

# O+M CREDIT SUMMARY CHARTS

Location & Transportation
15

LTC1 Alternative Transportation
1 15
Y

1 - Establishment

- Building Components and Infrastructure
- Policies - site management

Credit Structure

1 - Performance

- Discrete Actions - surveys, audits, testing
- Policies - energy and waste



CATEGORY



PREREQUISITE



CREDIT

**All Points displayed are for the Existing Buildings Rating System**

S	SCHOOL RATING SYSTEM SPECIFIC
EB	EXISTING BUILDINGS
DC	DATA CENTERS
R	COMPLIANCE REQUIRED
2	POINTS AVAILABLE FOR CREDIT
NA	CREDIT DOES NOT APPLY
Y	EXEMPLARY POINT AVAILABLE

\*XXy# is no longer the proper format - it is no XXy Credit Name, where XX is credit category, y refers to prerequisite or credit and # refers to the credit number, but will be used for ease of memorization

Recertification - Projects must recertify within five years of the previous certification and are

Sustainable Sites
10

SSp1 Site Management Policy
R

SSc1 Site Development—Protect or Restore Habitat
1 2
Y

SSc2 Rainwater Management
3 2
Y

SSc3 Heat Island Reduction
2
Y

SSc4 Light Pollution Reduction
1

SSc5 Site Management
1

SSc6 Site Improvement Plan
1

SSc7 Joint Use of Facilities
N A
1
Y

Water Efficiency
12

WEp1 Indoor Water Use Reduction
R

WEp2 Building-Level Water Metering
R

WEc1 Outdoor Water Use Reduction
1 2

WEc2 Indoor Water Use Reduction
1 5
y

WEc3 Cooling Tower Water Use
3

WEc4 Water Metering
1 2

Energy & Atmosphere
38

EAp1 Energy Efficiency Best Management Practices
R

EAp2 Minimum Energy Performance
R

EAp3 Building-Level Energy Metering
R

EAp4 Fundamental Refrigerant Management
R

EAc1 Existing Building Commissioning - Analysis
2

EAc2 Existing Building Commissioning - Implementation
2

EAc3 Ongoing Commissioning
3

EAc4 Optimize Energy Performance
1 20
Y

EAc5 Advanced Energy Metering
2

EAc6 Demand Response
1 3

EAc7 Renewable Energy and Carbon Offsets
1 5
Y

EAc8 Enhanced Refrigerant Management
1

Materials & Resources
8

MRp1 Ongoing Purchasing and Waste Policy
R

MRp2 Facility Maintenance and Renovation Policy
R

MRC1 Purchasing - Ongoing
1
Y

MRC2 Purchasing - Lamps
1
Y

MRC3 Purchasing - Facility Management and Renovation
1 2
Y

MRC4 Solid Waste Management (SWM) - Ongoing
2
Y

MRC5 SWM - Facility Maintenance and Renovation
2
Y

Indoor Environmental Quality
17

IEQp1 Minimum Indoor Air Quality Performance
R

IEQp2 Environmental Tobacco Smoke Control
R

IEQp3 Green Cleaning Policy
R

IEQc1 Indoor Air Quality Management Program
2

IEQc2 Enhanced Indoor Air Quality Strategies
1 2
Y

IEQc3 Thermal Comfort
1

IEQc4 Interior Lighting
1 2

IEQc5 Daylight and Quality Views
4
Y

IEQc6 Green Cleaning - Custodial Effectiveness Assessment
1

IEQc7 Green Cleaning - Products and Materials
1
Y

IEQc8 Green Cleaning - Equipment
1
Y

IEQc9 Integrated Pest Management
2

IEQc10 Occupant Comfort Survey
1

Innovation
6 6 6

IDc1.1 Innovation
1 1 1 3 3 3

IDc1.2 Exemplary Performance
1 1 1 2 2 2

IDc1.3 Pilot Credit
1 1 1 3 3 3

IDc2 LEED AP+ (appropriate specialty)
0 0 0 1 1 1

Regional Priority
4 4 4 6 6 6

RPC1 Regional Priority Credit
1 1 1

RPC2 Regional Priority Credit
1 1 1

RPC3 Regional Priority Credit
1 1 1

RPC4 Regional Priority Credit
1 1 1

**Minimum Program Requirements (MPR)**

**The minimum characteristics or conditions that make a project appropriate to pursue LEED certification**

EB	INTENT	REQUIREMENTS	ADDITIONAL GUIDANCE
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0	<p><b>MPR1</b></p> <p><b>Must Be in a Permanent Location on Existing Land</b></p> <p><b>INTENT:</b> The LEED rating system is designed to evaluate buildings, spaces, and neighborhoods in the context of their <b>surroundings</b>. A significant portion of LEED requirements are dependent on the project's location, therefore it is important that <b>LEED projects are evaluated as permanent structures</b>. Locating projects on existing land is important to <b>avoid artificial land masses that have the potential to displace and disrupt ecosystems</b>.</p>	<p><b>REQUIREMENTS:</b> All LEED projects must be constructed and operated on a <b>permanent location on existing land</b>. No project that is designed to move at any point in its lifetime may pursue LEED certification.</p>	<p><b>Permanent Location</b></p> <ul style="list-style-type: none"> <li>• Ex. Trailers or Boats or mobile homes are not eligible</li> <li>• Prefabricated or modular structures and building elements may be certified once permanently installed as part of the LEED project.</li> </ul> <p><b>Existing Land</b></p> <ul style="list-style-type: none"> <li>• If existing land is previously artificially developed in or above water such that it once supported a building or hardscape - <b>IT IS PERMISSIBLE</b></li> </ul>
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0	<p><b>MPR2</b></p> <p><b>Use a Reasonable LEED Boundary</b></p> <p><b>INTENT:</b> The LEED rating system is designed to evaluate buildings, spaces, or neighborhoods, and <b>all environmental impacts associated with those projects</b>. Defining a reasonable LEED boundary ensures that project is <b>accurately evaluated</b>.</p>	<p><b>REQUIREMENTS:</b> The LEED project boundary must include all contiguous land that is associated with the project and supports its typical operations, including:</p> <ol style="list-style-type: none"> <li>1 - Land permanently altered as a result of construction (Building footprint)</li> <li>2 - Hardscapes (parking + sidewalks)</li> <li>3 - Water treatment equipment</li> <li>4 - Landscaping</li> </ol> <ul style="list-style-type: none"> <li>• No Gerrymandering in LEED - Unreasonably adjusting the LEED boundary for the benefit of complying with prerequisite or credit requirements</li> <li>• Marketing material must <b>distinguish</b> between space being certified and space not pursuing LEED</li> <li>• <b>Property Boundary</b> - Platted property line of the project defining land and water within it</li> </ul>	<p><b>Site</b></p> <ul style="list-style-type: none"> <li>• If non-contiguous parcels of land support normal building operations and are accessible - <b>they are to be included</b></li> <li>• If project has <b>permission to use facilities</b> (IE. parking lots, bicycle storage, shower/changing facilities) which are outside of the LEED project boundary - <b>they are to be included</b></li> <li>• Projects that are <b>phased sites with multiple buildings</b> must designate a LEED project boundary for <b>each building</b></li> <li>• The <b>gross floor area</b> of the LEED project should be no less than <b>2% of the gross land area</b> within the LEED project boundary</li> </ul> <p><b>Building</b></p> <ul style="list-style-type: none"> <li>• <b>Standalone</b> Dedicated Parking garages are not eligible for LEED</li> <li>• Multiple Structures which depend on each other to function and are physically connected only by circulation, parking or mechanical/storage rooms - <b>can be considered a single building</b></li> <li>• An addition to an existing building may certify independently or alternatively the existing building and addition can be certified as one entity</li> </ul> <p><b>Interiors</b></p> <ul style="list-style-type: none"> <li>• If a single project is completely owned and managed by one entity and decides to renovate said project; <b>the renovated portion can apply for certification is the project boundary includes 100% of the scope</b></li> </ul> <p><b>Neighborhood</b></p> <ul style="list-style-type: none"> <li>• <b>Includes</b> the land, water, and construction within the LEED project boundary</li> <li>• LEED Project boundary is defined by <b>platted</b> (surveyed) <b>property line of the project</b></li> <li>• The project developer should control a majority of the buildable land within the boundary</li> </ul>
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0	<p><b>MPR3</b></p> <p><b>Comply with project size Requirements</b></p> <p><b>INTENT:</b> The LEED rating system is designed to evaluate buildings, spaces, or neighborhoods of a <b>certain size</b>. The LEED requirements <b>do not accurately assess</b> the performance of projects <b>outside</b> of these size requirements</p>	<p><b>REQUIREMENTS:</b> LEED BD+C and O+M - a minimum of <b>1,000 square feet</b> LEED ID+C - a minimum of <b>250 square feet</b> LEED ND at least two habitable buildings and be <b>no larger than 1500 acres</b>. LEED for Homes - defined as a "<b>dwelling unit</b>" by all applicable codes.</p> <ul style="list-style-type: none"> <li>• International Residential Code stipulation that a dwelling unit must include "permanent provisions for living, sleeping, eating, cooking, and sanitation.</li> </ul> <p>• A project take an additional 10% exemption for a credit</p> <ul style="list-style-type: none"> <li>- If the project team can't gather the necessary tenant data for the credit</li> <li>- If the applicant does not have control over the required element</li> </ul>	<p style="text-align: center;"><b>PERFORMANCE PERIODS SPECIFIC TO LEED FOR OPERATIONS AND MAINTENANCE -</b></p> <p>Definition: <b>The continuous implementation of the strategies set during the establishment period</b></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #f2f2f2;"> <th style="font-size: small;">Credit</th> <th style="font-size: small;">Start</th> <th style="font-size: small;">End*</th> <th style="font-size: small;">Duration**</th> </tr> </thead> <tbody> <tr> <td style="font-size: x-small;">WE Credit Outdoor Water Use</td> <td style="font-size: x-small;">February 22, 2014</td> <td style="font-size: x-small;">April 20, 2015</td> <td style="font-size: x-small;">14 months</td> </tr> <tr> <td style="font-size: x-small;">SS Credit Rainwater Management</td> <td style="font-size: x-small;">April 6, 2014</td> <td style="font-size: x-small;">April 22, 2015</td> <td style="font-size: x-small;">12.5 months</td> </tr> <tr> <td style="font-size: x-small;">EA Prerequisite Minimum Energy Performance</td> <td style="font-size: x-small;">April 1, 2014</td> <td style="font-size: x-small;">April 1, 2015</td> <td style="font-size: x-small;">12 months</td> </tr> <tr> <td style="font-size: x-small;">SS Credit Site Management</td> <td style="font-size: x-small;">August 25, 2014</td> <td style="font-size: x-small;">April 25, 2015</td> <td style="font-size: x-small;">8 months</td> </tr> <tr> <td style="font-size: x-small;">WE Prerequisite Indoor Water Use</td> <td style="font-size: x-small;">January 12, 2015</td> <td style="font-size: x-small;">April 26, 2015</td> <td style="font-size: x-small;">3.5 months</td> </tr> </tbody> </table> <p style="font-size: x-small;">* All performance periods must end with the same 30-day interval. ** Minimum duration = 3 months; maximum duration = 24 months</p> <p>• LEED for Building Operations and Maintenance certification applications must be submitted for review within 60 calendar days of the end of the performance periods. <b>IE. 60 days after APRIL 27TH</b></p>	Credit	Start	End*	Duration**	WE Credit Outdoor Water Use	February 22, 2014	April 20, 2015	14 months	SS Credit Rainwater Management	April 6, 2014	April 22, 2015	12.5 months	EA Prerequisite Minimum Energy Performance	April 1, 2014	April 1, 2015	12 months	SS Credit Site Management	August 25, 2014	April 25, 2015	8 months	WE Prerequisite Indoor Water Use	January 12, 2015	April 26, 2015	3.5 months
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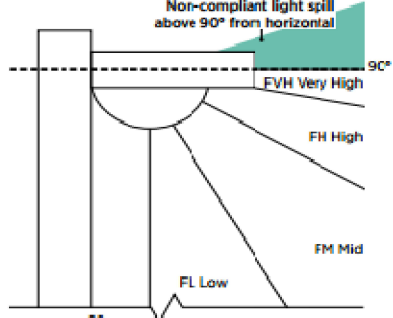
Recertification requires tracking of FTEs. And loads to be entered in ENERGY STAR

Unless major changes occur (as defined as a renovation, addition, or mgmt turnover) only performance documentation needs to be submitted for recertification.


15		LOCATION AND TRANSPORTATION (LT)		
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
15	<p><b>LTc1</b></p> <p><b>Alternative Transportation</b></p> <p><b>INTENT:</b> Reduce pollution and land development impacts from automobile use</p> <p><b>SYNERGIES:</b> none</p>	<p><b>REQUIREMENTS:</b></p> <p><b>OPTION 1 - Transportation Survey (1 point) - required for pursuit of options 2 / 3</b></p> <ul style="list-style-type: none"> <li>Conduct a survey of building occupants on their transportation patterns (additionally conduct 1 survey every 5 years after initial survey) <ul style="list-style-type: none"> <li>If visitors &gt; regular occupant FTE - visitors must be surveyed as well</li> </ul> </li> </ul> <p><b>Survey Procedure:</b></p> <ol style="list-style-type: none"> <li>Select Survey Approach (all occupants or random sampling) <ul style="list-style-type: none"> <li>Calculate how many participants must participate in random sampling (IE. 1000 Occupants = 286 Sampled)</li> </ul> </li> <li>Determine if visitors &gt; regular FTE (IE. Students in a school)</li> <li>Develop survey such that it collects info from 5 or 7 consecutive days, records mode of transportation for daily commute and all trips during the day</li> <li><b>Schedule and Distribute Survey</b> - Electronic survey or lobby blitz survey <ul style="list-style-type: none"> <li>Survey must occur throughout an entire primary peak period of at least two hours</li> </ul> </li> <li><b>Analyze Survey Results</b> - Survey response rate must exceed 5% for visitors and regular FTE <ul style="list-style-type: none"> <li>Apply extrapolation factor to account for non-responders based on response rate</li> </ul> </li> <li><b>Calculate Alternative Transportation Rate</b> <ul style="list-style-type: none"> <li>Calculations are performed relative to a baseline case that assumes all regular occupants commute alone in conventional automobiles.</li> <li>If alternative transportation rate is high enough, points can be rewarded in Option 2</li> </ul> </li> </ol> <p><b>- OR -</b></p> <p><b>OPTION 2 - Alternative Transportation Rate (3 - 15 points)</b></p> <ol style="list-style-type: none"> <li>Complete Option 1 to determine current alternative transportation rate</li> <li>Based on percentage of alternative transportation rate as compared to a 100% conventional gas operated automobiles baseline: <ul style="list-style-type: none"> <li>10% = 3 point</li> <li>15% = 4 point</li> <li>20% = 5 point</li> <li>25% = 6 points</li> <li>30% = 7 points</li> <li>35% = 8 points</li> <li>40% = 9 points</li> <li>45% = 10 point</li> <li>50% = 11 points</li> <li>55% = 12 points</li> <li>60% = 13 points</li> <li>65% = 14 points</li> <li>70% = 15 points</li> <li>80% = Exemplary Performance Point</li> </ul> </li> </ol> <p><b>- OR -</b></p> <p><b>OPTION 3 - Comprehensive Alternative Transportation Program (2 Points)</b></p> <ol style="list-style-type: none"> <li>Complete Option 1 to determine current alternative transportation rate</li> <li>Develop and Implement an alternative transportation program to reduce the conventional travel rates of building occupants.</li> </ol> <p><b>Include at least one element from each of the following three categories:</b></p> <p><b>Education strategies</b></p> <ul style="list-style-type: none"> <li>new-hire orientation;</li> <li>employee newsletter, flyer, announcements, memos, letters;</li> <li>carpool matching website; or</li> </ul> <p><b>Basic support strategies</b></p> <ul style="list-style-type: none"> <li>employer carpool events.</li> <li>guaranteed return trip;</li> <li>preferential parking for rideshare participants;</li> <li>flextime schedule; or</li> <li>ride-matching service.</li> </ul> <p><b>Direct Strategies</b></p> <ul style="list-style-type: none"> <li>telecommuting; · compressed workweek schedule; · transit subsidy; · introduction of a parking fee; · bicycle program; · parking cash-out; · employee clean vehicle purchase program; <b>OR</b> carpool program</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>Human-powered conveyances (e.g. walking or biking)</li> <li>Public transit</li> <li>Telecommuting</li> <li>Rideshare options (outside US only) - that involves independently owned and operated passenger cars or small vans</li> <li>Compressed workweeks</li> <li>Carpools</li> <li>Green vehicles (vehicles achieving a minimum green score of 45 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide (or a local equivalent for projects outside the U.S.)</li> <li>Use the USGBC supplied calculator to compute the number of alternative transportation trips</li> <li>Note - Local/Regional survey results can be used if: <ul style="list-style-type: none"> <li>Data is building specific</li> <li>Date is collected during performance period</li> </ul> </li> </ul> <p><b>Survey response rate - extrapolation factor</b></p> <p>60%-100% - 1.00  50%-59% - 0.80  40%-49% - 0.60  30%-39% - 0.40  &lt; 30% - 0.00</p> <ul style="list-style-type: none"> <li>Under 30% = Assume nonrespondents are commuting via single-occupancy vehicles</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <p><b>Options 1 + 2:</b></p> <ul style="list-style-type: none"> <li>Regular building occupant and visitor counts</li> <li>For regular building occupants' survey, description of methodology and how it meets survey requirements</li> <li>For visitors' survey (if applicable), description of methodology and how it meets survey requirements</li> <li>Survey results, including reduction in conventional commuting trips, trips for each transportation mode, and trips not taken (e.g., sick days, vacation days)</li> </ul> <p><b>Options 3:</b></p> <ul style="list-style-type: none"> <li>Regular building occupant and visitor counts</li> <li>Narrative describing comprehensive alternative transportation program and implementation</li> <li>Supporting documentation for each element of comprehensive alternative transportation program</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>American Council for Energy-Efficient Economy (ACEEE) Green Book® :greencars.org</li> </ul> <p><b>Definitions:</b></p> <p><b>Light Rail Transit</b> service using two- or three-car trains in a right-of-way that is often separated from other traffic modes. Spacing between stations tends to be 1/2 mile (800 meters) or more, and maximum operating speeds are typically 40–55 mph (65–90 kmh). Light-rail corridors typically extend 10 or more miles (16 kilometers).</p> <p><b>Rideshare</b> a transit service in which individuals travel together in a passenger car or small van that seats at least four people. It can include human-powered conveyances, which must accommodate at least two people. It must include an enclosed passenger seating area, fixed route service, fixed fare structure, regular operation, and the ability to pick up multiple riders</p>

10		SUSTAINABLE SITES (SS)		
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
0	<p><b>SSp1</b></p> <p><b>Site Management Policy</b></p> <p><b>INTENT:</b> preserve ecological integrity and encourage environmentally sensitive site management practices that provide a clean, well-maintained, and safe building exterior while supporting high-performance building operations and integration into the surrounding landscape.</p> <p><b>SYNERGIES:</b> SSc1; SSc5; SSc6; WEc1</p>	<p><b>REQUIREMENTS:</b> Create and implement a site management policy that employs best management practices for the following elements:</p> <ol style="list-style-type: none"> <li>Use of low emissions <b>maintenance equipment</b>;</li> <li>Snow and <b>ice removal</b>;</li> <li><b>Cleaning</b> of building exterior, pavement, and other impervious <b>surfaces</b>;</li> <li><b>Erosion and sedimentation control</b> (for <b>ongoing</b> operations and for <b>construction</b> activity);</li> <li><b>Organic waste</b> management (returned to the site or diverted from landfills);</li> <li><b>Invasive</b> and exotic <b>plant</b> species management (through monitoring and eradication);</li> <li><b>Fertilizer</b> use (testing soils before using fertilizer to prevent over application of nutrients);</li> <li><b>Irrigation management</b> (monitor irrigation systems manually or with automated systems)</li> <li><b>Storage</b> of materials and equipment.</li> </ol>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ol style="list-style-type: none"> <li>Replace gasoline-powered equipment with electric equipment and reduce lawn area requiring upkeep</li> <li>Identify high-traffic areas which require less de-icer, pre-treat surfaces before storm or use salt-free de-icers</li> <li>Use only green cleaning products for exterior surfaces and maximize manual cleaning strategies</li> <li>Protect drains from becoming clogged, manage cigarette butts, develop and implement Erosion + Sedimentation control plan to prevent pollution of adjacent streams</li> <li>Compost or mulch leaves on site</li> <li>Develop and eradicate list of invasive/exotic species found on site</li> <li>Test soil for pH levels and nutrient content, use environmentally preferable (non-ammonia based) fertilizer and spot spray weeds</li> <li>Test system for leaks, breaks or over usage regularly during operating season</li> <li>Store materials to prevent fuel leakage and ventilate storage areas properly</li> </ol> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>Site management policy document</li> <li>Justification for operational elements not included in policy</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>None</li> </ul> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>None</li> </ul> <p><b>DEFINITIONS:</b> <b>Invasive Plant</b> - non-native vegetation that has been introduced to an area and that aggressively adapts and reproduces. The plant's vigor combined with a lack of natural enemies often leads to outbreak populations. (Adapted from U.S. Department of Agriculture)</p>
1 2	<p><b>SSc1</b></p> <p><b>Site Development—Protect or Restore Habitat</b></p> <p><b>INTENT:</b> Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity</p> <p><b>SYNERGIES:</b> SSp1; SSc2; SSc3; SSc5; SSc6</p>	<p><b>REQUIREMENTS:</b></p> <p><b>OPTION 1 - On-Site Restoration (2 Points)</b></p> <ul style="list-style-type: none"> <li>20% of total site area (including building footprint) must have <b>native or adapted vegetation</b> in place</li> <li>5,000 <b>Square Feet</b> at a minimum</li> </ul> <p><b>- OR -</b></p> <p><b>OPTION 2 - Financial Support (1 Point)</b></p> <ul style="list-style-type: none"> <li>Provide at least <b>\$0.05/square foot annually</b> of total site area (including building footprint) to: <ul style="list-style-type: none"> <li>nationally or locally recognized land trust (accredited by the land trust alliance in the US), or</li> <li>conservation organization within the same EPA Level III ecoregion (land trust must be located within 100 miles for projects outside the US)</li> </ul> </li> </ul> <p><b>Exemplary Performance</b></p> <p><b>Option 1 - Restore at least 40% of total site area</b></p> <p><b>Option 2 - Double the annual requirement to \$0.10/square foot</b></p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>Restore existing ponds, riparian buffers, vegetation, and other natural features, <b>facilities restoration</b>.</li> <li>Consider restoring areas adjacent to greenfield areas, bordering natural areas, and contiguous parcels</li> <li>Areas that naturally do not contain vegetation can count toward restored area. For example, natural rock outcrops, ponds, and desert would all qualify under this credit</li> <li>lawns (turf grasses) qualify as adapted vegetation only if they are able to survive without mowing, fertilization, pesticides, and irrigation</li> <li>mulching is not a type of restoration</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <p><b>Option 1:</b></p> <ul style="list-style-type: none"> <li>Description of native or adapted vegetation</li> <li>Site plan</li> </ul> <p><b>Option 2:</b></p> <ul style="list-style-type: none"> <li><b>Agreement</b> with land trust or conservation organization</li> <li>U.S. projects: Confirmation that land trust is accredited by <b>Land Trust Alliance</b></li> <li>Projects outside U.S.: Verification that the conservation organization is <b>nationally or locally recognized</b></li> <li>Confirmation that financial support will continue to be <b>provided annually</b></li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>U.S. EPA Ecoregions: <a href="http://epa.gov/">epa.gov/</a></li> <li>Land Trust Alliance Accreditation: <a href="http://landtrustalliance.org/">landtrustalliance.org/</a></li> <li>- a non-profit organization that actively works to conserve land through conservation easement or acquisition</li> </ul> <p><b>CALCULATIONS:</b></p> <p><b>Option 1:</b> <b>Required area for native or adapted</b> = vegetation Total site area (including building footprint) × 0.20</p> <p><b>Option 2:</b> <b>Minimum financial contribution</b> = Total site area (ft<sup>2</sup>) × \$0.05/ft<sup>2</sup></p>


10		SUSTAINABLE SITES (SS)		
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
3 (S-2)	<p><b>SSc2</b></p> <p><b>Rainwater Management</b></p> <p>INTENT: Reduce runoff volume and improve water quality by replicating the natural hydrology and water balance of the site, based on historical conditions and undeveloped ecosystems in the region</p> <p>SYNERGIES: SSc1; SSc3; SSc6, WEp1; WEc1; WEc2</p>	<p><b>REQUIREMENTS:</b></p> <p><b>1 - Capture and Treat</b> water from <b>25%</b> of the impervious surfaces for the <b>95th</b> percentile storm event</p> <ul style="list-style-type: none"> <li>Collect locational rainfall data for 10+ years (use National Climate Data Center) <ul style="list-style-type: none"> <li>This data is put into the <b>USGBC Rainfall Events Calculator</b></li> </ul> </li> <li>Determine value for the 95th percentile rainfall events (95% of all rainfall events do not exceed runoff volume)</li> <li>Calculate runoff volume from 25% of the impervious surfaces in cubic feet (use any method)</li> <li>Modify site if needed to reduce volume of runoff</li> </ul> <p><b>2 - Monitor</b> - Establish and implement an annual inspection program of all rainwater management facilities</p> <p><b>3 - Maintain</b> - Perform necessary maintenance, repairs, or stabilization within <b>60</b> days of inspection.</p> <p><b>Exemplary Performance</b> <b>Capture and Treat</b> water from <b>50%</b> of the impervious surfaces for the 95th percentile storm event</p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <p><b>Green Infrastructure</b> - management approaches and technologies infiltrate, evapotranspire, capture and reuse stormwater to maintain or restore natural hydrologies</p> <p><b>Low Impact Development</b> - emphasizes on-site natural features to protect water quality, by replicating the natural land cover hydrologic regime of watersheds, and addressing runoff close to its source (IE. maintain vegetative swales, rain gardens and minimize impervious cover)</p> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>Rainfall data</li> <li>Rainfall events calculator or calculations for 95th percentile storm</li> <li>Calculations for runoff volume from 25% of impervious area</li> <li>Calculations for volume of rainwater managed by GI or LID strategies</li> <li>Plans, details, or cross sections depicting site conditions, GI or LID strategies, topography, direction of water flow, and area of site that each GI or LID measure addresses</li> <li>Narrative confirming that measures qualify as GI or LID</li> <li>Documents or narrative about inspections and maintenance</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <p><b>U.S. EPA Technical Guidance on Implementing the Rainwater Runoff Requirements</b> for Federal Projects under Section 438 of the Energy Independence and Security Act</p> <p><b>CALCULATIONS:</b> <b>Surface to manage</b> = 25% x total impervious area <b>The USGBC calculator determines the 95th percentile rainfall amounts based on data from the National Climate Data Center</b> To Calculate runoff volume the following methods may be used: Modified rational method TR-55 graphical peak discharge TR-55 tabular hydrograph</p>
2	<p><b>SSc3</b></p> <p><b>Heat Island Reduction</b></p> <p>INTENT: Minimize effects on microclimates and human and wildlife habitats by reducing heat islands</p> <p>SYNERGIES: SSc1; SSc2; SSc6, EAp1; EAc1</p>	<p><b>REQUIREMENTS:</b></p> <p><b>OPTION 1 - Nonroof (1 Point)</b> <b>Use any combination of the following strategies for a minimum of 50% of the site paving:</b></p> <ul style="list-style-type: none"> <li>Shade with natural (within 10 years) or artificial features with a (3 year - Solar reflectance (SR)&gt; 0.28 or initial SR &gt; .33)</li> <li>Cool pavement which has a 3 year - Solar reflectance (SR)&gt; 0.28 or initial SR &gt; .33</li> </ul> <p><b>- OR -</b></p> <p><b>OPTION 2 - Roof (1 Point)</b></p> <p><b>Case 1 - Use high Solar Reflectance Index (SRI) materials for 75% of the roof</b></p> <ul style="list-style-type: none"> <li>Low sloped roofs (&lt;2:12) = 3 year - Solar reflectance index (SRI)&gt; 64 or initial SRI &gt; 82</li> <li>Steep sloped roofs (&lt;2:12) = 3 year - Solar reflectance index (SRI)&gt; 32 or initial SRI &gt; 39</li> </ul> <p><b>Case 2 - Install a vegetative roof which covers 50% of the roof area</b></p> <p><b>Case 3 - Use both methods - (Area of High SRI Roof / 0.75) + (Area of vegetated roof / 0.5) &gt; Total roof Area</b></p> <p>*Calculations excludes mechanical rooftop equipment, sunlights and renewable energy equipment</p> <p><b>- OR -</b></p> <p><b>OPTION 3 - Roof and Nonroof (2 Points)</b> (Area of non roof measures / 0.5) + Area of High SRI Roof / 0.75) + (Area of vegetated roof / 0.5) &gt; Total roof Area + Total site paving area</p> <p>*If some materials fall below and other are above the SRI requirements, a <b>weighted average can be used</b></p> <p><b>- OR -</b></p> <p><b>OPTION 4 - Parking Under Cover (1 Point)</b></p> <ul style="list-style-type: none"> <li>Place 50%+ parking under cover or shade parking with natural or artificial features with a (3 year - SRI &gt; 32 or initial SRI &gt; 39) or vegetated surface or covered by energy generation systems such as PV or solar thermal</li> </ul> <p>*<b>Ensure all high SR and SRI surfaces are cleaned at least every 3 years</b></p> <p><b>Exemplary Performance</b></p> <p><b>Option 1</b> - Install SR-compliant materials and/or open-grid paving, or provide shading within 10 years, for at least <b>95%</b> of nonroof impervious surfaces.</p> <p><b>Option 2</b> - Install a vegetated roof system for at least <b>95%</b> of the project's roof area</p> <p><b>Option 3</b> - Achieve exemplary performance for both Option 1 and Option 2</p> <p><b>Option 4</b> - Locate at least 95% of parking under cover.</p>	<p><b>NON ROOF STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li><b>Vegetative shading</b> - Assume 10 year canopy width</li> <li><b>Vegetated planters</b> - turf grass does not count</li> <li><b>Vegetated shading structures</b> - must be installed at time of certification</li> <li><b>Shading structures with energy generation</b> - IE. PV or solar thermal</li> <li><b>Shading architectural devices or structures</b> - 3-year aged SR 0.28+, or initial SR of 0.33+</li> <li><b>High reflectance paving</b> - 3-year aged SR 0.28+, or initial SR of 0.33+ at installation</li> <li><b>Open-grid paving</b> - Paving must be at least 50% unbound.</li> </ul> <p><b>ROOF STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li><b>High-reflectance roof</b> - Consider maintenance and minimize glare</li> <li><b>Vegetated Roof</b> - Extensive or intensive vegetated roofs are eligible. Roof planters can contribute only if they are part of vegetated roof system</li> </ul> <p><b>PARKING STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li><b>Undercover Parking</b> - Extensive or intensive vegetated roofs are eligible. Roof planters can contribute only if they are part of vegetated roof system</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>Nonroof and/or roof area calculations</li> <li>Site plan indicating LEED project boundary, highlighting nonroof elements and measurements, hardscape area, and area of each nonroof measure</li> <li>Parking space calculations</li> <li>Plan indicating LEED project boundary and building footprint, highlighting roof elements and measurements, roof area, and area of each roof measure</li> <li>Manufacturers' documentation of SRI, SR, and paving permeability</li> <li>Description of maintenance program</li> <li>Attach drawings to show defined site areas, building footprint, hardscape, landscape plans (including shading)</li> <li>Identify paving materials, shaded parking, and/or underground or covered parking</li> <li>Indicate SR value for each paving material installed</li> <li>Select paving materials from standard list of reflective materials</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>ASTM Standards E903 and E892:astm.org/</li> <li>Cool Roof Rating Council Standard (CRRC-1): coolroofs.org/</li> </ul> <p><b>CALCULATIONS:</b> Refer to <b>LEED Reference Guide for Green Building Design and Construction Version 4</b></p> <p><b>ROOF -</b></p> <p>STEP 1. Determine the total roof surface area</p> <p>STEP 2. Determine the area of roof covered by mechanical equipment, solar energy panels, skylights and appurtenances and deduct from the total roof area</p> <p>STEP 3. Determine whether the areas of qualifying reflective and vegetated roofing are adequate to meet credit requirements</p>


10	SUSTAINABLE SITES (SS)			
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1	<p><b>SSc4</b></p> <p><b>Light Pollution Reduction</b></p> <p><b>INTENT:</b> Increase night sky access, improve nighttime visibility, and reduce the consequences of development for wildlife and people</p> <p><b>SYNERGIES:</b> EAp1; EAac1; MRc1; MRc2; MRc3</p>	<p><b>REQUIREMENTS:</b></p> <p><b>OPTION 1 - Fixture Shielding (1 Point)</b> For exterior light fixtures where the sum of the mean lamp lumens for that fixture exceeds <b>2,500</b>:</p> <ul style="list-style-type: none"> <li>Shield fixtures or change lamp such that they do not directly emit any light at a vertical angle more than 90 degrees from straight down</li> <li>Mean lumen is the average quantity of light output over the life of the lamp found in manufacturers' data sheet <ul style="list-style-type: none"> <li>IE. if a luminaire uses two identical lamps, each with a mean lamp lumen value of 2,500, the sum of mean lamp lumens for the luminaire is 5,000 and it must be shielded or changed out</li> </ul> </li> </ul>  <p>- OR -</p> <p><b>OPTION 2 - Perimeter Measurements (1 Point)</b></p> <ol style="list-style-type: none"> <li>Identify Measurement Points along the project boundary (at least 8 equally spaced at a maximum of 100 feet between points)</li> <li>Take illuminations measurements after civil twilight in the evening or before civil twilight in the morning <ul style="list-style-type: none"> <li>Take once with the building exterior and site lights <b>ON</b></li> <li>Take once with the building exterior and site lights <b>OFF</b></li> </ul> </li> <li>Compare On/Off Light Measurements <ul style="list-style-type: none"> <li>At each measurement point (not average), the lights-on illumination must be no more than 20% above the lights-off illumination.</li> </ul> </li> </ol> <p>• Credit awarded if the project building was certified under the LEED BD+C rating system and earned the Light Pollution Reduction credit</p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>Use shielding device for exterior lights</li> <li>Reduce lamp lumens under mean of 2500</li> <li>Reduce exterior lighting</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <p><b>Option 1:</b></p> <ul style="list-style-type: none"> <li>Fixture schedule showing exterior luminaire and lumen information</li> <li>Luminaire shielding information (e.g., typical detail, manufacturers' technical data sheets, or photographs)</li> </ul> <p><b>Option 2:</b></p> <ul style="list-style-type: none"> <li>Site plan showing project boundary, locations of all measurement points</li> <li>Illumination measurements for each measurement point</li> </ul>	<p><b>REFERENCED STANDARDS:</b> None.</p> <p><b>CALCULATIONS:</b> Refer to LEED Reference Guide for Green Building Design and Construction Version 4</p> <p><b>Option 2:</b> <b>% Increase when lights on =</b>  <math display="block">\left[ \frac{\text{Exterior lights on (fc)}}{\text{Exterior lights off (fc)}} \right] - 1</math></p>


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1	<p><b>SSc5</b></p> <p><b>Site Management</b></p> <p><b>INTENT:</b> Preserve ecological integrity and encourage environmentally sensitive site management practices that provide a clean, well-maintained, and safe building exterior while supporting high-performance building operations and integration into the surrounding landscape</p> <p><b>SYNERGIES:</b> SSp1; SSc1, SSc6, WEc1; MRc1; MRc2; MRc3</p>	<p><b>REQUIREMENTS:</b>  <b>Maintenance equipment</b> - use the <a href="#">USGBC emissions calculator</a> to show compliance  <b>Snow and ice removal</b> - Use <a href="#">no calcium chloride or sodium chloride de-icer</a> or reduce treatment areas by <b>50%</b> of paved surface  <b>Erosion and sedimentation control</b> - identify areas prone to erosion and sedimentation and implement <a href="#">preventative measures (C)</a>  <b>Air Pollution</b> - Prevent air pollution and erosion due to <a href="#">construction materials and activities (C)</a> - <a href="#">construction activity</a>  <b>Organic waste management</b> - <b>100%</b> of plant waste must be composted on/off site or used in a <b>waste-to-energy plant</b>  <b>Fertilizer and herbicide use</b> - test soil every other year for <b>pH and nutrients</b> and use no <b>ammonia</b> or <b>biosolid</b> based fertilizers  <b>Irrigation management</b> - manually or automatically test irrigation system for leaks every <b>two weeks</b> during the operating season  <b>Storage of materials and equipment</b> - Store materials to prevent fuel leakage and ventilate storage areas properly</p> <p><b>- AND -</b></p> <p><b>OPTION 1 - Limited Turf Area (1 Point)</b></p> <ul style="list-style-type: none"> <li>Limit turf to <b>25% or less</b> of the vegetated area - reduces maintenance requirement</li> <li><b>Playgrounds and athletic</b> fields in schools or parks are <b>excluded</b> from this option.</li> </ul> <p><b>- OR -</b></p> <p><b>OPTION 2 - All Manual or Electric-Powered Equipment (1 Point)</b></p> <ul style="list-style-type: none"> <li>No gasoline powered equipment</li> </ul> <p><b>- OR -</b></p> <p><b>OPTION 3 - Reduction in Emissions from site management Equipment (1 Point)</b></p> <p><b>Show and maintain a reduction of:</b></p> <ul style="list-style-type: none"> <li><b>50%</b> reduction in hydrocarbon (HC)</li> <li><b>50%</b> Nitrogen oxide (NO<sub>x</sub>) emissions</li> <li><b>75%</b> reduction in carbon monoxide (CO) emissions <b>from baseline conditions</b></li> </ul> <p><b>Exemplary Performance</b> Not Available.</p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li><b>This is a continuation of SSp1</b> - update the site management policy created in the prerequisite to satisfy this credit</li> <li>Use the performance metrics established in the site management policy as the basis for tracking and documenting all the activities</li> <li>Periodically spot-check equipment</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>Records of de-icer use</li> <li>Erosion and sedimentation prevention logs and photos</li> <li>Air quality protection logs and photos</li> <li>Plant material haul logs</li> <li>Soil test results</li> <li>Fertilizer application logs</li> <li>Biweekly irrigation monitoring logs</li> </ul> <p><b>- AND -</b></p> <p><b>OPTION 1:</b></p> <ul style="list-style-type: none"> <li>Turf area calculations</li> </ul> <p><b>OPTION 2:</b></p> <ul style="list-style-type: none"> <li>Inventory of all current maintenance equipment</li> </ul> <p><b>OPTION 3:</b></p> <ul style="list-style-type: none"> <li>Calculations for equipment emissions baseline and reduction, or equipment emissions reduction calculator results</li> </ul>	<p><b>REFERENCED STANDARDS:</b> None.</p> <p><b>CALCULATIONS:</b> Refer to <a href="#">LEED Reference Guide for Green Building Design and Construction Version 4</a> <b>% turf of total vegetated area =</b> (Turf Area / Total vegetated area) x 100</p>
1	<p><b>SSc6</b></p> <p><b>Site Improvement Plan</b></p> <p><b>INTENT:</b> Preserve and improve ecological integrity while supporting high-performance building operations</p> <p><b>SYNERGIES:</b> SSp1; SSc1; SSc2; SSc5; WEc1</p>	<p><b>REQUIREMENTS:</b>  <b>Develop a five-year site improvement plan that includes the following:</b>  1 - Documentation of <a href="#">existing site conditions</a>;  2 - Site improvement <a href="#">objectives</a>;  3 - <a href="#">Performance standards</a> to evaluate ongoing progress; and  4 - <a href="#">Monitoring</a> protocols</p> <p><b>- AND -</b></p> <p><b>The improvement plan must be developed by professionals and address the following topics</b></p> <p>A - <b>Hydrology</b> - Protection and improvement of water bodies on-site, rainwater management and reuse and potable water-use reduction.  B - <b>Vegetation</b> - Existing vegetation on-site, turf area reduction, management of native and invasive plants, protection of threatened, endangered or unique species.  C - <b>Soils</b> - Documentation of general soil structure, preservation of healthy soils, remediation of compacted soils and identification of previously developed area</p> <ul style="list-style-type: none"> <li><b>Document in the plan how the existing area will be protected.</b></li> </ul> <p><b>- AND -</b></p> <ul style="list-style-type: none"> <li>Show that at least <b>5%</b> of the site is vegetated</li> <li>Develop a new improvement plan and implement all new <b>no-cost and low-cost</b> measures every <b>five years</b>.</li> </ul> <p><b>Exemplary Performance</b> Not Available.</p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li><b>Integrated Team</b> - including landscape designers or maintenance firms, landscape architects, civil engineers, restoration ecologists, and hydrologists working collaboratively</li> <li><b>Site Inventory</b> - Establish and describe the history and current state of all natural site features</li> <li><b>Objectives</b> - IE. increase vegetation, decrease irrigation consumption and restore soils</li> <li><b>Implement Low/No Cost Measure, such as</b> <ul style="list-style-type: none"> <li>Install bracing and plantings to preserve eroding soil</li> <li>Replace 10% of turf area with native plants</li> <li>Convert parking wells into bioswales</li> <li>Remove small parking lot and convert it to green space</li> <li>Vegetate embankment at NW corner of property to prevent runoff</li> <li>Improve rainwater infiltration, collection, and irrigation water reuse pond</li> </ul> </li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>Site plan noting planned elements and measurements</li> <li>Site improvement plan document</li> <li>Qualifications of professional consultants</li> <li>Description and rationale of no-cost and low-cost site improvement measures</li> </ul>	<p><b>REFERENCED STANDARDS:</b> None.</p> <p><b>CALCULATIONS:</b> Refer to <a href="#">LEED Reference Guide for Green Building Design and Construction Version 4</a> <b>% Vegetated Area =</b> (Total vegetated area / Total Site Area) x 100</p>


10		SUSTAINABLE SITES (SS)		
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SCHOOLS ONLY - 1 POINT	<p><b>SSc7</b></p> <p><b>Joint Use of Facilities</b></p> <p><b>INTENT:</b> Integrate the school with the community by sharing the building and its playing fields for non-school events and functions</p> <p><b>SYNERGIES:</b> None.</p>	<p><b>REQUIREMENTS:</b> <b>SCHOOLS ONLY</b></p> <p><b>OPTION 1 - Make Building Space open to the General Public (1 Point)</b></p> <ul style="list-style-type: none"> <li>In collaboration with school authorities ensure <b>3 of the following types of spaces</b> are included and available for <b>shared</b> use: <ul style="list-style-type: none"> <li>1 – Auditorium</li> <li>2 – Gymnasium</li> <li>3 – Cafeteria</li> <li>4 – 1 or more classrooms</li> <li>5 – Playing fields and stadiums</li> <li>6 – Joint parking</li> </ul> </li> <li>Provide access to <b>toilets in joint-use</b> areas after normal school hours</li> </ul> <p><b>- OR -</b></p> <p><b>OPTION 2 - Contract with specific Organizations to share building space (1 Point)</b></p> <ul style="list-style-type: none"> <li>In collaboration with school authorities engage in a <b>contract</b> with community or other organizations to provide at least <b>2 types of dedicated</b> use spaces in the building: <ul style="list-style-type: none"> <li>– Commercial office</li> <li>– Health clinic</li> <li>– Community service centers (state, city or county offices)</li> <li>– Police offices</li> <li>– Library or media center</li> <li>– Parking lot</li> <li>– One or more commercial sector businesses</li> </ul> </li> <li>Provide access to <b>toilets in joint-use</b> areas after normal school hours</li> </ul> <p><b>- OR -</b></p> <p><b>OPTION 3 - Use shared space Owned by Other Organizations (1 Point)</b></p> <ul style="list-style-type: none"> <li>In collaboration with school authorities, ensure that at least <b>2 of the following 6</b> types of spaces that are <b>owned by other organizations/agencies</b> are accessible to students: <ul style="list-style-type: none"> <li>– Auditorium</li> <li>– Gymnasium (or owned pool)</li> <li>– Cafeteria/cafetorium</li> <li>– 1 or more classrooms</li> <li>– Playing fields</li> <li>– Joint parking</li> </ul> </li> <li>Provide direct pedestrian access to these spaces from the school</li> <li>Provide signed agreements with other organizations or agencies stipulating how spaces will be shared</li> </ul> <p><b>EXEMPLARY PERFORMANCE:</b> Not Available.</p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>Check with schools and other organizations to pool money and offer assistance</li> <li>Study security measures to implement</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <p><b>OPTION 1:</b></p> <ul style="list-style-type: none"> <li>Floor plan highlighting joint-use spaces, restroom facilities, and room names</li> <li>Shared use policy describing terms and conditions, and communications to the public</li> </ul> <p><b>OPTION 2:</b></p> <ul style="list-style-type: none"> <li>Floor plan highlighting joint-use spaces, restroom facilities, and room names</li> <li>Signed agreements between school authorities and occupying organization</li> </ul> <p><b>OPTION 3:</b></p> <ul style="list-style-type: none"> <li>Signed agreements stipulating how spaces will be shared with students</li> <li>Site plan showing pedestrian access route and distance from school to joint-use spaces</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>None</li> </ul> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>None</li> </ul>





12		WATER EFFICIENCY (WE)		
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
0	<p><b>WEp1</b></p> <p><b>Indoor Water Use Reduction</b></p> <p>INTENT: Reduce indoor water consumption</p> <p>SYNERGIES: WEp2; WEc4</p>	<p><b>REQUIREMENTS:</b></p> <p><b>OPTION 1: Calculated Water Use</b></p> <ul style="list-style-type: none"> <li>Use <b>less water than the LEED for EBOM water use baseline</b> for the building (calculated using values below) based on The Uniform Plumbing Code and the International Plumbing Code</li> </ul> <p>The baseline is the amount of water used if the project used only code-compliant fixtures and fittings:</p> <p><b>Step 1</b> - Calculate the baseline according to commercial and/or residential baselines</p> <p><b>Commercial Fixtures, Fittings &amp; Appliances:</b></p> <ul style="list-style-type: none"> <li>Water closets (Toilet): <b>1.6 gpf / 6 lpf</b></li> <li>Urinals: <b>1.0 gpf / 3.8 lpf</b></li> <li>Private (restroom) faucets: <b>2.2 gpm @ 60 psi / 8.3 lpm</b> (Duration = 60 seconds)</li> <li>Public (restroom) faucets: <b>0.5 gpm @ 60 psi / 1.9 lpm @ 415 kPa</b> (Duration = 30 seconds)</li> <li>Kitchen sink faucets: <b>2.2 gpm @ 60 psi / 8.3 lpm @ 415 kPa</b> (Duration = 60 seconds)</li> <li>Showerheads: <b>2.5 gpm / 9.5 lpm @ 80 psi</b> per shower stall (Commercial Duration = 300 seconds, Residential Duration = 480 seconds)</li> </ul> <ul style="list-style-type: none"> <li>For a building with a <b>certificate of occupancy dated 1995 or after</b>, the baseline is <b>120% of the baseline water use calculated</b></li> <li>For a building with a <b>certificate of occupancy dated before 1995</b> the baseline is <b>150% of the baseline water use calculated</b></li> <li>Older buildings that have had major renovations to some of the restrooms since 1995 use a prorated baseline</li> </ul> <p><b>Step 2</b> - Calculate Actual fixture and fitting performance and compare with the baseline</p> <p><b>Step 3</b> - If actual consumption exceeds LEED for EBOM baseline - <b>inspect, retrofit and replace fixture/fittings accordingly</b></p> <p><b>Step 4</b> - Implement a fixture and fitting replacement and retrofit policy specifying all new fixtures to be <b>WaterSense</b> labeled</p> <p><b>FOR RETAIL, HOSPITALITY AND SCHOOLS ONLY</b> - Implement a water equipment policy for the following appliances:</p> <p>Residential clothes washer - <b>ENERGY STAR</b> or performance equivalent</p> <p>Commercial clothes washer - <b>CEE Tier 3A</b></p> <p>Residential dishwasher - <b>ENERGY STAR</b> or performance equivalent</p> <p>Prerinse spray valve - <b>consumption ≤1.3 gpm (4.9 lpm)</b></p> <p>Ice machine - <b>ENERGY STAR</b> or performance equivalent, and use either air-cooled or closed-loop cooling</p> <p><b>Definitions:</b></p> <ul style="list-style-type: none"> <li>flush fixtures = toilets, water closets, urinals (gpf - gallons per flush)</li> <li>flow fixtures = faucets, showerheads (gpm - gallons per minute)</li> <li>psi = pounds per square inch</li> </ul> <p><b>- OR -</b></p> <p><b>OPTION 2: Metered Water Use</b></p> <ul style="list-style-type: none"> <li>Meter fixtures and fittings and record metered data for one year to establish a water-use baseline.</li> <li>For projects with at least 80% of fixtures and fittings metered, show that the water-use baseline has been maintained</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>Establish baseline water use</li> <li>Consider rainwater harvesting</li> <li>Consider graywater recycling</li> <li>Use non-water toilets and urinals</li> <li>Based on project occupant usage (sum of FTE- residents and visitors, customers, students etc.)</li> <li>Include both flush &amp; flow fixtures ( water closets, urinals, lavatory faucets, showers, kitchen sink faucets and pre-rinse spray valves)</li> <li>Use non-water toilets and urinals</li> <li>Use flow restrictors and reduced aerators</li> <li>Use automatic sensors</li> <li>Use WaterSense labeled products</li> <li>Some water saving technologies affect energy performance and require commissioning</li> </ul> <p><b>Campus</b> - each individual building must be measured as well</p> <p><b>Note on Occupant Calculations:</b></p> <p>If partially occupied space = Extrapolate calculations</p> <p>If completely Vacant at time of metering = Estimate Occupancy</p> <p>For visitors = USGBC Calculator inherently assumes lower usage</p> <p>If the project has different sets of fixtures for different parts of the building, create a separate table for each subset</p> <p><b>Excluded Water-Using Equipment:</b></p> <ul style="list-style-type: none"> <li>Equipment that use water on materials intended for human consumption, IE. Coffee machines</li> <li>Fixtures regulated by health codes, IE. Medical equipment</li> <li>Process water sinks such as janitor sinks, food service sinks, utility room items etc.</li> <li>Exclude Irrigation</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>Cutsheets, manufacturers' information</li> <li>Indoor water use calculator (except for appliances)</li> <li>Purchasing policy</li> </ul> <p><b>In the calculator teams will enter:</b></p> <p>Type of fixture</p> <p>Flush or flow rate</p> <p>Manufacturer and model</p> <p>Percentage of occupants using the fixture.</p>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>The Energy Policy Act (EPA) of 1992 (and as amended)</li> <li>The Energy Policy Act (EPA) of 2005</li> <li>International Association of Plumbing and Mechanical Officials Publication/American National Standards Institute IAPMO/ANSI UPC 1-2006, Uniform Plumbing Code 206, Section 402.0, Water Conserving Fixtures and Fittings</li> <li>International Code Council, International Plumbing Code 2006, Section 604, Design of Building Water Distribution System</li> <li>ENERGY STAR: energystar.gov</li> <li>Consortium for Energy Efficiency: cee1.org</li> <li>WaterSense: epa.gov/watersense</li> <li>IgCC/ASHRAE 189.1 – cooling tower and evaporative condenser requirements:</li> </ul> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>Refer to LEED Reference Guide for Green Building Design and Construction, version 4 Edition</li> <li>Calculate FTE and usage based on women &amp; men at 3 uses per day; split FTE 50% women &amp; 50% men</li> </ul> <p><b>Daily water use for each fixture type</b> = fixture flush or flow rate x duration of use x Users x Uses per person per day</p> <ul style="list-style-type: none"> <li>Calculate baseline case using baseline fixture rates</li> <li>water closets = 1.6 gpf</li> <li>Urinals = 1.0 gpf</li> <li>lavatory and sink faucets = 2.2 gpm</li> <li>showerheads = 2.5 gpm</li> <li>Calculate design case using water efficient fixture rates</li> <li>Calculate % reduction = 1 - (design case / baseline case)</li> </ul>
0	<p><b>WEp2</b></p> <p><b>Building-Level Water Metering</b></p> <p>INTENT: Support water management and identify opportunities for additional water savings by tracking water consumption</p> <p>SYNERGIES: WEp1; WEc4; EAp3</p>	<p><b>REQUIREMENTS:</b></p> <ul style="list-style-type: none"> <li>Have permanently installed water meters that measure the <b>total potable water use</b> for the building and grounds</li> <li>Record meter data on a <b>monthly</b> basis</li> <li>Commit to <b>sharing with USGBC</b> the resulting for a <b>five-year period</b> beginning on the date the project accepts LEED certification or typical occupancy, whichever comes first.</li> </ul> <p><b>Submit through:</b></p> <ul style="list-style-type: none"> <li>A third party data source</li> <li>ENERGY STAR's Portfolio Manager</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>Identify all sources of water including: <ul style="list-style-type: none"> <li>Public water supply</li> <li>On-site well</li> <li>On-site potable water treatment system</li> </ul> </li> <li>If all water comes from a public water supply and the utility's water meter provides monthly consumption data, that system's meter meets the prerequisite requirements</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>Meter declaration</li> <li>Sharing commitment</li> <li>Consumption data</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>None</li> </ul> <p><b>DEFINITIONS:</b></p> <ul style="list-style-type: none"> <li><b>Potable water</b> is water that meets or exceeds U.S. Environmental Protection Agency drinking water quality standards</li> <li><b>Private meter</b> is a device that measures water flow and is installed downstream from the public water supply meter</li> <li><b>Public water supply (PWS)</b> must be considered public, such system must have at least 15 service connections or regularly serve at least 25 individuals</li> </ul>


12		WATER EFFICIENCY (WE)			
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS	
1 2	<p><b>WEc1</b></p> <p><b>Outdoor Water Use Reduction</b></p> <p>INTENT: Reduce outdoor water consumption.</p> <p>SYNERGIES: WEp1; WEp2; WEc3; WEc4;</p>	<p><b>REQUIREMENTS:</b> <b>OPTION 1: No Irrigation Required (2 points)</b></p> <ul style="list-style-type: none"> <li>Show that the landscape does not require irrigation beyond a <b>maximum two-year</b> plant establishment period (Write a narrative) <ul style="list-style-type: none"> <li>The original baseline can be used for 10 years. To promote continued improvement after 10 years the baseline must be reset</li> </ul> </li> </ul> <p><b>- OR -</b></p> <p><b>OPTION 2: NO Irrigation Meter Installed - Calculated Water Budget (1-2 points)</b></p> <p><b>Step 1</b> - Use <b>WaterSense Water Budget Tool</b> to calculate <b>water use as a percentage of total irrigation and peak month irrigation</b></p> <ul style="list-style-type: none"> <li>The factors used to calculate LWR are <b>plant type, plant density, and the irrigation needs.</b></li> </ul> <p><b>Step 2</b> - Adjust landscape water requirement (LWR) to exclude <b>alternative water quantity (volume/month) if non-potable water</b></p> <p><b>Step 3</b> - Adjust landscape water requirement (LWR) to account for <b>WaterSense smart-sensor technology (15% reduction)</b></p> <p><b>Step 4 - Install irrigation water meters</b></p> <p><b>OPTION 3 - Irrigation Meter Installed (1-2 points)</b></p> <p><b>Step 1</b> - Establish the baseline irrigation water usage by taking the annual average of at least <b>3 years of consecutive data from the past 5</b></p> <p><b>Step 2</b> - Analyze and implement water saving systems, technology or select alternative water sources</p> <p><b>Step 3</b> - Measure water for <b>12 months</b> during performance period and <b>compare it to the Step 1 Baseline</b></p> <p><b>OPTION 2 and OPTION 3 Point System</b></p> <p><b>30%</b> reduction from baseline = <b>1 point</b></p> <p><b>40%</b> reduction from baseline = <b>2 points</b></p> <p><b>Exemplary Performance:</b> <b>Not Available.</b></p> <ul style="list-style-type: none"> <li>The original baseline can be used for <b>10 years</b>. To promote continued improvement after <b>10 years the baseline must be reset</b></li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>Rainwater Harvesting</li> <li>Plan &amp; design site considering water use <ul style="list-style-type: none"> <li>Plan water use zones</li> <li>Consider shading &amp; heat island reduction</li> </ul> </li> <li>Limit use of turf grass for functional benefits (i.e. recreation)</li> <li>Analyze soil &amp; amend accordingly for appropriate plant material</li> <li>Consider native or adaptive plants to reduce or eliminate irrigation <ul style="list-style-type: none"> <li>Consider mature size, form &amp; growth rates</li> <li>Avoid monocultures (single species) or excessive number of species</li> <li>Select species requiring little or no fertilization</li> <li>Consider species for integrated pest management</li> </ul> </li> <li>Effective &amp; efficient irrigation &amp; controls <ul style="list-style-type: none"> <li>Consider drip &amp; subsurface irrigation &amp; smart irrigation controls (computer, satellite, sensors)</li> <li>Keep water away from buildings &amp; air intakes</li> </ul> </li> <li>Mulch landscaped areas <ul style="list-style-type: none"> <li>Conserves moisture</li> </ul> </li> <li>Athletic fields and playgrounds (if vegetated) and food gardens may be included or excluded at the project team's discretion <ul style="list-style-type: none"> <li>If a portion of the site is xeriscaped and the other is not =</li> <li>Make two separate calculations, one for the irrigation section and one for the unirrigated area</li> </ul> </li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <p><b>OPTION 1:</b></p> <ul style="list-style-type: none"> <li>Site plan showing vegetated areas</li> <li>Narrative for plant species and water requirements</li> </ul> <p><b>OPTION 2:</b></p> <ul style="list-style-type: none"> <li>Site Plan showing location and size of landscape zones</li> <li>Water Budget Tool report</li> </ul>	<p><b>REFERENCED TOOLS:</b></p> <ul style="list-style-type: none"> <li>EPA's <b>WaterSense</b> website includes this reference for native vegetation in various parts of the U.S.: epa.gov/watersense/outdoor/what_to_plant.html. <ul style="list-style-type: none"> <li>Use the <b>WaterSense Water Budget Data Finder</b> to estimate the <b>evapotranspiration rate (ET<sub>o</sub>)</b> in inches per month for the critical month of the year, based on a project's zip code</li> <li><b>WaterSense Water Budget Tool</b> calculates a baseline landscape water requirement of a typical landscape</li> </ul> </li> </ul> <p><b>CALCULATIONS:</b> Refer to LEED Reference Guide for Operations and Maintenance, version 4 Edition - <b>PAGE 160</b></p> <ul style="list-style-type: none"> <li>Create baseline case</li> <li>Create design case</li> <li>Calculate % reduction in total irrigation water use</li> </ul> <ul style="list-style-type: none"> <li>Rainwater Harvesting <b>Amount available</b> = Roof area * 0.6 * Average inches of rain per month</li> </ul> <p><b>DEFINITIONS:</b> <b>evapotranspiration</b> is the combination of evaporation and plant transpiration into the atmosphere. Evaporation occurs when liquid water from soil, plant surfaces, or water bodies becomes vapor. Transpiration is the movement of water through a plant and the subsequent loss of water vapor.</p>	
1 5	<p><b>WEc2</b></p> <p><b>Indoor Water Use Reduction</b></p> <p>INTENT: Reduce indoor water consumption</p> <p>SYNERGIES: WEp1; WEp2; WEc4</p>	<p><b>REQUIREMENTS:</b> <b>OPTION 1: Calculated Water Use (1-5 Points)</b></p> <ul style="list-style-type: none"> <li>Use <b>less water than the LEED for EBOM water use baseline</b> for the building (calculated using values below) based on The Uniform Plumbing Code and International Plumbing Code</li> </ul> <p><b>Additional Percentage Reduction is rewarded as follows:</b></p> <p><b>10%</b> reduction from baseline = <b>1 point</b></p> <p><b>15%</b> reduction from baseline = <b>2 points</b></p> <p><b>20%</b> reduction from baseline = <b>3 points</b></p> <p><b>25%</b> reduction from baseline = <b>4 points</b></p> <p><b>30%</b> reduction from baseline = <b>5 points</b></p> <p><b>35%</b> reduction from baseline = <b>EP</b></p> <ul style="list-style-type: none"> <li>Demonstrate that all purchases made since the end of the performance period meet the design performance requirements</li> </ul> <p><b>- OR -</b></p> <p><b>OPTION 2: Metered Water Use</b></p> <ul style="list-style-type: none"> <li>Meter fixtures and fittings and record metered data for one year to establish a water-use baseline.</li> <li>For projects with at least 80% of fixtures and fittings metered, show that the water-use baseline has been maintained</li> </ul> <p><b>&lt;5%</b> reduction from baseline = <b>1 point</b></p> <p><b>5%</b> reduction from baseline = <b>2 points</b></p> <p><b>10%</b> reduction from baseline = <b>3 points</b></p> <p><b>15%</b> reduction from baseline = <b>4 points</b></p> <p><b>20%</b> reduction from baseline = <b>5 points</b></p> <p><b>25%</b> reduction from baseline = <b>EP</b></p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b> See WEp1 above</p> <p><b>Excluded Water-Using Equipment:</b> See WEp1 above</p> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>Meter data</li> <li>Indoor water use calculator</li> <li>Alternative water source calculations (if applicable)</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>The Energy Policy Act (EPAAct) of 1992 (and as amended)</li> <li>The Energy Policy Act (EPAAct) of 2005</li> <li>International Association of Plumbing and Mechanical Officials Publication/American National Standards Institute IAPMO/ANSI UPC 1-2006, Uniform Plumbing Code 206, Section 402.0, Water Conserving Fixtures and Fittings</li> <li>International Code Council, International Plumbing Code 2006, Section 604, Design of Building Water Distribution System</li> <li>ENERGY STAR: energystar.gov</li> <li>Consortium for Energy Efficiency: cee1.org</li> <li>WaterSense: epa.gov/watersense</li> <li>IgCC/ASHRAE 189.1 – cooling tower and evaporative condenser requirements:</li> </ul> <p><b>CALCULATIONS:</b> Refer to LEED Reference Guide for Green Building Design and Construction, version 4 Edition See WEp1 above</p>	


12		WATER EFFICIENCY (WE)			
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3	<p><b>WEc3</b></p> <p><b>Cooling Tower Water Use</b></p> <p><b>INTENT:</b> Conserve water used for cooling tower makeup while controlling microbes, corrosion, and scale in the condenser water system</p> <p><b>SYNERGIES:</b> WEp1; WEc4</p>	<p><b>REQUIREMENTS:</b> <b>FOR 2 POINTS MAINTAIN THE MAXIMUM LEVEL OF CONTAMINANTS:</b></p> <ul style="list-style-type: none"> <li>• Conduct a potable makeup water analysis within five years of submission for certification which measure 5+ parameters: <ul style="list-style-type: none"> <li>Ca (as CaCO<sub>3</sub>) &lt; 1,000 ppm</li> <li>Total alkalinity &lt; 1,000 ppm</li> <li>SiO<sub>2</sub> &lt; 100 ppm</li> <li>Cl<sup>-</sup> &lt; 250 ppm</li> <li>Conductivity &lt; 2000 µS/cm</li> </ul> </li> <li>• Calculate the number of cooling tower cycles by dividing the maximum allowed concentration level of each parameter by the actual concentration level of each parameter found in the potable makeup water. <ul style="list-style-type: none"> <li>- This is the water that can circulate through the system without creating performance or operational problems</li> </ul> </li> </ul> <p><b>FOR 1 EXTRA POINT use further treatment or non-potable water as makeup water:</b></p> <ul style="list-style-type: none"> <li>• Achieve a <b>minimum 10 cycles</b> by increasing the level of treatment or</li> <li>• Use a minimum <b>20% recycled nonpotable water</b></li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• <b>Reduce cycles of concentration</b> Cycles of concentration are the number of times that a volume of water can circulate through a cooling tower system before dissolved minerals become so concentrated</li> <li>• <b>Selecting Nonpotable Sources</b> (minimize dissolved contaminants) <ul style="list-style-type: none"> <li>- Air-conditioner condensate</li> <li>- Rainwater</li> <li>- Steam system condensate</li> <li>- Food steamer discharge water</li> <li>- Fire pump test water</li> <li>- Ice machine condensate</li> </ul> </li> <li>• Blending Water - always <b>test</b> the water first to see what dissolved solids exist</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Potable water analysis results</li> <li>• Potable water analysis narrative</li> <li>• Cycles of concentration calculations</li> <li>• System performance narrative</li> </ul> <p><b>Additionally for 3 points:</b></p> <ul style="list-style-type: none"> <li>• Nonpotable water calculations</li> <li>• Water treatment calculations</li> </ul>	<p><b>REFERENCED STANDARDS:</b> None.</p> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>• Refer to LEED Reference Guide for Green Building Design and Construction, version 4 Edition</li> </ul> <p><b>Cycles of concentration =</b> <u>Acceptable maximum concentrations in condenser water /</u> Parameter concentrations in makeup water</p> <p><b>DEFINITIONS:</b> <b>Blowdown</b> - the removal of makeup water from a cooling tower or evaporative condenser recirculation system to reduce concentrations of dissolved solids</p> <p><b>Makeup Water</b> - water that is fed into a cooling tower system or evaporative condenser to replace water lost through evaporation, drift, bleed-off, or other causes</p>	
1 2	<p><b>WEc4</b></p> <p><b>Water Metering</b></p> <p><b>INTENT:</b> Support water management and identify opportunities for additional water savings by tracking water consumption</p> <p><b>SYNERGIES:</b> WEC1; WEC2</p>	<p><b>REQUIREMENTS:</b> <b>Permanently install meters:</b></p> <ul style="list-style-type: none"> <li>2 water subsystems = <b>1 point</b></li> <li>4+ water subsystems = <b>2 points</b></li> </ul> <p><b>Subsystems include:</b></p> <ol style="list-style-type: none"> <li>1 - Irrigation water serving <b>80%+</b> of irrigated landscape area</li> <li>2 - <b>Indoor plumbing fixtures and fittings</b> serving at least <b>80%+</b> in WEp1</li> <li>3 - <b>Cooling Towers</b></li> <li>4 - <b>Domestic hot water</b> (<b>80%+</b> of the installed capacity)</li> <li>5 - <b>Reclaimed water</b></li> <li>6 - <b>Other Process water</b> - <b>80%+</b> of other process water end uses such as: <ul style="list-style-type: none"> <li>- Humidification systems</li> <li>- Dishwashers</li> <li>- Clothes washers</li> <li>- Pools</li> </ul> </li> </ol> <ul style="list-style-type: none"> <li>• All meters must be recorded at least <b>weekly</b></li> <li>• Commit to sharing with USGBC the resulting water usage data for a five-year period</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b> Primary factors to consider:</p> <ul style="list-style-type: none"> <li>• The most expensive systems to operate</li> <li>• The systems that most closely align with the goals of building management</li> <li>• The highest water consumers</li> </ul> <p><b>Excluded Water-Using Equipment:</b> See WEp1 above</p> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Water metering strategy narrative</li> <li>• Weekly meter log</li> <li>• Monthly and annual summaries of meter data</li> </ul>	<p><b>REFERENCED STANDARDS:</b> None.</p> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>• Refer to LEED Reference Guide for Green Building Design and Construction, version 4 Edition</li> </ul> <p>Amount Required to be metered / Total usage &gt; 0.8</p> <p><b>DEFINITION:</b> <b>External Meter</b> - a device installed on the outside of a water pipe to record the volume of water passing through it. AKA a clamp-on meter</p>	

38		ENERGY and ATMOSPHERE (EA)		
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
0	<p><b>EAp1</b></p> <p><b>Energy Efficiency Best Management Practices</b></p> <p><b>INTENT:</b> Promote continuity of information to ensure that energy-efficient operating strategies are maintained and provide a foundation for training and system analysis</p> <p><b>SYNERGIES:</b> EAp1; EAc1; EAc2; EAc3; EAc6;</p>	<p><b>REQUIREMENTS:</b></p> <p><b>Step 1 - Conduct an energy audit that meets both the requirements of the:</b></p> <p>1 - ASHRAE preliminary energy use analysis and</p> <ul style="list-style-type: none"> <li>- Establish target indices related to energy and cost reduction goals with the owner and operating staff</li> <li>- Determine the approximate breakdown of energy use for major end-use categories</li> </ul> <p>• If it is not ENERGY STAR eligible - <b>CBECs values or Labs21</b> can be used if building-specific information cannot be obtained.</p> <p><b>Step 2 - ASHRAE Level 1 walk-through assessment identified in the ASHRAE Procedures for Commercial Building Energy Audits</b></p> <p><b>ASHRAE Level 1 energy audit must include:</b></p> <ul style="list-style-type: none"> <li>• Collect <b>1-3 years</b> of utility bills - comparison of project building with similar building types</li> <li>• current energy cost index, energy demand index, energy use <b>index</b>, and reduction goals</li> <li>• Energy use breakdown by <b>major system types or end uses</b></li> <li>• financial assessment (e.g., return on investment, payback) and maintenance implications of no-cost and low-cost improvement opportunities</li> <li>• Assessments done within the past five years preceding the application submittal do not have to repeat the assessment, but any changes must be noted.</li> </ul> <p><b>Step 3 - Prepare and maintain a current facilities requirements and operations and maintenance plan which includes:</b></p> <ul style="list-style-type: none"> <li>• a current sequence of operations for the building;</li> <li>• the building occupancy schedule;</li> <li>• equipment run-time schedules;</li> <li>• set points for all <b>HVAC</b> equipment;</li> <li>• set points for lighting levels throughout the building;</li> <li>• minimum outside air requirements;</li> <li>• any changes in schedules or setpoints for different seasons, days of the week, and times of day;</li> <li>• a systems narrative describing the mechanical and electrical systems and equipment in the building - helps document the outdoor air requirement as well</li> <li>• a preventive maintenance plan for building equipment described in the systems narrative.</li> <li>• If building already has an ENERGY STAR rating, have its energy usage stamped by a professional</li> <li>• Serves as the maintenance plan for ventilation and other systems</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• The ASHRAE Level 1 Energy Audit Team should include the following members: <ul style="list-style-type: none"> <li>• Owner, general manager or property manager, Building engineering staff, Energy auditor</li> <li>• Audit option is more appropriate for major building upgrades</li> <li>• can be used to determine which end-uses to <b>submeter</b></li> <li>• Helps find <b>low/no cost items</b></li> </ul> </li> <li>• Collect at least one but ideally three years of utility bills.</li> <li>• Examine average and peak utility costs.</li> <li>• Develop an energy cost index, energy demand index, and energy use index</li> <li>• Consider in-house staff vs third-party energy auditor</li> <li>• Consider <b>performance period and operating schedule</b></li> <li>• Consider use of <b>ENERGY STAR portfolio manager</b> if eligible</li> <li>• List of <b>no-cost and low-cost improvement opportunities</b> could include: <ul style="list-style-type: none"> <li>- Modify fan controls</li> <li>- Add pipe insulation</li> <li>- Install LEDs on all exit signs</li> <li>- Chiller maintenance</li> <li>- Install light occupancy sensors in mechanical rooms and lobby</li> <li>- AHU sensor calibration issues, damper, economizer cycle issues</li> <li>- Adjust tenant lighting controls</li> </ul> </li> <li>• If audit was conducted in the last 5 years = no need to conduct another one</li> <li>• <b>Energy Audits include:</b> <ul style="list-style-type: none"> <li>- Energy Conservation Measures (ECMs)</li> <li>- Potential Facility Improvements</li> </ul> </li> <li>• Whereas <b>Commissioning</b> includes: <ul style="list-style-type: none"> <li>- Changes needed</li> <li>- Deficiencies</li> </ul> </li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Summary of ASHRAE preliminary energy use analysis</li> <li>• Summary of results of ASHRAE Level 1 walk-through</li> <li>• Current facility requirements and operations and maintenance plan</li> </ul>	<p><b>REFERENCED STANDARDS:</b> ASHRAE Procedures for Commercial Building Energy Audits, 2nd edition</p> <p><b>CALCULATIONS:</b> • None</p> <p><b>DEFINITIONS:</b></p> <p><b>Owners project requirements (OPR)</b> - the functional requirements as well as the expectations of the building's use and operation including:</p> <ul style="list-style-type: none"> <li>• Key project requirements</li> <li>• Occupant requirements</li> <li>• Budget considerations and limitations</li> <li>• Target goals</li> <li>• Performance criteria</li> <li>• Operations and maintenance requirements</li> </ul> <p><b>Basis of Design (BoD)</b> - how the construction and other details will execute the OPR including:</p> <ul style="list-style-type: none"> <li>• Systems and assemblies</li> <li>• Performance criteria and assumptions</li> <li>• Descriptions</li> <li>• Governing codes and standards</li> <li>• Owner directives</li> <li>• Design development guidelines.</li> <li>• Revision history</li> </ul> <p><b>Current Facilities Requirements (CFR)</b> Includes</p> <ul style="list-style-type: none"> <li>• Operational space requirements - Cleaning schedules + Lighting levels</li> <li>• Functional space requirements - Building functions by space</li> <li>• Building drawings</li> </ul> <p><b>Operations and Maintenance (O&amp;M) plan</b> - a plan that specifies major system operating parameters and limits, maintenance procedures and schedules, and documentation methods necessary to demonstrate proper building efficiency and operation, including:</p> <ul style="list-style-type: none"> <li>• A systems narrative - include system specific set points, flows and capacities, which would help with IAQ.</li> <li>• Minimum outside air requirements, process equipment and sequence of operations</li> </ul>


38		ENERGY and ATMOSPHERE (EA)		
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0	<p><b>EAp2</b></p> <p><b>Minimum Energy Performance</b></p> <p>INTENT: Reduce the environmental and economic harms associated with excessive energy use by establishing a minimum level of operating energy performance</p> <p>SYNERGIES: EAp1; EAac1; EAac4;</p>	<p><b>REQUIREMENTS:</b></p> <p><b>Step 1</b> - Calibrate energy meters or locate meters owned by a third party (IE. The Government or utilities)</p> <p><b>Step 2</b> - Meter the building's energy usage for <b>12 continuous months of operation</b> and comply with one of the following options:</p> <p><b>Case 1 - EPA's ENERGY STAR Rating - achieve an energy performance rating of 75+</b></p> <p><b>Streamlined submittal requirements:</b></p> <ul style="list-style-type: none"> <li>- Meter calibration report, as applicable</li> <li>- Access to ENERGY STAR Portfolio Manager account</li> <li>- Statement of energy performance stamped by a professional engineer or licensed architect</li> <li>- Letter from ENERGY STAR, copy of ENERGY STAR recognition certificate, or screenshot of ENERGY STAR website</li> </ul> <p>If score is available <b>but falls short</b> = determine the areas of greatest opportunity to improve performance</p> <p><b>Case 2 - Projects not eligible for ENERGY STAR rating</b> - compare with national averages, actual similar buildings or historical data</p> <p><b>OPTION 1 - Benchmark Against Typical Buildings</b></p> <ul style="list-style-type: none"> <li>• <b>Path 1 - National Average Data Available</b> <ul style="list-style-type: none"> <li>- Use ENERGY STAR'S Portfolio Manager tool to benchmark against the national source energy data</li> <li>- Demonstrate energy efficiency performance that is <b>25%</b> better than the median energy performance</li> </ul> </li> <li>• <b>Path 2 - National Average Data Not Available</b> <ul style="list-style-type: none"> <li>- Demonstrate a <b>25%</b> improvement against <b>3+ similar buildings</b>, normalized for climate, building use, and occupancy</li> </ul> </li> </ul> <p><b>OPTION 2 - Benchmark Against Historical Data</b></p> <ul style="list-style-type: none"> <li>- Demonstrate a <b>25%</b> improvement against 3 contiguous years of data out of 5, normalized for climate, building use and occupancy</li> </ul> <p><b>Update Building Benchmarking Data Routinely</b></p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Design building envelope, HVAC, lighting &amp; other systems to maximize performance</li> <li>• Use the results of the energy audit performed for EA Prerequisite Energy Efficiency Best Management Practices to determine the areas of greatest opportunity</li> <li>• <b>Demand reductions</b> includes reducing internal loads through shell and lighting improvements and setting operating schedules appropriately. Demand reduction involves no- or low-cost measures and is typically considered first.</li> <li>• <b>Harvesting site energy</b> includes using free resources, such as daylight, ventilation cooling, solar heating, solar power, and wind energy, to satisfy needs for space conditioning, service water heating, and power generation.</li> <li>• <b>Increasing efficiency</b> can be accomplished with more efficient envelope, lighting, and HVAC systems and by appropriately sizing HVAC systems. More efficient systems reduce energy demand and energy use.</li> <li>• <b>Recovering waste energy</b> can be accomplished through exhaust air energy recovery systems, graywater heat recovery systems, and cogeneration.</li> <li>• <b>Exclusion</b> - Up to 10% of the floor area and its associated energy consumption may be excluded from this prerequisite if it does not support the typical operations of the building.</li> <li>• The walk-through performed for EA Prerequisite Minimum Energy Performance can be used to determine which end-uses to submeter</li> <li>• <b>Parking garages</b> = special energy star portfolio manager entry</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Determine Option used</li> <li>• Determine climate zone for project location</li> <li>• Calculate energy use by type</li> <li>• Maintain list of energy uses for project bldg. (baseline &amp; design cases)</li> <li>• If using computer energy simulation, retain final report</li> <li>• If using prescriptive paths, assemble documentation</li> <li>• Narrative(s) for any special circumstances</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• Environmental Protection Agency (EPA) ENERGY STAR Portfolio Manager tool: energystar.gov/benchmark</li> <li>• ASHRAE Standard 90.1-2010, Appendices B and D: ashrae.org</li> </ul> <p><b>CALCULATIONS:</b> None.</p> <p><b>DEFINITIONS:</b></p> <p><b>District Energy System (DES)</b> - a central energy conversion plant and transmission and distribution system that provides thermal energy to a group of buildings</p> <p><b>Downstream Equipment</b> - the heating and cooling systems, equipment, and controls located in the project building or on the project site and associated with <b>transporting the thermal energy</b></p> <p><b>Upstream Equipment</b> - a heating or cooling system or control associated with the district energy system (DES) but not part of the thermal connection</p>
0	<p><b>EAp3</b></p> <p><b>Building-Level Energy Metering</b></p> <p>INTENT: Support energy management and identify opportunities for additional energy savings by tracking building-level energy use</p> <p>SYNERGIES: EAp1; EAp2; EAac5</p>	<p><b>REQUIREMENTS:</b></p> <p><b>Step 1 - identify all sources of energy delivered to the building, including:</b></p> <ul style="list-style-type: none"> <li>• <b>Electricity</b></li> <li>• Gas - natural gas, synthetic natural gas, propane, fuel oil, diesel fuel, other fossil fuels</li> <li>• Biofuels</li> <li>• District chilled water, steam, and hot water</li> </ul> <p><b>Step 2 - Ensure that you have access to utility meters that monitor monthly consumption or install privately</b></p> <p><b>Step 3 - Identify the location of permanent primary building-level meters for each energy source</b> (if utility meters do not meet)</p> <p><b>Step 4 - Track Energy Consumption and share with the USGBC using approved template</b></p> <ul style="list-style-type: none"> <li>• Track energy usage monthly <b>12+ months</b> prior to the final day of the O+M Performance period</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Ensure meter selection conforms to a standard or local law/regulation for revenue-grade metering</li> <li>• Ensure meter is located at the point where energy enters the building</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Confirmation of permanently installed meters</li> <li>• Letter of commitment</li> <li>• Confirmation of data sharing source</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• Electricity: American National Standards Institute, ANSI C12.20, Class 0.2 (±0.2): ansi.org</li> <li>• Natural gas: American National Standards Institute, ANSI B109: ansi.org</li> <li>• Thermal energy (Btu meter or heat meter), EN Standard, EN-1434: cen.eu</li> </ul> <p><b>CALCULATIONS:</b> None.</p> <p><b>DEFINITIONS:</b></p> <p><b>Revenue-grade meter</b> is a measurement tool designed to meet strict accuracy standards required by code or law. <b>Utility meters are often called revenue grade</b> because their measurement directly results in a charge to the customer.</p>


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0	<p><b>EAp4</b></p> <p><b>Fundamental Refrigerant Management</b></p> <p>INTENT: Reduce stratospheric ozone depletion</p> <p>SYNERGIES: EAc4; EAc8</p>	<p><b>REQUIREMENTS:</b></p> <ul style="list-style-type: none"> <li>• <b>ZERO</b> use of chlorofluorocarbons (CFC) based refrigerants in new base building HVAC&amp;R ( heating, ventilating, air-conditioning, and refrigeration) systems</li> <li>• <b>Phase out</b> existing CFC-based refrigerants within <b>10 years</b> <ul style="list-style-type: none"> <li>– If third party audit deems replacement of CFCs are not economically feasible, then <ul style="list-style-type: none"> <li>• Reduce annual leakage to <b>5% or less</b> (EPA Clean Air Act, Title VI, Rule 608)</li> <li>• reduce the total leakage over the remaining life of the unit to less than <b>30% of its refrigerant charge</b></li> </ul> </li> </ul> </li> </ul> <p><b>Refrigerant Charge = pounds of refrigerant / ton of cooling capacity</b></p> <ul style="list-style-type: none"> <li>• Existing small HVAC units (defined as containing less than 0.5 pounds (0.23 kg) of refrigerant) and other equipment such as standard refrigerators and water coolers and any other equipment that contains less than 0.5 pounds (0.23 kg) <b>ARE EXEMPT</b></li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• When reusing existing HVAC systems, or served by existing central plant: <ul style="list-style-type: none"> <li>– Replace or retrofit any CFC based refrigerants in HVAC&amp;R equipment &amp; fire suppressant systems in the base buildings</li> <li>– If building is connected to existing chilled water system, it must be CFC-free or have planned phase out within 5 years.</li> <li>– Consider replacing CFCs with HCFCs</li> <li>– Choose refrigerants with short environmental Lifetimes, small ozone depleting potential &amp; small global warming potential values</li> <li>- HCFCs have less GWP than HFC but more ODP</li> </ul> </li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Equipment, Refrigerant and Installation Type</li> <li>• Narrative describing CFC phase out plan, if applicable</li> <li>– Include dates &amp; refrigerant quantities as % of overall equipment</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• U.S. EPA Clean Air Act, Title VI, Section 608, Compliance with the Section 608 Refrigerant Recycling Rule</li> </ul> <p><b>DEFINITIONS:</b></p> <p><b>chlorofluorocarbon (CFC)-based refrigerant IS</b> a fluid, containing hydrocarbons, that absorbs heat from a reservoir at low temperatures and rejects heat at higher temperatures. When emitted into the atmosphere, CFCs cause depletion of the stratospheric ozone layer</p>
2	<p><b>EAc1</b></p> <p><b>Existing Building commissioning—analysis</b></p> <p>INTENT: Use the existing building commissioning process to improve building operations, energy, and resource efficiency</p> <p>SYNERGIES: EAp1; EAp2; EAc2; EAc4</p>	<p><b>REQUIREMENTS:</b></p> <p><b>OPTION 1 - Existing Building Commissioning Plan</b> to analyze and include the following systems:</p> <ul style="list-style-type: none"> <li>· updated <b>current facilities requirements (from prerequisite)</b>;</li> <li>· the commissioning team <b>members and their roles and responsibilities</b> during the commissioning process;</li> <li>· a description of the <b>approach</b> for identifying and analyzing <b>facility improvement opportunities</b>;</li> <li>· the process for <b>reviewing and prioritizing</b> identified opportunities with the owner and developing an implementation plan;</li> <li>· the format and content of the <b>eventual deliverables</b> from the commissioning process; and</li> <li>· the proposed <b>schedule</b></li> </ul> <p>Apply the requirements to all direct <b>energy-consuming or energy-producing systems</b>, including lighting, process loads, HVAC&amp;R, domestic water heating, and renewable energy</p> <ul style="list-style-type: none"> <li>• <b>Update and execute the existing building commissioning plan</b></li> </ul> <p><b>OPTION 2 - Energy Audit</b> which follows the requirements of <b>ASHRAE Level 2, Energy Survey and Analysis</b> + includes</p> <ul style="list-style-type: none"> <li>· the audit team members and their <b>roles and responsibilities</b> during the audit process;</li> <li>· a description of the approach for identifying and analyzing facility <b>improvement opportunities</b>;</li> <li>· the process for <b>reviewing and prioritizing</b> identified opportunities with the owner and developing an implementation plan;</li> <li>· the format and content of the <b>eventual deliverables</b> from the audit process; and</li> <li>· the proposed <b>schedule</b></li> </ul> <ul style="list-style-type: none"> <li>• <b>For each opportunity, describe the potential improvement, estimated implementation costs, and anticipated savings</b></li> <li>• <b>Level II audits are more appropriate for major upgrades to mechanical systems</b></li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• The choice between existing building commissioning (<b>Better for newer buildings</b>) and the ASHRAE Level 2 audit (<b>Better for older buildings</b>) depends on the owner's desired outcome</li> <li>• Deciding between in-house staff or third party to conduct audit / commissioning</li> <li>• In-house audit review - ASHRAE Procedures for Commercial Building Energy Audits</li> <li>• Identify and temporarily meter all energy using systems including: <ul style="list-style-type: none"> <li>- space heating/cooling</li> <li>- lighting</li> <li>- pumps/fans</li> <li>- Domestic Hot Water Systems</li> </ul> </li> <li>• The usage of an energy model</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <p><b>Option 1 ONLY:</b></p> <ul style="list-style-type: none"> <li>• Existing building commissioning plan</li> <li>• List of issues found and planned resolution</li> <li>• Updated CFR</li> </ul> <p><b>Option 2 ONLY:</b></p> <ul style="list-style-type: none"> <li>• Level 2 energy audit plan</li> <li>• Confirmation that significant upgrades and revisions have been added to CFR and O&amp;M plan</li> </ul> <p><b>Option 1 AND 2 :</b></p> <p>Team members, roles, responsibilities, Schedule, Energy use breakdown and planned improvements</p>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• ASHRAE Procedures for Commercial Building Energy Audits, 2nd edition</li> </ul> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>• None</li> </ul> <p><b>DEFINITIONS:</b></p> <p><b>Commissioning (Cx)</b> - the process of verifying and documenting that a building and all of its systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the owner's project requirements</p> <p>• <b>District Energy Systems (DES) note</b> - All upstream equipment which the building is taking credit for efficiency under EAc4 must follow this credit's requirements</p>


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2	<p><b>EAc2</b></p> <p><b>Existing Building Commissioning—Implementation</b></p> <p><b>INTENT:</b> Use the existing building commissioning process to improve building operations, energy, and resource efficiency. Implement the energy conservation measures (ECMs) (from the energy audit) or an issues log (from commissioning)</p> <p><b>SYNERGIES:</b> EAp2; EAc3; EAc4</p>	<p><b>REQUIREMENTS:</b></p> <p><b>Step 1</b> - Meet the requirements of EA Credit Existing Building Commissioning—Analysis (EAc1)</p> <p><b>Step 2</b> - Identify and implement <b>no/low cost measures</b> to conserve energy outlined in EAp1</p> <p><b>Step 3</b> - Create a <b>five-year implementation plan</b> to determine equipment replacement, improvements and proper budgeting</p> <p><b>Step 4</b> - Provide <b>training for building staff and operators</b></p> <p><b>Step 5</b> - <b>Track and verify</b> the energy conservation measures (ECMs) to assess <b>actual savings per ECM</b></p> <ul style="list-style-type: none"> <li>- <b>Cost-Benefit Ration</b></li> <li>- <b>Simple Payback period</b></li> <li>- <b>Rate of Return</b></li> </ul> <p><b>Step 6</b> - <b>Update the current facility requirements</b> to reflect the implementation of the no- and low-cost ECMs</p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Consider Turnkey implementation, in house supervised staff or owner-led implementation</li> <li>• <b>Optimize start and stop</b> times for air-handling units.</li> <li>• <b>Change the sequence</b> of operation for chillers to better match cooling demand.</li> <li>• Repair the <b>motorized damper motor</b> for outside air intake.</li> <li>• Repair or replace any non-functioning <b>temperature and humidity sensors</b>.</li> <li>• Repair duct <b>leaks</b>.</li> <li>• Reprogram DDC controls to <b>prevent simultaneous heating and cooling</b>.</li> <li>• Adjust operating schedules to <b>reflect daylight saving time</b>.</li> <li>• <b>Clean lighting fixtures</b> to boost light output</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• List of all no- and low-cost measures implemented and their benefits</li> <li>• Summary of capital plan for major retrofits, upgrades</li> <li>• Description of management staff training program</li> <li>• Revisions to CFR and O&amp;M plan</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• ENERGY STAR Building Manual—Retrocommissioning:</li> <li>• California Commissioning Guide: Existing Buildings:</li> <li>• Building Operator Certification: theboc.info/</li> <li>• International Performance Measurement and Verification Protocol—Concepts and Options for Determining Energy and Water Savings—Volume I</li> <li>• ENERGY STAR Guidelines for Energy Management:</li> </ul> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>• None</li> </ul> <p>• <b>District Energy Systems (DES) note</b> - All upstream equipment which the building is taking credit for efficiency under EAc4 must follow this credit's requirements</p>
3	<p><b>EAc3</b></p> <p><b>Ongoing Commissioning</b></p> <p><b>INTENT:</b> Use the existing building commissioning process to improve building operations, energy, and resource efficiency</p> <p><b>SYNERGIES:</b> EAp1; EAc1; EAc2; EAc5</p>	<p><b>REQUIREMENTS:</b></p> <p><b>Step 1</b> - Meet the requirements of EA Credit Existing Building Commissioning—Analysis (EAc1) and EA Credit Existing Building Commissioning—Implementation (EAc2)</p> <p><b>Step 2</b> - Attempt to maintain same roles/responsibilities throughout all commissioning credits</p> <p><b>Step 3</b> - Use the functional <b>testing</b> process for sensors/alarms created in EAc1</p> <p><b>Step 4</b> - <b>Schedule</b> the frequency of analysis</p> <ul style="list-style-type: none"> <li>- <b>Quarterly</b> reports are required for the <b>first year</b></li> <li>- After first year commissioning activities must occur quarterly at a rate which ensures <b>all systems are commissioned within 2 years</b> (IE. Must not exceed 24 month commissioning cycles)</li> </ul> <p><b>Step 5</b> - Determine <i>measurement requirements</i></p> <ul style="list-style-type: none"> <li>- Which points in the existing building automation system (BAS) and system-level submeter will be monitored</li> <li>- Determine the <b>acceptable values</b> and how to evaluate building performance</li> </ul> <p><b>Step 6</b> - Develop a <b>corrective action plan</b> when building systems conflict or operate beyond acceptable values</p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Ongoing commissioning is essentially repetition of initial commissioning to ensure CFR+O&amp;M plans are met</li> <li>• BAS systems should monitor trends in: <ul style="list-style-type: none"> <li>- Air-handling units</li> <li>- Chilled water systems</li> <li>- Condenser water systems</li> <li>- Hot water systems</li> </ul> </li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Ongoing commissioning plan</li> <li>• Confirmation that systems manual has been updated</li> <li>• Confirmation that CFR and O&amp;M plan have been updated to reflect actual conditions</li> <li>• List of activities and tasks implemented as part of ongoing Cx</li> </ul>	<p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>• None</li> </ul> <p>• <b>District Energy Systems (DES) note</b> - All upstream equipment which the building is taking credit for efficiency under EAc4 must follow this credit's requirements</p>


38		ENERGY and ATMOSPHERE (EA)		
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
<p style="text-align: center;"><b>1</b> <b>20</b></p>	<p><b>EAc4</b></p> <p><b>Optimize Energy Performance</b></p> <p>INTENT: Reduce environmental and economic harms associated with excessive energy use by achieving higher levels of operating energy performance</p> <p>SYNERGIES: EAp1; EAp2; EAc2</p>	<p><b>REQUIREMENTS:</b> Follow EAp2's metering requirements <b>Case 1 - EPA's ENERGY STAR Rating - achieve an energy performance rating of 76+ - see below:</b> <b>ENERGY STAR Rating of 76 = 3 points</b> • Points increase by <b>1 for every Energy Star point increase until:</b> <b>ENERGY STAR Rating of 91 = 18 points</b> <b>ENERGY STAR Rating of 93 = 19 points</b> <b>ENERGY STAR Rating of 95 = 20 points</b> <b>ENERGY STAR Rating of 97 = Exemplary Performance Point</b> - For projects outside the U.S., consult ASHRAE/ASHRAE/IESNA Standard 90.1-2010, Appendixes B and D</p> <p><b>Case 2 - Projects not eligible for ENERGY STAR rating</b></p> <p><b>OPTION 1 - Benchmark Against Typical Buildings</b></p> <p>• <b>Path 1 - National Average Data Available (1-20 Points)</b> - Use ENERGY STAR'S Portfolio Manager tool to benchmark against the national source energy data - Demonstrate energy efficiency performance that is <b>25%</b> better than the median energy performance <b>26%</b> improvement = <b>1 point</b> • Points increase by <b>1 for every percentage point increase until:</b> <b>45%</b> improvement = <b>20 points</b></p> <p>• <b>Path 2 - National Average Data Not Available (1-14 Points)</b> - Demonstrate a <b>25%</b> improvement against <b>3+ similar buildings</b>, normalized for climate, building use, and occupancy <b>- OR -</b></p> <p><b>OPTION 2 - Benchmark Against Historical Data</b> - Demonstrate a <b>25%</b> improvement against <b>3 contiguous years</b> of data out of 5, normalized for climate, building use and occupancy <b>27%</b> improvement = <b>2 points</b> • Points increase by <b>2 for every 3 percentage points until:</b> <b>45%</b> improvement = <b>14 points</b></p> <p><b>OPTION 3 - Benchmark Against both similar Buildings Historical Data (Options 1+2 for 1-14 points)</b> <b>47%</b> improvement = <b>Exemplary Performance Point</b></p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Design building envelope, HVAC, lighting &amp; other systems to maximize performance</li> <li>• Use the results of the energy audit performed for EA Prerequisite Energy Efficiency Best Management Practices to determine the areas of greatest opportunity</li> <li>• <b>Demand reductions</b> includes reducing internal loads through shell and lighting improvements and setting operating schedules appropriately. Demand reduction involves no- or low-cost measures and is typically considered first.</li> <li>• <b>Harvesting site energy</b> includes using free resources, such as daylight, ventilation cooling, solar heating, solar power, and wind energy, to satisfy needs for space conditioning, service water heating, and power generation.</li> <li>• <b>Increasing efficiency</b> can be accomplished with more efficient envelope, lighting, and HVAC systems and by appropriately sizing HVAC systems. More efficient systems reduce energy demand and energy use.</li> <li>• <b>Recovering waste energy</b> can be accomplished through exhaust air energy recovery systems, graywater heat recovery systems, and cogeneration.</li> <li>• <b>Exclusion</b> - Up to 10% of the floor area and its associated energy consumption may be excluded from this prerequisite if it does not support the typical operations of the building.</li> <li>• <b>Update Building Benchmarking Data Routinely</b></li> <li>• <b>Enter the vacant space separately from the occupied space</b> in ENERGY STAR portfolio mgr</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Determine Option used</li> <li>• Determine climate zone for project location</li> <li>• Calculate energy use by type and utility bills</li> <li>• Access to Energystar portfolio manager</li> <li>• Normalized Energy Use Intensity (EUI)</li> <li>• Maintain list of energy uses for project bldg. (baseline &amp; design cases)</li> <li>• If using computer energy simulation, retain final report</li> <li>• If using prescriptive paths, assemble documentation</li> <li>• Narrative(s) for any special circumstances</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• Environmental Protection Agency (EPA) ENERGY STAR Portfolio Manager tool: energystar.gov/benchmark</li> <li>• ASHRAE Standard 90.1-2010, Appendixes B and D: ashrae.org</li> </ul> <p><b>CALCULATIONS:</b> Percentage Improvement = (Actual - Baseline) / Actual</p> <p><b>DEFINITIONS:</b> <b>District Energy System (DES)</b> - a central energy conversion plant and transmission and distribution system that provides thermal energy to a group of buildings <b>Downstream Equipment</b> - the heating and cooling systems, equipment, and controls located in the project building or on the project site and associated with <b>transporting the thermal energy</b> <b>Upstream Equipment</b> - a heating or cooling system or control associated with the district energy system (DES) but not part of the thermal connection</p>





38		ENERGY and ATMOSPHERE (EA)		
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
2	<p><b>EAc5</b></p> <p><b>Advanced Energy Metering</b></p> <p><b>INTENT:</b> Support energy management and identify opportunities for additional energy savings by tracking building-level and system-level energy use</p> <p><b>SYNERGIES:</b> EAp2; EAp3; EAc1; EAc2; EAc3</p>	<p><b>REQUIREMENTS:</b></p> <p><b>Step 1 - identify all sources of energy delivered to the building, including:</b></p> <p><b>Step 2 - Identify the energy end uses which represent 20%+ of total annual consumption</b> (minus plug load)</p> <p><b>Step 3 - Install advanced meters on systems</b> (see strategies)</p> <p><b>Step 4 - Install/upgrade software</b> to generate <b>BOTH electricity demand and energy consumption</b> reports and - sound <b>alarm</b> when anticipated levels by more than <b>5%</b></p> <p><b>Step 5 - Establish a baseline through 12 months of utility bills or a calibrated Energy Model</b></p> <p><b>Step 6 - The system must be able to:</b></p> <ul style="list-style-type: none"> <li>• Store the data must for at least <b>36 months</b></li> <li>• Be <b>remotely accessible</b></li> <li>• Capable of <b>reporting hourly, daily, monthly, and annual energy use</b></li> <li>• Set an <b>alarm</b> whenever the energy consumption / peak demand rise above the anticipated amount by more than <b>5%</b></li> <li>• Measurements taken in increments no longer than what the <b>utility uses</b> or in <b>one-hour increments, whichever is less time</b></li> <li>• On at least a monthly basis, report the facility's utility <b>peak demand and total consumption</b> and compare it</li> <li>• Project team decides how to submeter different systems (Ex. Roof top units)</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <p><b>The advanced energy metering must have the following characteristics.</b></p> <ul style="list-style-type: none"> <li>• <b>permanently</b> installed, record at <b>intervals</b> of one hour or less, and transmit data to a <b>remote</b> location.</li> <li>• Electricity meters must record <b>both consumption and demand</b>. Whole-building electricity meters should Record the <b>power</b> factor, if appropriate.</li> <li>• The data collection system must use a <b>local area network, building automation system, wireless network</b>, or comparable communication infrastructure.</li> </ul> <ul style="list-style-type: none"> <li>• Ensure meter selection conforms to a standard or local law/regulation for revenue-grade metering</li> <li>• Ensure meter is located at the point where energy enters the building</li> <li>• Examples of typical end uses for a commercial office building that may require advanced metering include the following: <ul style="list-style-type: none"> <li>- space heating/cooling</li> <li>- lighting</li> <li>- pumps/fans</li> <li>- Domestic Hot Water Systems</li> <li>- Receptacle equipment</li> </ul> </li> <li>• CBECs 2003 End-Use Consumption Tables - must use a building automation system or software for data collection</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• List of all advanced meters to be installed, including type and energy source metered</li> <li>• Manufacturers' cutsheets</li> <li>• Confirm facility's energy management system alarm programming</li> <li>• Confirm project has monthly and annual summaries of energy consumption and monthly peak demand data</li> </ul>	<p><b>REFERENCED STANDARDS:</b> None.</p> <p><b>CALCULATIONS:</b> None.</p>
1 3	<p><b>EAc6</b></p> <p><b>Demand Response</b></p> <p><b>INTENT:</b> Increase participation in demand response technologies and programs that make energy generation and distribution systems more efficient, increase grid reliability, and reduce greenhouse gas emissions</p> <p><b>SYNERGIES:</b> EAp1; EAp2; EAc3; EAc4</p>	<p><b>REQUIREMENTS:</b></p> <p><b>OPTION 1 - Demand Response Program</b></p> <p><b>Case 1 - Demand Response Program Available (3 Points)</b></p> <ul style="list-style-type: none"> <li>• Have in place a system with the capability for real-time, <b>fully automated</b> DR based on external initiation by a DR program provider or utility (<b>IE. Ready to Go</b>)</li> <li>• <b>1+ year</b> minimum enrollment for <b>10%+</b> annual peak electricity demand</li> <li>• Include the DR processes in the current facilities requirements and operations and maintenance plan</li> <li>• Initiate at least one full test of the DR plan</li> <li>• <b>Manual</b> programs are not acceptable for LEED credit</li> </ul> <p><b>Case 2 - Demand Response Program Not Available (1 Point)</b></p> <ul style="list-style-type: none"> <li>• Have <b>infrastructure</b> in place to take advantage of <b>future demand response</b> programs or dynamic pricing</li> <li>• Plan to be able to shed <b>10% of annual peak demand</b></li> </ul> <p><b>case 3 - Permanent Load Shifting (2 Points)</b></p> <ul style="list-style-type: none"> <li>• System must be able to permanently shift at least <b>10%+</b> of the measured or calculated peak load such as: <ul style="list-style-type: none"> <li>- Hot water storage</li> <li>- Ice- or chilled-water storage,</li> <li>- Battery storage, and</li> <li>- EV charging stations</li> </ul> </li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <p><b>Ways to reduce demand include but are not limited to:</b></p> <ul style="list-style-type: none"> <li>• Global temperature adjustments</li> <li>• Turning off decorative features</li> <li>• Reschedule housekeeping activities, such as dishwashing and laundry</li> <li>• Consider implementing notification systems for occupants</li> <li>• Limit Ventilation during DR event</li> <li>• Switch lighting modes</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Evidence of ability to shed 10% of peak demand</li> <li>• Inclusion of DR or load shifting in CFR and O&amp;M plan</li> <li>• Comprehensive action plan</li> <li>• Performance of one full test of DR plan</li> <li>• Description of system for load shifting</li> </ul>	<p><b>REFERENCED STANDARDS:</b> None.</p> <p><b>CALCULATIONS:</b> Minimum Reduction = 10% * Peak Demand</p> <p><b>DEFINITIONS:</b></p> <p><b>Demand Response Program</b> – The project agrees to voluntarily have their power shut off in peak periods from the utility provider</p> <p><b>Load Shedding</b> - an intentional action by a utility to reduce the load on the system. Load shedding is usually conducted during emergency periods, such as capacity shortages, system instability, or voltage control</p> <p><b>Permanent peak load shifting</b> - the transfer of energy consumption to off-peak hours, when demand for power is lower and energy is therefore less expensive</p>


38		ENERGY and ATMOSPHERE (EA)		
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
1 5	<p><b>EAc7</b></p> <p><b>Renewable Energy and Carbon Offsets</b></p> <p>INTENT: Encourage the reduction of greenhouse gas emissions through the use of local and grid-source renewable energy technologies and carbon mitigation projects</p> <p>SYNERGIES: EAp1; EAp2; EAc1; EAc2; EAc3; EAc4</p>	<p><b>REQUIREMENTS:</b></p> <ul style="list-style-type: none"> <li>Source the project energy from renewable sources consisting of: <ul style="list-style-type: none"> <li><b>On-site</b> Renewable systems (subtract this energy from total project consumption) <ul style="list-style-type: none"> <li>Must be submetered</li> <li>Cannot be sold back to the grid unless the project purchases the equivalent amount of RECs for a minimum <b>10 years</b></li> </ul> </li> <li><b>7.5%</b> of project's energy is renewable = <b>5 points = 7.5%/1.5%</b></li> </ul> </li> <li><b>Off-site</b> renewable systems through a <b>2 year</b> contract to purchase a <b>Green-E Certified:</b> <ul style="list-style-type: none"> <li><b>green power</b> calculated in MWh</li> <li><b>carbon offsets</b> (can be used to both electric and non-electric use for calculations) calculated in <b>CO<sub>2</sub>e</b> or <ul style="list-style-type: none"> <li><b>Metric tons of CO<sub>2</sub>e = Annual Use (kBtu) x Direct GHG Emissions factor (mtCO<sub>2</sub>e/kBtu)</b></li> </ul> </li> <li><b>Renewable Energy Certificates (RECs)</b> calculated in MWh</li> </ul> </li> <li><b>Resources must have come online after January 1, 2005</b></li> <li>If renewable energy is purchased from a <b>third-party</b> who owns the equipment - the agreement must last for <b>10 years</b> + owner must retain all environmental benefits from the project</li> </ul> <p><b>% Energy Offset or Purchased = [(Quantity of RECs / Annual energy use) + (Green Power / Annual energy use) + (Carbon Offsets / Annual energy use)]</b></p> <p><b>Points = [(Renewable Energy Generated / Total building use) / (1.5%)] + [(% Energy Offset or Purchased) / (25%)]</b> Round to nearest whole number</p> <p><b>Exemplary Performance</b></p> <ul style="list-style-type: none"> <li><b>10%</b> of project's energy is renewable = <b>additional point</b></li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>Assess the project for on-site renewable energy potential and consider: <ul style="list-style-type: none"> <li>Photovoltaic or solar thermal</li> <li>Geothermal heating or electric (heat or electricity generated from subterranean steam)</li> <li>Wind energy</li> <li>Low impact hydroelectric power system</li> <li>Wave &amp; tidal power</li> <li>Biofuel based electric: <ul style="list-style-type: none"> <li>Untreated wood waste, including mill residues</li> <li>Agricultural crops or waste</li> <li>Animal waste or other organic waste</li> <li>Landfill gas (methane)</li> </ul> </li> </ul> </li> <li>Take advantage of net metering with the local utility</li> <li><b>Does not include</b> <ul style="list-style-type: none"> <li>Passive solar, Daylighting, Geo-exchange (ground source heat pumps/vapor compression cycle)</li> </ul> </li> <li>Energy from bio-fuels are <b>not eligible if:</b> <ul style="list-style-type: none"> <li>Combustion of municipal solid waste</li> <li>Forestry biomass waste other than mill residue</li> <li>Wood coated with paints, plastics or formica</li> <li>Treated woods containing halogens, chlorine or halide compounds, chromated copper arsenate or arsenic (1% max.)</li> </ul> </li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>Total annual energy use calculation</li> <li>Renewable energy production</li> <li>Two-year contract or owner commitment with Green-e provider for purchased green power, RECs, and/or carbon offsets, from sources that have come online since January 1, 2005</li> <li>Credit point calculation showing the contribution of renewable energy, RECs, green power, and/or carbon offsets</li> </ul>	<p><b>REFERENCED STANDARDS:</b> Center for Resource Solutions Green-e Energy and Green-e Climate Certification Program: green-e.org/</p> <p><b>CALCULATIONS:</b></p> <p><b>Metric tons of CO<sub>2</sub>e = Annual Use (kBtu) x Direct GHG Emissions factor (mtCO<sub>2</sub>e/kBtu)</b></p> <p><b>% Energy Offset or Purchased = [(Quantity of RECs / Annual energy use) + (Green Power / Annual energy use) + (Carbon Offsets / Annual energy use)]</b></p> <p><b>Points = [(Renewable Energy Generated / Total building use) / (1.5%)] + [(% Energy Offset or Purchased) / (25%)]</b> Round to nearest whole number</p> <p><b>DEFINITIONS:</b></p> <p><b>Scope 1 emissions</b> - greenhouse gases emitted directly (fossil fuels burned onsite)</p> <p><b>Scope 2 emissions</b> - an entity's greenhouse gases associated with purchased electricity</p>
1	<p><b>EAc8</b></p> <p><b>Enhanced Refrigerant Management</b></p> <p>INTENT: ozone depletion and support early compliance with the Montreal Protocol while minimizing direct contributions to climate change</p> <p>SYNERGIES: EAp4; EAc8</p>	<p><b>REQUIREMENTS:</b></p> <p><b>OPTION 1 - No Refrigerants or Low-Impact Refrigerants</b></p> <ul style="list-style-type: none"> <li>Refrigerants that have an <b>ozone depletion potential (ODP)</b> of <b>zero</b> and</li> <li>a <b>global warming potential (GWP)</b> of less than <b>50</b> are acceptable</li> </ul> <p><b>OPTION 2 - Calculation of Refrigerant Impact</b></p> <ul style="list-style-type: none"> <li>The combined ODP and GWP values must be below a certain threshold, see below: <b>LCGWP + LCODP × 10<sup>5</sup> ≤ 100</b></li> <li><b>LCODP</b> = [ODPr x (Lr x Life +Mr) x Rc]/Life</li> <li><b>LCGWP</b> = [GWPr x (Lr x Life +Mr) x Rc]/Life</li> <li><b>LCODP:</b> Lifecycle Ozone Depletion Potential (lbCFC11/Ton-Year)</li> <li><b>LCGWP:</b> Lifecycle Direct Global Warming Potential (lbCO<sub>2</sub>/Ton-Year)</li> <li><b>GWPr:</b> Global Warming Potential of Refrigerant (0 to 12,000 lbCO<sub>2</sub>/lbr)</li> <li><b>ODPr:</b> Ozone Depletion Potential of Refrigerant (0 to 0.2 lbCFC11/lbr)</li> <li><b>Lr:</b> Refrigerant Leakage Rate (0.5% to 2.0%; default of <b>2% unless otherwise demonstrated</b>)</li> <li><b>Mr:</b> End-of-life Refrigerant Loss (2% to 10%; default of <b>10% unless otherwise demonstrated</b>)</li> <li><b>Rc:</b> Refrigerant Charge (0.5 to 5.0 lbs of refrigerant per ton of cooling capacity)</li> <li><b>Life:</b> Equipment Life (10 years; default based on equipment type, unless otherwise demonstrated)</li> </ul> <ul style="list-style-type: none"> <li>Existing small HVAC units (defined as containing less than 0.5 pounds (0.23 kg) of refrigerant) and other equipment such as standard refrigerators and water coolers and any other equipment that contains less than 0.5 pounds (0.23 kg) <b>ARE EXEMPT</b></li> </ul> <p><b>Retail - The project could earn the credit by obtaining EPA GreenChill's silver-level store certification</b></p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <p><b>OPTION 1.</b></p> <ul style="list-style-type: none"> <li>Design and operate the facility without mechanical cooling and refrigeration equipment</li> </ul> <p><b>OR</b></p> <p><b>OPTION 2.</b></p> <ul style="list-style-type: none"> <li>Where mechanical cooling is used, utilize base building HVAC and refrigeration systems with zero or minimal ozone depletion and global warming potential</li> <li>Select HVAC&amp;R equipment with efficient refrigerant charge and increased equipment life</li> <li>Maintain equipment to prevent leakage of refrigerant to the atmosphere <ul style="list-style-type: none"> <li>Typically lower pressure</li> </ul> </li> <li>Utilize fire suppression systems that do not contain HCFCs or Halons.</li> <li>Use natural refrigerants (water, CO<sub>2</sub>, ammonia)</li> <li>Refer to Table 1+2 for CFC/HCFC values and <b>default Equipment life</b> values</li> <li>Variable Refrigeration Flow (VRF) = requires high refrigerant change</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>Complete refrigerant impact calculation table</li> <li>Calculations &amp; letter for bldgs w/ exist. chilled water syst.</li> <li>Narrative explaining calculations and any special circumstances</li> <li>Retain manufacturers documentation with type &amp; quantity of refrigerants</li> <li>Manufacturers confirmation of no halons, CFC's or HCFC's in fire suppression system</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>None</li> </ul> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>Refer to LEED Reference Guide for Green Building Design and Construction, version 4 Edition</li> </ul> <p><b>OPTION 1.</b> None.</p> <p><b>OPTION 2</b> See Requirements section</p> <p><b>DEFINITIONS:</b> <b>chlorofluorocarbon (CFC)-based refrigerant IS</b> a fluid, containing hydrocarbons, that absorbs heat from a reservoir at low temperatures and rejects heat at higher temperatures. When emitted into the atmosphere, CFCs cause depletion of the stratospheric ozone layer</p>


8		MATERIALS and RESOURCES (MR)		
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
0	<p><b>MRp1</b></p> <p><b>Ongoing Purchasing and Waste Policy</b></p> <p><b>INTENT:</b> Reduce the environmental harm from materials purchased, used, and disposed of in the operations within buildings</p> <p><b>SYNERGIES:</b> MRp2; MRc1; MRc4</p>	<p><b>REQUIREMENTS:</b></p> <p><b>1 - Environmentally Preferable Purchasing</b> policies for regularly purchased items such as:</p> <ul style="list-style-type: none"> <li>• <b>Ongoing Purchases</b> - IE. Lamps, Paper, toner cartridges, binders, batteries, and desk accessories (see MRc4)</li> <li>• <b>Durable Goods Purchases</b> - IE. Office equipment, appliances, and audiovisual equipment (see MRc4) <ul style="list-style-type: none"> <li>- Source reduction, contract agreements, communications with building occupants overlap between the two policies</li> </ul> </li> </ul> <p><b>2 - Solid Waste Management</b></p> <ul style="list-style-type: none"> <li>• Storage locations for recyclables including mixed paper, corrugated cardboard, glass, plastics, and metals</li> <li>• Hazardous waste - safe disposal of batteries and mercury-containing lamps (indoor, outdoor and all fixtures)</li> <li>• Have an environmentally preferable solid waste management policy that addresses reuse, recycling, or composting of products</li> </ul> <p><b>STEP 1 + 2 =</b> Require coordination on: CONTRACTS, SOURCE REDUCTION + COMMUNICATION</p> <p>Note: <b>LEED for Schools and Hospitality</b> have food waste requirements  Note: <b>LEED for Retail</b> has 4 must choose <b>1 of 4</b> options in regards to promoting responsible material sourcing</p> <ul style="list-style-type: none"> <li>• Establish a <b>supply chain survey</b></li> <li>• Supply chain <b>education</b> program for retail tenant representatives</li> <li>• Create an environmental preferable supply chain strategy</li> <li>• Supply chain education program for customers</li> </ul> <p><b>- AND -</b></p> <ul style="list-style-type: none"> <li>• <b>Conduct a waste stream audit every 5 years - OR -</b></li> <li>• <b>Meet MRc4 (Materials and Resources Credit Solid Waste Management—Ongoing - divert 75%)</b></li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Coordinate with anticipated collection services for size and functionality of recycling areas</li> <li>• Consider: <ul style="list-style-type: none"> <li>– Cardboard balers, Aluminum can crushers, Recycling chutes</li> </ul> </li> <li>• Several recycling collection points: <ul style="list-style-type: none"> <li>– Break rooms, individual floor areas, Open office area, Bins at individual workstations</li> <li>– Organic wastes - composting</li> </ul> </li> <li>• Co-mingling could reduce space</li> <li>• purchasing 100% rechargeable batteries and low mercury lamps</li> <li>• Communicate the waste diversion process to all tenants</li> <li>• Ensure proper training and waste haulers understand building policies</li> <li>• For additional credits consider - ongoing and electronic purchases as well as replacements</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Environmentally preferable purchasing policy</li> <li>• Floor and/or site plan identifying recycling storage areas</li> <li>• Waste stream audit report</li> <li>• Solid waste management policy</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• None</li> </ul> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>• None</li> </ul> <p><b>DEFINITIONS:</b></p> <p>Durable goods waste stream - the flow of long-lasting products from the project building after they are fully depreciated and have reached the end of their useful life for normal business operations. products with a useful life of approximately two or more years and that are replaced infrequently.</p> <p>Ongoing consumable - a product that has a low cost per unit and is regularly used and replaced in the course of business. Examples include paper, toner cartridges, binders, batteries, and desk accessories. Also known as ongoing purchases.</p>
0	<p><b>MRp2</b></p> <p><b>Facility Maintenance and Renovation Policy</b></p> <p><b>INTENT:</b> Reduce the environmental harms associated with the materials purchased, installed, and disposed of during maintenance and renovation of buildings</p> <p><b>SYNERGIES:</b> MRp1; MRc3; MRc5; IEQc1</p>	<p><b>REQUIREMENTS:</b></p> <p><b>1 - Purchasing Policy for Maintenance and Renovations</b> including:</p> <ul style="list-style-type: none"> <li>• <b>Base building elements</b> permanently or semi- permanently attached to the building (<b>MEP, fixture and equipment Excluded</b>)</li> <li>• <b>Furniture and furnishings</b></li> </ul> <p><b>2 - Waste Management Policy for Maintenance and Renovations</b> addressing:</p> <ul style="list-style-type: none"> <li>• <b>Facility maintenance waste</b> - safe storage and diversion of waste associated with <b>maintenance</b></li> <li>• <b>Renovation waste</b> - each renovation project should target <b>5 materials</b> and set <b>goals</b> for <b>volume</b> diversion</li> </ul> <p><b>3 - Indoor air quality Policy for Maintenance and Renovations</b></p> <ul style="list-style-type: none"> <li>• Follow Sheet Metal and Air Conditioning National Contractors Association (<b>SMACNA</b>) IAQ Guidelines <ul style="list-style-type: none"> <li>- Protect stored <b>on-site</b> and installed absorptive materials from <b>moisture</b> damage</li> <li>- Do not use HVAC+R during construction unless covered with <b>MERV 8 filtration media</b></li> <li>- Before occupancy, replace all filtration media with the final design filtration media</li> <li>- Determine whether a <b>flush-out or air quality testing</b> is needed after construction ends <ul style="list-style-type: none"> <li>- Flush-out until 14, 000 cubic feet per square foot @ 60°F and RH , 60%</li> </ul> </li> </ul> </li> <li>• <b>Before Flushout:</b> <ul style="list-style-type: none"> <li>- Install all finishes and furniture</li> <li>- Complete punch-list items that would generate VOCs or other contaminants</li> <li>- Test and balance the HVAC system</li> </ul> </li> <li>- Test by EPA's Compendium of Methods for the Determination of Air Pollutants in Indoor Air</li> </ul> <p>• Maintenance includes activities such as painting, recarpeting, furniture, replacement, repair, and more.</p> <p>• Renovations are considered larger projects such as an alteration or addition that can cover materials from gypsum to flooring, ceiling tiles, etc.</p> <p>• At a minimum renovations must include: Tenant fit-outs, HVAC upgrades and Building improvements</p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Consider policy synergies and alignments between <b>purchasing, waste, cleaning and HVAC</b></li> <li>• <b>Stress education</b> so that purchasers can identify preferable products</li> <li>• Consider dedicated storage for items that require special handling (hazardous waste like paint cans)</li> <li>• Do not store materials in mechanical rooms, to avoid contamination to mechanical systems.</li> </ul> <p><b>Adopt an IAQ management plan during construction:</b></p> <ul style="list-style-type: none"> <li>• <b>HVAC:</b> When possible, avoid use during demolition and construction to avoid contamination (try temporary ventilation); Protect ductwork &amp; HVAC openings from dust &amp; moisture; Use MERV 8 filters, if air handlers used during construction &amp; replace before occupancy</li> <li>• <b>SOURCE CONTROL:</b> Specify finish materials w/ low or no toxicity levels when possible; Specify control measures for materials containing VOC's; Isolate and ventilate containers w/ toxic materials; Avoid or exhaust fumes from vehicles and gas-fueled tools to exterior of building</li> <li>• <b>PATHWAY INTERRUPTION:</b> During construction, isolate areas of work to prevent contamination, provide temporary barriers as applicable; Weather permitting, ventilate 100% outside air during VOC emitting material installation; Consider depressurizing work area to better contain dust</li> <li>• <b>HOUSEKEEPING:</b> Institute cleaning activities to control contaminants in building space during construction; Protect all porous materials from moisture and contamination; Use vacuum cleaners with high-efficiency particulate filters, and wetting agents for dust</li> <li>• <b>SCHEDULING:</b> Coordinate construction activities to minimize or eliminate disruption from occupied portions of building; Sequence activities to minimize impact on IAQ; Plan adequate time to flush out; Replace filtration media prior to occupancy</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Facility maintenance and renovations policy addressing maintenance and renovation purchasing, waste management, and indoor air quality</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• 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:smacna.org</li> <li>• European Standard EN 779: 2002, Particulate Air Filters for General Ventilation, Determination of the Filtration Performance: ashrae.org</li> <li>• EPA's Compendium of Methods for the Determination of Air Pollutants in Indoor Air:cen.eu</li> </ul> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>• None</li> </ul> <p><b>DEFINITIONS:</b></p> <p><b>base building</b> - materials and products that make up the building or are permanently and semi-permanently installed in the project</p>

8		MATERIALS and RESOURCES (MR)		
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1	<p><b>MRc1</b></p> <p><b>Purchasing — Ongoing</b></p> <p><b>INTENT:</b> Reduce environmental harm from materials used in the operations and maintenance of buildings</p> <p><b>SYNERGIES:</b> MRp1</p>	<p><b>REQUIREMENTS:</b></p> <p><b>1 - Ongoing consumables - Purchase at least 60%</b>, by cost, of total ongoing consumables that meet <b>at least one of the following criteria (Exclude Lamps):</b></p> <ul style="list-style-type: none"> <li>• <b>Postconsumer recycled content</b> - U.S. Environmental Protection Agency Comprehensive Procurement Guidelines</li> <li>• <b>Extended use</b> - Batteries must be <b>rechargeable</b>. Toner cartridges = <b>remanufactured</b>.</li> <li>• <b>Sustainable agriculture</b> - Food and beverages must be <b>labeled</b> USDA Organic, Food Alliance Certified, Rainforest Alliance Certified, Protected Harvest Certified, Fair Trade, or Marine Stewardship Council's Blue Eco-Label, or labeled with the European Community Organic Production logo <b>(Schools and Hospitality must purchase 25% by cost)</b></li> <li>• <b>Local sourcing of food and beverages</b> - Contain raw materials harvested and produced within <b>100 miles</b> (160 kilometers) of the site. <b>(Schools and Hospitality must purchase 25% by cost)</b></li> <li>• <b>Bio-based materials</b> - meet the Sustainable Agriculture Network's Sustainable Agriculture Standard. Bio-based raw materials must be tested using ASTM Test Method D6866 and be legally harvested, as defined by the exporting and receiving country.</li> <li>• <b>Paper and wood products</b> - Forest Stewardship Council certified or USGBC-approved equivalent</li> </ul> <p><b>2 - Electric-Powered Equipment - Purchase at least 40%</b>, by cost, electric-powered equipment that meets at least one of the following criteria:</p> <ul style="list-style-type: none"> <li>• <b>EPEAT rating</b> - The equipment must have a <b>silver</b> Electronic Product Environmental Assessment Tool (EPEAT) rating or better.</li> <li>• <b>ENERGY STAR rating</b> - if the equipment does not yet fall under the EPEAT rating systems, it must be ENERGY STAR® qualified or performance equivalent for projects outside the U.S. - <b>only use ENERGY STAR if EPEAT is not available</b></li> </ul> <p>• <b>Create a phase-out plan to replace remaining products with compliant equipment at the end of their useful life</b></p> <p><b>Exemplary Performance:</b></p> <ul style="list-style-type: none"> <li>• Purchase at least <b>95%</b> of total ongoing consumables and at least <b>80%</b> of electric-powered equipment</li> <li>• <b>Schools and Hospitality</b> projects, purchase at least <b>50%</b> food and beverage purchases</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• If a product meets more than one of the criteria in the credit requirements, count its overall cost contribution by percentage of product weight <b>for each criterion met</b></li> <li>• <b>develop a tracking system</b> to gather data for all purchases for the building</li> <li>• Focus first on <b>high-cost or high-volume</b> noncompliant items.</li> <li>• Always try to <b>reduce the need for equipment</b></li> <li>• <b>Exclude:</b> <ul style="list-style-type: none"> <li>- <b>Hide</b></li> <li>- <b>Non-rated materials</b></li> <li>- <b>Equipment with no electric alternative</b></li> </ul> </li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• List of compliant ongoing consumable purchases made during performance period, including product name, manufacturer, cost, date of purchase, and quantity</li> <li>• List of compliant electric-powered equipment purchases made during performance period, including name of product, manufacturer, cost, date of purchase, and quantity</li> <li>• List of compliant food and beverage purchases made during the performance period, including name, manufacturer, cost, date of purchase, and quantity</li> <li>• Documentation verifying products meet credit criteria (e.g., manufacturer's documentation, third-party certifications)</li> <li>• Total cost of ongoing consumables and electric powered equipment</li> <li>• Total cost of food and beverage purchases</li> </ul>	<p>REFERENCED STANDARDS:</p> <ul style="list-style-type: none"> <li>• U.S. Environmental Protection Agency Comprehensive Procurement Guidelines:</li> <li>• ASTM Test Method</li> <li>• Forest Stewardship Council: fsc.org/</li> <li>• Sustainable Agriculture Network's Sustainable Agriculture Standard: sanstandards.org/sitio/</li> <li>• Clean Production Action's Green Screen v1.2 • Benchmark 1: cleanproduction.org/Greenscreen.php</li> <li>• REACH</li> <li>• EPEAT: epeat.net/</li> <li>• ENERGY STAR: energystar.gov/</li> <li>• USDA Organic</li> <li>• Food Alliance Certified: foodalliance.org/</li> <li>• Rainforest Alliance Certified</li> <li>• Protected Harvest Certified:</li> <li>• Fair Trade: fairtradeusa.org/</li> <li>• Marine Stewardship Council's Blue Eco Label:</li> <li>• European Community Organize Production logo in accordance with Regulations (EC) No. 834/2007</li> </ul> <p>CALCULATIONS:</p> <p>% Compliant = (Total cost of compliant purchases / total cost of all purchasing) * 100</p> <p>DEFINITIONS:</p> <p>Bio-based material - commercial or industrial products (other than food or feed) that are composed in whole, or in significant part, of biological products, renewable agricultural materials (including plant, animal, and marine materials), or forestry materials. This excludes leather and other animal hides</p>
1	<p><b>MRc2</b></p> <p><b>Purchasing — Lamps</b></p> <p><b>INTENT:</b> Establish and maintain a toxic material source reduction program to reduce the amount of mercury brought onto the building site through purchases of lamps</p> <p><b>SYNERGIES:</b> MRp1, MRc4</p>	<p><b>REQUIREMENTS:</b></p> <p><b>All mercury-containing lamps in the building and associated grounds must have:</b></p> <ul style="list-style-type: none"> <li>• An overall <b>average</b> of less than <b>70 picograms of mercury per lumen hour</b> <ul style="list-style-type: none"> <li>- IE The <b>combined mercury content</b> for all lamps listed in the purchasing plan that must meet the requirements</li> </ul> </li> <li>• Have a purchasing plan in place to ensure that an overall building average of <b>70 picograms of mercury</b> per lumen-hour or less</li> <li>• Choose lamps with <b>low mercury, long life, and high light output.</b></li> <li>• Exclude Lamps if: No mercury + Energy efficiency is less than its mercury containing equivalent</li> </ul> <p><b>Step 1 - Record the following manufacturer data:</b></p> <ul style="list-style-type: none"> <li>• NAED code, if available (a unique five- or six-digit number used to identify specific lamps)</li> <li>• Manufacturer - data includes - Mean lumen output, Rated average life at <b>3 hours instant start</b> + mercury content</li> <li>• Quantity installed</li> </ul> <p><b>Step 2 - Calculate the picograms per lumen hour for each purchased lamp using USGBC's calculator</b></p> <p><b>Exemplary Performance:</b></p> <ul style="list-style-type: none"> <li>• Reduce the mercury content of lamps to an <b>average 35 picograms per lumen hour or less.</b></li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• <b>If credit is not met</b> - do not to replace any lamps that have not yet reached the end of their useful life. For lamps that remain, write a purchasing plan for their eventual replacement.</li> <li>• Lamps must be purchased during the performance period</li> <li>• Ensure that employees are adequately trained or use outside experts for this work</li> <li>• <b>Mercury-free LEDs</b> can be included if they have <b>high enough energy efficiency</b> levels</li> <li>• <b>Mean lumen output</b> - a measurement of a source's emitted light derived from industry standards, taken with an instant-start ballast that has a ballast factor of 1.0 as measured at 40% of lamp life</li> <li>• To determine Picograms per lumen hour you need the weight, lamp life, and lumens.</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• MR purchasing calculator or equivalent tracking tool listing lamps included in the plan with calculated picograms per lumen hour</li> <li>• Verification of mercury-free lamps and energy efficiency of mercury-containing counterparts</li> <li>• List of purchased lamps, verifying compliance with plan</li> <li>• Lamp purchasing plan</li> </ul>	<p>REFERENCED STANDARDS:</p> <p>None.</p> <p>CALCULATIONS:</p> <p>Picograms per lumen hour = [milligrams / (lumens x lamp life)] x 109</p> <p>Overall picograms per lumen hour = (total picograms per hour / # lamps)</p> <p>DEFINITIONS:</p> <p>Average LED intensity (ALI) - the illumination output for light-emitting diode lamps</p> <p>Elemental mercury - mercury in its purest form (rather than a mercury-containing compound), the vapor of which is commonly used in fluorescent and other bulb types</p>


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<p>1 2</p>	<p><b>MRC3</b></p> <p><b>Purchasing — Facility Maintenance and Renovation</b></p> <p><b>INTENT:</b> Reduce the environmental harm from materials used in building renovations</p> <p><b>SYNERGIES:</b> MRp1, MRC4</p>	<p><b>REQUIREMENTS:</b></p> <p><b>OPTION 1 - Products and Materials (1 Point)</b></p> <p>• Purchase <b>50%+ by cost</b> of maintenance and renovation materials meeting <b>1+</b> of the following: <u>The following criteria are for both Options 1+2:</u></p> <ul style="list-style-type: none"> <li>- <b>Recycled content</b> - sum of postconsumer recycled content plus one-half the preconsumer recycled content</li> <li>- <b>Wood products</b> - Forest Stewardship Council certified (<b>chain of custody certificate</b>) or USGBC-approved equivalent</li> <li>- <b>Bio-based materials</b> - meet the Sustainable Agriculture Network's Sustainable Agriculture Standard and be tested using ASTM Test Method D6866</li> <li>- <b>Materials reuse</b> - salvaged, refurbished, or reused products</li> <li>- <b>Extended producer responsibility</b> - Manufacturer (producer) that participates in an extended producer responsibility program or <ul style="list-style-type: none"> <li>• Products valued at <b>50% of their cost</b></li> </ul> </li> <li>- <b>GreenScreen v1.2 Benchmark</b> - inventoried chemical ingredients to 100 ppm <ul style="list-style-type: none"> <li>• GreenScreen List Translator, value these products at <b>100% of cost</b></li> <li>• GreenScreen Assessment, value these products at <b>150% of cost</b></li> </ul> </li> <li>- <b>Cradle to Cradle Certified</b> <ul style="list-style-type: none"> <li>• Cradle to Cradle v2 Gold / v3 Silver = <b>100% of cost</b></li> <li>• Cradle to Cradle v2 Platinum / v3 Gold / Platinum = <b>150% of cost</b></li> </ul> </li> <li>- <b>International Alternative Compliance Path – REACH Optimization</b> - no substances of <b>very high concern</b></li> <li>- <b>Product Manufacturer Supply Chain Optimization</b> - to know health, safety, hazard + risk for building products that: <ul style="list-style-type: none"> <li>• Document 99%+ of ingredients</li> <li>• sourced from product manufacturers with independent <b>third party verification of their supply chain</b></li> </ul> </li> <li>- <b>Low emissions of volatile organic compounds</b> <ul style="list-style-type: none"> <li>• <b>inherently nonemitting or be tested</b> Comply with the California Department of Public Health Standard Method V1.1–2010</li> <li>• CPDH methods to be followed for material insulation and finishes</li> </ul> </li> <li>- <b>Another USGBC approved program</b> <u>The following criteria are for both Options 1 ONLY:</u></li> <li>- <b>VOC content requirements for wet-applied products</b> - for the health of the installers and other tradesworkers <ul style="list-style-type: none"> <li>• <b>Paints and Coatings</b> - California Air Resources Board 2007 / South Coast Air Quality Management District Rule 1113</li> <li>• <b>Adhesives and Sealants</b> - South Coast Air Quality Management District (SCAQMD) Rule 1168</li> </ul> </li> <li>- <b>Low emissions of formaldehyde</b> - wood cabinetry and architectural millwork <ul style="list-style-type: none"> <li>• Meet California Air Resources Board for ultra-low-emitting formaldehyde (ULEF) resins or no-added formaldehyde resins</li> </ul> </li> </ul> <p><b>- AND / OR -</b></p> <p><b>OPTION 2 - Furniture (1 Point)</b></p> <p>• Purchase <b>75%+ by cost</b> of total furniture and furnishings materials meeting 1+ of the aforementioned criteria</p> <p>- OR -</p> <p><b>OPTION 3 - NO Alterations or Furniture Purchasing (1 Point)</b></p> <p>• Make no alterations to the project space and do not purchase any furniture</p> <p><b>Exemplary Performance:</b> <b>OPTION 1 - Products and Materials</b> - Purchase <b>95%+ by cost</b> of maintenance and renovation materials meeting the requirements</p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Focus first on high-cost or high-volume noncompliant items.</li> <li>• Look for opportunities to swap noncompliant items for products that meet the criteria, are easy accessible, and are comparably priced</li> <li>• Each product that meets several criteria receives credit for each criterion met. For instance, a product that contains both bio-based materials and recycled content can receive credit for both criteria</li> <li>• Percentage of the product that is compliant, <b>by weight, determines the percentage of the product cost</b> that contributes toward the credit</li> <li>• Steel has a standard of 25% recycled content</li> <li>• Reused/reclaimed = actual cost paid or replacement value (excluding labor)</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Total cost of materials and products for base building and site FMR activities</li> <li>• Total cost of materials and products for furniture and furnishings</li> <li>• List of compliant material and product purchases for base building and site FMR activities, including product name, environmental criterion, manufacturer, cost, date of purchase, and quantity, with any weighted average calculations</li> <li>• Documentation verifying purchases meet credit criteria (e.g., manufacturer's documentation, third-party certifications)</li> <li>• Documentation demonstrating that no maintenance or renovation activities occurred during performance period</li> <li>• The credit requires no minimum scope of renovation or new construction work.</li> </ul> <p><b>SPECIAL NOTE:</b> <b>Location Valuation Factor (LVF)</b></p> <ul style="list-style-type: none"> <li>• <b>Products and materials are worth 200% of their cost if they are:</b> <ol style="list-style-type: none"> <li><b>1 - Extracted</b></li> <li><b>2 - Manufactured, and</b></li> <li><b>3 - Purchased</b> (including distribution) <b>must be within 100 miles of the project site</b></li> </ol> </li> </ul> <p>The distance is measured as the crow flies, not by actual travel distance</p>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• ASTM Test Method D6866:</li> <li>• Forest Stewardship Council:fsc.org/</li> <li>• Sustainable Agriculture Network's Sustainable Agriculture Standard:</li> <li>• California Department of Public Health Standard Method V1.1–2010</li> <li>• ISO Guide 65, ISO/IEC 17025, ISO 16000-3: 2010, ISO 16000-6: 2011,</li> <li>• German AgBB Testing and Evaluation Scheme (2010):</li> <li>• DIBt testing method (2010):</li> <li>• California Air Resources Board (CARB) 2007, Suggested Control Measures (SCM) for Architectural Coatings and requirements for ultra-low-emitting formaldehyde (ULEF):arb.ca.gov/homepage.htm</li> <li>• South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3, 2011, SCAQMD Rule 1168, effective July 1, 2005, Adhesive and Sealant Applications:aqmd.gov/default.htm</li> <li>• European Decopaint Directive:</li> <li>• Canadian VOC Concentration Limits for Architectural Coatings:</li> <li>• Hong Kong Air Pollution Control Regulation:</li> <li>• Clean Production Action's Green Screen v1.2 Benchmark 1, Avoid Chemicals of High Concern:</li> <li>• European Commission EC No. 1907/2006 Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH)</li> <li>• ANSI/BIFMA Standard Method M7.1–2011:</li> <li>• BIFMA e3–2010 Furniture Sustainability Standard, Sections 7.6.1 and 7.6.2: bifma.org/public/e3interps.html</li> </ul> <p><b>CALCULATIONS:</b> Compliant purchases = (total cost of compliant / Total cost of purchases)</p> <p><b>DEFINITIONS:</b> Assembly - a product formulated from multiple materials Furniture and furnishings - the stand-alone furniture items purchased for the project, including individual and group seating; open-plan and private-office workstations; desks and tables; storage units, credenzas, bookshelves, filing cabinets, and other case good Recycled content - defined in accordance with the International Organization of Standards document ISO 14021 Salvaged material - a construction component recovered from existing buildings or construction sites and reused EPP Plan - Environmentally Preferable Purchasing</p>


8		MATERIALS and RESOURCES (MR)		
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
2	<p><b>MRc4</b></p> <p><b>Solid Waste Management — Ongoing</b></p> <p><b>INTENT:</b> Reduce the waste that is generated by building occupants and hauled to and disposed of in landfills and incinerators</p> <p><b>SYNERGIES:</b> MRp1, MRc1</p>	<p><b>REQUIREMENTS:</b> Maintain a waste reduction and recycling program that reuses, recycles, or composts the following:</p> <ul style="list-style-type: none"> <li>• <b>50% of Ongoing Purchases</b> - IE. Lamps, Paper, toner cartridges, binders, batteries, and desk accessories (see MRp1)</li> <li>• <b>75% of Durable Goods Purchases</b> - IE. Office equipment, appliances, and audiovisual equipment (see MRp1) <ul style="list-style-type: none"> <li>- Measured by <b>weight, volume or replacement value AND</b></li> </ul> </li> <li>• <b>Safely dispose of the following:</b> <ul style="list-style-type: none"> <li>- All discarded <b>batteries</b>; and</li> <li>- All <b>mercury-containing lamps</b></li> </ul> </li> </ul> <p><b>SCHOOLS ONLY</b> can exclude food waste from the total building waste stream if:</p> <ul style="list-style-type: none"> <li>• Food waste composting services are not available in the region</li> <li>• Implement an awareness program that encourages occupants to reduce food waste</li> <li>• Schools and Hospitality require a minimum 25% of combined food and beverage purchases to either locally sourced or be from sustainable agriculture</li> </ul> <p><b>Exemplary Performance:</b></p> <ul style="list-style-type: none"> <li>• Divert <b>75%</b> of Ongoing Purchases and <b>100%</b> of Durable Goods Purchases</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Develop procedures for separating durable goods from ongoing consumables waste</li> <li>• <b>Exclude furniture and furnishings</b> covered under MRc5</li> <li>• Work with waste haulers to ensure that they provide the right information</li> <li>• Measuring the volume of containers may be necessary if waste haulers can't provide the data</li> <li>• Communicate with building occupants about preferred waste disposal practices</li> <li>• Consider source reduction opportunities, such as providing reusable items like coffee mugs</li> <li>• Warn tenants about handling used lamps</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Quantity of ongoing consumables waste both produced and diverted</li> <li>• Quantity of durable goods waste both produced and diverted</li> <li>• Narratives describing safe storage and disposal of batteries and mercury-containing lamps</li> <li>• Documentation that composting of food waste is not available nor economically feasible</li> </ul>	<p>REFERENCED STANDARDS: None.</p> <p>CALCULATIONS: Ongoing Consumables Performance = (quantity diverted / total quantity of waste generated) x 100</p> <p>DEFINITIONS: See MRp1</p>
2	<p><b>MRc5</b></p> <p><b>Solid Waste Management — Facility Maintenance and Renovation</b></p> <p><b>INTENT:</b> Divert construction, renovation, and demolition debris from disposal in landfills and incinerators and recover and recycle reusable materials</p> <p><b>SYNERGIES:</b> MRp2, MRc3</p>	<p><b>REQUIREMENTS:</b></p> <ul style="list-style-type: none"> <li>• Divert at least <b>70%</b> of the waste (<b>by weight or volume</b>) generated by facility maintenance and renovation activities from disposal in landfills and incinerators.</li> <li>• Include base building elements as specified in the Materials and Resources prerequisite: Facility Maintenance and Renovation Policy. <b>Exclude</b> furniture and furnishings that pose <b>human health concerns (e.g., mold)</b> as well as components not considered base building elements; mechanical, electrical, and plumbing components; and specialty items, such as elevators</li> </ul> <p><b>Exemplary Performance:</b></p> <ul style="list-style-type: none"> <li>• Divert at least <b>95%</b> of FMR waste from landfills and incinerators.</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Develop a tracking system to gather data on all FMR waste during the performance period</li> <li>• Waste hauler - determine whether separating materials on-site or sending commingled waste</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Solid waste management plan for each renovation during performance period</li> <li>• Total waste generated and waste diverted for FMR activities during performance period</li> <li>• Description of hazardous materials excluded from credit calculations</li> </ul>	<p>REFERENCED STANDARDS: None.</p> <p>CALCULATIONS: Diverted FMR waste = (FMR waste diverted / total quantity of FMR waste) x 100</p> <p>DEFINITIONS: Commingled waste - building waste streams that are combined on the project site and hauled away for sorting into recyclable streams. Also known as single-stream recycling</p>


17		INDOOR ENVIRONMENTAL QUALITY (EQ)		
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
0	<p><b>EQp1</b></p> <p><b>Minimum Indoor Air Quality Performance</b></p> <p>INTENT: Contribute to the comfort and well-being of building occupants by establishing minimum standards for indoor air quality (IAQ)</p> <p>SYNERGIES: EAp2; EQc1</p>	<p><b>REQUIREMENTS:</b> Design mechanical ventilation systems per the ventilation rate procedure as defined by <b>ASHRAE 62.1-2010</b>, or the applicable local code, whichever is more stringent</p> <p><b>- AND -</b></p> <p><b>CASE 1 - MECHANICALLY VENTILATED SPACES</b> <b>OPTION 1 - ASHRAE STANDARD 62.1 - 2010 OR NON U.S. EQUIVALENT</b></p> <ul style="list-style-type: none"> <li>• Meet the minimum requirements of Sections 4 through 7 of ASHRAE Standard 62.1-2007, Ventilation for Acceptable Indoor Air Quality</li> <li>– Projects outside the U.S. may use a local equivalent to Sections 4 through 7 of ASHRAE Standard 62.1-2007 or a local equivalent</li> <li>• If it cannot meet ASHRAE 62.1 - All occupied spaces must have a minimum of <b>10 cfm per person</b> + measure to confirm this.</li> <li>• The calculations are run for the worst-case conditions - In heating mode when supply airflows are lowest or supply air temperature is highest</li> </ul> <p><b>- OR -</b></p> <p><b>OPTION 2. CEN STANDARDS EN 15251: 2007 AND EN 13779: 2007</b></p> <p>Projects outside the U.S. may earn this prerequisite by meeting the minimum requirements of Annex B of Comité Européen de Normalisation (CEN) <b>Standard EN 15251: 2007</b>, Indoor environmental input parameters for design and assessment of energy performance of buildings</p> <p><b>CASE 2. Systems Unable to Meet required Outdoor airflow rates</b></p> <ul style="list-style-type: none"> <li>• <b>Complete an engineering assessment</b> of the system's maximum outdoor air delivery rate. Supply the maximum possible to reach the minimum setpoint in Case 1 and not <b>less than 10 cubic feet per minute of outdoor air per person</b>.</li> </ul> <p><b>Naturally Ventilated Spaces</b></p> <ul style="list-style-type: none"> <li>• Follow the <b>Chartered Institution of Building Services Engineers (CIBSE)</b> Applications Manual AM10, March 2005, Natural Ventilation in Nondomestic Buildings, Figure 2.8 and meet the requirements of <b>ASHRAE Standard 62.1–2010</b>, Section 4, or a local equivalent</li> <li>• <b>Mixed-mode</b> - Measure outdoor air during Performance Period</li> <li>• Implement and maintain an HVAC system maintenance program, based on ASHRAE 62.1–2010, Section 8</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <p><b>CASE 1. MECHANICALLY VENTILATED SPACES: Ventilation Rate Procedure (VRP)</b></p> <ul style="list-style-type: none"> <li>– Use as-built drawings, BaS data, and/or field investigations to understand: <ul style="list-style-type: none"> <li>- Where units are located</li> <li>- How air is distributed (VAV vs CV)</li> </ul> </li> <li>– Confirm MERV 11+ filters - <b>use air cleaning device if necessary</b></li> <li>– Ensure Ozone levels comply with ASHRAE</li> </ul> <p><b>CASE 2. NATURALLY VENTILATED SPACES</b></p> <ul style="list-style-type: none"> <li>• Use chartered institution of Building Services engineers (ciBSe) applications manual am10</li> <li>• Minimum ceiling height in the space</li> <li>• Location of natural ventilation openings (on one side, two opposite sides, or two adjacent sides)</li> <li>• Size of the natural ventilation openings (operable area)</li> <li>• Refer to ASHRAE Standard 62.1–2010, Section 6.4 for exceptions</li> <li>• All spaces / Zones must meet the requirements</li> <li>• Maintain system as per ASHRAE 62.1 - Section D</li> <li>• <b>Testing and Balancing Technician</b> = Measures Outdoor Air rates</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• If Mechanically ventilated: <ul style="list-style-type: none"> <li>– Mechanical designer to initial verifying compliance with ASHRAE 62.1-2010 or more stringent local code</li> <li>– MERV 11 or higher filters and non-attainment area for ozone</li> <li>– Ventilation rate procedure and Measured outdoor airflow rates</li> </ul> </li> <li>• If Naturally ventilated in part or in whole: <ul style="list-style-type: none"> <li>– Documentation of CIBSE flow diagram process for project</li> <li>– Natural ventilation procedure calculations and ventilation opening information</li> <li>– Any natural ventilation exception from mechanical ventilation system (ASHRAE 62.1–2010, 6.4)</li> <li>– Any exception from authority having jurisdiction</li> </ul> </li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• ASHRAE 62.1–2010: ashrae.org</li> <li>• CEN Standard EN 15251–2007: cen.eu</li> <li>• CEN Standard EN 13779–2007: cen.eu</li> <li>• CIBSE Applications Manual AM10, March 2005: cibse.org</li> </ul> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>• Refer to LEED Reference Guide for Green Building Design and Construction, v4 Edition</li> <li>• ASHRAE 62.1–2010</li> </ul> <p><b>DEFINITIONS:</b></p> <p><b>Occupied space</b> - an enclosed space intended for human activities, excluding those spaces that are intended primarily for other purposes, such as storage rooms and equipment rooms, and that are only occupied occasionally and for short periods of time</p> <p><b>Unoccupied space</b> an area designed for equipment, machinery, or storage rather than for human activities.</p> <p><b>Ventilation zone</b> - Area with similar occupancy categories, occupant density, zone air distribution effectiveness and zone primary airflow per unit area</p> <p>Non-regularly Occupied Space (1 hour) – PAGES 390 - 393 Hallways and Washrooms</p>
0	<p><b>EQp2</b></p> <p><b>Environmental Tobacco Smoke (ETS) Control</b></p> <p>INTENT: Prevent or minimize exposure of building occupants, indoor surfaces, and ventilation air distribution systems to environmental tobacco smoke</p> <p>SYNERGIES: EAp2; EQc1</p>	<p><b>REQUIREMENTS:</b></p> <ul style="list-style-type: none"> <li>• Prohibit smoking in the building</li> <li>• Prohibit on-property smoking within <b>25 feet (7.5 meters)</b> of entries, outdoor air intakes and operable windows</li> <li>• Provide signage must be posted within <b>10 feet (3 meters)</b> of all building entrances indicating the no-smoking policy</li> <li>• Prohibit smoking <b>outside</b> the property line in spaces used for <b>business purposes</b> <ul style="list-style-type: none"> <li>- <b>Provide documentation of the code</b> if sidewalk is closer than <b>25 feet</b></li> </ul> </li> </ul> <p><b>RESIDENTIAL PROJECTS ONLY</b></p> <ul style="list-style-type: none"> <li>• Prohibit smoking in all common areas of building and enforce it</li> <li>• Prohibit smoking outside the building except in <b>designated</b> smoking areas at least <b>25 feet (7.5 meters)</b> from entries, outdoor air intakes and operable windows</li> <li>• Prohibit smoking <b>outside</b> the property line in spaces used for <b>business purposes</b></li> <li>• Provide signage must be posted within <b>10 feet (3 meters)</b> of all building entrances indicating the no-smoking policy</li> </ul> <p><b>Each unit must be compartmentalized:</b></p> <ul style="list-style-type: none"> <li>• <b>Weather-strip exterior</b> doors, doors leading to <b>common spaces and operable windows</b> in the residential units to minimize leakage</li> <li>• Minimize uncontrolled pathways for ETS transfer between individual residential units by sealing penetrations in walls, ceilings and floors in the residential units and by <b>sealing vertical chases adjacent to the units</b></li> <li>• Demonstrate acceptable <b>sealing of residential units</b> by a <b>blower door test</b> conducted in accordance with ANSI/ASTM-E779-03, Standard Test Method for Determining Air Leakage Rate By Fan Pressurization.</li> <li>• Demonstrate on a regular basis (at least once every <b>five years</b>) a maximum leakage of <b>0.50 cubic feet per minute per square foot at 50 Pa</b> of enclosure (i.e., all surfaces enclosing the apartment, including exterior and party walls, floors, and ceilings) OR a <b>30% improvement</b></li> </ul> <p><b>SCHOOLS ONLY</b></p> <ul style="list-style-type: none"> <li>• Prohibit smoking <b>on site</b></li> <li>• Signage must be posted at the property line indicating the no-smoking policy</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Consider design strategies that may encourage people to use the designated smoking area, such as covered seating</li> <li>• Educate occupants on the smoking policy and encourage them to self-police</li> <li>• Ashtrays signal that smoking is allowed in a particular area</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Description of project's no-smoking policy, including information on how policy is communicated to building occupants and enforced</li> <li>• Copy of no-smoking policy, signed letter from owner describing project's no smoking policy and enforcement or copy of any legally binding covenants or restrictions to verify status of residential units as non-smoking</li> <li>• Door schedule demonstrating weather-stripping at exterior unit doors and doors leading from units to common hallways</li> <li>• Differential air pressure test report for units in project building</li> <li>• Scaled site plan or map showing location of designated outdoor smoking and no smoking areas, location of property line, and site boundary and indicating 25-foot (7.5-meter) distance from building openings</li> <li>• Drawings, photos, or other evidence of signage communicating no-smoking policy</li> <li>• Any code or landlord restrictions that prevent establishment of non-smoking requirements</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• Standard Test Method for Determining Air Leakage Rate by Fan Pressurization, ASTM E779-03: astm.org</li> <li>• Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door, ASTM E1827-11: astm.org</li> <li>• Non-destructive testing, Leak testing—Criteria for method and technique selection, CEN Standard EN 1779—1999: cen.eu</li> <li>• Non-destructive testing, Leak testing, Tracer gas method, CEN Standard EN 13185—2001: cen.eu</li> <li>• Non-destructive testing, Leak testing, Calibration of reference leaks for gases, CEN Standard EN 13192—2001: cen.eu</li> <li>• RESNET Standards: resnet.us/standards</li> <li>• ENERGY STAR Multifamily Testing Protocol: energystar.gov/is/partners/bldrs_lenders_raters</li> </ul> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>• None</li> </ul>


17		INDOOR ENVIRONMENTAL QUALITY (EQ)		
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
0	<p><b>EQp3</b></p> <p><b>Green Cleaning Policy</b></p> <p>INTENT: Reduce levels of chemical, biological, and particulate contaminants that can compromise air quality, human health, building finishes, building systems, and the environment</p> <p>SYNERGIES: EQc6; EQc7; EQc8;</p>	<p><b>REQUIREMENTS:</b></p> <p><b>OPTION 1 - In-House Green Cleaning Policy</b></p> <ul style="list-style-type: none"> <li>Have in place a <b>green cleaning policy</b> for the building and site addressing the green cleaning <b>credits, goals</b> and <b>personnel</b> involved</li> </ul> <p><b>Goals and Strategies:</b></p> <ul style="list-style-type: none"> <li>Operating procedures for <b>hard floor and carpet</b></li> <li>Address <b>protection of vulnerable building</b> occupants during cleaning</li> <li>selection of <b>disinfectants and sanitizers</b></li> <li>Safe <b>handling and storage</b> of cleaning <b>chemicals</b> used in the building + managing <b>hazardous spills</b></li> <li>Reduce the toxicity of the chemicals used for <b>laundry</b></li> <li>Conserve of <b>energy, water, and chemicals used for cleaning</b></li> <li>Improve <b>hand hygiene</b></li> </ul> <p><b>Personnel:</b></p> <ul style="list-style-type: none"> <li>Manage <b>staffing shortages</b> and obtain occupant and custodial staff <b>feedback</b> after</li> <li><b>Train</b> maintenance personnel in the hazards of use, disposal, and recycling of cleaning chemicals, dispensing equipment, and packaging.</li> </ul> <p><b>• ALWAYS TRACK PERFORMANCE GOALS</b></p> <p><b>OPTION 2 - Certified Cleaning Service</b> -In-house or contracted service provider must be certified under 1 of:</p> <ul style="list-style-type: none"> <li><b>Green Seal's</b> Environmental Standard for Commercial Cleaning Services (<b>GS-42</b>); or</li> <li><b>International Sanitary Supply Association (ISSA)</b> Cleaning Industry Management Standard for Green Buildings (<b>CIMS-GB</b>); or</li> <li><b>Local equivalent</b> for projects outside the U.S.</li> </ul> <ul style="list-style-type: none"> <li><b>Confirm that the building was audited by the third party within 12 months of the end of the performance period</b></li> <li><b>Conserve of energy, water, and chemicals used for cleaning</b></li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>Create and implement a tracking plan for each component: <ul style="list-style-type: none"> <li>- water, energy, and toxic chemicals</li> <li>- Staffing and staff training</li> <li>- Cleaning products purchasing</li> <li>- Cleaning equipment purchasing</li> </ul> </li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <p><b>OPTION 1:</b></p> <ul style="list-style-type: none"> <li>Green cleaning policy addressing procedures, materials, and services under building and site management's control, with name of organization responsible for cleaning</li> <li>Description of goals and strategies to conserve energy and water and reduce chemicals used for cleaning</li> </ul> <p><b>OPTION 2:</b></p> <ul style="list-style-type: none"> <li>Copy of contract with certified cleaning vendor</li> <li>Documentation demonstrating that vendor is certified under GS-42 or CIMS-GB</li> <li>Description of goals and strategies to conserve energy and water and reduce chemicals used for cleaning</li> <li>Date of audit for certification</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>Green Seal's Environmental Standard for Commercial Cleaning Services (GS-42): <a href="http://greenseal.org/GreenBusiness/Standards.aspx">greenseal.org/GreenBusiness/Standards.aspx</a></li> <li>International Sanitary Supply Association (ISSA) Cleaning Industry Management Standard for Green Buildings (CIMS-GB): <a href="http://issa.com/">issa.com/</a></li> </ul> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>None</li> </ul>
2	<p><b>EQc1</b></p> <p><b>Indoor Air Quality Management Program</b></p> <p>INTENT: Contribute to the comfort and well-being of building occupants by establishing minimum standards for indoor air quality (IAQ)</p> <p>SYNERGIES: EAp1; EQp1; EQp3; EQc9</p>	<p><b>REQUIREMENTS:</b></p> <ul style="list-style-type: none"> <li>Develop and implement an indoor air quality (IAQ) <b>management program</b> based on the <b>EPA Indoor Air Quality Building Education</b></li> <li>Include plan in the project's <b>current facilities requirements and operations and maintenance Plan</b></li> <li><b>Conduct an I-BEAM audit</b> on a regular basis (at least once every <b>five</b> years) and revise the IAQ management program <ul style="list-style-type: none"> <li>- At least once during the performance period audit the <b>occupied spaces, mechanical systems, and building exterior.</b></li> <li>- Base the audit on the baseline IAQ audit forms</li> </ul> </li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <p><b>IAQ management plan should include:</b></p> <ul style="list-style-type: none"> <li>Preventive maintenance for each piece of equipment</li> <li>Periodic inspection for unusual conditions, leaks, rust, dirt, and mechanical problems</li> <li>HVAC testing and balancing</li> <li>Parts replacement</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>O&amp;M plan with IAQ management program, addressing all components</li> <li>Summary of audit with issues summary or list</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>EPA I-BEAM guidance and audit forms: <a href="http://epa.gov">epa.gov</a></li> </ul> <p><b>CALCULATIONS:</b></p> <p>None.</p> <p><b>DEFINITIONS:</b></p> <p>None.</p>






17		INDOOR ENVIRONMENTAL QUALITY (EQ)		
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
<p>1 2</p>	<p><b>EQc2</b></p> <p><b>Enhanced Indoor Air Quality Performance</b></p> <p>INTENT: Promote occupants' comfort, well-being, and productivity by improving indoor air quality</p> <p>SYNERGIES: EAp2; EQc1</p>	<p><b>REQUIREMENTS:</b></p> <p><b>OPTION 1 - Entryway Systems (1 Point)</b></p> <ul style="list-style-type: none"> <li>Employ <b>permanent entryway systems</b> at least <b>10 feet</b> (3 meters) long in the <b>primary direction of travel</b> to capture dirt and particulates entering the building at regularly used exterior entrances</li> </ul> <p><b>Data Center</b> - the filtration is necessary for ventilation systems serving regularly occupied spaces</p> <p><b>Warehouse</b> - are not required at doors leading from the exterior to the loading dock or garage</p> <p><b>Healthcare</b> - are required to provide pressurized entryway vestibules at high-volume building entrances</p> <p><b>- AND / OR -</b></p> <p><b>OPTION 2 - Additional Enhanced IAQ Strategies (1 Point)</b></p> <p>Comply with the requirements of <b>at least one of the following:</b></p> <p><b>1 - Filtration for Mechanically Ventilated Spaces</b></p> <ul style="list-style-type: none"> <li>Minimum efficiency reporting value (<b>MERV</b>) of <b>13 or higher</b>, in accordance with ASHRAE Standard 52.2–2007 - or -</li> <li><b>Class F7</b> or higher as defined by CEN Standard EN 779–2002, Particulate Air Filters for General Ventilation, Determination of the Filtration</li> </ul> <p><b>2 - Carbon Dioxide Monitors</b></p> <ul style="list-style-type: none"> <li>CO<sub>2</sub> monitors in all <b>densely occupied spaces (25+ people / 1000 square feet)</b></li> <li>Monitors must be between <b>3 and 6 feet</b> above the floor (Breathing Zone)</li> <li>Visual alarm if CO<sub>2</sub> concentration in any zone rises more than <b>15%</b></li> <li>Sensors to have an accuracy of no less than <b>75 parts per million</b> or <b>5%</b> of the reading</li> </ul> <p><b>3 - Outdoor Air Monitoring for Mechanically Ventilated Spaces</b> - For variable air volume (VAV) systems:</p> <ul style="list-style-type: none"> <li>Airflow measurement <b>device</b> at least <b>80%</b> of the outdoor air flow</li> <li><b>Accuracy of +/-10%</b> of the design minimum outdoor airflow rate as per IEQp1</li> <li>An <b>alarm</b> must indicate when the outdoor airflow value <b>varies by 15%</b></li> </ul> <p><b>For Constant Volume (CV) Systems:</b></p> <ul style="list-style-type: none"> <li><b>Install a current transducer</b> on the supply fan, an airflow switch, or similar monitoring device</li> </ul> <p><b>4 - Outdoor Air Monitoring for Naturally Ventilated Spaces:</b></p> <ul style="list-style-type: none"> <li>Airflow measurement <b>device</b> capable of measuring the <b>exhaust airflow</b></li> <li><b>Accuracy of +/-10%</b> of the design minimum outdoor airflow rate as per IEQp1</li> <li>An <b>alarm</b> must indicate when the outdoor airflow value varies by <b>15%</b></li> </ul> <p><b>5 - Alarmed Openings for Naturally Ventilated Spaces</b></p> <ul style="list-style-type: none"> <li><b>Provide automatic indication devices on all openings</b> intended to meet the minimum opening requirements</li> <li>An <b>alarm</b> must indicate when any one of the openings is closed during occupied hours</li> </ul> <p><b>Exemplary Performance</b></p> <ul style="list-style-type: none"> <li>Achieve <b>both</b> Option 1 and Option 2 and incorporate an <b>additional Option 2 strategy</b>.</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <p><b>OPTION 1:</b></p> <ul style="list-style-type: none"> <li>Acceptable entryway systems include permanently installed grates, grilles and slotted systems that allow for cleaning underneath. Roll-out mats are acceptable only when maintained on a <b>weekly</b> basis</li> </ul> <p><b>OPTION 2:</b></p> <ul style="list-style-type: none"> <li>Establish a regular schedule for maintenance and replacement of filtration media</li> <li>CO<sub>2</sub> sensors must be located in the breathing zone, as defined in the credit requirements</li> <li>Monitors can reduce energy use by decreasing amount of unrequired outdoor air</li> <li>Temperature or current transducers are <b>NOT</b> allowed for airflow measurement</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <p><b>OPTION 1:</b></p> <ul style="list-style-type: none"> <li>Entryway systems: photos, drawings, or scaled floor plans highlighting locations and measurements</li> <li>Entryway systems: confirmation that entryway systems were maintained weekly</li> </ul> <p><b>OPTION 2:</b></p> <ul style="list-style-type: none"> <li>Filtration Media Information</li> <li>CO<sub>2</sub> Monitor Documentation and Information</li> <li>Outdoor Air Monitoring Device location and information</li> <li>Alarm information and location</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>ASHRAE Standard 52.2–2007: ashrae.org</li> <li>CEN Standard EN 779–2002: cenorm.be</li> <li>ASHRAE Standard 62.1–2010: ashrae.org</li> <li>Chartered Institution of Building Services Engineers (CIBSE) Applications Manual AM10, March 2005: cibse.org</li> <li>Chartered Institution of Building Services Engineers (CIBSE) Applications Manual 13–2000: cibse.org</li> <li>National Ambient Air Quality Standards (NAAQS): epa.gov/air</li> </ul> <p><b>DEFINITIONS:</b></p> <p><b>Regularly occupied space</b> an area where one or more individuals normally spend time (more than one hour per person per day on average) seated or standing as they work, study, or perform other focused activities inside a building. The one-hour timeframe is continuous and should be based on the time a typical occupant uses the space. For spaces that are not used daily, the one-hour timeframe should be based on the time a typical occupant spends in the space when it is in use.</p> <p><b>Regularly used exterior entrance</b> - a frequently used means of gaining access to a building. Examples include the main building entrance as well as any building entryways attached to parking structures, underground parking garages, underground pathways, or outside spaces. Atypical entrances, emergency exits, atriums, connections between concourses, and interior spaces are not included.</p>

17		INDOOR ENVIRONMENTAL QUALITY (EQ)		
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1	<p><b>EQc3</b></p> <p><b>Thermal Comfort</b></p> <p>INTENT: Promote occupants' comfort, well-being, and productivity by providing quality thermal comfort</p> <p>SYNERGIES: EQp1; EQc2; EQc10</p>	<p><b>REQUIREMENTS:</b> Design heating, ventilating and air conditioning (HVAC) systems and the building envelope to meet the requirements of one of the following options:</p> <p><b>OPTION 1 - ASHRAE STANDARD 55-2010</b></p> <ul style="list-style-type: none"> <li>• Meet the requirements of ASHRAE Standard 55-2010 section 2.5 or 5.3, Thermal Comfort Conditions for Human Occupancy <ul style="list-style-type: none"> <li>– Demonstrate design compliance in accordance with the Section 6.1.1 documentation</li> <li>– Projects outside the U.S. may use a local equivalent to ASHRAE Standard 55-2010 Thermal Comfort Conditions for Human Occupancy Section 6.1.1</li> </ul> </li> </ul> <p><b>- OR -</b></p> <p><b>OPTION 2 - ISO 7730: 2005 &amp; CEN STANDARD EN 15251: 2007</b></p> <p>Projects outside the U.S. may earn this credit by designing heating, ventilating and air conditioning (HVAC) systems and the building envelope to meet the requirements of International Organization for Standardization (ISO) 7730: 2005 Ergonomics of the thermal environment, Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria; and CEN Standard EN 15251: 2007, Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics</p> <p><b>HOSPITALITY ONLY</b></p> <ul style="list-style-type: none"> <li>• Guest rooms are assumed to provide adequate thermal comfort and are therefore not included in the credit calculations</li> </ul> <p><b>The monitoring system must meet the following requirements.</b></p> <ul style="list-style-type: none"> <li>• <b>Continuous monitoring</b> - Monitor at least air temperature and humidity in occupied spaces, at sampling intervals of <b>15 minutes or less.</b> <ul style="list-style-type: none"> <li>- One sensor per humidity zone</li> <li>- One thermometer per Thermal Zone</li> </ul> </li> <li>• <b>Periodic testing</b> - Monitor <b>air speed and radiant temperature</b> in <b>occupied spaces</b></li> <li>• <b>Alarms</b> - indicate conditions that require system adjustment or repair.</li> <li>• <b>Prompt repair</b></li> <li>• <b>Calibration</b></li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Establish comfort criteria per ASHRAE Standard 55- 2010 that support the desired quality and occupant satisfaction with building performance</li> <li>• Design building envelope and systems with the capability to deliver performance to the comfort criteria under expected environmental and use conditions</li> <li>• Evaluate and integrate thermal comfort aspects: <ul style="list-style-type: none"> <li>– Air temperature</li> <li>– Radiant temperature</li> <li>– Air speed</li> <li>– Relative humidity</li> </ul> </li> <li>• <b>Permanent or Handheld</b> monitoring for - Air temperature, humidity, data logs and alarm conditions</li> <li>• <b>NOT ALLOWED</b> - Air temperature and humidity temperature readings using a handheld meter</li> <li>• Exclude unoccupied areas until they are occupied</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Description of thermal comfort criteria established for occupied spaces</li> <li>• Description of continuous monitoring of air temperature and humidity, including sensor locations, frequency, instrumentation, and data logging and analysis</li> <li>• Description of periodic monitoring of air speed and radiant temperature, including measurement location, instrumentation, and data analysis</li> <li>• Confirmation that periodic testing was performed and continuous monitoring and alarms were in place during performance period</li> <li>• Description of how monitoring, testing, and alarms inform adjustments or repairs</li> <li>• Trend graphs of at least 20% of the air temperature sensors and 20% of the relative humidity sensors</li> <li>• Summary system report of all alarms that occurred during the entire performance period</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• ASHRAE Standard 55–2010, Thermal Environmental Conditions for Human Occupancy: ashrae.org</li> <li>• ISO 7730–2005 Ergonomics of the thermal environment, Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria: iso.org</li> <li>• CEN Standard EN 15251–2007, Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics: cen.eu</li> </ul> <p><b>CALCULATIONS:</b> None: Describe how thermal comfort conditions were established and how the design of conditioning systems addresses the thermal comfort design</p> <p><b>DEFINITIONS:</b> None.</p>

17		INDOOR ENVIRONMENTAL QUALITY (EQ)		
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<p>1</p> <p>2</p>	<p><b>EQc4</b></p> <p>Interior Lighting</p> <p>INTENT: Promote occupants' productivity, comfort, and well-being by providing high-quality lighting</p> <p>SYNERGIES: EAc1; EAc2; MRc2; EQc3</p>	<p><b>REQUIREMENTS:</b></p> <p><b>OPTION 1 - Lighting Control (1 Point)</b></p> <ul style="list-style-type: none"> <li>Provide <b>50%+</b> of individual occupant spaces with individual lighting controls (on, off, midlevel lighting levels)</li> </ul> <p>For all shared multi-occupant spaces, meet all of the following requirements.</p> <ul style="list-style-type: none"> <li>Have in place <b>multizone</b> control systems to meet <b>group needs</b> (on, off, midlevel lighting levels)</li> <li>Lighting for any <b>presentation or projection wall must be separately controlled.</b></li> <li>Switches or manual controls must be <b>located in the same space</b> as the lights. <b>Operator</b> needs direct line of sight to lights</li> </ul> <p>- <b>AND/OR</b> -</p> <p><b>OPTION 2 - Lighting Quality (1 Point)</b></p> <p>Choose <b>four of the eight</b> following strategies:</p> <p>A. For <b>all</b> regularly occupied spaces, have in place light fixtures with a luminance of <b>less than 2,500cd/m<sup>2</sup></b> between 45 and 90 degrees from nadir.</p> <p>B. For the <b>entire</b> project, have in place light sources with a <b>CRI of 80</b> or higher.</p> <p>C. For <b>75%+</b> of all lights have a rated life (or L70 for LED sources) of <b>24,000+</b> hours (at 3-hour per start, if applicable).</p> <p>D. <b>Direct-only overhead</b> lighting for <b>25% or less</b> of the total connected lighting load for all regularly occupied spaces.</p> <p>E. For <b>90%+</b> of floor area, meet or <b>exceed</b> average surface reflectance - : <b>85% for ceilings, 60% for walls, and 25% for floors</b></p> <p>F. Meet or exceed area-weighted average surface reflectance: <b>45% for work surfaces and 50% for movable partitions.</b></p> <p>G. For <b>75%+</b> of the regularly occupied floor area, meet a ratio of average wall surface illuminance (excluding fenestration) to average work surface illuminance that does not exceed <b>1:10</b>. Must also meet <b>strategy E, strategy F</b>, or demonstrate area-weighted surface reflectance of at least <b>60% for walls</b></p> <p>H. For <b>75%+</b> of the regularly occupied floor area, meet a ratio of average ceiling illuminance (excluding fenestration) to work surface illuminance that does not exceed 1:10. Must also meet <b>strategy E, strategy F</b>, or demonstrate area-weighted surface reflectance of at least <b>85% for ceilings.</b></p>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>Strategies A-D are based on characteristics of the lighting fixtures, light sources, and luminaires</li> <li>Strategies E-H are based on characteristics of the surfaces in the building and the illuminance levels that fall on those surfaces</li> <li>Design the building with occupant controls for lighting</li> <li>categorize controls for all lighting, including task lighting, by location type</li> <li>Strategies to consider include lighting controls and task lighting</li> <li>Integrate lighting systems controllability into the overall lighting design, providing ambient and task lighting while managing the overall energy use of the building</li> <li>In classrooms, lighting controls should be easily accessible to teachers</li> </ul> <p><b>OPTION 2:</b></p> <p><b>A. Exceptions</b> include wall wash fixtures properly aimed at walls, as specified by manufacturer's data, indirect uplighting fixtures, provided there is no view down into these uplights from a regularly occupied space above, and any other specific applications (i.e. adjustable fixtures)</p> <p><b>B. Exceptions</b> include lamps or fixtures specifically designed to provide colored lighting for effect, site lighting, or other special use.</p> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>Complete table showing lighting controls for all regularly occupied spaces</li> <li>Space ID</li> <li>Occupancy type</li> <li>Quantity</li> <li>Lighting control type</li> <li>Lighting control description</li> <li>Quantify occupants, spaces, individual workstations with individual lighting controls &amp; lighting control coverage (%)</li> <li>Upload representative floor plans and any other applicable drawings for building to document</li> <li>Optional narrative for any special circumstances or alternate compliance approach</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>The Lighting Handbook, 10th edition, Illuminating Engineering Society of North America: ies.org</li> </ul> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>Refer to LEED Reference Guide for Green Building Design and Construction, v4 Edition</li> <li><b>Strategies E+F:</b> Weighted avg surface reflectance = [(surface reflectance1 x surface area1..) / total area]</li> <li><b>Strategies G+H:</b> Illuminance Ratio = average work surface illuminance / average wall/ceiling surface illuminance</li> </ul> <p><b>DEFINITIONS:</b></p> <p><b>Color rendering index</b> - a measurement from 0 to 100 that indicates how accurately an artificial light source, as compared with an incandescent light, displays hues. The higher the index number, the more accurately the light is rendering colors.</p> <p><b>Illuminance</b> - the incident luminous flux density on a differential element of surface located at a point and oriented in a particular direction, expressed in lumens per unit area</p>

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4	<p><b>EQc5</b></p> <p>Daylight and Quality Views</p> <p>INTENT: Connect building occupants with the outdoors, reinforce circadian rhythms, and reduce the use of electrical lighting by introducing daylight and views into the space</p> <p>SYNERGIES: None.</p>	<p><b>REQUIREMENTS:</b></p> <p><b>OPTION 1 - Daylight Measurement (2 Points)</b></p> <ul style="list-style-type: none"> <li>Achieve illuminance levels between <b>300 lux and 3,000 lux for at least 50%</b> of the regularly occupied floor area in both measurements</li> <li>With <b>furniture, fixtures, and equipment in place</b>, measure illuminance levels as follows: <ul style="list-style-type: none"> <li>Measure between <b>9 a.m. and 3 p.m.</b></li> <li>Take one measurement in any regularly occupied month, and take a second in the following opposite season</li> <li>For spaces <b>larger</b> than 150 square feet - take measurements on a maximum <b>10 foot</b> square grid.</li> <li>For spaces 150 square feet or <b>smaller</b>, take measurements on a maximum <b>3 foot</b> square grid</li> </ul> </li> </ul> <p><b>- AND / OR -</b></p> <p><b>OPTION 2 - Quality Views (2 Points)</b></p> <ul style="list-style-type: none"> <li>Achieve a direct line of sight to the outdoors via vision glazing for <b>50%</b> of all regularly occupied floor area AND</li> <li><b>Two</b> of the following views: <ul style="list-style-type: none"> <li>multiple lines of sight to vision glazing in different directions at least 90 degrees apart;</li> <li>views that include at least two of the following: (1) flora, fauna, or sky; (2) movement; and (3) objects at least 25 feet (7.5 meters) from the exterior of the glazing;</li> <li>unobstructed views located within the distance of three times the head height of the vision glazing; and</li> <li>views with a view factor of 3 or greater, as defined in "Windows and Offices; A Study of Office Worker Performance and the Indoor Environment.</li> </ul> </li> <li>Views into interior <b>atria</b> may be used to meet up to <b>30% of the required area.</b></li> </ul> <p><b>Exemplary Performance</b></p> <ul style="list-style-type: none"> <li>Achieve both options for 75% of all regularly occupied floor area.</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>for daylight, spaces where tasks would be hindered by the use of daylight may be excluded.</li> <li>for views, spaces whose functional requirements prohibit the incorporation of glazing for direct access to views may be excluded.</li> <li>Spaces may not be excluded for security or noise concerns.</li> <li>Refer to the IESNA reference Guide, 10th edition, Section 9.7, for more information on light meters</li> <li><b>View factor</b> is a measure of the amount and quality of views within a 90-degree cone of vision from an individual workstation. View factor is rated from 0 (poor quality) to 5 (high quality)</li> <li><b>Vision glazing</b> is defined as that portion of exterior windows that permits views to the exterior (or an atrium)</li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>List of all regularly occupied spaces, with total area and qualifying floor area in each space</li> <li>Sample daylight measurement report with measured illuminance values for at least one space, height of measurement point, measurement grid size, and results for first and second measurements</li> <li>Calculations demonstrating percentage of compliant space with 300 lux to 3,000 lux.</li> <li>Sample documentation showing how project meets credit requirements for each view type attempted and illustrating at least one space</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>The Lighting Handbook, 10th edition, Illuminating Engineering Society: ies.org</li> <li>Windows and Offices: A Study of Office Worker Performance and the Indoor Environment: h-m-g.com</li> </ul> <p><b>CALCULATIONS:</b></p> <ul style="list-style-type: none"> <li>Refer to LEED Reference Guide for Green Building Design and Construction, v4 Edition</li> </ul> <p><b>DEFINITIONS:</b></p> <p><b>Annual sunlight exposure (ASE)</b> - a metric that describes the potential for visual discomfort in interior work environments.</p> <p><b>Spatial daylight autonomy (SDA)</b> - a metric describing annual sufficiency of ambient daylight levels in interior environments.</p>	
1	<p><b>EQc6</b></p> <p>Green Cleaning— Custodial Effectiveness Assessment</p> <p>INTENT: Reduce levels of chemical, biological, and particulate contaminants, which can compromise human health, building finishes and systems, and the environment, by implementing effective cleaning procedures</p> <p>SYNERGIES: EQp3</p>	<p><b>REQUIREMENTS:</b></p> <p>1 - Implement the strategies set forth in the facility's green cleaning policy (EQp3) and perform routine inspection and monitoring</p> <p>2 -Conduct an annual audit in accordance with APPA Leadership in Educational Facilities' Custodial Staffing Guidelines</p> <ul style="list-style-type: none"> <li>The appearance level must score 2.5 or better (IE lower-1 (highest cleanliness) to 5 (most unkempt))</li> <li>Audit forms must include: <ul style="list-style-type: none"> <li>Space Type - mechanical rooms and parking garages do not need to be audited</li> <li>Appearance Items - IE. a chalkboard</li> <li>Time-averaged weighting factors - relative importance of each appearance item in maintaining a healthy, clean environment</li> </ul> </li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>Ensure all staff are trained and prepared for a random audit</li> <li>Optionally perform a non-APPA, internal Audit which examines the same items as the APPA audit</li> <li><b>Who can perform the audit:</b> <ul style="list-style-type: none"> <li><b>Independent third party</b></li> <li><b>Two members of the project team working separately</b></li> </ul> </li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>Description of procedures for routine monitoring and inspection of work performed by cleaning staff</li> <li>Overall score and date of audit</li> <li>Report of audit results</li> <li>Description of audit procedures</li> <li>Description of improvement opportunities</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>Association of Physical Plant Administrators (APPA), Operational Guidelines for Educational Facilities: Custodial: appa.org/bookstore</li> </ul> <p><b>CALCULATIONS:</b> None.</p> <p><b>DEFINITIONS:</b> None.</p>	

17		INDOOR ENVIRONMENTAL QUALITY (EQ)			
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS	
1	<p><b>EQc7</b></p> <p><b>Green Cleaning— Products and materials</b></p> <p>INTENT: Reduce the environmental effects of cleaning products, disposable janitorial paper products, and trash bags</p> <p>SYNERGIES: SSp1; EQp3; EQc8; EQp9;</p>	<p><b>REQUIREMENTS:</b>  <b>75%+ by cost of the total annual purchases must meet at least one of the following standards:</b></p> <ul style="list-style-type: none"> <li>• <b>Cleaning products</b> must meet 1: <ul style="list-style-type: none"> <li>- Green Seal GS-37, GS-40</li> <li>- Environmental Choice CCD-110, 146, 147, 148</li> <li>- <b>EPA Design for the Environment Program's Standard for Safer Cleaning Products</b></li> </ul> </li> <li>• <b>Disinfectants, metal polish</b>, or other products not addressed by the above standards must meet 1: <ul style="list-style-type: none"> <li>- Green Seal GS-52/53</li> <li>- Environmental Choice CCD-112, 113, 115</li> </ul> </li> <li>• <b>Disposable janitorial paper products and trash bags</b> must meet 1: <ul style="list-style-type: none"> <li>- Green Seal GS-01</li> <li>- Environmental Choice CCD-082, 086</li> <li>- EPA comprehensive procurement guidelines, for janitorial paper / EPA's comprehensive procurement guideline</li> <li>- Janitorial paper products derived from rapidly renewable resources or made from tree-free fibers</li> <li>- FSC certification, for fiber procurement</li> <li>- California integrated waste management requirements, for plastic trash can liners</li> </ul> </li> <li>• <b>Hand soaps and hand sanitizers</b> must meet 1: <ul style="list-style-type: none"> <li>- Green Seal GS-41</li> <li>- Environmental Choice CCD-104, 170</li> <li>- No antimicrobial agents</li> </ul> </li> </ul> <p><b>Exemplary Performance</b></p> <ul style="list-style-type: none"> <li>• Meet the criteria for <b>100%</b> of purchased cleaning products and materials.</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• The tracking tool should catalogue the following information (table 1): <ul style="list-style-type: none"> <li>· date of purchase</li> <li>· Purchaser</li> <li>· Product name</li> <li>· cost</li> <li>· quantity</li> <li>· applicable referenced standard</li> </ul> </li> <li>• substitute compliant for noncompliant products and materials</li> <li>• to demonstrate compliance, the responsible party must collect material safety data sheets (MSDS) or other product documentation</li> <li>• <b>Cleaning devices that use steam, ionized or electrolyzed water, or other nonchemical processes may be counted toward credit achievement, since they eliminate the need for standard cleaning chemicals.</b></li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Purchasing spreadsheet for all products</li> <li>• MSDS or other documentation for each product</li> <li>• Executed contract language requiring that purchases achieve threshold (optional)</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• <b>Design for environment (DfE) EPA</b> - for cleaning products demonstrated to be less damaging to human health and environment. Only products listed on DfE website without double daggers (‡) may contribute to this credit. Listing indicates product has completed DfE audit.</li> <li>• <b>Forest Stewardship Council (FSC)</b> - Labeling program that identifies wood products grown and harvested with responsible forest management practices</li> <li>• <b>Green Seal</b> - based on life-cycle sustainability standards</li> <li>• <b>Environmental Choice (ecologo)</b> - awards certification to products that meet program's criteria as verified by third-party</li> </ul> <p>See page 505 in v4 Reference Guide</p>	
1	<p><b>EQc8</b></p> <p><b>Green Cleaning— Equipment</b></p> <p>INTENT: Reduce the chemical, biological, and particulate contaminants from powered cleaning equipment</p> <p>SYNERGIES: SSp1; EQc3; EQc9;</p>	<p><b>REQUIREMENTS:</b>  <b>40% of all powered janitorial equipment</b> (purchased, leased, or used by contractors) must meet the following criteria</p> <ul style="list-style-type: none"> <li>- <b>Safeguards</b>, such as rollers or rubber bumpers, to avoid damage to building surfaces</li> <li>- <b>Ergonomic</b> design to minimize vibration, noise, and user fatigue (ISO 5349-1 and 11201 - max 70 dBA)</li> <li>- <b>Environmentally preferable batteries</b> (e.g., gel, absorbent glass mat, lithium-ion)</li> </ul> <ul style="list-style-type: none"> <li>• <b>Vacuum Cleaners</b> - <b>Carpet and Rug Institute Seal of Approval/Green Label Vacuum Program @ 70 dBA or less</b></li> <li>• <b>Carpet extraction equipment</b> - <b>Carpet and Rug Institute's Seal of Approval</b></li> <li>• <b>Propane-powered equipment</b> - <b>California Air Resources Board</b> or EPA standards for engine size @ <b>x&lt;90 dBA</b></li> <li>• <b>Automated scrubbing machines</b> - equipped with <b>variable speed pumps</b> or <b>chemical meters</b></li> <li>• For existing equipment that does not meet the criteria, develop a phase-out plan for its replacement</li> </ul> <p><b>Exemplary Performance</b></p> <ul style="list-style-type: none"> <li>• Meet the criteria for <b>100%</b> of powered janitorial equipment</li> </ul>	<p><b>STRATEGIES &amp; IMPLEMENTATION:</b></p> <ul style="list-style-type: none"> <li>• Consider developing a list of equipment that meets credit requirements and requiring the individuals with purchasing authority to seek approval for substitutions</li> <li>• Purchase requirements in cleaning vendor contracts can be an effective way to ensure that equipment used on the project meets credit criteria <ul style="list-style-type: none"> <li>· Provide the tracking tool for the vendor to complete.</li> <li>· request photographs of the equipment model tags.</li> <li>· check and record equipment as it is brought on site</li> </ul> </li> </ul> <p><b>SUBMITTAL DOCUMENTATION:</b></p> <ul style="list-style-type: none"> <li>• List of equipment and manufacturers' urls or cutsheets indicating compliance</li> <li>• Contributing equipment calculation</li> <li>• Phase-out plan, as applicable</li> <li>• Updated contributing equipment calculation, as applicable</li> </ul>	<p><b>REFERENCED STANDARDS:</b></p> <ul style="list-style-type: none"> <li>• <b>Carpet and Rug Institute (CRI)</b>:carpet-rug.org</li> <li>· Seal of Approval, Green Label Vacuum Program</li> <li>· Seal of Approval, Deep Cleaning Extractors</li> <li>· Seal of Approval, Deep Cleaning Systems Program</li> </ul> <p><b>CALCULATIONS:</b>  <b>% Compliant equipment =</b>  (cost (or quantity) of compliant / Total cost (or quantity) of all items)</p> <p><b>DEFINITIONS:</b>  <b>Powered floor maintenance equipment</b> - electric and battery-powered floor buffers and burnishers. It does not include equipment used in wet applications</p>	

6  INNOVATION (ID)				
ALL	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
1 5	<b>IDc1</b> <b>INNOVATION IN DESIGN</b> INTENT: To provide the opportunity to achieve exceptional performance above the requirements set by the rating system or innovative performance not addressed by the rating system	<b>REQUIREMENTS:</b> <b>OPTION 1 - INNOVATION IN DESIGN (1-3 points)</b> <ul style="list-style-type: none"> <li>Achieve significant, measurable environmental performance using a strategy not addressed in the LEED rating system</li> <li>One point is awarded for each innovation achieved</li> </ul> <b>OPTION 2 - Pilot Credit (1- 3 points)</b> <ul style="list-style-type: none"> <li>Achieve one pilot credit from USGBC's LEED Pilot Credit Library</li> <li>Registers through the USGBC's LEED Pilot Credit Library</li> <li>USGBC member companies can submit pilot credits.</li> </ul> A pilot credit proposal includes: <ul style="list-style-type: none"> <li>Survey feedback questions</li> <li>Submittal Documentation</li> <li>Identified Guest Expert</li> </ul> <b>OPTION 3 - EXEMPLARY PERFORMANCE (1-2 points)</b> <ul style="list-style-type: none"> <li>Achieve exemplary performance as specified in the LEED rating system for applicable credits</li> <li>An exemplary performance point may be awarded for achieving double the credit requirements and/or achieving the next incremental threshold for an existing credit</li> <li>One point is awarded for each exemplary performance achieved</li> </ul>	<b>SUBMITTAL DOCUMENTATION:</b>  <b>Innovation</b> <ul style="list-style-type: none"> <li>Innovation narrative</li> <li>Supporting documentation</li> </ul> <b>Pilot Credit</b> <ul style="list-style-type: none"> <li>Supporting documentation</li> <li>Pilot credit registration</li> <li>Pilot credit survey</li> <li>Pilot credit specific submittals</li> </ul> <b>Exemplary performance</b> <ul style="list-style-type: none"> <li>Exemplary performance credit and level</li> <li>Supporting documentation</li> </ul>	
	IDc1.2	Refer to IDc1.1		
	IDc1.3	Refer to IDc1.1		
1	<b>IDc2</b> <b>LEED AP</b> INTENT: Encourage the team integration required by a LEED project and to streamline the application and certification process	<b>REQUIREMENTS:</b> At least one principal participant of the project team must be a <b>LEED Accredited Professional (AP) with a specialty</b> appropriate for the project	<b>SUBMITTAL DOCUMENTATION:</b> <ul style="list-style-type: none"> <li>Full name and specialty credential of LEED AP</li> </ul>	
ALL  REGIONAL PRIORITY (RP)				
EB	CREDIT / INTENT / SYNERGIES	REQUIREMENTS / EXEMPLARY PERFORMANCE	STRATEGIES & IMPLEMENTATION / SUBMITTAL DOCUMENTS	REFERENCED STANDARDS / CALCULATIONS
1 4	Provide an incentive for the achievement of credits that address geographically specific environmental, social equity, and public health priorities	<ul style="list-style-type: none"> <li>Earn 1 of the 6 Regional Priority Credits (credits identified by the USGBC Regional Councils and Chapters as having additional regional environmental importance). A database of Regional Priority Credits and their geographic applicability is available on the USGBC Web site</li> <li>One point is awarded for each Regional Priority credit achieved. <b>No more than 4 credits identified as Regional Priority</b> credits may be earned.</li> </ul> USGBC has prioritized credits for projects located in the U.S., Puerto Rico, the U.S. Virgin Islands, and Guam – All other international projects should check the database for eligible Regional Priority credits	<ul style="list-style-type: none"> <li>Determine and pursue the prioritized credits for the project location</li> <li>6 credits are available for each zip code but only 4 credits maximum can be selected</li> </ul>	
	RPc1.1			
	RPc1.2			
	RPc1.3			
	RPc1.4			