



| v3 - LEED 2008

# Water reuse in mid-rise buildings

MWEc1 | Possible 5 points

Glossary

## Intent

Use municipal recycled water, or offset central water supply through the capture and controlled reuse of rainwater and/or graywater.

## Requirements

### Prerequisites

None.

### Credits

*Note: Rainwater and graywater capture systems are subject to local codes and may require special permits. Note that the water quality should meet local standards and consult manufacturers' recommendations to determine the compatibility of plumbing fixtures with graywater. Many states and regulatory agencies require that water going into a toilet or sink meet potable water standards; builders should comply with local codes.*

**1. Water reuse for mid-rise** (maximum of 5 points, as specified in Table 9). Design and install systems so that  $\geq 10\%$  of total water demand (landscape irrigation and indoor water use combined) is offset by water reuse strategies, including any combination of the strategies listed below. Estimates must be calculated and prepared by a qualified professional using the method outlined below.

- a. Rainwater Harvesting System. Design and install a rainwater harvesting and storage system (including surface runoff and/or roof runoff) for landscape irrigation use or indoor water use.
- b. Graywater Reuse System. Design and install a graywater reuse system for landscape irrigation use or indoor water use. Graywater may be collected from any of the following:
  - a.  $\square$  clothes washers;
  - b.  $\square$  showers;
  - c.  $\square$  faucets and other sources.
- c. Municipal Recycled Water System. Design the plumbing such that the irrigation system water demand is supplied by municipal recycled water. This is applicable only in communities with a municipal recycled water program.

Table 9. Water reuse	
Percentage of total water demand supplied by water reuse strategies	Points
$\geq 10\%$	1
$\geq 20\%$	2
$\geq 30\%$	3
$\geq 40\%$	4
$\geq 50\%$	5

### Method for calculating the percent of water reuse:

#### Step 1.

Calculate Total Indoor Water Use for one month for the entire building for the following sources: toilets, bathroom sinks, kitchen sinks, showers, clothes washing, and dish washing. Assumptions for the calculation are given in Tables 10-1 and 10-2 below.

For fixture flow rates and appliance water consumption, use information provided by the manufacturer. If units have different fixtures and appliances, calculate water usage for each unit and sum the water use over all units. If the water usage for fixtures, fittings, and appliances are unknown, use default values in Table 11 below.

#### Step 2.

Calculate Outdoor Water Use. Use either of the following approaches:

- a. Design Case Usage, calculated using project information for the landscape and irrigation system. Use the methodology in this guidance for WE Credit 2.2, Step 2.

#### OR

- b. Default Usage, calculated according to the following equation:  
Default Usage = Landscaped Area \* ET0 \* 0.62,

Where: Landscaped Area is the square footage of landscape softscapes and ET0 is the average evapotranspiration rate in inches for the month of July.

#### Step 3.

Calculate Total Water Demand:

Total Water Demand = Total Indoor Water Use + Outdoor Water Use

#### Step 4.

Estimate the total monthly reused water for each of the following water reuse methods, as applicable to the project. Sum the volumes of water provided by graywater

collection, rainwater collection, and municipal recycled water for the Total Water Reuse.

- a. For graywater collection, predict the volume using the values calculated in Step 1 for each fixture or appliance providing graywater.
- b. For rainwater collection, EITHER
  - a. Use historical average precipitation for the month of July

**OR**

  - b. Estimate the volume of water expected to be in the storage cistern at the beginning of July, based on precipitation and usage estimates for each month prior to July, AND add this to the volume of precipitation collected during July.
- c. For municipal recycled water, predict the volume using the agreement with the recycled water provider.

Note: The amount of water reused cannot exceed the water usage being offset. For example, if a graywater system is designed to collect 5,000 gallons of water from showerheads, but the water will only be reused in toilets with a monthly demand of 2,000 gallons, the Total Water Reuse should be 2,000 gallons per month, not 5,000 gallons.

**Step 5.**

Calculate the Percent of Water Reuse:

$$\text{Percent Water Reuse} = \text{Total Reused Water} \div \text{Total Water Demand} * 100\%$$

Table 10-1. Indoor Water Usage Assumptions & Sample Calculator for Fixtures & Fittings					
Flush Fixture	Monthly uses per resident	Building residents <sup>4</sup>	Flowrate (GPM or GPF)	Duration	Monthly water use (gal)
Toilet	150			1 flush	
Bathroom Sink	150			0.25 min. flush	5 min.
Kitchen Sink	120			1 min.	
Shower	30			5 min	
Where monthly water use = monthly uses per resident * residents * flowrate * duration					

Table 10-2. Indoor Water Usage Assumptions & Sample Calculator for Appliances				
Appliance	Monthly uses per unit	Number of units in the building	Water consumption per use (gal)	Monthly water use
Dishwater*	16			
Clothes washer**	30			
Where monthly water use = monthly uses per unit* units * consumption per unit				

\* For each unit without a dishwasher, add 96 gal per month to account for washing by hand.

\*\* If there are clothes washers in the building, this calculation should still be completed, even if the clothes washers are not in each unit.

Fixture for Appliance	Default Flowrate or Water Consumption
Toilet	1.6 gal/flush
Bathroom Sink	2.5 gal/minute
Kitchen Sink	2.5 gal/minute
Shower	2.5 gal/minute
Dishwasher	6 gal/cycle
Clothes washer	50 gal/load