2-1999 (with errata but without addenda[10]), must be used at each return air grille. Replace all filtration media immediately before occupancy.

[10] Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

EQ CREDIT: OUTDOOR AIR DELIVERY MONITORING

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To promote occupants' comfort and well-being by monitoring the ventilation system.

Requirements

CI, RETAIL, HOSPITALITY

Install permanent monitoring systems to ensure that ventilation systems maintain design minimum requirements. Configure all monitoring equipment to generate an alarm via the building automation system to the building operator or via a visual or audible alert to the building occupants when the conditions below are not met.

AND

CASE 1. Mechanically Ventilated Spaces or Mixed-Mode Systems When Mechanical Ventilation Is Activated

Provide a direct outdoor airflow measurement device capable of measuring the minimum outdoor air intake flow with an accuracy of +/- 10% of the design minimum outdoor airflow rate, as defined by ASHRAE Standard 62.1-2010 (with errata but without addenda[11]). An alarm condition exists whenever the outdoor airflow value varies by 15% or more from the outdoor airflow setpoint.

OR

CASE 2. Naturally Ventilated Spaces or Mixed-Mode Systems When Mechanical Ventilation Is Inactivated

At a minimum, comply with one of the following strategies.

- For projects using exhaust systems, for each such system provide a direct exhaust airflow measurement device capable of measuring the minimum exhaust airflow from the system with an accuracy of +/- 10% of the design minimum exhaust airflow rate. An alarm condition exists whenever 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 condition exists whenever 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 above the floor and within the ventilation zone. CO_2 sensors may be mounted on the wall. Each thermal zone shall have its own CO_2 sensor.

[11] Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

EQ CREDIT: INCREASED VENTILATION

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To promote occupants' comfort, well-being and productivity by improving indoor air quality (IAQ) through additional outdoor air ventilation.

Requirements

CI, RETAIL, HOSPITALITY

CASE 1. Mechanically Ventilated Spaces

Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates required by ASHRAE Standard 62.1-2010 (with errata but without addenda[12]) as determined by EQ Prerequisite : Minimum Indoor Air Quality Performance.

CASE 2. Naturally Ventilated Spaces

Determine that natural ventilation is an effective strategy for the project by following the flow diagram process in the Chartered Institution of Building Services Engineers CIBSE Applications Manual 10:2005, Natural Ventilation in Non-domestic Buildings, Figure 2.8.

AND

OPTION 1

Show that the natural ventilation system design meets the recommendations set forth in the CIBSE manuals appropriate to the project space.

PATH 1. CIBSE Applications Manual 10: 2005, Natural Ventilation in Non-Domestic Buildings

PATH 2. CIBSE AM 13:2000, Mixed Mode Ventilation

OR

OPTION 2

Use a macroscopic, multi-zone, analytic model to predict that room-by-room airflows will provide effective natural ventilation, defined as the minimum ventilation rates required by ASHRAE 62.1-2010 Chapter 6 (with errata but without addenda[13]), for at least 90% of occupied spaces.

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[12] Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

[13] Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

EQ CREDIT: CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT PLAN—BEFORE OCCUPANCY

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, HOSPITALITY

Develop an IAQ management plan and implement it after all finishes have been installed and the building has been completely cleaned before occupancy.

OPTION 1. Flush-Out[14]

PATH 1. Pre-Occupancy

After construction ends, before occupancy and with all interior finishes installed, 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 of floor area while maintaining an internal temperature of at least 60° F 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 of floor area. Once the space is occupied, it must be ventilated at a minimum rate of 0.30 cubic feet per minute (cfm) per square foot of outside air or the design minimum outside air rate determined in IEQ Prerequisite: Minimum Indoor Air Quality Performance, whichever is greater. During each day of the flush-out period, ventilation must begin at least 3 hours before occupancy and continue during occupancy. These conditions must be maintained until a total of 14,000 cubic feet per square foot of outside air has been delivered to the space.

OR

OPTION 2. Air Testing

After construction ends and before occupancy, conduct baseline IAQ testing using protocols consistent with the EPA Compendium of Methods for the Determination of Air Pollutants in Indoor Air and as additionally detailed in the LEED Reference Guide for Green Building Design and Construction, 2012 Edition.

Demonstrate that the contaminant maximum concentration levels listed below are not exceeded:

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[14] All finishes must be installed prior to flush-out.

Contaminant	Maximum Concentration
Formaldehyde	27 parts per billion
Particulates (PM10)	50 micrograms per cubic meter
Total volatile organic compounds (TVOCs)	500 micrograms per cubic meter
4-Phenylcyclohexene (4-PCH)[15]	6.5 micrograms per cubic meter
Carbon monoxide (CO)	9 part per million and no greater than 2 parts per million above outdoor levels

For any sampling point where the maximum concentration limits are exceeded, conduct an additional flush-out with outside air and retest the noncompliant concentrations. Repeat until all requirements are met. When retesting noncompliant building areas, it is recommended that project teams take samples from the same locations as in the first test.

Conduct the air sample testing as follows:

All measurements must be conducted before occupancy, but during normal occupied hours with the building ventilation system started at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the test.

All interior finishes, such as millwork, doors, paint, carpet, and acoustic tiles must be installed. Movable furnishings such as workstations and partitions should be in place for the testing, although it is not required.

The number of sampling locations depends on the size of the building and number of ventilation systems. For each portion of the building served by a separate ventilation system, the number of sampling points must not be less than one per 25,000 square feet or one for each contiguous floor area, whichever is larger. Include areas with the least ventilation and greatest presumed source strength.

Air samples must be collected between 3 and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum 4-hour period.

RETAIL

Develop an IAQ Management Plan and implement it after all finishes have been installed and the building has been completely cleaned before occupancy.

OPTION 1. Flush Out[16]

PATH 1. Pre-Occupancy

After construction ends, 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 of floor area while maintaining an internal temperature of at least 60° F and relative humidity no higher than 60%.

OR

[15] This test is only required if carpets and fabrics with styrene butadiene rubber (SBR) latex backing are installed as part of the base building systems.
[16] All finishes must be installed prior to flush-out.

PATH 2. During Occupancy

If occupancy is desired before the flush-out is complete, the space may be occupied only after delivery of a minimum of 3,500 cubic feet of outdoor air per square foot of floor area. Once the space is occupied, it must be ventilated at a minimum rate of 0.30 cubic feet per minute (cfm) per square foot of outside air or the design minimum outside 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 3 hours before occupancy and continue during occupancy. These conditions must be maintained until a total of 14,000 cubic feet per square foot of outside air has been delivered to the space.

OR

OPTION 2. Air Testing

After construction ends and within 14 days following occupancy, conduct baseline IAQ testing, using protocols consistent with the EPA Compendium of Methods for the Determination of Air Pollutants in Indoor Air and as additionally detailed in the LEED Reference Guide for Green Building Design and Construction, 2012 Edition.

Demonstrate that the contaminant maximum concentrations listed below are not exceeded.

Contaminant	Maximum Concentration
Formaldehyde	27 parts per billion
Particulates (PM10)	50 micrograms per cubic meter
Total volatile organic compounds (TVOCs)	500 micrograms per cubic meter
4-Phenylcyclohexene (4-PCH)[17]	6.5 micrograms per cubic meter
Carbon monoxide (CO)	9 part per million and no greater than 2 parts per million above outdoor levels

For any sampling point where the maximum concentration limits are exceeded conduct an additional flush-out with outside air and retest the noncompliant concentrations. Repeat until all requirements are met. When retesting noncompliant building areas, take samples from the same locations as in the first test.

Conduct the air sample test as follows:

All measurements must be conducted before occupancy or within 14 days following occupancy, during normal occupied hours, with the building ventilation system started at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the test.

All interior finishes such as millwork, doors, paint, carpet and acoustic tiles must be installed. Movable furnishings such as workstations and partitions should be in place for the testing.

The number of sampling locations depends on the size of the building and number of ventilation systems. For each portion of the building served by a separate ventilation system, the number of sampling points must not be less than one per 25,000 square feet, or one for each contiguous floor area, whichever is larger. Include areas with the least ventilation and greatest presumed source strength.

[17] This test is only required if carpets and fabrics with styrene butadiene rubber (SBR) latex backing are installed as part of the base building systems.

Air samples must be collected between 3 and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum 4-hour period.

EQ CREDIT: LOW-EMITTING INTERIORS

This credit is available in the Pilot Credit Library

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, RETAIL, HOSPITALITY

This credit uses a systems approach to minimizing air quality problems. The building interior is organized into five systems: flooring, ceilings, walls, thermal and acoustic insulation, and furniture, as defined in Table 1. Components and subcomponents of each category required to be in compliance are indicated below. If furniture is included in the scope of the project, include furniture in the credit calculations, regardless of which rating system is used.

System Category	Required Criteria & Achievement Rate[18,19]	Maximum Points Available	
		With furniture	Without furniture
For all categories	Percent compliant = percent of (X) that is compliant. Every identified component and subcomponent (i.e., all separate layers) shall be individually compliant.		
Floors	X = Total finished floor area		
Ceilings	X = [Ceiling plan area] + [Area of additional finished ceiling planes]		
Walls	X = Wall surface area		
Acoustic & Thermal Insulation	X = Total planar area, irrespective of placement		
Furniture	Compliance with sections 7.6.1 and/or sections 7.6.2 of on BIFMA e3-2008 is required. X = [0.5] x [total purchasing cost compliant with Section 7.6.1] +		

[18] **Compliance points awarded**:
(a) For each percent between 50-89% compliant = **1/40 points** (with furniture); **1/32 points** (without furniture)
(b) **≥**90% compliant = **1 point** (with furniture); **1.25 points** (without furniture)
[2] **Point adjustment** for walls ceilings and floors
[Awarded point =compliance points] **x** [0.7] **x** [percent of area on which are applied full spread containerized products not having met both the content test AND the emissions test]

	[percent compliant with Section 7.6.2] (The sum is truncated not to exceed 100%)		
Total Points (Calculated as the sum of system category points earned rounded down to the nearest point)			

Every system and component in each category shall meet the following testing requirements to be in compliance.

General Emissions Testing
Building products (excluding furniture) shall be tested and evaluated in accordance with California Department of Public Health (CDPH) Standard Method V1.1-2010 using the applicable exposure scenario. The default scenario shall be the school classroom scenario. For LEED projects outside North America, testing and evaluation with either the CDPH standard method or the German AgBB Testing and Evaluation Scheme (2008)[20] together with ISO 16000-11 will be accepted[21].

Containerized Products

Paints and Coatings

- **Content:** All paints and coatings shall meet the chemical content requirements of South Coast Air Quality Management District (SCAQMD) Rule 1113-July 13, 2007 (to be updated to most current version of rule when available), "Architectural coatings" as analyzed by the methods specified in Rule 1113. For LEED projects outside North America, either the SCAQMD content requirements or compliance with the European "Decopaint" Directive (2004/42/EC, to be updated to most current version when available) Phase II, water-borne coatings, as analyzed by the methods specified in ISO 11890 parts 1 and 2, will be accepted.
- **Emissions:** Additionally, paints and coatings applied to floors, ceilings and walls shall meet the VOC emission requirements as specified above.

Adhesives and Sealants

- **Content:** All adhesives and sealants shall meet the chemical content requirements of SCAQMD Rule 1168-January 7, 2005 (to be updated to most current version of rule when available), "Adhesive and sealant applications" as analyzed by the methods specified in Rule 1168. For LEED projects outside North America, either the SCAQMD test methods or test results obtained by the methods specified in ISO 11890 parts 1 and 2 will be accepted.
- **Emissions:** Additionally, full-spread adhesives and sealants applied to floors, ceilings and walls shall meet the VOC emissions requirements as specified above.

Built-In Cabinetry and Architectural Woodwork[22] and Composite Wood Flooring

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[20] AGBB, Ausschuss zur gesundheitlichen Bewertung von Bauprodukten, Evaluation Procedure for VOCs from Building Products, Committee for Health-related Evaluation of Building Products - 1st March 2008. www.umweltbundesamt.de/building-products/agbb.htm.

[21] the formaldehyde limit value of 10 µg/m^3 at 28 days must also be met when using the AGBB alternative, as specified in AFSSET: Avis de l'Agence française de sécurité sanitaire de l'environnement et du travail relatif à une procédure de qualification des émissions des composées organiques volatiles par les matériaux de construction et produits de décoration, Saisine Afsset n°2004/11 (2009). http://www.afsset.fr/upload/bibliotheque/892980998778406505212938602998/COV_Avis_signe_2009_10.pdf.

[22] Built-in cabinetry and architectural woodwork applied to walls are considered to be components of the wall category.

Built-in cabinetry and architectural woodwork applied to walls are considered components of the wall category.

For built-in cabinetry, architectural wood work and composite wood flooring, compliance is determined based on the following criteria intended to limit the sources of indoor VOC contaminants:

Composite woods and agri-fiber materials constituting all or a portion of a product (e.g., countertops, and cabinetry with composite wood cores and internal components) must be constructed with materials documented to have low formaldehyde emissions that meet the California Air Resources Board ATCM for formaldehyde Phase 2 requirements or do not exceed a maximum 50% of the formaldehyde limit of the European formaldehyde class E1 as specified in EN 13986 and related norms. Materials exempt from formaldehyde emission testing requirements because they are documented as having no added formaldehyde or ultra low formaldehyde emitting resins are considered to be compliant.

Salvaged and re-used architectural woodwork more than one-year old at the time of use is considered compliant provided they meet the requirements for any site-applied paints, coatings, adhesives, and sealants.

Furniture
New furniture and furnishing items shall be tested following ANSI/BIFMA Standard Method M7.1-2007 (To be revised to M7.1-2010 pending ANSI and/or organizational approval). Comply with BIFMA e3-2008 Furniture Sustainability Standard, Sections 7.6.1 and 7.6.2 using either the concentration modeling approach or the emission factor approach. Salvaged and re-used architectural woodwork more than one-year old at the time of use is considered compliant provided they meet the requirements for any site-applied paints, coatings, adhesives, and sealants.

Inherently non-emitting sources
Products that are inherently non-emitting sources of VOC s, specifically stone and ceramic, powder-coated, plated or anodized metals, and glass without integral organic-based surface coatings, binders, or sealants, are considered fully compliant without any VOC emissions testing.

Manufacturers' claims
Both first-party and third-party claims regarding product compliance shall follow the guidelines in CDPH SM V1.1-2010, Section 8. Organizations certifying manufacturers' claims regarding product compliance with the tests specified within this credit shall be ISO Guide 65 accredited.

Laboratory requirements
Laboratories conducting the tests specified within this credit shall be ISO/IEC 17025 accredited with relevant test methods included in their scopes of accreditation.

EQ CREDIT: INDOOR CHEMICAL AND POLLUTANT SOURCE CONTROL

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To minimize building occupant exposure to potentially hazardous particulates and chemical pollutants.

Requirements

CI, RETAIL, HOSPITALITY

Design to minimize and control the entry of pollutants into buildings and later cross-contamination of regularly occupied areas through the following strategies:

Install permanent entryway systems at least 10 feet 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, grill s and slotted systems that allow for cleaning underneath. Roll-out mats are acceptable only when maintained on a weekly basis by a contracted service organization.

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) 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. The exhaust rate must be at least 0.50 cubic feet per minute (cfm) per square foot with no air recirculation. The pressure differential with the surrounding spaces must be at least 5 Pascals (Pa) (0.02 inches of water gauge) on average and at least 1 Pa (0.004 inches of water) when the doors to the rooms are closed.

In mechanically ventilated buildings, each ventilation system that supplies outdoor air must have particle filters or air cleaning devices to filter the outdoor air before it reaches occupied spaces.

These filters or devices must have a Minimum Efficiency Reporting Value (MERV) of 13 or higher, in accordance with ASHRAE Standard 52.2.

Clean air filtration media shall be installed in all air systems after completion of construction and before occupancy.

EQ CREDIT: INTERIOR LIGHTING

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

CI, HOSPITALITY

Lighting Control

For at least 90% of workstations, provide individual lighting controls that enable occupants to adjust the lighting to suit their individual tasks and preferences.

For all shared multi-occupant spaces, provide multi-zone 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, mid-level).

Any control lighting for feature or presentation walls must be separate.

Switches or manual controls must be within a direct line of sight of the luminaires they control and located as close as possible to the area illuminated (e.g., on the wall list by wall-washers).

Provide manual or automatic (with manual override) glare-control devices (e.g. blinds, shades, curtains) in all instructional and regularly occupied spaces to give occupants visual privacy and security and block any glare from daylight.

All regularly occupied spaces must have manual-on, auto-off lighting controls with manual-off capability.

RETAIL

Provide individual lighting controls for 90% of retail employees in office and administrative spaces, enabling adjustments to suit individual task needs and preferences.

AND

CI, HOSPITALITY

This requirement is available in the Pilot Credit Library

Lighting Quality

Incorporate at least 5 of the following interior lighting features for the regularly occupied spaces:

- suspended, wall-mounted, freestanding or partition mounted direct/indirect ambient lighting;
- task-ambient lighting solutions that achieve recommended IESNA illuminance levels with the combination of both systems;
- an efficiency of greater than 50% for all luminaires;

- sources with more than 50 lumens / Watt for 95% of the demand power;
- rooms surfaces with reflectance exceed 80% (ceiling), 60% (walls), 30% (floor), and 40% (work surfaces and movable partitions),
- a surface brightness of less than 10,000cd/m^2 for all luminaires with luminous parts (lamps, diffusers, meshes, reflectors, etc.) within an 11-degree field of view from 4 feet above finished floor;
- an average wall-surface-to-work-surface illuminance ratio that does not exceed 3:1;
- a ceiling-surface-to-work-surface illuminance ratio that does not exceed 10:1;
- dimmable fixtures for 90% of the luminaires;
- a CRI of 80 or higher for 100% of lamps
- in all day lit spaces, automated shade controls which retract blinds or shades at the beginning of each day, with glare sensors for each floor and orientation that receive sunlight (either directly or reflected from another building); and
- automated or fixed shade control for top-lighting daylight systems.

EQ CREDIT: THERMAL COMFORT

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

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

Requirements

Thermal Comfort Design

CI, RETAIL, HOSPITALITY

Design heating, ventilating and air conditioning (HVAC) systems and the building envelope to meet the requirements of ASHRAE Standard 55-2004, Thermal Comfort Conditions for Human Occupancy (with errata but without addenda[23]). Demonstrate design compliance in accordance with Section 6.1.1 documentation.

For natatoriums, demonstrate compliance with ASHRAE HVAC Applications Handbook, 2003 Edition, Chapter 4, Places of Assembly, Typical Natatorium Design Conditions (with errata but without addenda[24]).

Provide heating, ventilating and air conditioning (HVAC) systems and controls designed to monitor and control zone relative humidity to 65% or less during all design load conditions. Monitoring and control of the zone relative humidity applies when zones are both occupied and unoccupied.

AND

Thermal Comfort Control

CI, HOSPITALITY

For at least 50% of occupants, provide thermal comfort controls[25] that enable adjustments to meet individual needs and preferences. Individual comfort controls that increase energy consumption must be accounted for in EA credit – Optimize Energy Performance.

Operable windows may be used in lieu of controls for occupants located 20 feet inside and 10 feet to either side of the operable part of the window. The areas of operable window must meet the requirements of ASHRAE 62.1-2010 (with errata but without addenda[26]).

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[23] Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

[24] Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

[25] Individual comfort controls could include UFAD individual diffusers and thermally powered diffusers.
Operable windows may be used in lieu of controls for occupants located 25 feet inside and 10 feet to either side of the operable part of a window. The areas of operable window must meet the requirements of ASHRAE 62.1-2010 (with errata but without addenda[2]).
Individual comfort plug-in devices are acceptable for meeting the intent of this credit.

[26] Project teams wishing to use addenda approved by ASHRAE for the purposes of this credit may do so at the project team's discretion. Addenda must be applied consistently across all LEED credits.

For all workstations and shared multi-occupant spaces, provide comfort controls that enable adjustments to meet group needs and preferences.

Conditions for thermal comfort are described in ASHRAE Standard 55-2004 (with errata but without addenda[2]) and include the primary factors of air temperature, radiant temperature, air speed and humidity.

RETAIL

For at least 50% of retail employees in office and administrative spaces, provide thermal comfort controls that enable adjustments to meet individual needs and preferences.

Operable windows may be used in lieu of controls for occupants located 20 feet inside and 10 feet to either side of the operable part of the window. The areas of operable window must meet the requirements of ASHRAE 62.1-2010 (with errata but without addenda[27]).

[27] Project teams wishing to use addenda approved by ASHRAE for the purposes of this credit may do so at the project team's discretion. Addenda must be applied consistently across all LEED credits.

EQ CREDIT: DAYLIGHT

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To provide building occupants with a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building. To reduce the use of electrical lighting and give building occupants a circadian stimulus and a connection to the outdoors by admitting daylight into regularly occupied areas.

Requirements

CI, RETAIL, HOSPITALITY

For all daylighting, provide manual or automatic (with manual override) glare control devices(e.g. blinds, shades or curtains) must be provided for all instructional and regularly occupied spaces to give occupants visual privacy and security, and block any glare from daylight.

Translucent glazing may not be used in perimeter glazing if it constitutes the view for the occupant located farthest away (see EQ Credit, Quality Views).

AND

OPTION 1. Simulation - Daylight Autonomy

Demonstrate through computer simulations that at least 75% of all regularly occupied spaces (or 75% of instructional spaces for Schools projects) achieve a minimum DA value of 50%, based on an annual illuminance of 30 footcandles (fc) when blinds are operated to block direct sunlight.

Demonstrate that all regularly occupied spaces achieve a maximum DA value of 5%, based on an illuminance level of 200 fc when blinds are operated to block direct sunlight.

Calculation grids must be no more than 3 feet square and at the appropriate work plane height (30 inches above finished floor if otherwise undefined).

OR

OPTION 2. Simulation - Illuminance Calculations

Demonstrate through computer simulations that at least 75% of all regularly occupied space achieves illuminance levels between 30 fc and 200 fc when blinds are operated to block direct sunlight for any two of the following four sky conditions:

- 9 am equinox on a clear-sky day (solar time);
- Noon equinox on a clear-sky day;
- 3 pm equinox on a clear-sky day;

- Noon equinox on a CIE standard overcast day

Illuminance intensity for sun (direct component) and sky (diffuse component) for clear sky and overcast conditions for those time periods shall be derived from the local weather data, or TMY weather tapes for the nearest city, first by selecting the two days within 15 days of September 21st and March 21st that represent the clearest sky and most overcast sky condition, and then averaging the hourly value for the appropriate spring and fall hour.

OR

OPTION 3. Measurement

Demonstrate through records of indoor illuminance measurements that at least 75% of the regularly occupied spaces have illuminance levels between 25 fc and 200 fc during any given hour between 9 a.m. and 3 p.m. solar time.

Measurements may be taken during any regularly occupied month.

Measurements must be taken on a maximum 10-foot-square grid for all occupied spaces larger than 150 square feet and on a maximum 3-foot-square grid for all smaller spaces that are recorded on building floor plans.

EQ CREDIT: QUALITY VIEWS

This credit is available in the Pilot Credit Library

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To give building occupants a connection with the natural outdoor environment by providing quality views.

Requirements

CI, RETAIL, HOSPITALITY

Achieve a direct line of sight to the outdoors via vision glazing for 80% of all regularly occupied spaces. Regularly occupied areas that can be counted toward this credit must meet the following criteria:

- In plan view, the area is within sight lines drawn from perimeter vision glazing to provide at least an 11 degree horizontal angle of view to the perimeter vision glazing.

- In section view, the area is within sight lines drawn from perimeter vision glazing to provide at least an 11 degree vertical angle of view to the perimeter vision glazing.

The view from each area must include objects at least 50 feet outside the vision glazing, objects lit with daylight that are exposed to direct sunlight or display wind movement, and natural elements (e.g. sky, vegetation, water, people, animals, or other random movement).

For private offices, the entire square footage of the office may be counted if 80% of the area satisfies the line-of-sight criteria. For other multi-occupant spaces, only the actual square footage that satisfies the line-of-sight criteria may be counted.

Lines of sight may be drawn through interior glazing. Any permanent interior obstructions (e.g. lab hoods, fixed partitions) must be considered as limiting the view angle. Movable opaque full-height or partial-height partitions must be included in calculations and line-of-sight drawings.

Fixed window treatments (e.g. ceramic frit patterns, wire meshes, bars, grill-work) in the field of view may compromise the quality of the view. The project team must submit photographs of the views from the interior spaces to demonstrate that such fixed treatments do not compromise the quality of view.

EQ CREDIT: ACOUSTIC PERFORMANCE

This credit is available in the Pilot Credit Library

This credit applies to:

- Commercial Interiors
- Hospitality

Intent

To provide workspaces and classrooms that promote occupants' well-being, productivity, and communications through effective acoustic design.

Requirements

CI, HOSPITALITY

Establish criteria for background noise levels (NC, RC(N), or dBA). Provide calculations of rooms' background noise levels, and include any mitigation measures in the project documents. Assess sound isolation needs (STC ratings) and levels of speech privacy in applicable project spaces, and show that appropriate speech privacy levels, reverberation time, and sound isolation values have been designed for on a space-by-space basis. Document reverberation time calculations, indicating compliance with established criteria. efforts to limit reverberation time by considering the sound absorbing qualities of surface materials such as ceilings, wall and floor treatments. Describe any sound reinforcement or sound masking systems to be employed in the project.

EQ CREDIT: OFFICE ERGONOMICS STRATEGY

ID&C
This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To promote healthy, comfortable, and productive work by designing the office workplace to accommodate its users.

Requirements

CI, RETAIL, HOSPITALITY

Develop and implement a comprehensive ergonomics that will enhance health and comfort during daily activity for at least 75% of full time equivalent office users. This strategy must include the following four components.

1. Identify activities and building functions for which ergonomics enhancement is both desirable and possible through education and equipment.

   Project teams are encouraged to consult one or more of the existing ergonomics standards and guidelines. For computer workstations, these include BIFMA G1, ANSI/HFES 100-2007, and CSA Z4 12-00.

2. Define performance goals for the ergonomics strategy, addressing productivity, comfort, and health. Communicate the goals and ergonomics plan to office workers.

   Provide an informal, periodic feedback system to collect anonymous responses and respond to them.

   Maintain ongoing office user access to appropriate ergonomics machine, equipment, tools, work-aids (METWAs), furnishings, and accessories and education.

   Conduct a more formal, periodic survey of office user satisfaction. The survey must cover a representative sample of office occupants making up at least 30% of the total occupants. Track and report the results of the ergonomics strategy, ensure that the performance goals have been met, and identify areas for improvement.

3. Provide METWAs, furnishings, and accessories that reduce the risk of work-related musculoskeletal disorders and are acceptable to a wide range of office users.

   If office users spend 50% or more of their time at computer workstations, address display, computer peripherals (keyboard/mouse), work surface, and chair.

4. Provide ergonomics education, such as classroom sessions conducted by an ergonomics professional; access to literature on products and basic information relevant to the office user's tasks; regularly scheduled workstation evaluations; interactive Internet-based products (e.g., assessment and training tools); and hands-on experiences, such demonstrations by an ergonomic furnishings supplier. Offer at least two such opportunities, at least one of which must be interactive. Conduct follow-up evaluations.

PERFORMANCE

PF PREREQUISITE: TENANT-LEVEL METERING
Required

This prerequisite applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

Meter, track and share tenant-level resource use to encourage energy management and support LEED program evaluation.

Requirements

CI, RETAIL, HOSPITALITY

Install new or use existing tenant-level energy resource meters (e.g. electricity, natural gas, chilled water, steam, fuel oil, propane, biomass, etc). Utility owned meters are acceptable.

Commit to providing energy consumption data and electrical demand data to USGBC extending for a five year period beginning on the date the Project accepts LEED certification from the Green Building Certification Institute (GBCI). At a minimum, energy consumption must be tracked at one month intervals or in accordance with utility billing intervals.

Participate in the USGBC Building Performance Partnership (BPP) extending for a five year period beginning on the date the Project accepts LEED certification from GBCI or typical occupancy.

PF PREREQUISITE: FUNDAMENTAL COMMISSIONING AND VERIFICATION Required

This prerequisite applies to:
- Commercial Interiors
- Retail
- Hospitality

Intent

To verify that the project's energy, water, and indoor air quality related systems and the exterior envelope assemblies and systems are designed, installed, and calibrated to perform according to the owner's project requirements, basis of design and construction documents.

Requirements

CI, RETAIL, HOSPITALITY

The following requirements only apply to systems included within the project's scope of work (e.g., when the exterior envelope is not included in the scope of the project).

A commissioning process must be incorporated into pre-design, design, construction, and the first year occupancy of the project; the process must verify that the delivered building and its components, assemblies, and systems comply with the documented Owner's Project Requirements (OPR).

The Owner or Owner's Representative must complete the following commissioning process activities:

- Document and/or approve the OPR, which meets the requirements of Section 5.2.2.4 of ASHRAE Guideline 0-2005. Alternatively, the Owner may designate a commissioning authority (CxA) to develop and update the OPR.
- Designate an individual as the CxA to lead, review and oversee the completion of the commissioning process activities. The CxA must be designated and involved prior to or immediately after completion of design development.

The individual serving as the CxA must meet all of the following qualifications:

- A commissioning provider with documented commissioning authority experience in implementing the commissioning process with at least two (2) building projects;
    - Documented CxA experience must include pre-design or early design phase involvement through at least 10 months of occupancy;
        - Must be independent of the project design and construction management activities;
        - For projects smaller than 20,000 gross square feet, the CxA may be a qualified employee of the design or construction team (i.e., not an independent consultant);

- For projects 20,000 gross square feet or larger, the CxA must be an independent consultant who is not a part of the project's design team, employed by the project's construction management firm or sister company;
- The CxA may be a qualified employee of the owner.

The design team must:

- Develop the Basis of Design in accordance with Owner's Project Requirements and the requirements of Section 6.2.2 in ASHRAE Guideline 0-2005;
- Participate in commissioning meetings
- Work with the CxA to incorporate commissioning requirements into construction documents;

The CxA must:

- Review the design development and OPR at the design development stage;
- Provide support in developing the commissioning requirements for construction documents;
- Develop and implement the commissioning plan;
- With assistance from the project team, develop and incorporate commissioning requirements into construction documents prior to bid or when formal construction is scheduled for non-bid projects;
- Review the 95% or final contract design drawings and specifications prior to permitting or bid submittal of all commissioned systems and assemblies;
- Review construction documents to verify:
    - maintenance access
    - relevant sensor locations
    - the proper documentation of devices and control sequences
    - that envelope thermal and moisture control details are shown
    - the inclusion of commissioning tests, meetings and methods
- Report results, findings and recommendations directly to the owner;
- Form and lead the commissioning process team;
- Conduct regularly scheduled commissioning process team meetings;
- Maintain an issues/benefit log for the commissioning process
- Verify construction checklists against contractor installation prior to acceptance testing of the systems to be commissioned.
- Witness and document acceptance tests. For each acceptance test, complete test form and include a signatures for the parties who has performed and witnessed the test.
    - Seasonally dependent system operations that cannot be fully commissioned in accordance with the commissioning plan at time of occupancy must be commissioned at the earliest time after occupancy, when the operation of systems is allowed to be fully demonstrated as determined by CxA
- Review and include the following tasks in the final commissioning process report:
    - A water vapor transmission analysis of all exterior envelope types used in the building
    - Confirm building envelope materials and their installation are in compliance with the contract documents, if within the tenant scope of work.
- Prepare the final commissioning process report.

If the following are within the tenant scope of work, the commissioning team must demonstrate:

- That ventilation equipment and system meet the design minimum indoor air quality for both mechanically ventilated spaces and naturally ventilated spaces.

Verification must be performed by:
  - Review of contractor submittals for ventilation equipment during construction
  - Review of testing and balance reports
  - Independent measurements of at least 20% of outdoor air sources
- That water using fixtures and appliances, within the tenant scope of work, meet the design minimum water usage requirements;
  Verification shall be performed through:
  - Review of contractor submittals for applicable water using fixtures and equipment
  - Evaluation of water usage or re-usage systems included (e.g. stormwater, refrigeration equipment condensate, rainwater) or gray water usage.
  - Independent measurements of at least 10% of water using fixtures or equipment
- If there are substantial variations or failure to meet the minimum ventilation or water usage design requirements, corrective action must be taken by the owner or contractor until the requirements achieve verification testing

The construction team is responsible for the following:

- Developing a construction quality implementation plan per the contract documents;
- Including subcontractors in commissioning process team meetings;
- Forming the required teams for appropriate tests included in the specifications;
- Verifying the installation and performance of the systems to be commissioned, including completion of the construction checklist.

Commissioned Systems

Commissioning process activities must be completed for the following energy-related and exterior envelope systems and assemblies within the tenant project scope, at a minimum:

- Heating, ventilating, air conditioning and refrigeration (HVAC&R) systems (mechanical and passive) and associated controls
- Lighting and daylighting controls
- Domestic hot water systems
- Renewable energy systems (e.g., wind, solar)
- Roofing assemblies and systems
- Thermal, air, and vapor transmission properties of walls, roofs, windows and doors
- Water monitoring and measuring devices for potable and reclaimed water entering the building project
- Plumbing automatic sensing devices, irrigation systems, cooling tower chemical treatment and bleed rates, rain water collection systems, and on-site waste water treatment systems.

Projects that are connected to district energy systems must follow LEED’s DES requirements.

PF CREDIT: ENHANCED COMMISSIONING

This credit applies to:
- Commercial Interiors
- Retail
- Hospitality

Intent

To ensure that systems are installed, calibrated and maintained for high performance operations through the commissioning process.

Requirements

CI, RETAIL, HOSPITALITY

Implement, or have a contract in place to implement, the following additional commissioning process activities that are within the tenant's scope of work, in addition to the requirements of PF Prerequisite .

The Owner or Owner's Representative must select and individual to serve as the commissioning authority (CxA) who meets the following requirements:

- Be a commissioning provider with documented commissioning authority experience in implementing the commissioning process with at least two (2) building projects.
- Be independent of the project design and construction management activities;
- Be an independent consultant who is not an employee of the project's design or construction management firm or sister company and has the required experience .
- CxA may be contracted through the designer or construction manager not holding construction contracts related to the project. It is recommended that the CxA be contracted directly with the owner
- CxA may be a qualified employee of the owner.

The CxA will perform the following actions, in addition to fulfilling the requirements of PF Prerequisite X:

- Develop an enhanced commissioning plan, initiated prior to design development, this will include activities during pre-design, design, construction, and occupancy
- Develop design phase checklists for commissioning activities and for the design team submittals of partial design and the delivered construction documents
- For project less than 20,000 sq. feet the CxA must conduct, at a minimum, one (1) commissioning process verification review of the owner's project requirements (OPR), basis of design, and design documents prior to mid-construction document development and back-check the review comments in all subsequent design submissions, including an additional full verification review at the 95% completion of the design documents and basis of design.
- For project over 20,000 sq. feet the CxA must conduct, at a minimum, three (3) commissioning process verification reviews of the OPR and basis of design; one (1) review of design documents prior to the start of design development, one (1) review of design documents prior to mid-construction documents, and one (1) review of 100% complete design documents including

adjudication of previous review comments in all subsequent design submissions, and an additional full verification review at the 100% completion of the design documents and basis of design. Develop a tracking means for all commissioning process issues and estimate the economic value or descriptive value to the owner for all commissioning process issues

- Review contractor submittals applicable to commissioned systems and assemblies for compliance with the OPR and basis of design. This review must be concurrent with the review of the architect or engineer of record and the review report submitted to both the design team and the owner.
- Verify that the requirements for training operating personnel and building occupants have been met.
- Reviewing the operation of the building with operations and maintenance (O&M) staff and occupants within 10 months of substantial completion. A plan for resolving outstanding commissioning-related issues must be included.
- Develop, direct and document acceptance testing of the building envelope for moisture intrusion, if within the tenant scope of work.
    - For extensive existing building renovations, where the existing building envelope will remain and no previous evidence of moisture intrusion is observed, acceptance testing of existing building envelope is not required.
- Develop, in coordination with building operating staff, a lifetime on-going or monitoring based "commissioning" program to meet the minimum requirements of ASHRAE Guideline 0-2005, Sections 8.2.4.1, 8.2.5.1, 8.2.6.1, 8.2.7, and 8.2.8, in conjunction with building operating staff, and:
    - Sustain the energy, water, and envelope quality and performance levels achieved at the end of the 10-month occupancy period
    - Enhance the energy, water, and envelope quality and performance for the life of the building,
    - Provide requirements for re-commissioning
    - Annually evaluate the current facility requirements and a means to address changing activities or use of the facility
    - Adopts and implements policy and procedures for application of the commissioning process over the life of the tenant lease, including minor and major modifications to building interior, exterior, mechanical, electrical, life safety and process related systems

Commissioned Systems

All commissioning activities defined above must include all systems listed below that are within the tenant scope of work, in addition to those required under PF Prerequisite X.

- Subterranean water proofing and penetrations
- Exterior wall assemblies and fenestration systems
- Above grade penetration
- Stormwater control and removal systems
- Associated pumping systems, if applicable

For all options, projects that are connected to district energy systems (DES) must follow LEED's DES requirements.

PF CREDIT: ADVANCED ENERGY METERING

This credit is available in the Pilot Credit Library

This credit applies to:
- Commercial Interiors
- Retail
- Hospitality

Intent

To provide for the ongoing accountability of building energy consumption over time.

Requirements

CI, RETAIL, HOSPITALITY

Install *advanced energy metering*. This is defined as:
- Meters that are permanently installed, record at intervals of 1 hour or less, and transmit data to a remote location. Electrical meters shall record both consumption and demand. Whole-building electrical meters should record power factor if appropriate.
- Data collection system that uses a LAN, Building Automation System, wireless network, or some other similar communication infrastructure.
- Data storage with the capability of storing all meter data for at least 18 months.
- Remotely-accessible data retrieval that provides energy use management features that include, as a minimum, reporting of hourly, daily, monthly, and annual energy use data for all meters in the system.

Commit to sharing with USGBC or Building Performance Partnership (BPP) all energy usage data acquired from the advanced energy metering system, extending for a five year period beginning on the date the Project accepts LEED certification from GBCI or typical occupancy.

AND, select Option 1 or 2 below:

OPTION 1. Prescriptive Approach

PATH 1.

- Install advance energy metering for all whole-building energy sources consumed in the tenant space.
- Install advance energy metering for any individual tenant energy end-uses that represent 20% or more of the total annual energy consumption of the tenant space.

PATH 2.

- Install advance energy metering for all whole-building energy sources consumed in the tenant space.
- Install advance energy metering for any individual tenant energy end-uses that represent 5% or more of the total annual energy consumption of the tenant space.

OPTION 2. Performance Approach

PATH 1.

- Install *cost-effective advanced energy metering*. *Cost-effective* is defined as:

  - Incremental cost for the entire system (over and above monitoring and control systems already installed in the building) up 30% of the projected total annual energy cost for all energy sources consumed in the tenant space.

    AND

  - Incremental cost (over and above monitoring and control systems already installed in the building) of metering any individual tenant energy end-use or portion of end-use that represents 20% or more of the total annual energy consumption of the tenant space up to 30% of the total annual energy cost for that end-use or portion of end-use.

- Assess and install metering according to the following prioritization:

  1. Whole-building energy sources consumed within the tenancy.
  2. Tenant energy end-uses, proceeding from the largest to the smallest based on projected energy consumption.

PATH 2.

- Install *cost-effective advanced energy metering*. *Cost-effective* is defined as:

  - Incremental cost for the entire system (over and above monitoring and control systems already installed in the building) up 50% of the projected total annual energy cost for all energy sources consumed in the tenant space.

    AND

  - Incremental cost (over and above monitoring and control systems already installed in the building) of metering any individual tenant energy end-use or portion of end-use that represents 5% or more of the total annual energy consumption of the tenant space up to 50% of the total annual energy cost for that end-use or portion of end-use.

- Assess and install metering according to the following prioritization:

  1. Whole-building energy sources consumed within the tenancy.
  2. Tenant energy end-uses, proceeding from the largest to the smallest based on projected energy consumption.

FOR BOTH OPTIONS:

Typical energy sources may include:

- Electricity
- Natural Gas
- Propane
- Steam
- Chilled water
- On-site Renewable Generation
- Geothermal or Ground Source Energy

Typical end-uses may include:

- HVAC systems and equipment
- Lighting
- Plug loads
- Vertical transportation
- Processes
- Other end-uses as appropriate to the facility type

PF CREDIT: RECONCILE PROJECTED AND ACTUAL ENERGY PERFORMANCE

This credit is available in the Pilot Credit Library

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To provide for the ongoing accountability of building energy consumption over time.

Requirements

CI, RETAIL, HOSPITALITY

Develop and implement a tenant-level Measurement & Verification (M&V) program in accordance with Option D: Calibrated Simulation (either Savings Estimation Method 1 or 2) , as specified by the International Performance Measurement and Verification Protocol (IPMVP), Concepts and Options for Determining Energy Savings in New Construction, Volume III, 2006.

The M&V period must cover at least one year of post-construction occupancy.

An executed contract(s) must be in place for all services necessary to execute the M&V program.

Prepare and submit a final report to the project design team and the building owner describing the M&V program and its outcomes, including:

- Reconciliation between actual tenant energy use and tenant energy use predicted by EA Credit 1.
- Discussion of reconciliation and variances between actual tenant energy use and tenant energy use predicted by EA Credit 1.
- Actual avoided tenant energy use compared to the EA Credit 1 baseline.
- Avoided tenant energy costs compared to the EA Credit 1 baseline.
- Avoided tenant GHG emissions compared to the EA Credit 1 baseline.
- Recommendations for any remedial or future action.

PF CREDIT: OCCUPANT EXPERIENCE SURVEY

This credit applies to:
- Commercial Interiors
- Retail
- Hospitality

Intent

To provide feedback to owners, operators, and the USGBC on occupant experience with Indoor Environmental Quality (IEQ) in LEED certified buildings, in order to address issues within the building, and for further improvements to the IEQ-related credits.

Requirements

CI, RETAIL, HOSPITALITY

Implement a occupant experience survey within the tenant space to collect anonymous regarding the occupants' satisfaction with air quality, thermal comfort, lighting quality, acoustics, building cleanliness and maintenance, and ergonomics, and opportunities for improvement, in the building.

Survey either the entire population of the tenant space or a randomly selected, statistically representative sample of the population. Where feasible, use systematic sampling for subpopulations stratified by location, occupation or another characteristic believed to be relevant to occupant experience with IEQ in the space. The applicant must fully document the methodology by which the sampling population was selected and establish the statistical soundness of the approach employed to ensure random selection. The required minimum sample size to be determined by the following formula:

Required Random Sample Size = (# of regular occupants X 752) / (# of regular occupants +752)

Use the USGBC survey questions either in the web-based format or distribute as a paper questionnaire (USGBC survey questions are provided in appendix A)

Complete a minimum of two occupant surveys within 18 months of the performance period, one in the winter and one in the summer.

Agree to develop a plan for corrective action to remediate issues, where possible, if the results indicate that more than 20% of the respondents are dissatisfied with any of the surveyed IEQ aspects

Provide survey results to USGBC no later than two months after completion of the final survey.

INNOVATION

IN CREDIT: INNOVATION

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To provide projects the opportunity to achieve exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in categories not specifically addressed by the LEED Green Building Rating System.

Requirements

CI, RETAIL, HOSPITALITY

Credit can be achieved through any combination of the Innovation in Design and Exemplary Performance paths as described below:

OPTION 1. Innovation

Achieve significant, measurable environmental performance using a strategy not addressed in the LEED Green Building Rating System.

One point is awarded for each innovation achieved. No more than 5 points under IDc1 may be earned through OPTION 1—Innovation.

Identify the following in writing:

- The intent of the proposed innovation credit.
- The proposed requirement for compliance.
- The proposed submittals to demonstrate compliance.
- The design approach (strategies) used to meet the requirements.

OPTION 2. Exemplary Performance

Achieve exemplary performance in an existing LEED 2009 prerequisite or credit that allows exemplary performance as specified in the LEED Reference Guide 2009 Edition. An exemplary performance point is typically earned for achieving double the credit requirements and/or achieving the next incremental percentage threshold of an existing credit in LEED.

One point is awarded for each exemplary performance achieved. No more than 3 points under IDc1 may be earned through OPTION 2— Exemplary Performance.

REGIONAL PRIORITY

RP CREDIT: REGIONAL PRIORITY

This credit applies to:

- Commercial Interiors
- Retail
- Hospitality

Intent

To provide an incentive for the achievement of credits that address geographically specific environmental, social equity, and public health priorities.

Requirements

CI, RETAIL, HOSPITALITY

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.