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Today
WATER EFFICIENCY - GREEN BUILDING TECHNOLOGY
TRAINING PROGRAM
FOR GREEN BUILDING AND SUSTAINABILITY SPECIALISTS
KRISHNAJI PAWAR, LEED AP BD+C,GSAS CGP,ISO 14001:2015,GCP
WATER EFFICIENCY SPECIALIST CURRICULUM
CERTIFIED WATER EFFICIENCY SPECIALIST
CWES

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BUILDING-LEVEL WATER METERING - CREDIT
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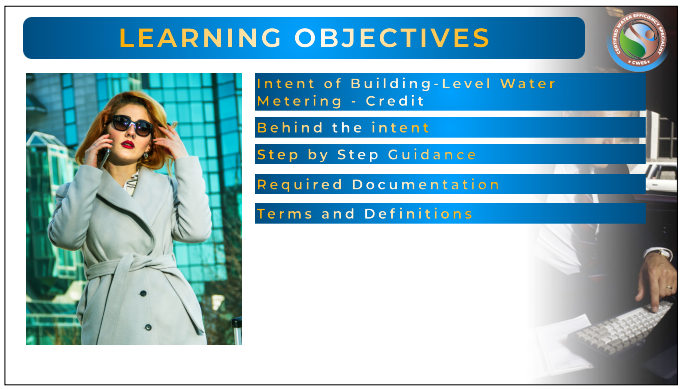

LEARNING OBJECTIVES
Intent of Building-Level Water Metering - Credit
Behind the intent
Step by Step Guidance
Required Documentation
Terms and Definitions

WE- CR(1) - DESIGN

WATER METERING

Intent

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

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.

Potential Technologies & Strategies

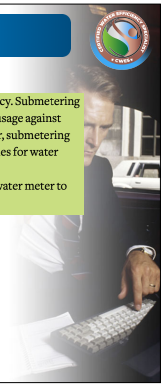
- [x] Metering water usage by subsystem helps facilities managers better gauge a building's water efficiency. Submetering the major building water systems provides a way to formulate independent system baselines, track usage against those baselines, isolate and identify potential sources of waste, and 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

Implementation

REQUIRED DOCUMENTATION

Documentation	All projects
WRWF MMTering strategy narrative	X

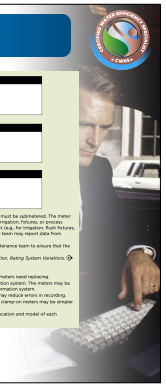
BEHIND THE INTENT



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 baselines, 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.

This credit expands on WE Prerequisite Building-Level Water Metering, which requires a main water meter to measure the total quantity of water entering the building.

STEP-BY-STEP GUIDANCE



STEP 1. IDENTIFY CANDIDATE SYSTEMS FOR SUBMETERING

Identify all systems serving the project building and grounds. These subsystems may include irrigation, indoor plumbing fixtures, domestic hot water, process water, reclaimed water, and boiler water. Cooling tower submeters are addressed separately, under WE Prerequisite Indoor Water Use Reduction.

- Consider those subsystems that consume the most water, are the most expensive to operate, or most closely align with the goals of the building management.
- Consider not only the number, types, and sizes of meters but also the effort required to take meter readings.
- The cost of a wet meter (a meter installed in the pipe) increases with pipe size; many external, clamp-on meters are adaptable to a range of pipe sizes. Clamp-on meters are more costly on small-diameter pipes, but initial cost differences are reduced for larger pipes.
- The higher cost of a larger meter may be offset by reduced operations and maintenance costs if facilities staff will be making manual readings.
- Automatic data logging also adds to initial cost, but it may be cost-effective if it reduces the effort of obtaining and recording readings.
- Plumbing system layout affects where submeters can be installed. New construction projects may facilitate submetering during plumbing system design.

Some projects may require more than one submeter to measure 80% to 100% of flow in some systems.

STEP 2. DETERMINE SCOPE OF SUBMETERING

Identify which subsystems are most appropriate to submeter based on the project objectives.

- As noted in WE Prerequisite Building-Level Water Metering, consider location and accessibility when placing submeters, particularly for taking manual readings.
- If the project team is claiming credit for irrigation, indoor plumbing fixtures, domestic hot water, or other process water submeters, at least 80% of water distribution must be submetered. If 100% of the water used by a subsystem is metered, no calculation is necessary.
- Determine how much of the total water system will be submetered by comparing the submetered portions with total landscape area, number of indoor fixtures, domestic water heating units, or process use quantities, as follows:

EQUATION 1. Landscape area

$$\frac{\text{Metered irrigated landscape area}}{\text{Total irrigated landscape area}} \geq 0.8$$

Unirrigated landscape areas should not be included in either the numerator or denominator of this equation.

EQUATION 2. Fixtures

$$\frac{\text{Number of metered indoor fixtures and fittings}}{\text{Total number of indoor fixtures}} \geq 0.8$$

EQUATION 3. Domestic hot water

$$\frac{\text{Heating capacity of metered domestic water heating units}}{\text{Total heating capacity of all domestic water heating units}} \geq 0.8$$

EQUATION 4. Other process water

$$\frac{\text{Daily metered gallons (or liters) for process-type end uses}}{\text{Total expected daily gallons (or liters) for process-type end uses}} \geq 0.8$$

- If the team is using reclaimed water for irrigation, 100% of this water must be submetered. The meter for reclaimed water may also be the same meter that is counted for irrigation, fixtures, or process water. If reclaimed water is used in multiple applications in the project (e.g., for irrigation, flush fixtures, and process water), 100% of reclaimed water use must be metered; the team may report data from multiple submeters, as applicable.
- Discuss water efficiency goals with the building operations and maintenance team to ensure that the metered systems reflect needs.
- Healthcare projects have specific requirements. *See Further Explanation, Rating System Variations.*

STEP 3. SELECT METERING EQUIPMENT

Choose a submeter type if no existing meters are present or if existing meters need replacing.

- Submeters may be manually read or connected to a building information system. The meters may be connected directly to the building system or independent of a building information system.
- If meters are to be read manually, consider digital indicators, which may reduce errors in recording.
- Wet meters will likely be the most cost-effective approach. However, clamp-on meters may be simpler to install.

Prepare a narrative describing the subsystems metered, including the location and model of each installed submeter.

REQUIREMENTS

Install permanent water meters for two or more of the following water subsystems, as applicable to the project:

- ☑ Irrigation Meter : water systems serving at least 80% of the irrigated landscaped area.Calculate the percentage of irrigated landscape area served as the total metered irrigated landscape area divided by the total irrigated landscape area. Landscape areas fully covered with xeriscaping or native vegetation that requires no routine irrigation may be excluded from the calculation.

REQUIREMENTS +

- ☑ Indoor plumbing fixtures and fittings : Meter water systems serving at least 80% of the indoor fixtures and fitting described in WE Prerequisite Indoor Water Use Reduction, either directly or by deducting all other measured water use from the measured total water consumption of the building and grounds.
- ☑ Domestic hot water : Meter water use of at least 80% of the installed domestic hot water heating capacity (including both tanks and on-demand heaters).
- ☑Boiler with aggregate projected annual water use of 100,000 gallons (378 500 liters) or more, or boiler of more than 500,000 BtuH (150 kW). A single makeup meter may record flows for multiple boilers.

REQUIREMENTS +

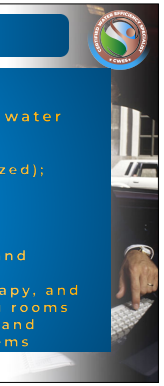
- ☑Reclaimed water: Meter claimed water, regardless of rateA reclaimed water system with a makeup water connection must also be metered so that the true reclaimed water component can be determined.
- ☑Other process water : Meter at least 80% of expected daily water consumption for process end uses, such as humidification systems, dishwashers, clothes washers, pools, and other subsystems using process water.

REQUIREMENTS +

Healthcare Projects only

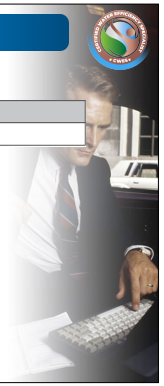
In addition to the requirements above, install water meters in any five of the following:

- ☑purified water systems (reverse osmosis, deionized);
- ☑filter backwash water;
- ☑water use in the dietary department;
- ☑water use in laundry;
- ☑using water in the laboratory;
- ☑water consumption in the Central Sterilisation and Processing Department
- ☑Water consumption in physiotherapy, hydrotherapy, and treatment areas; water consumption in operating rooms
- ☑A closed-loop hydronic system makes up water, and
- ☑cold-water makeup for domestic hot water systems



REQUIRED DOCUMENTATION

Documentation	All projects
Water metering strategy narrative	X



REFERENCED STANDARDS

☑NONE

CONNECTION TO ONGOING PERFORMANCE

LEED O+M WE credit Water Performance : Sub metering water subsystems helps facility managers track changes in water usage over time and provides the data necessary to identify opportunities for water savings by end use, which may help improve a project's water performance score. Sub metering is an important component of a successful water management program; metered data enables monitoring of consumption and costs as well as progress reporting throughout the building life cycle.

TERMS AND DEFINITIONS

- ☑ External meter a device installed on the outside of a water pipe to record the volume of water passing through it. Also known as a clamp-on meter.
- ☑ Reclaimed water wastewater that has been treated and puriied for reuse
- ☑ Wet meter a device installed inside a water pipe to record the volume of passing water