LEED Rating System Draft
November 2010

BUILDING OPERATIONS & MAINTENANCE

Includes:
Existing Buildings: Operations and Maintenance
Schools
Retail
Data Centers
Hospitality

INTEGRATED PROCESS (IP) 7

IP Credit: Integrated Process 7
EBOM, Schools, Retail, Data Centers, Hospitality 7

IP Credit: LEED Accredited Professional 9
EBOM, Schools, Retail, Data Centers, Hospitality 9

LOCATION AND TRANSPORTATION (LT) 10

LT Credit: LEED Certified Design and Construction 10
EBOM, Schools, Retail, Data Centers, Hospitality 10

LT Credit: Alternative Commuting Transportation 11
EBOM, Schools, Retail, Data Centers, Hospitality 11

Appendix 1: Diverse Uses 13

Appendix 2: Default Occupancy Counts 14

Glossary 16

SUSTAINABLE SITES 22

SS Credit: Site Development—Protect or Restore Habitat 22
EBOM, Schools, Retail, Data Centers, Hospitality 22

SS Credit: Rainwater Management 23
EBOM, Schools, Retail, Data Centers, Hospitality 23

SS Credit: Heat Island Reduction 25
EBOM, Schools, Retail, Data Centers, Hospitality 25

SS Credit: Light Pollution Reduction 27
EBOM, Schools, Retail, Data Centers, Hospitality 27

SS Credit: Joint Use of Facilities 28
Schools EBOM 28

SS Credit: Fundamental Green Site Management 30
EBOM, Schools, Retail, Data Centers, Hospitality 30

SS Credit: Advanced Green Site Management—Site Assessment and Improvement Plan 31
EBOM, Schools, Retail, Data Centers, Hospitality 31

WATER EFFICIENCY 33

WE Prerequisite: Landscape Water Use Reduction 33
EBOM, Schools, Retail, Data Centers, Hospitality 33

WE Prerequisite: Minimum Fixture and Fitting Water Use Reduction 34
EBOM, Schools, Retail, Data Centers, Hospitality 34

WE Prerequisite: Appliance and Process Water Use Reduction 36
EBOM, Schools, Retail, Data Centers, Hospitality 36

WE Credit: Additional Landscape Water Use Reduction 38
EBOM, Retail, Data Centers, Hospitality 38
Schools EBOM 38

WE Credit: Additional Fixture and Fitting Water Use Reduction 39
EBOM, Schools, Retail, Data Centers, Hospitality 39

WE Credit: Cooling Tower Makeup Water 41
EBOM, Schools, Retail, Data Centers, Hospitality 41

WE Credit: Additional Appliance and Process Water Use Reduction 43
EBOM, Schools, Retail, Data Centers, Hospitality 43

ENERGY AND ATMOSPHERE 47

EA Prerequisite: Minimum Energy Performance 47
EBOM, Schools, Retail, Data Centers, Hospitality 47

EA Credit: Optimize Energy Performance 49
EBOM, Schools, Retail, Data Centers, Hospitality 49

EA Credit: Demand Response 53
EBOM, Schools, Retail, Data Centers, Hospitality 53

EA Credit: On-site and Off-site Renewable Energy 54
EBOM, Schools, Retail, Data Centers, Hospitality 54

EA Credit: Refrigerant Management 56
EBOM, Schools, Retail, Data Centers, Hospitality 56

MATERIALS AND RESOURCES 58

MR Prerequisite: Sustainable Purchasing Policy 58
EBOM, Schools, Data Centers, Hospitality 58
EBOM Retail 58

MR Prerequisite: Solid Waste Management Policy 61

EBOM, Schools, Retail, Data Centers, Hospitality 61

MR Credit: Solid Waste Management—Waste Stream Audit 62
EBOM, Schools, Retail, Data Centers, Hospitality 62

MR Credit: Solid Waste Management—Ongoing Consumables 63
EBOM, Schools, Retail, Data Centers, Hospitality 63
Schools EBOM 63

MR Credit: Solid Waste Management—Durable Goods 65
EBOM, Schools, Retail, Data Centers, Hospitality 65

MR Credit: Solid Waste Management—Facility Alterations and Additions 66
EBOM, Schools, Retail, Data Centers, Hospitality 66

MR Credit: Purchasing—Ongoing Consumables 67
EBOM, Schools, Retail, Data Centers, Hospitality 67

MR Credit: Purchasing—Durable Goods 69
EBOM, Schools, Retail, Data Centers, Hospitality 69

MR Credit: Purchasing—Facility Alterations and Additions 71
EBOM, Schools, Retail, Data Centers, Hospitality 71

MR Credit: Purchasing—Reduced Mercury in Lamps 73
EBOM, Schools, Retail, Data Centers, Hospitality 73

MR Credit: Purchasing—Food 74
EBOM, Schools, Retail, Data Centers 74
Hospitality EBOM 74

INDOOR ENVIRONMENTAL QUALITY 75

EQ Prerequisite: Minimum Indoor Air Quality Performance 75
EBOM, Schools, Retail, Data Centers, Hospitality 75

EQ Prerequisite: Environmental Tobacco Smoke (ETS) Control 77
EBOM, Schools, Retail, Data Centers, Hospitality 77

EQ Prerequisite: Green Cleaning Policy 79
EBOM, Schools, Retail, Data Centers, Hospitality 79

EQ Credit: Indoor Air Quality Best Management Practices—Indoor Air Quality Management Program 81
EBOM, Schools, Retail, Data Centers, Hospitality 81

EQ Credit: Indoor Air Quality Best Management Practices—Outdoor Air Delivery Monitoring 82
EBOM, Schools, Retail, Data Centers, Hospitality 82

EQ Credit: Indoor Air Quality Best Management Practices—Reduce Particulates in Air Distribution **84**
EBOM, Schools, Retail, Data Centers, Hospitality 84

EQ Credit: Indoor Air Quality Best Management Practices—Indoor Air Quality Management for Facility Alterations and Additions **85**
EBOM, Schools, Retail, Data Centers, Hospitality 85

EQ Credit: Controllability of Systems—Lighting **87**
EBOM Schools 87
EBOM, Retail, Data Centers, Hospitality 88

EQ Credit: Daylight **89**
EBOM, Schools, Retail, Data Centers, Hospitality 89

EQ Credit: Office Ergonomics Strategy **91**
EBOM, Schools, Retail, Data Centers, Hospitality 91

EQ Credit: Green Cleaning—High-Performance Cleaning Program **93**
EBOM, Schools, Retail, Data Centers, Hospitality 93

EQ Credit: Green Cleaning—Custodial Effectiveness Assessment **94**
EBOM, Schools, Retail, Data Centers, Hospitality 94

EQ Credit: Green Cleaning—Purchase of Cleaning Products and Materials **95**
EBOM, Schools, Retail, Data Centers, Hospitality 95

EQ Credit: Green Cleaning—Cleaning Equipment **97**
EBOM, Schools, Retail, Data Centers, Hospitality 97

EQ Credit: Green Cleaning—Indoor Chemical and Pollutant Source Control **99**
EBOM, Schools, Retail, Data Centers, Hospitality 99

EQ Credit: Green Cleaning—Indoor Integrated Pest Management **100**
EBOM, Schools, Retail, Data Centers, Hospitality 100

PERFORMANCE **101**

PF Prerequisite: Building-Level Energy Metering **101**
EBOM, Schools, Retail, Data Centers, Hospitality 101

PF Prerequisite: Energy Efficiency Best Management Practices—Planning, Documentation and Opportunity Assessment **102**
EBOM, Schools, Retail, Hospitality 102
Data Centers EBOM 103

PF Prerequisite: Ongoing Occupant Experience Survey **104**
EBOM, Schools, Retail, Data Centers, Hospitality 104

PF Credit: Existing Building Commissioning—Investigation and Analysis 105
EBOM, Schools, Retail, Data Centers, Hospitality 105

PF Credit: Existing Building Commissioning—Implementation 108
EBOM, Schools, Retail, Data Centers, Hospitality 108

PF Credit: Existing Building Commissioning—Ongoing Commissioning 110
EBOM, Schools, Retail, Data Centers, Hospitality 110

PF Credit: Water Performance Measurement 112
EBOM, Schools, Retail, Data Centers, Hospitality 112

PF Credit: Performance Measurement— Advanced Building Energy Metering 114
EBOM, Schools, Retail, Data Centers, Hospitality 114

PF Credit: Performance Measurement—System-Level Energy Metering 115
EBOM, Schools, Retail, Data Centers, Hospitality 115

INNOVATION 116

IN Credit: Innovation 116
EBOM, Schools, Retail, Data Centers, Hospitality 116
EBOM 116

IN Credit: The School as a Teaching Tool 118
Schools EBOM 118

IN Credit: Documenting Sustainable Building Cost Impacts 119
EBOM, Schools, Retail, Data Centers, Hospitality 119

REGIONAL PRIORITY 120

RP Credit: Regional Priority 120
EBOM, Schools, Retail, Data Centers, Hospitality 120

INTEGRATED PROCESS (IP)

IP CREDIT: INTEGRATED PROCESS

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M 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

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Demonstrate that key systems interactions are explored and analyzed in a way that informs basic building renovation/reconfiguration, envelope modifications, site-related modifications, technical systems operations, and maintenance decisions while determining EBOM credits to pursue, by implementing the following:

Water Synergies: (x points)
Develop an implementation plan (roadmap) that schedules tasks and activities to identify and analyze cost and performance synergies between systems relative to water use and water quality. This analysis must identify interactions between no less than 5 credits across no less than three credit categories (SS, WE, EA, MR, IEQ). Document projected cost and performance benefits for at least 8 years of future operations relative to the benchmarks established for each of the germane credits.

AND

Implement the above Water Synergies Plan over the performance period (no less than 2 years) and document resultant quantified cost and performance benefits by utilizing ongoing performance data and integrated cost bundling to analyze the effectiveness of the plan.

Energy Synergies: (x points)
Develop an implementation plan (roadmap) that schedules tasks and activities to identify and analyze cost and performance synergies between systems relative to energy use. This analysis must identify interactions between no less than 5 credits across no less than three credit categories (SS, WE, EA, MR, IEQ). Document projected cost and performance benefits for at least 8 years of future operations relative to the benchmarks established for each of the germane credits.

AND

Implement the above Energy Synergies Plan over the performance period (no less than 2 years) and document resultant quantified cost and performance benefits by utilizing ongoing performance data and integrated cost bundling to analyze the effectiveness of the plan.

IP CREDIT: LEED ACCREDITED PROFESSIONAL

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, 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: LEED CERTIFIED DESIGN AND CONSTRUCTION

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reward environmentally sensitive building design and construction, thereby enabling high-performance building operations.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

OPTION 1

Show that the building has previously been certified under a LEED Building Design and Construction rating system.

OR

OPTION 2

Show that the building has been previously certified under LEED for Schools.

OR

OPTION 3

Show that the building has previously been certified under LEED for Core and Shell Development and at least 75% of the floor area has also been certified under LEED for Commercial Interiors.

LT CREDIT: ALTERNATIVE COMMUTING TRANSPORTATION

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce pollution and land development impacts from automobile use for commuting.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

CASE 1. NON-RETAIL PROJECTS

Reduce the number of commuting round trips made by regular building occupants using single-occupant, conventional vehicles. For the purposes of this credit, alternative transportation strategies include telecommuting, compressed workweeks, mass transit, walking, bicycles or other human-powered conveyances, carpools, vanpools, *low-emitting, or fuel-efficient vehicles*, and minor structural improvements such as the re-allocation of vehicle parking to bicycle parking and the installation of shower and changing facilities.

Performance calculations are made relative to a baseline case that assumes all regular occupants commute alone in conventional automobiles. The calculations must account for seasonal variations in the use of alternative commuting methods and, where possible, indicate the distribution of commuting trips using each type of alternative transportation strategy.

Points are earned for demonstrated reductions in conventional commuting trips during the performance period according to Table 1.

Table 1. Points for percentage reduction in conventional commuting

Demonstrated percentage reduction in conventional commuting trips	Points
10%	
13.75%	
17.50%	
21.25%	
25.00%	

31.25%	
37.50%	
43.75%	
50.00%	
56.25%	
62.50%	
68.75%	
75.00%	

CASE 2. RETAIL PROJECTS

OPTION 1.

Extend the CASE 1 alternative transportation strategies to include customers.

OR

OPTION 2.

For all regular occupants (retail employees), demonstrate reductions in conventional commuting trips during the performance period according to Case 1 requirements.

AND

Implement at least two of the following options for customers:

- Provide discounted transit pass for frequent customers.
- Provide a delivery service to customers for purchases made from the retail establishment. It is not required that the delivery service be free of charge.
- Provide a webpage with transit trip planning assistance, an online map to store, and links to the transit authority.
- Provide customers with alternative transportation information in the store, including information on carpooling programs, transit trip planning assistance, transit maps, maps of preferred bicycle routes, the locations of secure bicycle parking and changing facilities if provided, maps of walking routes to the store, a summary of the company's transportation management plan, and contacts for more information.
- Provide on-site bicycle racks for 3% of customers for projects up to 300,000 square feet, and 3.5% of customers for projects larger than 300,000 square feet.
- Provide car-sharing vehicles on-site.

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: SITE DEVELOPMENT—PROTECT OR RESTORE HABITAT

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To conserve existing natural areas, restore damaged areas, and restore disturbed soils to provide habitat and promote biodiversity, promote healthy plants, biological communities, water storage, and infiltration.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

OPTION 1. Onsite Restoration

During the performance period, have in place native or adapted vegetation on 30% of the total site area (excluding the building footprint)

EBOM Schools only:

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

OR

OPTION 2. Offsite Conservation

Donate offsite land equal to 60% of the total site area (including the building footprint), in perpetuity, to a land trust within the same EPA Level III Ecoregion identified for the project site. The land trust must adhere to the Land Trust Alliance's "Land Trust Standards and Practices" (2004 revision).

SS CREDIT: RAINWATER MANAGEMENT

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To restore or maintain the natural hydrology and water balance of the site based on historical conditions and undeveloped ecosystems in the region.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

OPTION 1. Improvement Over Existing Conditions

Employ strategies in landscape and impervious coverage that reduce the annual volume of stormwater runoff from an existing site. The baseline condition is defined as the site conditions prior to LEED registration. This may be achieved by demonstrating ONE of the following:

- 15% reduction in existing impervious surface (from baseline condition) by a minimum of 1,500 square feet. This may be achieved by removal of impervious surface and conversion to native/adaptive landscaping, installation of green roof, or replacement with pervious pavement.
- 50% reduction in existing lawn (from baseline condition) through conversion to landscaping conditions meeting the criteria for native/adaptive landscaping per SS Credit 5.
- Disconnect 50% of existing directly connected impervious surfaces (from baseline condition) and redirect to pervious areas.

In addition, implement a semiannual inspection program of all stormwater management facilities to confirm continued performance. Maintain documentation of inspection, including identification of areas of erosion, maintenance needs, and repairs. Perform all routine required maintenance, necessary repairs or stabilization within 60 days of inspection.

OR

OPTION 2: Rainwater Management Best Practices

Demonstrate that over the performance period ONE of the following strategies was in place:

- Rain gardens or bioretention capturing runoff from 25% of impervious surfaces
- Stormwater detention system capturing 1” volume from 50% of project area
- Rainwater collection system capturing and reusing 25% of runoff from impervious surfaces
- Surface types with a weighted-average runoff coefficient for the site of no greater than 0.6

In addition, implement an annual inspection program of all stormwater management facilities to confirm continued performance. Maintain documentation of inspection, including identification of areas of erosion, maintenance needs and repairs. Perform all routine required maintenance, necessary repairs or stabilization within 60 days of inspection.

SS CREDIT: HEAT ISLAND REDUCTION

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Choose 1 of the following options:

OPTION 1

Use any combination of the following strategies to meet the following criterion: (Area of Nonroof Measures / 0.5) + (Area of High-reflectance Roof / 0.75) + (Area of Vegetated Roof / 0.5) ≥ Total Site Hardscape Area + Total Roof Area

Nonroof Measures

- Provide shade from the existing tree canopy or within 5 years of landscape installation; landscaping (trees) must be in place at the time of certification application.
- Provide shade from structures covered by solar panels that produce energy used to offset some nonrenewable resource use.
- Provide shade from architectural devices or structures that have a solar reflectance index (SRI)[1] of at least 29. Implement a maintenance program that ensures these surfaces are cleaned at least every 2 years to maintain good reflectance.
- Use hardscape materials with an SRI of at least 29 and implement a maintenance program that ensures these surfaces are cleaned at least every 2 years to maintain good reflectance.
- Use an open-grid pavement system (at least 50% pervious).

High-Reflectance Roof

- Use roofing materials that have an SRI equal to or greater than the values in Table 1

[1]The solar reflectance index (SRI) is a measure of the constructed surface's ability to reflect solar heat, as shown by a small temperature rise. It is defined so that a standard black surface (reflectance 0.05, emittance 0.90) is 0 and a standard white surface (reflectance 0.80, emittance 0.90) is 100. To calculate the SRI for a given material, obtain the reflectance value and emittance value for the material. SRI is calculated according to ASTM E 1980. Reflectance is measured according to ASTM E 903, ASTM E 1918 or ASTM C 1549. Emittance is measured according to ASTM E 408 or ASTM C 1371.

Vegetated Roof

- Install a vegetated roof

OR

OPTION 2

Place a minimum of 50% of parking spaces under cover[2]. Any roof used to shade or cover parking must have an SRI of at least 29, be a vegetated roof or be covered by solar panels that produce energy used to offset some nonrenewable resource use. Implement a maintenance program that ensures all SRI surfaces are cleaned at least every 2 years to maintain good reflectance. The top parking level of a multilevel parking structure is included in the total parking spaces calculation but is not considered a roof and is not required to be an SRI surface.

[2]For the purposes of this credit, under cover parking is defined as parking underground, under deck, under roof, or under a building.

SS CREDIT: LIGHT POLLUTION REDUCTION

This credit is available in the Pilot Credit Library.

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M 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

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Project teams must comply with the interior lighting requirement and 1 of the 2 options for exterior lighting

Reduction of Light Pollution from Interior Sources

Include a requirement in any building operations guidelines stating that all interior lighting must be turned off by the cleaning staff after hours when the space is unoccupied. There are two exceptions:

- lighting specifically required to be operated 24-7; and
- lighting that is exempted under ANSI/ASHRAE/IESNA Standard 90.1–2010, Section 9.1.1.

Reduction of Light Pollution from Exterior Sources

OPTION 1

Shield all exterior fixtures where the sum of the mean lamp lumens for that fixture exceeds 2,500, such that the installed fixture does not directly emit any light at a vertical angle more than 90 degrees from straight down.

OR

OPTION 2

Demonstrate that the project complies with the exterior lighting requirements of the latest published LEED for New Construction SS Credit, Light Pollution Reduction.

SS CREDIT: JOINT USE OF FACILITIES

This credit applies to:

- EB:O&M Schools

Intent

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

Requirements

SCHOOLS EBOM

OPTION 1

In collaboration with the school board or other decision-making body, ensure that at least 3 of the following spaces included in the school are accessible to and available for shared use by the general public: auditorium, gymnasium, cafeteria/cafetorium, 1 or more classrooms, playing fields and stadiums, and/or joint parking.

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

OR

OPTION 2

In collaboration with the school board or other decision-making body, engage in a contract with community or other organizations to provide at least 2 dedicated-use spaces in the building.

Dedicated-use spaces include, but are not limited to:

- Commercial office
- Health clinic
- Community service centers (provided by state, city, or county offices)
- Police offices
- Library or media center
- Parking lot
- One or more commercial sector businesses

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

OR

OPTION 3

In collaboration with the school district or other decision-making body, ensure that at least 2 of the following 6 spaces that are owned by other organizations/agencies are accessible to students:

- Auditorium
- Gymnasium
- Cafeteria
- One or more classrooms
- Swimming pool
- Playing fields and stadiums

Provide direct pedestrian access to these spaces from the school. In addition, provide signed agreements with the other organizations/ agencies that stipulate how they and the school district and organizations or agencies will share these spaces.

SS CREDIT: FUNDAMENTAL GREEN SITE MANAGEMENT

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To encourage environmentally sensitive site management practices that provide a clean, well-maintained, and safe building exterior while supporting high-performance building operations.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Create and implement a site management plan that employs best management practices to reduce harmful chemical use, energy waste, water waste, air pollution, solid waste, and/or chemical runoff for all of the following operational elements on the building and grounds:

- maintenance equipment;
- snow and ice removal (where applicable);
- cleaning of building exterior
- cleaning of sidewalks, pavement, and other hardscape;
- erosion and sedimentation control (ongoing and for construction projects);
- landscape waste management;
- fertilizer use; and
- irrigation management.

In addition, during the performance period, demonstrate that at least three of the following performance criteria were met:

- Use no calcium chloride or sodium chloride deicers, or establish reduced treatment areas equal to 50% of applicable hardscape.
- Divert 100% of landscape waste via mulching, composting or other low-impact means.
- At least 50% of all powered site maintenance equipment used on-site is electric, propane, natural gas, or biodiesel or is certified to CARB Tier III standards.
- An additional 50%, for 100% total, of all powered site maintenance equipment used on-site is electric, propane, natural gas, or biodiesel or is certified to CARB Tier III standards.
- Use no ammonia-based fertilizers, biosolid-based fertilizers, synthetic quick-release fertilizers, or “weed and feed” formulations.

SS CREDIT: ADVANCED GREEN SITE MANAGEMENT—SITE ASSESSMENT AND IMPROVEMENT PLAN

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To improve ecological integrity, enhance natural diversity, and restore ecological services while supporting high-performance building operations.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Perform an assessment of existing site conditions, develop a five-year site improvement plan, and implement all no-cost and low-cost measures during the LEED performance period. Establish specific site improvement objectives, performance standards that will be used to evaluate ongoing progress, and protocols for periodic monitoring.

The assessment must cover the following areas:

topography: contour mapping, unique topographic features, slope stability risks;

hydrology: 100-year floodplain, delineated wetlands, lakes, streams, shorelines, rainwater collection and reuse opportunities, TR-55 initial water storage capacity of site;

climate: solar exposure and seasonal sun angles, prevailing winds, monthly precipitation and temperature ranges;

vegetation: primary vegetation types, greenfield area, significant trees, threatened or endangered species, unique habitat, invasive plants;

soils: Natural Resources Conservation Service soils delineation, USDA prime farmland, healthy soils, previously developed area; and

human use: views, adjacent transportation infrastructure, potentially recyclable or reusable on-site construction materials.

The assessment must be performed by professionals trained and experienced in these areas:

- soil health;
- plant health;
- biodiversity; and

- toxicity and eutrophication.

For this credit, the LEED project scope must include vegetation or other ecologically appropriate features covering at least 5% of the building site area (including building footprint, hardscape area, and parking footprint).

WATER EFFICIENCY

WE PREREQUISITE: LANDSCAPE WATER USE REDUCTION
Required

This prerequisite applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce water consumption from landscape irrigation.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

This prerequisite applies to projects with a minimum of 1,000 square feet of exterior vegetated surface area and applies to all irrigation water, regardless of source.

Reduce irrigation water to or below the landscape water allowance (LWA), defined as 20% below baseline for the site's peak watering month, as established by the U.S. Environmental Protection Agency's WaterSense Water Budget Tool.

The budget is based on calculations of total landscape area (in square feet), average monthly reference evapotranspiration (ET_o), average monthly rainfall for the peak watering month at the site (determined by postal zip code and obtained from the Water Budget Data Finder), and landscape area (in square feet) for each vegetation hydrozone (vegetation type) and means of irrigation.

WE PREREQUISITE: MINIMUM FIXTURE AND FITTING WATER USE REDUCTION Required

This prerequisite applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce indoor fixture and fitting water use within buildings to reduce the burdens on potable water[3] supply and wastewater systems.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Reduce potable water use of indoor plumbing fixtures and fittings to or below the LEED 2012 for Existing Buildings: Operations & Maintenance baseline, calculated assuming 100% of the building's indoor plumbing fixtures and fittings meet the plumbing code requirements as stated in the 2006 editions of the Uniform Plumbing Code (UPC) or International Plumbing Code (IPC) pertaining to fixture and fitting performance. Fixtures and fittings included in the calculations for this credit are water closets, urinals, showerheads, faucets, faucet replacement aerators, and metering faucets.
The LEED 2012 for Existing Buildings: Operations & Maintenance water use baseline is set depending on the year of substantial completion of the building's indoor plumbing system. Substantial completion is defined as either initial building construction or the last plumbing renovation of all or part of the building that included 100% retrofit of all plumbing fixtures and fittings as part of the renovation. Set the baseline as follows:

- For a plumbing system substantially completed in 1993 or later throughout the building, the baseline is 100% of the water use that would result if all fixtures met the codes cited above.
- For a plumbing system substantially completed before 1993 throughout the building, the baseline is 120% of the water use that would result if all fixtures met the codes cited above.

If indoor plumbing systems were substantially completed at different times (because the plumbing renovations occurred at different times in different parts of the building), set a whole-building average baseline by prorating between the above limits. Prorate based on the proportion of plumbing fixtures installed during the plumbing renovations in each date period, as explained in the LEED Reference Guide for Green Building Operations & Maintenance, 2012 Edition. Pre-1993 buildings that have had only minor fixture retrofits (e.g., aerators, showerheads, flushing valves) but no plumbing renovations in or after 1993 may use the 160% baseline for the whole building.

Demonstrate fixture and fitting performance through calculations to compare the water use of the as-installed fixtures and fittings with the use of UPC- or IPC-compliant fixtures and fittings, as explained in the LEED Reference Guide for Green Building Operations & Maintenance, 2012 Edition.

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[3] Potable water is defined as water that is suitable for drinking and is supplied from wells or municipal water systems.

Inspect all existing fittings or fixtures to determine if they are operating properly. Make any repairs needed to bring all fixtures into good working order.

Develop and implement a policy requiring economic assessment of conversion to high-performance plumbing fixtures and fittings as part of any future indoor plumbing renovation. The assessment must account for potential water supply and disposal cost savings and maintenance cost savings.

WE PREREQUISITE: APPLIANCE AND PROCESS WATER USE REDUCTION Required

This prerequisite is available in the Pilot Credit Library.

This prerequisite applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Water-consuming appliances, devices, and processes installed within the building beginning on the date of LEED application 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

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	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 LANDSCAPE WATER USE REDUCTION

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To limit the use of potable or other water for landscape irrigation.

Requirements

EBOM, RETAIL, DATA CENTERS, HOSPITALITY

Option 1. Landscape Water Requirement

Use the existing landscape to calculate the landscape water requirement (LWR). Points are earned for reductions beyond the prerequisite requirement of 20% less than the baseline.

Option 2. Landscape Water Allowance

Calculate the outdoor water use for the peak watering month, taking an average of the past three years as a percentage reduction from the LWA.

SCHOOLS EBOM

Option 1. Landscape Water Requirement

Use the existing landscape to calculate the landscape water requirement (LWR). Points are earned for reductions beyond the prerequisite requirement of 20% less than the baseline.

Option 2. Landscape Water Allowance

Calculate the outdoor water use for the peak watering month, taking an average of the past three years as a percentage reduction from the LWA.

Playgrounds and athletic fields may be included in the calculations for this credit.

If playgrounds and athletic fields are excluded, the project team must document the successful implementation of one or more of the following best management practices:

- Provide metering capability for the irrigation of the sports playing fields to allow building managers to evaluate water consumption for playgrounds and athletic fields. Meters must be monitored, either through data logging or manual readings, at one-week or shorter intervals.
- Develop an irrigation management plan for athletic fields and verify that the plan is in place throughout the performance period. This plan should specify best practices for irrigation efficiency in the project's climate zone and may include soil analysis, regular inspections, or weather-based controls to determine watering needs; time-of-day scheduling to minimize evaporation rates; and use of effluent water to reduce potable water consumption.

WE CREDIT: ADDITIONAL FIXTURE AND FITTING WATER USE REDUCTION

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M 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

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Option 1. Prescriptive

Ensure all indoor plumbing fixtures and fittings comply with the water usage limits in the 2006 editions of the Uniform Plumbing Code (UPC) or International Plumbing Code (IPC). Inspect all existing fixtures and fittings in the building and inventory their rated water consumption. Replace or retrofit fixtures or fittings consuming more than the code-specified flow requirements shown below. Inspect existing fittings or fixtures rated at or below the current baseline that are to be retained to determine if they are operating properly. Make any repairs needed to bring them into good working order.

The inventory and compliance must include the following fixtures and fixture fittings (as applicable): toilets (water closets), urinals, lavatory faucets, showers, and kitchen sink faucets.

Fixtures and Fittings	Current Baseline
Toilets (water closets)	1.6 gallons per flush (gpf)*
Urinals	1.0 (gpf)
Public lavatory (restroom) faucets	2.2 gallons per minute (gpm) at 60 pounds per square inch (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	
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 as specified above (2.5 gpm) per shower compartment (shall), where the floor area of the shower compartment is less than 1,500 square inches. For each increment of 1,500 square inches of floor area thereafter or part thereof, an additional showerhead with total allowable flow rate from all flowing devices equal to or less than the allowable flow rate as specified above must be allowed. Exception: Showers that emit recirculated nonpotable water originating from within the shower compartment while operating are allowed to exceed the maximum as long as the total potable water flow does not exceed the flow rate as specified above.

OR

Option 2. Performance

In aggregate, use less water than the baseline calculated in WE Prerequisite: Minimum Fixture and Fitting Water Use Reduction.

Points are awarded according to Table 1.

Table 1. Points for percentage reduction in water use

Percentage Reduction	Points
10%	
15%	
20%	
25%	
30%	

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 CREDIT: COOLING TOWER MAKEUP WATER

This credit is available in the Pilot Credit Library.

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, 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:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

During the performance period, have in place process water equipment strategies and systems that in aggregate use 10% less water than the water use baseline in the Commercial Equipment Performance Requirements table.

Calculations must include the items listed below as appropriate to the project. Water used for industrial processes and building systems, such as cooling towers, boilers, and chillers, is not included in this credit.

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.

COMMERCIAL LAUNDRY			
EQUIPMENT	DESCRIPTION	METRIC	CREDIT VALUE
WASHING MACHINES	On Premise Laundry Minimum Capacity 2400lbs/8hr shift	Less than or equal to 2.25 Galllons per pound *	
	On Premise Laundry Minimum Capacity 2400lbs/8hr shift	Less than or equal to 1.8 Galllons per pound *	
	On Premise Laundry Minimum Capacity 2400lbs/8hr shift	Less than or equal to 1.0 Galllons per pound *	

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

COMMERCIAL KITCHEN

EQUIPMENT	DESCRIPTION	METRIC	CREDIT VALUE
DISH WASHERS	Under Counter	0.7 Gallons/Rack	
	Door Type	0.7 Gallons/Rack	
	Conveyor	0.4 Gallons/Rack	
	Flight Machines	Less than 1 gal/100 9" Dishes	
	Flight Machines	Less than 1 gal/120 9" Dishes	
FOOD STEAMERS	Connection less	US EPA Energy Star label	
COMBINATION OVENS	Connection less	US EPA Energy Star label	
ICE MACHINES		US EPA Energy Star label	
FOOD WASTE DISPOSERS	Grinders	1 gpm no load condition, 3-8 gpm full load condition, 10 minute auto shutoff	
	Scrap Collector	Maximum 2 gpm makeup water	
	Pulper	Maximum 2 gpm makeup water	
	Strainer Basket	No additional water usage	

For air compressors, ice machines and vacuum pumps, use either air cooled or closed loop cooling such as cooling tower or chilled or condenser water system.

LABORATORY/MEDICAL			
EQUIPMENT	DESCRIPTION	METRIC	CREDIT VALUE
WATER PURIFICATION	Reverse osmosis	75% recovery rate	
	Reverse osmosis	reclaim and use all reject water	
STERILIZERS	Cooling of sterilizer steam condensate discharged to drainage system with expansion tank, heat recovery system or reclaimed water		

WASHERS	Sterile process applications	0.35 Gals per US Tray 0.20 Gals per US Tray	
XRAY PROCESSING	Greater than 150mm any dimension	film processor water recycling units (need better)	
DIGITAL IMAGERY	All sizes	no water use	

For washers used in sterile processing applications, use no more than 0.55 gals per US tray.

Simple distillation is not acceptable as a method of water purification.

Recovery rate for reverse osmosis water purification shall be no less than 60%.

VEHICLE WASHING			
EQUIPMENT	DESCRIPTION	METRIC	CREDIT VALUE
WASHER	Conveyor	Recycling system in place or maximum 35 gallons per car	
	In Bay Automatic	Recycling system in place or maximum 35 gallons per car	

MUNICIPAL STEAM SYSTEMS WITH NO CONDENSATE RETURN COLLECTION SYSTEMS			
EQUIPMENT	DESCRIPTION	METRIC	CREDIT VALUE
COOLING OF STEAM CONDENSATE	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	Reclaim and use all condensate (and cooling water if applicable)	

<u>All</u> equipment listed in the equipment category must meet the minimum metrics requirements set forth to achieve the credit.

The credit in an equipment category is not additive. For example the credit value for one Energy Star ice machine or ten Energy Star ice machines is one (1).

Only one credit value will be awarded per equipment category. For example, if the project has three (3) types of dishwashers (under counter, door, and conveyor) the maximum credit from the dishwasher equipment category is one (1.)

ENERGY AND ATMOSPHERE

EA PREREQUISITE: MINIMUM ENERGY PERFORMANCE
Required

This prerequisite applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce the environmental and economic impacts associated with excessive energy use by establishing a minimum level of operating energy performance

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Meter the building's energy use for a full 12 months of continuous operation and achieve the levels of efficiency set forth in the options below. Each building's energy performance must be based on actual metered energy consumption for both the LEED project building(s) and all comparable buildings used for the benchmark.

Calibrate meters within the manufacturer's recommended interval if the building owner, management organization or tenant owns the meter. Meters owned by third parties (e.g., utilities or governments) are exempt.

AND

Record the source Energy Utilization Index (EUI) of the project. The source EUI 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.

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

OPTION 1. Energy Star Rating

For buildings eligible to receive an energy performance rating using the EPA's ENERGY STAR® Portfolio Manager tool, achieve an energy performance rating of at least 69.

OPTION 2. Benchmark Against Typical Building

Path 1. National Average Source Energy Available
Demonstrate energy efficiency at least 19% better than the average for typical buildings of similar type by benchmarking against national average source energy data provided in the Portfolio Manager tool

Path 2. National Average Source Energy Not Available
If national average source energy data is unavailable for buildings of similar type, benchmark against the building site energy data of at least three like buildings, normalized for climate and building use.

OPTION 3. Demonstrate Energy Efficiency Improvement

Demonstrate energy efficiency improvement of at least 20%, normalized for climate and building use, by comparing the building's site energy data for the previous 12 months with the data from three contiguous years of the previous five. Buildings without four consecutive years of site energy data are ineligible.

EA CREDIT: OPTIMIZE ENERGY PERFORMANCE

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To achieve increasing levels of operating energy performance relative to typical buildings of similar type to reduce environmental and economic impacts associated with excessive energy use.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Demonstrate increased energy efficiency or efficiency improvement beyond EA Prerequisite 1 by using one of the following options. Each building must provide actual metered energy data. A full 12 months of continuous energy data is required.

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

OPTION 1. ENERGY STAR Rating

Option 1 is for buildings eligible to receive an energy performance rating using the EPA's ENERGY STAR's Portfolio Manager tool.

Points will be awarded at the following thresholds:

EPA ENERGY STAR Energy Performance Rating	Points
71	
73	
74	
75	
76	
77	
78	
79	
80	
81	

82	
83	
85	
87	
89	
91	
93	
95	

OPTION 2. Benchmark Against a Typical Building

PATH1. National Average Source Energy Data Available

Demonstrate energy efficiency better than the average for typical buildings of similar type by benchmarking against national average source energy data provided in the Portfolio Manager tool as an alternative to energy performance ratings.

Percentile level above the national median (buildings not eligible for ENERGY STAR performance rating)	Points
21	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
35	
37	
39	

41	
43	
45	

PATH 2. National Average Source Energy Data Not Available

If national average source energy data is unavailable for buildings of similar type, benchmark against the weather and building use normalized by the building site energy data of at least three like buildings.

Percentile level above three like Buildings (national energy data not available for similar building type)	Points
21	
25	
29	
33	
37	
41	
45	
49	
54	

OPTION 3: Demonstrate Energy Efficiency Improvement
Demonstrate weather and building use normalized energy efficiency improvement comparing the building's site energy data for the previous 12 months to the source energy consumption from three contiguous years of the previous five. Buildings without 4 consecutive years of site energy data are ineligible for this compliance path.

Percent Improvement	Points
24	
28	
32	
36	
40	
44	
48	
52	
56	

EA CREDIT: DEMAND RESPONSE

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

Improve and enhance the optimization of electric generation and transmission resources, integration of renewable generation sources, and ambient air quality.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

During the performance period have in place a program which reduces the building's demand for electricity (voluntary or mandatory) during periods of critical system conditions or periods of high market power costs:

OPTION 1. Load Response Programs

Have in place a contractual relationship in a formal Demand Response program with a participating local utility, Independent System Operator, Curtailment Service Provider, or other recognized entity that provides, manages or services a Demand Response program.

OPTION 2. Price Response Programs

Have in place an automated operating strategy to reduce electric demand in response to critical peak pricing, demand bidding, time-of-use pricing, or real-time pricing. This strategy must be automated based on external cues and automated via the building automation system. The strategy must also be able to reduce load by at least 5% of the building peak based on these cues.

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

EA CREDIT: ON-SITE AND OFF-SITE RENEWABLE ENERGY

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

During the performance period, meet some or all of the building's total energy use with on-site or off-site renewable energy systems. Projects must provide at least 1% on-site renewable energy to meet this credit. Additional points are earned according to the following table, which shows the percentages of building energy use met by renewable energy during the performance period.

Off-site renewable energy sources are defined by the Center for Resource Solutions Green-e Energy program's products certification requirements, or the equivalent. Green power may be procured from a Green-e Energy-certified power marketer or a Green-e Energy-accredited utility program, or through Green-e Energy-certified tradable renewable energy certificates (RECs) or the equivalent. For on-site renewable energy that is claimed for LEED 2012 credit, the associated environmental attributes must be retained or retired and cannot be sold.

If the green power is not Green-e Energy certified, equivalence must exist for both major Green-e Energy program criteria: 1) current green power performance standards, and 2) independent, third-party verification that those standards are being met by the green power supplier over time.

Up to the X -point limit, any combinations of individual actions are awarded the sum of the points allocated to those individual actions. For example, X point would be awarded for implementing 1% of on-site renewable energy, and X additional points would be awarded for meeting 67% of the building's energy load with renewable power or certificates during the performance period. Projects must submit proof of a contract to purchase Green-e eligible or equivalent resources that came on line after Jan 1, 2005 for a minimum of 5 years and must also make a commitment to purchase RECs on an ongoing basis beyond that.

On-site renewable energy	Points	Off-site renewable energy certificates	Points
1%		33%	
3%		67%	
5%		100%	
10%			

15%			
20%			
25%			

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

EA CREDIT: REFRIGERANT MANAGEMENT

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, 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.

MATERIALS AND RESOURCES

MR PREREQUISITE: SUSTAINABLE PURCHASING POLICY Required

This prerequisite applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce environmental harm from materials used in the operations, maintenance, and upgrades of buildings.

Requirements

EBOM, SCHOOLS, DATA CENTERS, HOSPITALITY

Have in place an Environmentally Preferable Purchasing (EPP) policy for the building and site addressing of the products and purchases covered under MR Credit: Sustainable Purchasing—Ongoing Consumables. The policy must cover at least those product purchases within the building and site management's control.

The policy must also address the products and purchases covered under at least one of the credits listed below.

- MR Credit: Sustainable Purchasing—Durable Goods
- MR Credit: Sustainable Purchasing—Facility Alterations and Additions
- MR Credit: Sustainable Purchasing—Reduced Mercury in Lamps

The policy must adhere to the LEED 2012 for Existing Buildings: Operations & Maintenance policy model (see Introduction).

This prerequisite requires only the establishment of policies, not ongoing actual sustainable performance.

EBOM RETAIL[4]

[4] Retail Project: A space or building is considered a Retail Project if it is 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,

Meet Case 1 requirements.

AND

Promote environmentally responsible sourcing of retail merchandise through one (1) of the four (4) following options:

OPTION 1. Supply Chain Survey

Establish procedures and resources for implementing a supply chain survey including the process for obtaining information, how often information should be collected, a sample survey including required data to be obtained, and a suggested format for an output report.

The survey should request information regarding the following:

- Social equity practices
- Energy and carbon reduction measures
- Material selection practices for products, packaging and distribution
- Waste reduction and waste management measures
- Human health protection measures

OR

OPTION 2. Supply Chain Education Program for Retail Employees and/or Retail Tenant Representatives

Establish procedures and resources for implementing an education program to educate employees and/or tenants that have departments involved in merchandise purchasing, packaging and distribution decisions about environmentally preferable supply chain strategies through a guideline, manual, preferred sustainable work practices report or regular educational workshop program.

The Education Program should include the following information:

- Description of program including format, location, frequency, and employees or tenants included in education program.
- Summary of environmental best practices for supply chain decisions.
- Suggestions of supply chain strategy best practices to implement.
- Resources for additional information.
- Internal contacts for more information.

OR

OPTION 3. Supply Chain Environmental Criteria List

Establish criteria for encouraging an environmentally preferable supply chain strategy.

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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.

The supply chain environmental criteria list should address each of the following areas [5]:

- Purchasing
- Materials Handling (packaging)
- Storage (Inventory)
- Materials Recovery (during manufacturing)
- Disposition (waste disposal)
- Product Take Back (product recovery)

OR

OPTION 4. Sustainable Purchasing Education for Customers

Provide an educational display in the retail project that promotes awareness of the environmental impacts of materials sourcing and supply chains. The educational display should be a kiosk, educational board, etc and should incorporate information including but not limited to the supply chain environmental criteria list above.

[5] The Lean and Green Supply Chain, EPA742-R-00-001, January 2000

MR PREREQUISITE: SOLID WASTE MANAGEMENT POLICY
Required

This prerequisite applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Have in place a solid waste management policy for the building and site addressing the products and purchases covered under the following credits as well as recycling of all mercury-containing lamps. The policy must cover at least those product purchases within the building and site management's control.

- MR Credit: Solid Waste Management—Ongoing Consumables
- MR Credit: Solid Waste Management—Durable Goods
- MR Credit: Solid Waste Management—Facility Alterations and Additions

The policy must adhere to the LEED for Existing Buildings: Operations & Maintenance policy model (see Introduction).

This prerequisite requires only policies, not ongoing actual sustainable performance.

MR CREDIT: SOLID WASTE MANAGEMENT—WASTE STREAM AUDIT

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Conduct an audit of the building's entire waste stream of ongoing consumables (not durable goods or construction waste from facility alterations and additions). Use the audit's results to establish a baseline that identifies the types of waste and the amounts of each type, by weight or volume. Identify opportunities for increased recycling and waste diversion. The audit must be conducted during the performance period.

MR CREDIT: SOLID WASTE MANAGEMENT—ONGOING CONSUMABLES

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce the waste and toxins that are generated from the building occupants' use of ongoing consumables and hauled to and disposed of in landfills.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Maintain a waste reduction and recycling program that addresses ongoing consumable goods. Include at a minimum, paper, toner cartridges, glass, plastics, corrugated cardboard; food waste, and metals.

Reuse, recycle or compost 50% of the ongoing consumables waste stream (by weight or volume).

Materials that may be considered either ongoing consumables or durable goods (see MR Credit: Solid Waste Management—Durable Goods) can be counted under either category, provided consistency is maintained with MR Credit X: Solid Waste Management- Durable Goods, with no contradictions, exclusions or double-counting. Consistency must also be maintained with MR Credits X: Sustainable Purchasing—Ongoing Consumables and MR Credit X: Sustainable Purchasing—Food.

Have in place a battery recycling program that implements the policy adopted in MR Prerequisite X: Solid Waste Management Policy. The program must have a target of diverting at least 80% of discarded batteries from the trash, and actual diversion performance must be verified at least annually. The program must cover all portable dry-cell types of batteries, including single-use and/or rechargeables used in radios, phones, cameras, computers and other devices or equipment.

SCHOOLS EBOM

K-12 schools are allowed to exclude food waste from the final performance calculations of the total building waste stream if both of the following criteria are met:

1. Provide documentation that food waste composting services are not available in their region and/or are not economically feasible based on the school or district's operational budget for solid waste management.

2. Provide documentation that an awareness program was implemented during the performance period in the project school aimed at adjusting occupant behavior and reducing food waste. Compliant programs should include at least two of the following:

- Visible signage in food service and cafeteria areas encouraging building occupants to reduce food waste
- Food service employee training aimed at reducing waste in food preparation and helping occupants make positive choices when selecting menu options to reduce the potential for food

waste

- Extra-curricular activities or student organizations aimed at promoting awareness of the environmental impacts associated with food waste that is not composted

MR CREDIT: SOLID WASTE MANAGEMENT—DURABLE GOODS

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce the waste and toxins that are generated from the building occupants' use of durable goods and hauled to and disposed of in landfills or incinerators.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Maintain a waste reduction, reuse and recycling program that addresses durable goods. Include at a minimum, office equipment (computers, monitors, copiers, printers, scanners, fax machines), appliances (refrigerators, dishwashers, water coolers), external power adapters, and televisions and other audiovisual equipment.

Reuse or recycle 75% of the durable goods waste stream[6] (by weight, volume or replacement value) during the performance period.

Materials that may be considered either ongoing consumables (see MR Credit X. Solid Waste Management—Ongoing Consumables) or durable goods can be counted under either category provided consistency is maintained with MR Credit X: Solid Waste Management – Ongoing Consumables, with no contradictions, exclusions or double-counting. Consistency must also be maintained with MR Credit X: Sustainable Purchasing.

[6] Durable goods waste stream is defined as durable goods leaving the project building, site and organization that have fully depreciated and reached the end of their useful lives for normal business operations. Durable goods that remain useful and functional and are moved to another floor or building, etc. do not qualify. Leased durable goods returned to their owner at the end of their useful lives for normal business operations do qualify.

MR CREDIT: SOLID WASTE MANAGEMENT—FACILITY ALTERATIONS AND ADDITIONS

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Divert at least 70% of the waste (by volume) generated by facility alterations and additions, including facility renovations, demolitions, refits, and new construction additions from disposal to landfills and incineration facilities. Include only base building elements permanently or semi-permanently attached to the building itself such as building components and structures (wall studs, insulation, doors, windows), panels, attached finishings (drywall, trim, ceiling panels), carpet and other flooring material, adhesives, sealants, paints and coatings.

Exclude furniture, fixtures and equipment (FF&E), which are not considered base building elements; mechanical, electrical, and plumbing components, and specialty items such as elevators.

MR CREDIT: PURCHASING—ONGOING CONSUMABLES

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce environmental harm from materials used in the operations and maintenance of buildings.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Maintain a purchasing program that addresses ongoing consumables. Include, at a minimum, paper (printing copy paper, notebooks, notepads, envelopes), toner cartridges, binders, batteries, and desk accessories. Food and beverages are excluded from this credit but are covered under MR Credit: Purchasing – Food.

At least 60%, of total purchases (by cost) during the performance period must meet one or more of the following criteria:

- Purchases contain postconsumer recycled content meeting or exceeding the levels listed in the Comprehensive Procurement Guidelines of the U.S. Environmental Protection Agency.
- Purchases contain at least 50% bio-based materials.
- Purchases contain at least 50% materials harvested and processed or extracted and processed within 500 miles of the project.
- At least 50% of paper products are certified to .

  (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 this 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.)

- Batteries are rechargeable.
- Toner cartridges for laser printers are remanufactured
- Keyboard dusting systems do not use aerosol propellants

Materials that may be considered either ongoing consumables or durable goods (see MR Credit, Purchasing—Durable Goods) can be counted under either category, provided consistency is maintained with MR Credit, Purchasing—Durable Goods with no contradictions, exclusions, or double-counting.

Consistency must also be maintained with MR Credit, Solid Waste Management—Durable Goods.

Each purchase can receive credit for each criterion met (i.e., a $100 purchase that contains both 10% postconsumer recycled content and 50% of content harvested within 500 miles of the project counts twice in the calculation, for a total of $200 of purchasing).

A template calculator is available in the LEED Reference Guide for Green Building Operations & Maintenance, 2012 Edition.

Include only ongoing consumables purchased during the performance period.

MR CREDIT: PURCHASING—DURABLE GOODS

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce environmental harm from materials used in the operations and maintenance of buildings.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Maintain a purchasing program that addresses durable goods, using one of the options below. Materials that may be considered either ongoing consumables or durable goods (see MR Credit: Purchasing—Ongoing Consumables), can be counted under either category provided consistency is maintained with MR Credit : Purchasing – Ongoing Consumables, with no contradictions, exclusions or double-counting. Consistency must also be maintained with MR Credit: Solid Waste Management—Durable Goods.

OPTION 1. Electric-Powered Equipment

At least 40% of total purchases of electric-powered equipment (by cost) must meet one or both of the following criteria:

- The equipment is rated as Electronic Product Environmental Assessment Tool (EPEAT) silver or better. If the equipment does not yet fall under the EPEAT rating systems, then it must be ENERGY STAR® qualified
- The equipment (either battery or corded) replaces conventional gas-powered equipment.

OR

OPTION 2. Furniture

At least 75% of total purchases of furniture (by cost) must meet the low-emissions requirements of BIFMA level Silver, GreenGuard Indoor Air Quality standard, or Scientific Certification Systems (SCS) Indoor Advantage Gold Environmental Certification Program. In addition, these purchases shall meet one or more of the following criteria:

- Purchases contain at least 70% material salvaged from off-site or outside the organization.
- Purchases contain at least 70% material salvaged from on-site, through an internal organization materials and equipment reuse program.
- Purchases contain at least 50% bio-based material.
- Purchases contain at least 50% certified wood.

  (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 this 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.)

- Purchases contain at least 50% material harvested and processed or extracted and processed within 500 miles of the project.
- Purchases are GREENGUARD Children and Schools Program certified, or meet the equivalent thresholds
- Purchases are Collaboration of High Performance Schools certified, or meet the equivalent thresholds

Each furniture purchase can receive credit for each criterion met. A template calculator is available in the LEED Reference Guide for Green Building Operations & Maintenance, 2012 Edition.

Durable goods must be purchased during the performance period to earn points in this credit.

OR

OPTION 3. Combination

Achieve the requirements of both Option 1 and Option 2.

MR CREDIT: PURCHASING—FACILITY ALTERATIONS AND ADDITIONS

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce the environmental harm from materials used in building renovations.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Maintain a purchasing program that addresses materials for facility renovations, demolitions, refits and new construction additions. Include only base building elements permanently or semi-permanently attached to the building itself, such as building components and structures (wall studs, insulation, doors, windows), panels, attached finishings (drywall, trim, ceiling panels), carpet and other flooring material, adhesives, sealants, paints, and coatings.

Exclude furniture, fixtures and equipment (FF&E), which are not considered base building elements; mechanical, electrical and plumbing components and specialty items, such as elevators.

At least 50% of the total purchases (by cost) must meet one or more of the following criteria:

- Purchases contain at least 10% (by weight) recycled content. No more than 5% of the total sustainable purchases costs may come from preconsumer material.
- Purchases contain at least 70% material salvaged from off-site or outside the organization.
- Purchases contain at least 70% material salvaged from on-site, through an internal organization materials and equipment reuse program.
- Purchases contain at least 50% bio-based material.
- Purchases contain at least 50% paper products that are certified to .

  (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 this 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.)

- Purchases contain at least 50% material harvested and processed or extracted and processed within 500 miles of the project.
- Adhesives and sealants have a VOC content less than the current VOC content limits of

South Coast Air Quality Management District (SCAQMD) Rule #1168, or sealants used as fillers meet or exceed the requirements of the Bay Area Air Quality Management District Regulation 8, Rule 51.

- Paints and coating have VOC emissions not exceeding the VOC and chemical component limits of Green Seal's Standard GS-11 requirements.
- Non-carpet finished flooring is FloorScore-certified and constitutes a minimum of 25% of the finished floor area.
- Carpet meets the requirements of the CRI Green Label Plus Carpet Testing Program.
- Carpet cushion meets the requirements of the CRI Green Label Testing Program.
- Composite panels and agrifiber[7] products contain no added urea-formaldehyde resins.

Each purchase can receive credit for each criterion met (i.e., a $100 purchase that contains both 10% postconsumer recycled content and 50% regionally harvested content counts twice in the calculation, for a total of $200 of eligible purchasing). A sample calculation is available in the LEED Reference Guide for Green Building Operations & Maintenance, 2012 Edition.

Include only materials for alterations or additions purchased during the performance period.

[7] Composite wood and agrifiber products are defined as particleboard, medium-density fiberboard (MDF), plywood, oriented-strand board (OSB), wheatboard, strawboard, panel substrates and door cores.

MR CREDIT: PURCHASING—REDUCED MERCURY IN LAMPS

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce the amount of mercury brought to the project site by establishing a toxin source reduction program for lamps.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Develop and implement a lighting purchasing plan that specifies an overall maximum of 90 picograms of mercury per lumen hour for mercury-containing lamps purchased for the building and associated grounds. Include lamps for both indoor and outdoor fixtures, as well as both hard-wired and portable fixtures. Lamps containing no mercury may be counted toward plan compliance only if they have energy efficiency at least as good as their mercury-containing counterparts.

At least 90% of all mercury-containing lamps (measured by the number of lamps) must meet the overall target for mercury content.

A template calculator to aid in documenting performance for this credit is available in the LEED Reference Guide for Green Building Operations & Maintenance, 2012 Edition.

Screw-based, integral compact fluorescent lamps (CFLs) may be excluded from both the plan and the performance calculation if they comply with the voluntary industry guidelines for maximum mercury content published by the National Electrical Manufacturers Association (NEMA), as described in the LEED Reference Guide for Green Building Operations & Maintenance, 2012 Edition. Screw-based, integral CFLs that do not comply with the NEMA guidelines must be included in the purchasing plan and the performance calculation.

Performance metrics for lamps — including mercury content (mg/lamp), mean light output (lumens) and rated life (hours) — must be derived according to industry standards, as described in the LEED Reference Guide for Green Building Operations & Maintenance, 2012 Edition. Mercury values generated by toxicity characteristic leaching procedure (TCLP) tests do not provide the required mercury information for LEED 2012 for Existing Buildings: Operations & Maintenance and cannot be used in the calculation.

This credit addresses only lamps purchased during the performance period, not lamps installed in the building. It does not require that each purchased lamp meet the specified mercury limit; only the overall average of purchased lamps must comply.

MR CREDIT: PURCHASING—FOOD

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce the environmental harm associated with food production and distribution.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS

At least 25% of total combined food and beverage purchases (by cost) must meet 1 or both of the following criteria:

- The food or beverage is labeled USDA Organic, Food Alliance Certified, Rainforest Alliance Certified, Protected Harvest Certified, Fair Trade or Marine Stewardship Council's Blue Eco-Label.
- The food or beverage is produced within a 100-mile radius of the site.

Each purchase can receive credit for each criterion met (i.e., a $100 purchase that is both USDA Organic and is produced on a farm within 100 miles of the project counts twice in the calculation, for a total of $200 of sustainable purchasing).

Food or beverages must be purchased during the performance period to earn points in this credit.

HOSPITALITY EBOM

Meet the requirements above and exclude wine, beer, and liquor purchases from the credit calculations.

INDOOR ENVIRONMENTAL QUALITY

EQ PREREQUISITE: MINIMUM INDOOR AIR QUALITY PERFORMANCE Required

This prerequisite applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

CASE 1. Systems Able to Meet ASHRAE Standard 62.1–2010

Modify or maintain each outdoor air intake, supply air fan and ventilation distribution system to meet the requirements of ASHRAE Standard 62.1–2010 (with errata but without addenda[8]) using the Ventilation Rate Procedure or the Natural Ventilation Rate Procedure (or a combination) under all normal operating conditions. The Indoor Air Quality Procedure as defined in Standard 62.1-2010 shall not be used to comply with the requirements of this prerequisite.

CASE 2. Systems Unable to Meet ASHRAE Standard 62.1–2010

If meeting ASHRAE Standard 62.1–2010 ventilation rates (with errata but without addenda[1]) is not feasible because of the physical constraints of the existing ventilation system, modify or maintain the system to supply at least 10 cubic feet per minute (cfm) of outdoor air per person under all normal operating conditions. Demonstrate through design documentation, measurements or other evidence that the current system cannot provide the flow rates required by ASHRAE Standard 62.1-2010 under all normal operating condition even when functioning properly.

All EB:O&M Projects

Each air-handling unit in the building must comply with either Case 1 or Case 2. If some air-handling units

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

can provide the outdoor air flow required by ASHRAE Standard 62.1-2010 (with errata but without addenda[1]) and others cannot, those that are able must do so. Buildings must provide at least 10 cfm per person of outdoor air at each air-handling unit under all normal operating conditions.

AND

Show compliance with the applicable requirement above (Case 1 or Case 2) through measurements taken at the system level (i.e., the air-handling unit) within twelve (12) months of the end of the performance period. For variable air volume systems, the dampers, fan speeds, etc. must be set during the test to the worst-case system conditions (minimum outdoor air flow) expected during normal ventilation operations. Measurements must be taken and recorded for each air handling unit; sampling or grouping of air-handlers is prohibited. Measured airflow must be within +/- 10% of the design setpoint.

Implement and maintain an HVAC system maintenance program to ensure the proper operations and maintenance of HVAC components as they relate to outdoor air introduction and exhaust.

Test and maintain the operation of all building exhaust systems, including bathroom, shower, kitchen, and parking exhaust systems.

EQ PREREQUISITE: ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL
Required

This prerequisite applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Prohibit smoking in the building.

Prohibit on-property smoking within 25 feet of entries, outdoor air intakes and operable windows. If the smoking prohibition within 25 feet requirement cannot be implemented due to code or landlord regulation, documentation of these regulations is required.

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.

Residential projects:

Prohibit smoking in all common areas of the building. The prohibition must be communicated in building rental or lease agreements condo or coop association covenants and restrictions, and provisions for enforcement must be included.

Locate any exterior designated smoking areas, including balconies where smoking is permitted, at least 25 feet from entries, outdoor air intakes and operable windows opening to common areas.

Prohibit on-property smoking within 25 feet of entries, outdoor air intakes and operable windows. If the smoking prohibition within 25 feet requirement cannot be implemented due to code or landlord regulation, documentation of these regulations is required.

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

AND

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

Weather-strip all exterior doors and operable windows in the residential units to minimize leakage from outdoors. Minimize uncontrolled pathways for the transfer of ETS and other indoor air pollutants between residential units by sealing penetrations in the walls, ceilings and floors and by sealing vertical chases

(including utility chases, garbage chutes, mail drops, and elevator shafts) adjacent to the units. Weather-strip all doors leading from residential units into common hallways.

Demonstrate acceptable sealing of residential units by a blower door test. Follow the procedure described in the ENERGY STAR Testing and Verification Protocols for multifamily high-rise buildings, with an allowable maximum leakage of 0.30 cfm50 per square foot of enclosure (i.e. all surfaces enclosing the apartment, including exterior and party walls, floors, and ceilings) or 1.50 square inches of leakage (effective leakage area (ELA) at 4 Pa) per 100 square feet of enclosure.

EQ PREREQUISITE: GREEN CLEANING POLICY
Required

This prerequisite applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce levels of chemical, biological and particulate contaminants that can compromise air quality, human health, building finishes, building systems, and the environment.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Have in place a green cleaning policy for the building and site addressing the following green cleaning credits and other requirements:

- Purchase cleaning, hard floor, carpet care, hand care, sanitary paper, plastic liners, and other products that meet the sustainability criteria outlined in IEQ Credit: Green Cleaning—Purchase of Sustainable Cleaning Products and Materials.
- Develop a strategy to replace multifold sanitary hand-towel dispensers with paper dispensed from large rolls.
- Purchase cleaning equipment meeting the criteria outlined in IEQ Credit : Green Cleaning—Sustainable Cleaning Equipment.
- Develop strategies for purchasing other tools, supplies and equipment for which no third-party environmental standards exist such as mop buckets and wringers, carts and floor pads that address environmentally preferable attributes such as durability, reparability, recycled content, and non-toxic materials.
- Establish standard operating procedures addressing how an effective cleaning and hard floor and carpet maintenance system will be consistently used, managed and audited. Specifically address cleaning to protect vulnerable building occupants and the selection and appropriate use of disinfectants and sanitizers.
- Develop strategies for promoting the conservation of energy, water and chemicals and reducing the toxicity of the chemicals used for laundry, ware washing and other cleaning activities.
- Develop strategies for promoting and improving hand hygiene, including both hand washing and the use of alcohol-based waterless hand sanitizers.
- Develop guidelines addressing the safe handling and storage of cleaning chemicals used in the building, including a plan for managing hazardous spills and mishandling incidents.
- Develop requirements for maintenance personnel. Specifically address contingency planning to manage staffing shortages and service interruptions due to absenteeism, pandemic and other causes and include a process to obtain occupants' input and feedback when contingency plans are implemented. Address the training of maintenance personnel in the hazards of use, disposal

and recycling of cleaning chemicals, dispensing equipment and packaging.

- Plan for occupant surveys to evaluate new technologies, procedures and processes.

This policy must adhere to the LEED 2012 for Existing Buildings: Operations & Maintenance policy model (see Introduction). At a minimum, the policy must cover green cleaning procedures, materials, and services that are within the building and site management's control, including the organization responsible for cleaning the building and site.

EQ Credit: Indoor Air Quality Best Management Practices—Indoor Air Quality Management Program

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To maintain the well-being of occupants by preventing and correcting indoor air quality (IAQ) problems.

Requirements

EBOM, Schools, Retail, Data Centers, Hospitality

Develop and implement on an ongoing basis an IAQ management program based on the EPA Indoor Air Quality Building Education and Assessment Model (I-BEAM).

EQ CREDIT: INDOOR AIR QUALITY BEST MANAGEMENT PRACTICES—OUTDOOR AIR DELIVERY MONITORING

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Install permanent systems to continuously monitor ventilation system performance to ensure minimum outdoor airflow rates under all operating conditions.

AND

CASE 1. Mechanical Ventilation Systems

Provide an outdoor airflow measurement device capable of measuring the minimum outdoor airflow rate at all expected system operating conditions within +/- 10% of the design minimum outdoor airflow rate for each system serving occupied spaces.

The outdoor airflow measurement device(s) must take measurements at the system level (e.g., the air-handling unit). The device must be monitored by a control system that is configured to trend outdoor airflow in intervals no greater than 15 minutes whenever the spaces served are occupied. Configure the control system to generate a visual alarm to the system operator or a visual or audible alarm to the building occupants if the minimum outdoor air rate falls more than 15% below the outdoor airflow set point.

All measurement devices must be calibrated within the manufacturer's recommended interval.

Carbon dioxide (CO_2 sensors) in return air ducts do not meet this credit requirement.

CASE 2. Mechanical Ventilation Systems for Densely Occupied Spaces[9]

If the total square footage of all dense space is less than 5% of total occupied square footage, the project is exempt from the requirements of this section. Rooms smaller than 150 square feet are also exempt.

Have a CO_2 sensor or sampling location for each space with a design occupant density of 25 people

[9] Densely occupied space is defined as an area with a design occupant density of 25 people or more per 1,000 square feet (40 square feet or less per person). If the total square footage of all dense space is less than 5% of total occupied square footage, the project is exempt from the requirements of this section. Rooms smaller than 150 square feet are also exempt.

or more per 1,000 square feet and compare it with outdoor ambient CO_2 concentrations. Each sampling location must be between 3 and 6 feet above the floor. CO_2 sensors may be mounted on the wall.

Test and calibrate CO_2 sensors to have an accuracy of no less than 75 parts per million (ppm) or 5% of the reading, whichever is greater. Sensors must be tested and calibrated at least once every five years or per the manufacturer's recommendation, whichever is shorter.

Monitor CO_2 sensors with a system configured to trend CO_2 concentrations in intervals no greater than 30 minutes. Configure the system to generate a visual alarm to the system operator and, if desired, to building occupants if the differential CO_2 concentration in any zone rises more than 15% above that corresponding to the minimum outdoor air rate required by ASHRAE Standard 62.1-2010 (with errata but without addenda[10]) (see IEQ Prerequisite: Energy Efficiency Best Management Practices).

CO_2 sensors may be used for demand-controlled ventilation provided the control strategy complies with ASHRAE Standard 62.1-2010 (see EQ Prerequisite 1: Energy Efficiency Best Management Practices, including maintaining the area-based component of the design ventilation rate).

CASE 3. Natural Ventilation Systems

Locate CO_2 sensors in the breathing zone of each space with a design occupant density of 25 people or more per 1,000 square feet. CO_2 sensors may be mounted on the wall.

CO_2 sensors must generate an audible or visual alarm to the system operator and occupants if CO_2 concentrations exceed 530 ppm above outdoor CO_2 levels or 1,000 ppm absolute. The alarm must indicate that ventilation adjustments (e.g. opening windows) are required in the affected space.

All monitoring devices must be calibrated within the manufacturer's recommended interval.

Permanently open areas must meet the requirements of ASHRAE 62.1-2010 (with errata but without addenda[11]).

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

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

EQ Credit: Indoor Air Quality Best Management Practices—Reduce Particulates in Air Distribution

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce levels of particulate contaminants, which adversely affect air quality, human health, building systems and the environment.

Requirements

EBOM, Schools, Retail, Data Centers, Hospitality

Have in place filtration media with a minimum efficiency reporting value (MERV) of 13 for all outside air intakes and inside air recirculation returns during the performance period. Establish and follow a regular schedule for maintenance and replacement of these filtration media according to the manufacturer's recommended interval.

EQ CREDIT: INDOOR AIR QUALITY BEST MANAGEMENT PRACTICES—INDOOR AIR QUALITY MANAGEMENT FOR FACILITY ALTERATIONS AND ADDITIONS

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Develop and implement an IAQ management plan for the construction and occupancy phases, 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).

- Develop and implement an IAQ management plan for the preoccupancy phases of any tenant improvement project.
- Perform a building flush-out procedure:
    - After construction ends and all interior finishes have been installed, install new filtration media and flush out the affected space by supplying a total outdoor air volume of 14,000 cubic feet per square foot of floor area while maintaining an internal temperature of at least 60° F and a relative humidity no higher than 60% where cooling mechanisms are operated.
    - 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, whichever is greater. During each day of the flush-out period, ventilation must begin a minimum of 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.

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

- If permanently installed air-handlers must be used during construction, filtration media with a minimum efficiency reporting value (MERV) of 8 must be used at each return air grille, as determined by ASHRAE Standard 52.2-1999 (with errata but without addenda[12]). Replace all

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

filtration media immediately before occupancy.

- Upon the completion of construction, HVAC and lighting systems must be returned to the designed or modified sequence of operations.

EQ CREDIT: CONTROLLABILITY OF SYSTEMS—LIGHTING

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To promote the productivity, comfort and well-being of building occupants by providing additional lighting system controls.

Requirements

EBOM SCHOOLS

CASE 1. Administrative Offices and Other Regularly Occupied Spaces

For at least 90% of the workstations, provide individual lighting controls that enable occupant 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.

CASE 2. Classrooms

In classrooms, provide a lighting system that operates in at least 2 modes: general illumination and A/V.

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.

EBOM, RETAIL, DATA CENTERS, HOSPITALITY

For at least 50% of the workstations, provide individual lighting controls that enable occupants to adjust the lighting to suit their individual tasks and preferences.

For at least 50% of shared multi-occupant spaces, provide multi-zone lighting controls that enable occupants to adjust the lighting to meet group needs and preferences, with at least three lighting levels or scenes (on, off, midlevel). 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 luminaries they control and located as close as possible to the area illuminated (e.g., on the wall lit 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.

EQ CREDIT: DAYLIGHT

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M 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

EBOM, SCHOOLS, RETAIL, DATA CENTERS, 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: OFFICE ERGONOMICS STRATEGY

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, 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.

EQ CREDIT: GREEN CLEANING—HIGH-PERFORMANCE CLEANING PROGRAM

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce levels of chemical, biological and particulate contaminants, which can compromise air quality, human health, building finishes, building systems and the environment.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Have in place during the performance period a high-performance cleaning program, supported by a green cleaning policy (EQ Prerequisite 3: Green Cleaning Policy), that includes the following activities:

- Provide an appropriate staffing plan.
- Implement a training of maintenance personnel in the hazards, use, maintenance, disposal and recycling of cleaning chemicals, dispensing equipment and packaging.
- Use chemical-free cleaning products and equipment OR chemical concentrates with appropriate dilution systems to minimize chemical use wherever possible.
- Use environmentally preferable cleaning materials, products (including microfiber tools and wipes), equipment, janitorial paper products and trash bags that meet the criteria outlined in EQ Credit: Green Cleaning – Purchase of Cleaning Products and Materials.
- Use cleaning equipment that meets the criteria outlined in EQ Credit: Green Cleaning—Cleaning Equipment.

OR

During the performance period, demonstrate that the project building is being cleaned by a cleaning service provider that has earned certification under Green Seal's Environmental Standard for Commercial Cleaning Services (GS-42). The certified cleaning service may be provided by either an in-house custodial staff or may be contracted out using a certified building service contractor.

OR

During the performance period, demonstrate that the project is being cleaned by a cleaning service provider that has earned certification under the International Sanitary Supply Association's (ISSA's) Cleaning Industry Management Standard for Green Buildings (CIMS-GB). The certified cleaning services may be provided by either an in-house custodial staff or may be contracted out using a certified building service contractor.

EQ CREDIT: GREEN CLEANING—CUSTODIAL EFFECTIVENESS ASSESSMENT

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce levels of chemical, biological and particulate contaminants, which can compromise air quality, human health, building finishes, building systems and the environment, by implementing effective cleaning procedures.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Conduct an audit in accordance with APPA Leadership in Educational Facilities' (APPA) "Custodial Staffing Guidelines" to determine the appearance level of the facility.

- The facility must score 1.5 or better.

More information about the audit procedures is provided in the LEED Reference Guide for Green Building Operations & Maintenance, 2012 Edition.

EQ CREDIT: GREEN CLEANING—PURCHASE OF CLEANING PRODUCTS AND MATERIALS

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce the environmental effects of cleaning products, disposable janitorial paper products and trash bags.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Purchase green cleaning materials and products, floor finishes and strippers, disposable janitorial paper products and trash bags. Cleaning product and material purchases include items used by in-house staff or outsourced service providers.

At least 60% of the total annual purchases of these products (by cost) must meet at least one of the following standards, by category:

Cleaning products must meet 1 or more of the following standards for the appropriate category:

- Green Seal GS-37, for general-purpose, bathroom, glass and carpet cleaners used for industrial and institutional purposes.
- Environmental Choice CCD-110, for cleaning and degreasing compounds.
- Environmental Choice CCD-146, for hard surface cleaners.
- Environmental Choice CCD-148, for carpet and upholstery care.
- Green Seal GS-40, for industrial and institutional floor care products.
- Environmental Choice CCD-147, for hard floor care.
- US EPA's Design for the Environment Program's Standard for Safer Cleaning Products for these product categories.
- EcoForm's Information-Based Environmental Label for these product categories.

Disinfectants, metal polish, or other products not addressed by the above standards must meet 1 or more of the following standards for the appropriate category:

- Environmental Choice CCD-112, for digestion additives for cleaning and odor control.
- Environmental Choice CCD-113, for drain or grease traps additives.
- Environmental Choice CCD-115, for odor control additives.
- California Code of Regulations maximum allowable VOC levels for the specific product category.
- US EPA's Design for the Environment Program's Standard for Safer Cleaning Products for these product categories.
- EcoForm's Information-Based Environmental Label for these product categories.

Disposable janitorial paper products must meet the minimum requirements of 1 or more of the following programs for the applicable product category:

- Environmental Protection Agency (EPA) Comprehensive Procurement Guidelines for Janitorial Paper.
- Green Seal GS-09, for paper towels and napkins.
- Green Seal GS-01, for tissue paper.
- Environmental Choice CCD-082, for toilet tissue.
- Environmental Choice CCD-086, for hand towels.
- Janitorial paper products derived from rapidly renewable resources or made from tree-free fibers.
- Fiber procurement meets forestry requirements as specified by USGBC
- Environmental Protection Agency (EPA) Comprehensive Procurement Guidelines for Plastic Trash Can Liners
- California Integrated Waste Management requirements for Plastic Trash Can Liners (California Code of Regulations Title 14, Chapter 4, Article 5 or now SABRC 42290-42297 Recycled Content Plastic Trash Bag Program (PTB)
- EcoForm's Information-Based Environmental Label for these product categories.

Hand soaps and hand sanitizers must meet 1 or more of the following standards:

- No antimicrobial agents (other than as a preservative) except where required by health codes and other regulations (e.g., food service and health care requirements).
- Green Seal GS-41, for industrial and institutional hand cleaners.
- Environmental Choice CCD-104, for hand cleaners and hand soaps.
- Environmental Choice CCD-170, for hand sanitizers.
- US EPA's Design for the Environment Program's Standard for Safer Cleaning Products for this product category.
- EcoForm's Information-Based Environmental Label for hand soaps and hand sanitizers.

The materials and products described above must be purchased during the performance period to count toward the credit.

EQ CREDIT: GREEN CLEANING—CLEANING EQUIPMENT

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce chemical, biological and particulate contaminants from powered cleaning equipment.

Requirement

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Implement a program for the use of janitorial equipment that reduces building contaminants and minimizes environmental effects. All powered equipment purchased during the performance period must meet the following criteria and 75% of all janitorial equipment (by number of equipment items or by cost at time of purchase) must meet at least one of the following criteria (other than the requirement for equipment safeguards).

- Vacuum cleaners are certified by the Carpet and Rug Institute Seal of Approval Testing Program for vacuum cleaners and operate with a sound level of 70dBA or less in accordance with ISO 11201.
- Carpet extraction equipment used for restorative deep cleaning is certified by the Carpet and Rug Institute's Seal of Approval Testing Program for deep-cleaning extractors.
- Powered floor maintenance equipment, including electric and battery-powered floor buffers and burnishers (with the exception of equipment used in wet applications), has vacuums, guards or other devices for capturing fine particulates and operates with a sound level of 70dBA or less in accordance with ISO 11201.
- Propane-powered floor equipment has high-efficiency, low-emissions engines with catalytic converters and mufflers that meet the California Air Resources Board (CARB) or Environmental Protection Agency (EPA) standards for the specific engine size and operate with a sound level of 90dBA or less in accordance with ISO 11201.
- Automated scrubbing machines are equipped with variable-speed feed pumps and on-board chemical metering to optimize the use of cleaning fluids. Alternatively, the scrubbing machines are equipped with variable-speed feed pump and use dilution control systems for chemical refilling or use only tap water with no added cleaning products.
- Battery-powered equipment is equipped with environmentally preferable batteries including gel, absorbent glass mat (AGM) and lithium-ion are preferred except in applications requiring deep discharge and heavy loads where performance or battery life is reduced by the use of sealed batteries.
- Powered equipment is ergonomically designed to minimize vibration, noise and user fatigue, as reported in the user manual in accordance with ISO 5349-1 for arm vibrations, ISO 2631-1 for vibration to the whole body is subjected and ISO 11201for sound pressure at operator's ear.

- Equipment is designed with safeguards, such as rollers or rubber bumpers, to avoid damage to building surfaces.

Keep a log for all powered cleaning equipment to document the date of equipment purchase and all repair and maintenance activities and include vendor specification sheets for each type of equipment in use.

EQ CREDIT: GREEN CLEANING—INDOOR CHEMICAL AND POLLUTANT SOURCE CONTROL

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To prevent the entry of chemical, biological and particulate contaminants, that can compromise air quality, human health, building finishes, building systems and the environment.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Employ permanent entryway systems (grilles, grates, mats) at least 10 feet long in the primary direction of travel to capture dirt and particulates entering the building at all public entry points, and develop cleaning strategies to maintain those entryway systems as well as exterior walkways. Public entryways that are not in use or serve only as emergency exits are excluded from the requirements, as are private offices.

EQ CREDIT: GREEN CLEANING—INDOOR INTEGRATED PEST MANAGEMENT

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To reduce levels of chemical, biological and particulate contaminants that can compromise air quality, human health, building finishes, building systems and the environment by minimizing the use of pesticides.

Requirement

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Develop, implement and maintain an indoor integrated pest management (IPM) plan, defined as managing indoor pests in a way that protects human health and the surrounding environment and that improves economic returns through the most effective, least-risk option. IPM calls for using least-toxic chemical pesticides, minimum use of chemicals, use of chemicals only in targeted locations and only for targeted species. IPM requires routine inspection and monitoring. The plan must include the following elements, integrated with any outdoor IPM plan used for the site as appropriate:

- Integrated methods, site or pest inspections, pest population monitoring, evaluation of the need for pest control and one or more pest control methods, including sanitation, structural repairs, mechanical and living biological controls, other nonchemical methods, and if nontoxic options are unreasonable and have been exhausted, a least-toxic pesticide.
- Specification of the circumstances under which an emergency application of pesticides in a building or on surrounding grounds being maintained by building management can be conducted without complying with the earlier provisions.
- A communications strategy directed to building occupants that addresses universal notification, which requires advance notice of not less than 72 hours before a pesticide under normal conditions and 24 hours after application of a pesticide in emergencies, other than a least-toxic pesticide, is applied in a building or on surrounding grounds that the building management maintains.

Any cleaning products included in the integrated pest management policy must meet the requirements for EQ Credit: Green Cleaning—Purchase of Cleaning Products and Materials.

PERFORMANCE

PF PREREQUISITE: BUILDING-LEVEL ENERGY METERING
Required

This prerequisite applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

During the performance period, install new or use existing building-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.

Note: This commitment must carry forward if the building changes ownership or lessee.

PF PREREQUISITE: ENERGY EFFICIENCY BEST MANAGEMENT PRACTICES—PLANNING, DOCUMENTATION AND OPPORTUNITY ASSESSMENT
Required

This prerequisite applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To promote continuity of information to ensure that energy-efficient operating strategies are maintained and provide a foundation for training and system analysis.

Requirements

EBOM, SCHOOLS, RETAIL, HOSPITALITY

Conduct an energy audit that meets the requirements of the Preliminary Energy Use Analysis and ASHRAE Level I walk-through assessment that includes each step identified in the ASHRAE Procedures for Commercial Building Energy Audits or equivalent. Use the ASHRAE Guideline Forms or their equivalent to document audit results.

AND

Prepare and maintain a Current Facilities Requirements and Operations and Maintenance Plan documenting information necessary for efficient building operations. These documents must include, at a minimum:

- Current sequence of operations for the building
- Building occupancy schedule
- Equipment run-time schedule
- Set points for all HVAC equipment
- Set lighting levels throughout the building.
- Minimum outside air requirements,
- Any changes in schedules or set points for different seasons, days of the week and times of day
- Systems narrative describing the mechanical and electrical systems and equipment in the building
- Preventive maintenance plan for building equipment described in the systems narrative

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

DATA CENTERS EBOM

Data center projects use the U.S. DOE DC PRO Profiling Tool to perform a preliminary assessment of energy consumption in data center spaces for critical systems.

PF PREREQUISITE: ONGOING OCCUPANT EXPERIENCE SURVEY Required

This prerequisite applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M 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

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Implement a building-wide occupant experience survey 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 building occupants or a randomly selected, statistically representative sample of the building population. Where feasible, use systematic sampling for subpopulations stratified by location, employer/tenant, occupation or another characteristic believed to be relevant to occupant experience with IEQ in the building. 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. The results will be used to assess the effectiveness of EQ credit requirements in future revisions to the Rating System.

PF CREDIT: EXISTING BUILDING COMMISSIONING—INVESTIGATION AND ANALYSIS

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To identify and implement improvements to building operations, energy and resource efficiency using the existing building commissioning process.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Step 1. Evaluate the current performance of your building compared to the Current Facilities Requirements (CFR) and the Operations & Maintenance Plan and benchmarked against national standards and / or national average building performance data.

Step 2. Identify the components in each of the building systems being analyzed and provide a breakdown of the utility or other resource use for each of these systems.

Step 3. Identify at a high level the potential options and opportunities for enhancing the CFR, including opportunities for improving building operations, reducing environmental impact, and optimizing energy and other utility performance.

Step 4. Develop a commissioning plan to effectively inventory and evaluate specific opportunities within the systems being analyzed.

The commissioning plan should include:

- Updated CFR document based on the information gathered during Steps 1 and 3;
- Existing building commissioning process team and their roles and responsibilities during the existing building commissioning process;
- Investigative approach for identification and analysis of facility improvement opportunities;
- Process of reviewing and prioritizing identified opportunities with the owner and development of an implementation plan;
- Format and content of the eventual deliverables from the existing building commissioning process; and
- Proposed schedule.

Step 5. Implement the existing building commissioning plan and prepare existing building commissioning report.

When conducting the identification and analysis of facility improvement opportunities use one of the two options below:

OPTION 1. Conduct a detailed audit of operations practices, current system performance, building controls and set points, and equipment efficiencies and retrofit opportunities for each building system covered by existing building commissioning plan that will result in operations savings. For each opportunity, describe the potential improvement, estimated implementation costs, and anticipated savings.

OPTION 2. Use procedures in the Assessment and Investigation Sections of ASHRAE Guidelines 0.2 and 1.2 for existing building commissioning process to identify improvement opportunities.

In addition to Option 1 or Option 2, meet the requirements of Path 1 or Path 2:

PATH 1. Energy Systems Analysis

Apply the requirements above to all direct energy consuming or producing systems including:

- Lighting
- Plug Loads
- Process Loads
- HVAC & R
- Domestic Water Heating
- Renewable Energy

Step 1 should build upon the data collected in EA Prerequisites 1 and PF Prerequisite X including their required activities.

Step 2, Option 1 must follow the requirements of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Level II, Energy Survey and Analysis including all identified steps and deliverables.

DATA CENTERS ONLY: Step 2, Option 1 must also follow the Department of Energy's Save Energy Now Program's on-line DC Pro Energy Assessment Tools for data center critical systems.

PATH 2. Whole Building Analysis

Achieve Path 1.

AND

Apply the requirements above to the remaining building systems including:

- Building Envelope
- Plumbing and Irrigation
- Stormwater
- Tel / Data
- Security

Step 5 ,Option 1 must apply a similar level of rigor to those systems not analyzed in Path 1 to the remaining building systems and follow steps and result in deliverables similar to those identified in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Level II, Energy Survey and Analysis for the building energy systems.

DATA CENTERS ONLY: Step 5, Option 1 must also result in deliverables similar to the Department of Energy's Save Energy Now Program's on-line DC Pro Energy Assessment Tools for data center critical systems.

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

PF CREDIT: EXISTING BUILDING COMMISSIONING—IMPLEMENTATION

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To use the existing building commissioning process to identify and implement improvements to building operations, energy and resource efficiency.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Implement no- or low-cost operational improvements and develop a five-year plan for equipment replacement and major modifications or upgrades following the project review and prioritization process identified in the existing building commissioning plan developed in EA Prerequisite 2 and incorporating the organization's standard investment evaluation processes..

Confirm training of building operations staff so that they are adequately prepared for efficient operations of all new or substantially altered building equipment or system changes.

Develop a formal project tracking and verification program for all projects implemented as part of the existing building commissioning process that includes verification of project effectiveness and documentation of the observed financial costs and benefits as well as observed or estimated environmental and/or human health and comfort benefits. Produce annual reports summarizing these projects.

Update the Operations and Maintenance Plan and the CFR to incorporate the newly implemented improvements identified through the existing building commissioning process.

AND meet the requirements of Path 1 or Path 2.

PATH 1. Energy System Implementation

Achieve EBOM PF Credit X Existing Building Commissioning—Investigation and Analysis Path 1.

AND

Apply the requirements above to all direct energy consuming or producing systems including:

- Lighting
- Plug Loads
- Process Loads
- HVAC & R
- Domestic Water Heating
- Renewable Energy

PATH 2. Whole Building Implementation

Achieve EBOM PF Credit X Existing Building Commissioning—Investigation and Analysis 2.

AND

Apply the requirements above to the remaining building systems including:

- Building Envelope
- Plumbing and Irrigation
- Stormwater
- Tel / Data
- Security

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

PF CREDIT: EXISTING BUILDING COMMISSIONING—ONGOING COMMISSIONING

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To use the existing building commissioning process to identify and implement improvements to building operations, energy and resource efficiency.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Implement an ongoing commissioning process that includes elements of planning, monitoring points, system testing, performance verification, corrective action response, ongoing measurement and documentation to proactively address operating problems in those systems being commissioned.

The process must include:

An on-going commissioning plan that defines:

- Roles and responsibilities
- Measurement requirements (i.e., meters, points, metering system, data access)
- List trend points and associated frequency and duration
- The limits of acceptable values for tracked points and metered values. Where appropriate, the acceptable values can be determined by predictive algorithms in order to dynamically compare ideal values with actual values.
- Review techniques that will be used to evaluate and identify performance of monitored points and associated systems, including:
    - Conflicts between systems
    - Out of sequence operation of system components
    - Energy and water usage profiles
- An action plan for correction of operational issues and deficiencies:
    - Identification of operational errors and recommended training to help ensure errors are not duplicated
    - Repairs needed to maintain performance
- Frequency of analysis (Analysis shall occur at least quarterly) in the first year of implementation with subsequent year analysis not to exceed 24 months
- Update Systems Manual with modifications performed, settings as appropriate, and the reasoning for the modifications from the original design.
- Define methods for improving O&M

- Include quarterly reports during the first year of implementation and annual reports on the performance of building systems, corresponding resource consumption, and LEED related performance metrics in subsequent years.

ASHRAE Guideline 0.2, Ongoing Commissioning Section 10, must be used as minimum requirements to develop and implement the ongoing commissioning plan.

Only activities associated with ongoing commissioning completed within 2 years prior to application may be included to show progress in the ongoing commissioning cycle.

Continue to update the facility's operating and maintenance plan and CFR to reflect actual conditions and issue annual revisions of these documents.

AND meet the requirements of Path 1 or Path 2.

PATH 1. Energy System Ongoing Commissioning

Achieve EBOM PF Credit X, Existing Building Commissioning—Implementation, Path 1.

AND

Apply the requirements above to all direct energy consuming or producing systems including:

- Lighting
- Plug Loads
- Process Loads
- HVAC & R
- Domestic Water Heating
- Renewable Energy

PATH 2. Whole Building Ongoing Commissioning

Achieve EBOM PF Credit X, Existing Building Commissioning—Implementation, Path 2.

AND

Apply the requirements above to the remaining building systems including:

- Building Envelope
- Plumbing and Irrigation
- Stormwater
- Tel / Data
- Security

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

PF CREDIT: WATER PERFORMANCE MEASUREMENT

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To understand water consumption patterns and identify opportunities for additional savings by measuring water performance.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

OPTION 1.

Have in place permanently installed water meters that measure the total potable water[13] use for the building and associated grounds. Meter data must be recorded at least weekly and compiled into monthly and annual summaries; meter readings can be manual or automated. Metering of any gray or reclaimed water supplied to the building is encouraged but not required.

OR

OPTION 2.

Meet the requirements for Option 1 and install permanent meters for one or more of the following systems:

- Irrigation. Meter water systems serving at least 80% of the irrigated landscaped area on the grounds. The percentage of irrigated landscape area served must be calculated as the total metered irrigated landscape area divided by the total irrigated landscape area. All landscaping areas fully covered with xeriscaping or native vegetation that requires no routine irrigation may be excluded from the calculation.
- Indoor plumbing fixtures and fittings. Meter water systems serving at least 80% of the indoor plumbing fixtures and fittings listed in WE Prerequisite, Minimum Indoor Plumbing Fixture and Fitting Efficiency, either directly or by deducting all other measured water use from the measured total water consumption of the building and grounds.
- Cooling towers. Meter replacement water use of all cooling towers serving the facility.
- Domestic hot water. Meter water use of at least 80% of the installed domestic hot water heating capacity (including both tanks and on-demand heaters).
- Other process water. Meter at least 80% of expected daily water consumption for process-type end uses, such as humidifiers, dishwashers, clothes washers, and pools.

Compile monthly and annual summaries of results for each subsystem metered.

[13] Potable water is defined as water that is suitable for drinking and is supplied from wells or municipal water systems

The meters must measure potable water use, but gray or reclaimed water use may also be measured to meet the requirements of this credit. Metering must be continuous and data-logged to allow for an analysis of time trends.

Meters must be calibrated within the manufacturer's recommended interval if the building owner, management organization, or tenant owns the meter. Meters owned by third parties (e.g., utilities or governments) are exempt.

PF CREDIT: PERFORMANCE MEASUREMENT— ADVANCED BUILDING ENERGY METERING

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To provide accurate building level energy-use information to support energy management and identify opportunities for additional energy-saving investments.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Install permanent building level advanced meters for all utilities that measure demand and consumption and make this information available remotely via a connection to the building's energy management system. Demand measurements must be taken in time increments no larger than the increments used for billing by the applicable utility company or in one hour increments, whichever is less time.

On at least a monthly basis, create reports documenting the facility's utility peak demand and total consumption and comparing it to the previous month's and the same month from the previous year's peak demand and total consumption.

Include programming within the facility's energy management system to set an alarm whenever the peak demand rises above the anticipated peak by more than 5%. The anticipated peak should be determined by analyzing historic facility performance and weather and operating conditions and should be set on at least a monthly basis if not daily.

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

PF CREDIT: PERFORMANCE MEASUREMENT—SYSTEM-LEVEL ENERGY METERING

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To provide accurate system level energy-use information to further support energy management and identify opportunities for additional energy-saving improvements.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Install permanent sub-meters for at least three of the following energy systems not already being isolated by building-level meters.

- HVAC pumps and fans
- Lighting
- Plug loads
- Building conveyance
- Renewable energy
- Heating
- Cooling
- Domestic hot water
- Process energy uses (constituting 5% of total energy demand)

Sub-meters must measure demand and consumption and make this information available remotely via a connection to the building's energy management system. Demand measurements must be taken in time increments no larger than the increments used for billing by the applicable utility company or in one hour increments, whichever is less time.

On at least a monthly basis, create reports documenting the systems' peak demand and total consumption and comparing it to the previous month's and the same month from the previous year's peak demand and total consumption.

Include programming within the facility's energy management system to set an alarm whenever the peak demand rises above the anticipated peak by more than 5%. The anticipated peak should be determined by analyzing historic facility performance and weather and operating conditions and should be set on at least a monthly basis if not daily.

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

INNOVATION

IN CREDIT: INNOVATION

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M 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

EBOM, SCHOOLS, RETAIL, DATA CENTERS, 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.

EBOM

EB:O&M projects can achieve up to 4 points.

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.

IN CREDIT: THE SCHOOL AS A TEACHING TOOL

This credit applies to:

- EB:O&M Schools

Intent

To integrate the sustainable features of a school facility with the school's educational mission.

Requirements

SCHOOLS EBOM

Implement a comprehensive signage program or displays inside the building and on the site to educate occupants and visitors of the benefits of green buildings.

AND

Implement one of the following options:

- Design a curriculum based on the high-performance features of the building, and commit to implementing the curriculum within 10 months of LEED certification. The curriculum should not just describe the features themselves, but explore the relationship between human ecology, natural ecology and the building. Curriculum must meet local or state curriculum standards, be approved by school administrators and provide 10 or more hours of classroom instruction per year, per full-time student.

- Organize a student lead sustainability initiative. This group must be a sanctioned group and have a defined mission statement, regular meetings, and a measureable impact on students or the larger community.

- Include student involvement in the implementation of at least three of the following credits:
    - Schools: SSc5, WEc1, EAp2/EAc1, EAc6, MRc1, MRc6, MRc7, and EQc1.1.
    - EB:O&M Schools: SSc5, WEp1/WEc3, EAp2/EAc1, MRp1, EQc5, and EQc7.2.
- Conduct educational programming around a learning landscape and/or edible garden. Specific programming is not prescribed but must actively engage students on an ongoing basis. Educational programming may be facilitated through after school programming, parent groups, or outside organizations. Teams should be prepared to document a description of the program, the schedule of activities, and a summary of activities conducted during the performance period.

IN CREDIT: DOCUMENTING SUSTAINABLE BUILDING COST IMPACTS

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

To document sustainable building cost impacts.

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, HOSPITALITY

Document overall building operating costs for the previous 5 years (or length of building occupancy, whichever is shorter) and track changes in overall building operating costs during the performance period. Document building operating costs and financial impacts of all aspects of LEED 2009 for Existing Buildings: Operations & Maintenance implementation on an ongoing basis.

Follow the detailed instructions in the LEED Reference Guide for Green Building Operations & Maintenance, 2009 Edition.

REGIONAL PRIORITY

RP CREDIT: REGIONAL PRIORITY

This credit applies to:

- Existing Buildings: Operations & Maintenance
- EB:O&M Schools
- EB:O&M Retail
- EB:O&M Data Centers
- EB:O&M Hospitality

Intent

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

Requirements

EBOM, SCHOOLS, RETAIL, DATA CENTERS, 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.