

BEYOND

SMART CITIES

LEED IMPLEMENTATION GUIDE

FOR DESIGN PROFESSIONALS

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SUSTAINABILITY SPECIALIST ONLINE CURRICULUM COURSE

GREEN BUILDING

INSTITUTE

OF INDIA

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WATER EFFICIENCY - WE

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LEARNING OBJECTIVES

INTRODUCTION WATER EFFICIENCY-WE

OUTDOOR WATER USE REDUCTION / INDOOR WATER USE REDUCTION

BUILDING-LEVEL WATER METERING

OUTDOOR WATER USE REDUCTION / INDOOR WATER USE REDUCTION

COOLING TOWER WATER USE / WATER METERING

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WATER EFFICIENCY



The Water Efficiency (WE) section addresses water holistically, looking at indoor use, outdoor use, specialized uses, and metering. The section is based on an "efficiency first" approach to water conservation. As a result, each prerequisite looks at water efficiency and reductions in potable water use alone. Then, the WE credits additionally recognize the use of nonpotable and alternative sources of water



CRITERIA IN THIS CATEGORY

WE PR OUTDOOR WATER USE REDUCTION

WE PR INDOOR WATER USE REDUCTION

WE PR BUILDING-LEVEL WATER METERING

WE CR OUTDOOR WATER USE REDUCTION

WE CR INDOOR WATER USE REDUCTION

WE CR COOLING TOWER WATER USE

WE CR WATER METERING



MAXIMUM POSSIBLE CREDITS : 3 P / 11 C

WE - PR- DESIGN

INTENT

To reduce outdoor potable water consumption and preserve no and low-cost potable water resources.

POTENTIAL TECHNOLOGIES & STRATEGIES

☒ The landscape water requirement (LWR) can be estimated by developing a water budget that allows landscape professionals to consider the effects of the many design variables, such as plant types, planting density, and irrigation system elements. Using a water budget optimizes water use in landscape designs

OUTDOOR WATER USE REDUCTION

REQUIREMENTS

permeable or impermeable pavement, should be excluded from the landscape area calculations. Athletic fields and playgrounds (if vegetated) and food gardens may be included or excluded at the project team's discretion.
Option 1. No Irrigation Required Show that the landscape does not require a permanent irrigation system beyond a maximum two-year establishment period. OR Option 2. Reduced Irrigation Reduce the project's landscape water requirement by at least 30% from the calculated baseline for the site's peak watering month. Reductions must be achieved through plant species selection and irrigation system efficiency, as calculated by the Environmental Protection Agency (EPA) WaterSense Water Budget Tool.

IMPLEMENTATION

REQUIRED DOCUMENTATION

Documentation	Option 1	Option 2
Site plan showing vegetated areas	X	
Narrative for plant species and water requirements	X	
Site plan showing location and size of landscape zones		X
Water Budget Tool report		X

WE - PR- DESIGN

INTENT

To reduce indoor potable water consumption and preserve no and low cost potable water resources. REQUIREMENTS

POTENTIAL TECHNOLOGIES & STRATEGIES

☒ Potable water usage in buildings constitutes a large portion of freshwater consumption. Strategies to reduce potable water use in buildings entail the selection of efficient plumbing fittings, fixtures, and equipment. Fixtures that use 20% to 50% less water than code-required levels are now widely available. The WaterSense label was developed by the U.S. Environmental Protection Agency to identify these efficient fixtures and ensure that higher efficiency does not come at the cost of performance. The WaterSense label has been incorporated as a requirement for this credit to ensure that fixtures in a LEED building are both water efficient and high performing.

INDOOR WATER USE REDUCTION

REQUIREMENTS

For the fixtures and fittings listed in Table 1, as applicable to the project scope, reduce aggregate water consumption by 20% from the baseline. Base calculations on the volumes and flow rates shown in Table 1. All newly installed toilets, urinals, private lavatory faucets, and showerheads that are eligible for labeling must be WaterSense labeled (or a local equivalent for projects outside the U.S.).

Fixture or fitting	Baseline (IP units)	Baseline (IP units)
Private water closet	1.6 gpf	1.6 gpf
Urinal	1.0 gpf	1.0 gpf
Public lavatory (restroom) faucet	0.5 gpm at 60 psi or all others except prior applications	0.8 gpm at 60 psi, all others except prior applications
Private lavatory faucets	0.2 gpm at 60 psi	0.2 gpm at 60 psi
Kitchen faucet (excluding faucets used exclusively for filling operations)	0.2 gpm at 60 psi	0.2 gpm at 60 psi
Showerhead	2.5 gpm at 80 psi per shower stall	2.5 gpm at 80 psi per shower stall

IMPLEMENTATION

REQUIRED DOCUMENTATION

Documentation	Attributes	Project credit
PREREQUISITES, mandatory information	X	X
Water use reduction	X	X

WE- PR- DESIGN

BUILDING-LEVEL WATER METERING

REQUIREMENTS

Install permanent water meters that measure the total potable water use for the building and associated grounds. Meter data must be compiled into monthly and annual summaries; meter readings can be manual or automated. Commit to sharing with USGBC the resulting whole-project water usage data for a five-year period beginning on the date the project accepts LEED certification or typical occupancy, whichever comes first. This commitment must carry forward for five years or until the building changes ownership or lessee.

POTENTIAL TECHNOLOGIES & STRATEGIES

One system often subject to gaps between projected and actual performance is water use. As a first step in improving efficiency, the project team must install water metering to track water consumption by both the project building and any associated grounds.

IMPLEMENTATION

REQUIRED DOCUMENTATION

	Documentation	All projects
Meter declaration		X
Sharing commitment		X

Install permanent water meters that measure the total potable water use for the building and associated grounds. Meter data must be compiled into monthly and annual summaries; meter readings can be manual or automated. Commit to sharing with USGBC the resulting whole-project water usage data for a five-year period beginning on the date the project accepts LEED certification or typical occupancy, whichever comes first. This commitment must carry forward for five years or until the building changes ownership or lessee.

Documentation	All projects
Meter declaration	X
Sharing commitment	X

WE- CR(3) - DESIGN

OUTDOOR WATER USE REDUCTION

INTENT

To reduce outdoor potable water consumption and preserve no- and low-cost potable water resources.

POTENTIAL TECHNOLOGIES & STRATEGIES

- ✓ Develop the plant species and water requirement narrative. Include a description of the plantings and explain why they will not require irrigation beyond their specified establishment periods. Indicate why average rainfall will be sufficient. - A landscaping plan showing native plants may be provided to confirm that irrigation will not be required, based on local rainfall and plants' water demands.

REQUIREMENTS

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

IMPLEMENTATION

Documentation	Option 1	Option 2
Alternative water source and controls calculations		X

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

Documentation	Option 1	Option 2
Alternative water source and controls calculations		X

WE- CR(6) - DESIGN

INDOOR WATER USE REDUCTION

INTENT

To reduce indoor potable water consumption and preserve no and low-cost potable water resources.

POTENTIAL TECHNOLOGIES & STRATEGIES

☒ When planning the site layout, consider factors such as proximity to water source for optimized irrigation, distance from water meter, and so on. Resolve uncertainties about plants' water requirements by referring to local resources, such as plant guides, state agricultural extension services, or nurseries to classify each plant type as a low, medium, or high water user

IMPLEMENTATION

Documentation	Points	Appendix	Re-use rate
		Best practices (Appendix A)	Best practices (Appendix A)
Alternative water source calculation (if applicable)	5	X	
Potting system design (avoiding 0 if applicable)	5		
Alternative water services	5		
Calculated maximum water use	X	X	X
Indoor water use calculator	5		

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

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

Documentation	Features	Appliances	Process water
		(Retail, Healthcare, Hospitality and Schools projects only)	
Alternative water source calculations (if applicable)	X		
Purifying system design details (if applicable)	X		
Alternative water narrative	X		
Cut sheets, manufacturers' information		X	X
Indoor water use calculator	X		

WE- CR(2) - DESIGN

INTENT

To conserve low cost potable water resources used for mechanical processes while controlling, corrosion and scale in the condenser water system.

POTENTIAL TECHNOLOGIES & STRATEGIES

To significantly reduce makeup water inputs, it is important to achieve target cycles of concentration (see Further Explanation, Cycles of Concentration). Cooling tower or evaporative condenser water efficiency is measured in the number of recirculation cycles before water must be removed by blowdown

OPTIMIZE PROCESS WATER USE

REQUIREMENTS

Whether the project uses 100% potable or 100% nonpotable water for c cooling, the first step is to obtain a chemical analysis. - Engage a water treatment professional to perform the analysis. If a potable water analysis has already been completed, it must be no more than five years old. At a minimum, the analysis must measure the concentration parameters identified in the credit requirements. Highlight each parameter in the documentation. - Describe the analysis. The narrative must identify the source of the makeup water and the process for analysis

IMPLEMENTATION

REQUIRED DOCUMENTATION

Documentation	1 point	2 points
Potable water analysis results	X	X
Potable water analysis narrative	X	X
Cycles of concentration calculations	X	X
Nonpotable water calculations		X
Water treatment calculations		X
Nonpotable water analysis (if using 100% nonpotable water)		X

WE- CR(1) - DESIGN

INTENT

To conserve low cost potable water resources and support water management and identify opportunities for additional water savings by tracking water consumption.

POTENTIAL TECHNOLOGIES & STRATEGIES

Metering water usage by subsystem helps facilities managers better gauge a building's water efficiency. Submetering the major building water systems provides a way to formulate independent system baseline, track usage against those baselines, isolate and identify potential sources of waste, and take corrective action. Moreover, submetering helps track periodic changes in water usage and provides the data necessary to calculate opportunities for water savings at a systemwide level

WATER METERING

REQUIREMENTS

Install permanent water meters for two or more of the following water subsystems, as applicable to the project: Irrigation, Indoor plumbing fixtures and fittings, Domestic hot water, Reclaimed water and Other process water.

IMPLEMENTATION

REQUIRED DOCUMENTATION

Documentation	All projects
Water metering strategy narrative	X
