

efficiency (WE) summarized in Table 5.6.

WE Prerequisite 1 (WEp1): Water Use Reduction: 20 Percent

Achieving this prerequisite requires that the design of the building employ a strategy to reduce by 20 percent the water use established in the baseline calculation. The baseline calculation must meet the requirements established by the Energy Policy Act of 2005 as well as the 2006 edition of the Uniform Plumbing Code. The baseline calculation is based on occupant usage and should only incorporate flow and flush fixtures, such as water closets, urinals, lavatory faucets, showers, kitchen sink faucets, and prerinse spray valves. More information on how to calculate a baseline water model can be found in Chapter 10.

TABLE 5.6

Water Efficiency (WE) Credits and Points under LEED-NC 3.0

Prerequisite/Credit	Name of Prerequisite/Credit	Maximum Points
WE Prerequisite 1	Water Use Reduction: 20%	NA
WE Credit 1	Water-Efficient Landscaping	4
WE Credit 2	Innovative Wastewater Technologies	2
WE Credit 3		

sions (Sections 5.4, 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1, 13.1, 14.1, 15.1, 16.1, 17.1, 18.1, 19.1, 20.1, 21.1, 22.1, 23.1, 24.1, 25.1, 26.1, 27.1, 28.1, 29.1, 30.1, 31.1, 32.1, 33.1, 34.1, 35.1, 36.1, 37.1, 38.1, 39.1, 40.1, 41.1, 42.1, 43.1, 44.1, 45.1, 46.1, 47.1, 48.1, 49.1, 50.1, 51.1, 52.1, 53.1, 54.1, 55.1, 56.1, 57.1, 58.1, 59.1, 60.1, 61.1, 62.1, 63.1, 64.1, 65.1, 66.1, 67.1, 68.1, 69.1, 70.1, 71.1, 72.1, 73.1, 74.1, 75.1, 76.1, 77.1, 78.1, 79.1, 80.1, 81.1, 82.1, 83.1, 84.1, 85.1, 86.1, 87.1, 88.1, 89.1, 90.1, 91.1, 92.1, 93.1, 94.1, 95.1, 96.1, 97.1, 98.1, 99.1, 100.1) prescriptive requirements (Sections 5.5, 6.5, 7.5, 8.5, 9.5, 10.5, 11.5, 12.5, 13.5, 14.5, 15.5, 16.5, 17.5, 18.5, 19.5, 20.5, 21.5, 22.5, 23.5, 24.5, 25.5, 26.5, 27.5, 28.5, 29.5, 30.5, 31.5, 32.5, 33.5, 34.5, 35.5, 36.5, 37.5, 38.5, 39.5, 40.5, 41.5, 42.5, 43.5, 44.5, 45.5, 46.5, 47.5, 48.5, 49.5, 50.5, 51.5, 52.5, 53.5, 54.5, 55.5, 56.5, 57.5, 58.5, 59.5, 60.5, 61.5, 62.5, 63.5, 64.5, 65.5, 66.5, 67.5, 68.5, 69.5, 70.5, 71.5, 72.5, 73.5, 74.5, 75.5, 76.5, 77.5, 78.5, 79.5, 80.5, 81.5, 82.5, 83.5, 84.5, 85.5, 86.5, 87.5, 88.5, 89.5, 90.5, 91.5, 92.5, 93.5, 94.5, 95.5, 96.5, 97.5, 98.5, 99.5, 100.5) requirements (Section 11) of ASHRAE 90.1-2007. The building must comply with the mandatory provisions and either the prescriptive or Energy Cost Budget Method performance requirements of the standard.

EA Prerequisite 3 (EAp3): Fundamental Refrigerant Management

Chlorofluorocarbons (CFCs), as previously noted, are ozone-depleting substances with a long history of use in building air-conditioning equipment. This prerequisite has the intent of eliminating CFCs from buildings, thereby protecting the ozone layer. It requires zero use of CFCs in new building HVAC&R systems. For a reuse project with existing equipment, a plan to phase out the CFCs must be submitted prior to project completion.

EA Credit 1 (EAc1): Optimize Energy Performance (19 Points Maximum)

Designing and building an energy-efficient building is important for sustainability reasons as well as for earning a LEED rating. By virtue of having more than half of the EA credits assigned to it, EA Credit 1: Optimize Energy Performance is by far the most important credit in the EA category—in fact, in the entire LEED rating system. ASHRAE 90.1-2007 is the basis for

WE Credit 1 (WEC1): Water-Efficient Landscaping (4 Points Maximum)

In order to improve the stormwater management system and limit or eliminate the use of potable water for landscape irrigation, two options are available.

Option 1. Reduce potable water use for landscaping by 50 percent. (2 Points Maximum)

Water reduction is based on calculated midsummer baselines. Reducing the use of potable water can be achieved through methods such as specifying plant species that do not require much watering; applying a density factor that reduces the number of plants; improving irrigation efficiency; and using captured rainwater, recycled wastewater, or reclaimed water for irrigation purposes.

Option 2. Further reduce potable water consumption. (2 Points Maximum)

In addition to achieving Option 1, the design must require a 100 percent reduction of potable water irrigation, which can be achieved through measures such as those identified in Option 1.

DOE Commercial Buildings Energy Consumption Survey (CBECS) database to estimate electricity use. Up to 7 points are available, from 1 point for providing 1 percent of the total building energy requirements to 7 points if 13 percent is provided.

EA Credit 3 (EAc3): Enhanced Commissioning (2 Points Maximum)

Enhanced commissioning adds several additional requirements to the Fundamental Building Commissioning category. These requirements include reviewing the energy systems design, reviewing contractor submittals, creating a systems manual for building operators, verifying training of operators, and rechecking the building operation within 10 months of occupancy to verify performance.

EA Credit 4 (EAc4): Enhanced Refrigerant Management (2 Points Maximum)

EA Prerequisite 3 calls for zero use of CFC refrigerants in new building HVAC&R equipment. EAc4 provides for measures that further reduce the use of ozone-depleting refrigerants in buildings and addresses the climate change impacts of these substances. EAc4 has two options:

life-cycle

MR Prerequisite 1 (MRP1): Storage and Collection of Recyclables

A very interesting and progressive LEED requirement is that an easily accessible area must be set aside for the separation, collection, and storage of materials, which, at a minimum, include paper, corrugated cardboard, glass, plastics, and metals.

MR Credit 1 (MRc1): Building Reuse (4 Points Maximum)

Reusing a building to the maximum extent possible is an excellent strategy for reducing the materials impacts of construction and LEED offers a maximum of 4 points for building reuse. MR Credit 1.1 provides one point for reusing 55 percent of the existing walls, floors, and roof, two points for 75 percent, and a third point if 75 percent of these elements are reused. MR Credit 1.2 provides yet another point if 50 percent of the interior nonstructural elements are reused. Interior nonstructural elements refer to such building components as interior walls, doors, floor coverings, and ceiling systems.

MR Credit 1.1 (MRc1.1): Building Reuse—Maintain Existing Walls, Floors, and Roof (3 Points Maximum)

The requirement of this credit is to maintain existing building structural elements, such as walls, floors, and the roof. If 55 percent (by area) of these elements are retained, one point is awarded; an additional point for 75 percent, and a third point if 95 percent are retained. If there is a case when a project includes an addition to an existing building, the square footage of the addition must be less than twice the square footage of the existing building.

value
exclude the m

MR Credit 4

The use of re
LEED buildi
content valu
consumer rec
content) is a
content valu
calculations,
but plumbi

MR Credit

Placing an
impacts ass
achievable
and produc
500 miles o
these mate
distance, a

MR Credit

For the pu
are derived
or less. To

wool, cotton insulation, ... , strawboard, and cork.

MR Credit 7 (MRc7): Certified Wood (1 Point Maximum)

The use of certified wood has been established as one of the key criteria for green buildings. This credit is awarded if a minimum of 50 percent of the wood-based

materials and products in the project are certified and have the seal of a Forest Stewardship Council (FSC) certifier. In the context of LEED-NC, wood-based products include structural and general framing; flooring; finishes; furnishings; and temporary structures for formwork, bracing, and pedestrian barriers that are not rented. Initially, for wood products, it was anticipated that only FSC would satisfy the top-tier certification requirements for this credit at this stage. However, as other certification systems for wood improve and as certification systems for bamboo, cork, or agricultural products emerge that meet the USGBC criteria, in the future they may be included under MRc7.

THE INDOOR ENVIRONMENTAL QUALITY (IEQ) CATEGORY

The LEED-NC category of Indoor Environmental Quality (IEQ) has two prerequisites and eight credits that provide a maximum of 15 points. Table 5.9 gives an overview of the EQ structure of LEED-NC.

recommendations in the Green Trust Good Practice Guide 237. they meet the

**IEQ Credit 3 (IEQc3): Construction Indoor Air Quality Management Plan
(2 Points Maximum)**

This credit has two subcredits, which are described below.

EQ Credit 3.1 (IEQc3.1): Construction Indoor Air Quality Management Plan—During Construction (1 Point Maximum)

This credit addresses measures employed during the construction process that enhance air quality for the eventual building occupants. The requirements are that absorptive materials must be protected from moisture damage; filters with a Minimum Efficiency Reporting Value (MERV) of 8 must be used on return air grilles if the HVAC system is used during construction; all filters must be replaced prior to occupancy; and, during installation of the HVAC system, the approaches recommended in the SMACNA "IAQ Guidelines for Occupied Buildings under Construction" (2nd Edition, 2007) must be followed.

IEQ Credit 3.2 (IEQc3.2): Construction Indoor Air Quality Management Plan—Before Occupancy (1 Point Maximum)

This credit addresses the period of time between the end of construction and building occupancy and has two options. The first option is a building flush-out prior to occupancy but with all interior finishing installed. The flush-out consists of 14,000 cubic feet (396 cubic meters) of outside air per square foot of floor area. The internal building temperature must be at least 60°F (16°C) with a relative humidity no higher than 60 percent. Alternatively, if occupancy is desired prior to completion of flush-out, the building must be flushed out with 3500 cubic feet (99 cubic meters) of outdoor air per square foot prior to occupancy and then ventilated at the rate of 0.30 cubic foot (0.01 cubic meter) per minute of outside air, or the design minimum from EAp1, whichever is greater. The second option is to conduct an air quality test after construction ends and prior to occupancy using the US Environmental Protection Agency (EPA) Compendium of Methods for the Determination of Air Pollutants in Indoor Air. As long as the air quality test shows that contaminant levels do not surpass their maximum concentration, then the point will be allocated. The concentrations of formaldehyde, total volatile organic compounds (TVOC), particulates (PM₁₀), 4-phenylcyclohexene (4-PCH), and carbon monoxide (CO) must be measured when using the US EPA procedure.

IEQ Credit 4 (IEQc4): Low-Emitting Materials
Reducing the volatile organic compounds (VOCs) emitted by building materials is addressed by this credit, which is subdivided into the four subcredits described below.

IEQ Credit 4.1 (IEQc4.1): Low-Emitting Materials—Adhesives and Sealants (1 Point Maximum)

Adhesives, sealants, and sealant primers must comply with the VOC content limits of the South Coast Air Quality Management District (SCAQMD) Rule 1168. Aerosol adhesives must comply with the Green Seal Standard for Commercial Adhesives GS-36 requirements.

IEQ Credit 4.2 (IEQc4.2): Low-Emitting Materials—Paints and Coatings (1 Point Maximum)

Architectural paints, coatings, and primers used in the interior of the building must show they meet the requirements of Green Seal GS-11 with flat paints having no more than 50 grams per liter of VOCs and nonflat paints not exceeding 150 grams per liter. Anticorrosive and antirust paints applied to interior metal surfaces should not exceed 250 grams per liter of total VOC content as stated in Green Seal GC-03, Anti-Corrosive Paints. Wood finishes should not exceed 250 grams per liter of total VOC content.

wood finishes should not exceed 250 grams per liter for lacquer; floor coatings must not exceed 275 grams per liter; and sealers less than 275 grams per liter.

IEQ Credit 4.3 (IEQc4.3): Low-Emitting Materials—Flooring Systems

(1 Point Maximum)

All carpet systems must meet the requirements of the Carpet and Rug Institute's Green Label Plus Indoor Air Quality Program, and carpet adhesives must contain no more than 50 grams per liter of total VOCs. All hard-surface flooring must be compliant with the FloorScore standard. Flooring products covered by FloorScore include vinyl, linoleum, laminate flooring, wood flooring, ceramic flooring, rubber flooring, wall base, and associated sundries.

IEQ Credit 4.4 (IEQc4.4): Low-Emitting Materials—Composite Wood and Agrifiber Products (1 Point Maximum)

Composite wood and agrifiber products must contain no urea formaldehyde (UF) resins. This also applies to the laminating adhesives used to fabricate composite wood and agrifiber assemblies.

IEQ Credit 5 (IEQc5): Indoor Chemical and Pollutant Source Control (1 Point Maximum)

Designing the building to minimize the entry of pollutants into occupied spaces