

Water Efficiency (WE)

GA02 Excerpt WE Overview. LEED BD+C RG v4 – Pgs. 257-258



The Water Efficiency (WE) category addresses efficiency and reduction of potable water for:

- Indoor use
- Outdoor use
- Specialized uses
- Metering





potable water

water that meets or exceeds U.S. Environmental Protection Agency drinking water quality standards (or a local equivalent outside the U.S.) and is approved for human consumption by the state or local authorities having jurisdiction; it may be supplied from wells or municipal water systems

nonpotable water

water that does not meet drinking water standards

graywater

“untreated household waste water which has not come into contact with toilet waste. Graywater includes used water from bathtubs, showers, bathroom wash basins, and water from clothes-washers and laundry tubs. It must not include wastewater from kitchen sinks or dishwashers” (Uniform Plumbing Code, Appendix G, Gray Water Systems for Single-Family Dwellings); “wastewater discharged from lavatories, bathtubs, showers, clothes washers and laundry sinks” (International Plumbing Code, Appendix C, Gray Water Recycling Systems). Some states and local authorities allow kitchen sink wastewater to be included in graywater. Other differences can likely be found in state and local codes. Project teams should comply with the graywater definition established by the authority having jurisdiction in the project area.

process water

water that is used for industrial processes and building systems, such as cooling towers, boilers, and chillers. It can also refer to water used in operational processes, such as dishwashing, clothes washing, and ice making.



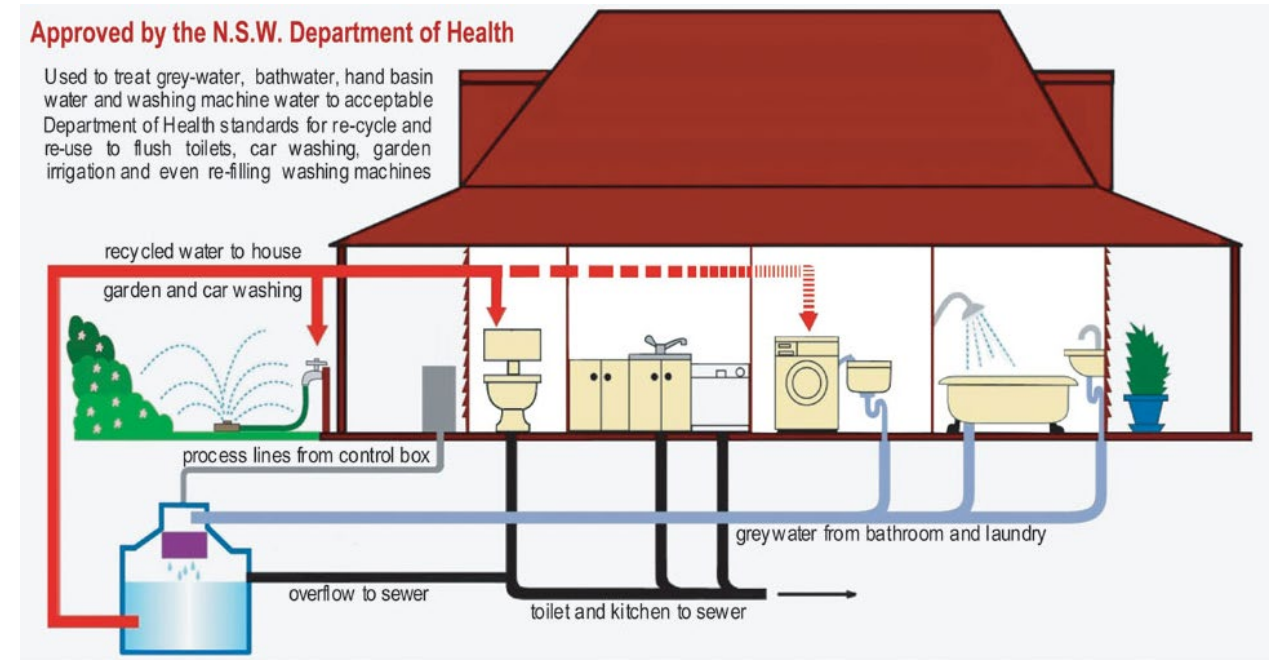
The conservation and creative reuse of water are important because only 3% of Earth's water is fresh water.

Sources of Potable Water

- Public water supply (municipal)
- Wells

Wastewater

- Piped to processing plant.
- Septic tanks



**No Human Waste or Food Processing
i.e. kitchen sinks and dishwashers**



Importance of Metering

Energy required to treat water for drinking, transport it to and from a building, and treat it for disposal represents a significant amount of energy use not captured by a building's utility meter. (GHG Red Flag!)

In the U.S., buildings account for 13.6% of potable water use. (LCCG – 12%)

Designers and builders can construct green buildings that use significantly less water than conventional construction by incorporating native landscapes that eliminate the need for irrigation, installing water efficient fixtures, and reusing wastewater for nonpotable water needs.



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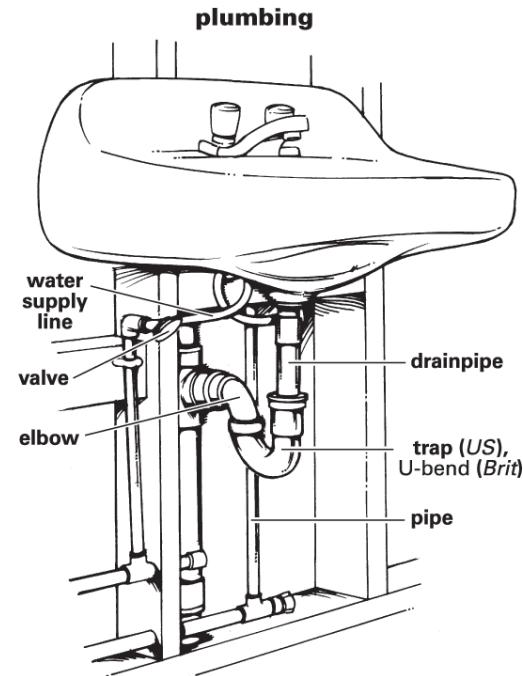
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The WE category comprises three major components: indoor water (used by fixtures, appliances, and processes, such as cooling), irrigation water, and water metering.

Several kinds of documentation span these components, depending on the project's specific water-saving strategies.

- Site Plans
- [Fixture Cutsheets](#)





Alternative Water Sources

- Graywater reuse
- Rainwater harvesting
- Municipally supplied wastewater (purple pipe)

Note: Team cannot apply the same water to multiple credits unless the water source has sufficient volume to cover the demand of all the uses (e.g., irrigation plus toilet-flushing demand).





Occupancy Calculations

FTE

1. A LEED BD+C: New Construction project has 400 full-time (40 hrs/wk) and 200 part-time (10 hrs/wk) employees. How many Full Time Equivalent (FTE) must be included for indoor water efficiency calculations?
 - A. 400
 - B. 450
 - C. 500
 - D. 600



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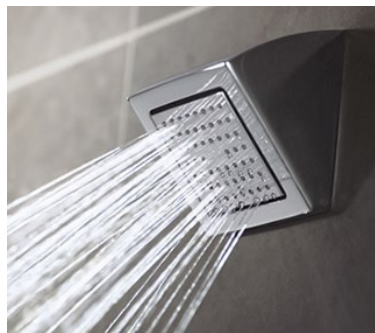
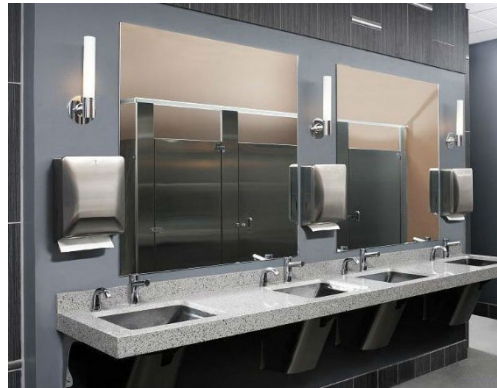
GUIDING QUESTIONS FOR A TEAM TO CONSIDER MAY INCLUDE THE FOLLOWING:

- How much rain falls on the site per year?
- How will water be used on site, and how can the amount be reduced?
- What are the sources of graywater, such as from sinks and showers, that could be collected and reused for nonpotable uses, such as irrigation?

The operation of buildings, including landscaping, accounts for approximately 47 billion gallons per day—12% of total water use.



Indoor Water Use





Indoor Water Use Reduction

Installing water-efficient fittings and fixtures

Use nonpotable water for flush functions

Installing submeters to track and log water use trends, check fixture performance, and identify problems.

Industrial Processes and Systems

Cooling Towers

Boilers

Chillers

Washing Machines

Dishwashers

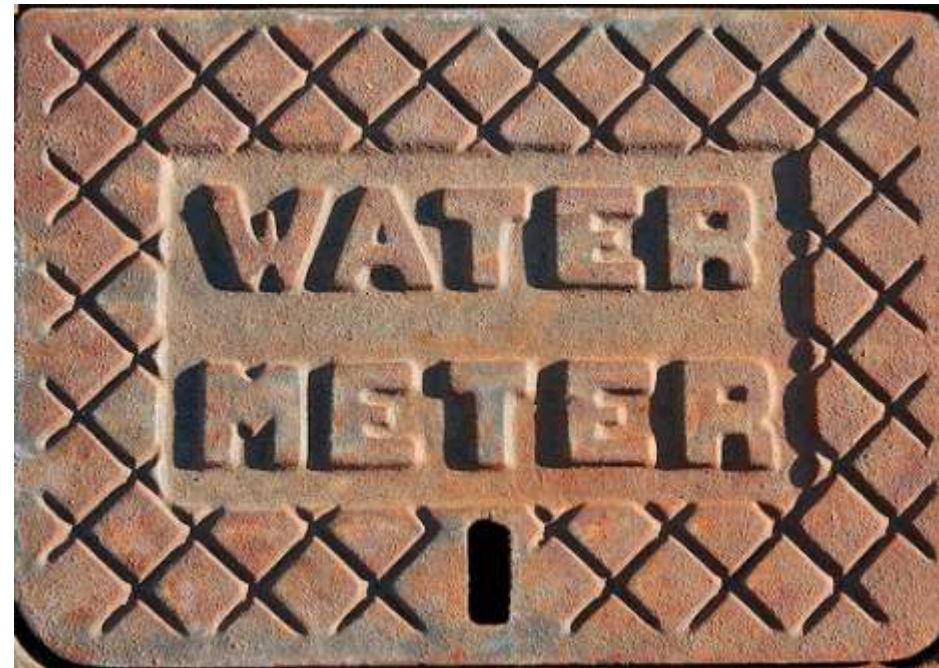
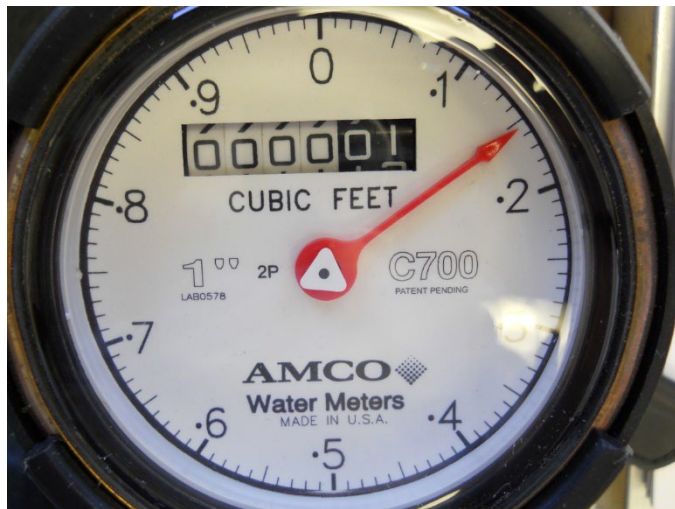
Substitute harvested rainwater
and nonpotable water sources



Submeters

Report how much water is used by systems and fixtures.

Alerts building maintenance to leaks and other inefficiencies.





Water Efficiency Goals

- Infiltrate rainwater on site to recharge the local aquifer.
- Use water more efficiently.
- Reduce the buildings water demand from indoor water (used by fixtures, appliances, and processes, such as cooling), and irrigation water.
- Install building level water meter and sub meters to track consumption and identify issues.



Quick Fill-in

| Prerequisite / Credit | Percentage Reduction Required | Additional Reductions/Points |
|-----------------------------|-------------------------------|--|
| Outdoor Water Use Reduction | 30% | Points: 1 <u>50%</u> 2 <u>100%</u> |
| Indoor Water Use Reduction | 20% | Points: 1 <u>25%</u> 2 <u>30%</u> 3 <u>35%</u> 4 <u>40%</u> 5 <u>45%</u> 6 <u>50%</u> EP? ≥55% |



STRATEGIES FOR REDUCING INDOOR WATER USE:

- **INSTALL EFFICIENT PLUMBING FIXTURES.** Install new high-efficiency fixtures, including high-efficiency lavatories, kitchen sinks and showers, dual-flush toilets, waterless urinals, and composting toilets. High-efficiency fixtures use less water than specified by the Energy Policy Act (EPAAct) of 1992. Select EPA WaterSense and ENERGY STAR products. In existing buildings, if porcelain replacement proves cost-prohibitive, install new flush valves or flow restrictors (e.g., aerators) to achieve water savings.
- **USE NONPOTABLE WATER.** If permitted by the jurisdiction, use captured rainwater, graywater, or municipally-provided reclaimed water for flush fixtures. Design and install plumbing systems that can use captured rainwater or graywater in flush fixtures. Graywater use is not an option in all municipalities, so it is important check regulations before planning to use this strategy.
- **INSTALL SUBMETERS.** Meter indoor water systems and monitor the data to track consumption trends, determine fixture performance, and pinpoint leaks.



Outdoor Water Use

STRATEGIES FOR REDUCING OUTDOOR WATER USE:

- **CHOOSE LOCALLY ADAPTED PLANTS.** Landscape with native and adapted plants that require less water. These plantings have the added benefit of providing habitat for native wildlife.
 - **USE XERISCAPING.** These drought-tolerant plantings have extremely low water needs. Especially in arid regions, employ xeriscape principles when designing the site landscape.
 - **SELECT EFFICIENT IRRIGATION TECHNOLOGIES.** Drip and bubbler systems and weather-based controllers can save water.
 - **USE NONPOTABLE WATER.** Captured rainwater, graywater, or municipal reclaimed water is suitable for irrigation.
 - **INSTALL SUBMETERS.** Meter the irrigation system to track water consumption and identify leaks.
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WATER EFFICIENCY

Water Efficiency (WE)

| Adaptation | NC | CS | S | R | DC | WDC | HOS | HC |
|-------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Total | 11 | 11 | 12 | 12 | 11 | 11 | 11 | 11 |
| Outdoor Water Use Reduction | req | req | req | req | req | req | req | req |
| Indoor Water Use Reduction* | req | req | req | req | req | req | req | req |
| Building-Level Water Metering | req | req | req | req | req | req | req | req |
| Outdoor Water Use Reduction | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| Indoor Water Use Reduction | 6 | 6 | 7 | 7 | 6 | 6 | 6 | 7 |
| Cooling Tower and Process Water Use | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Water Metering | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |