A PRESENTATION FOR

Green Build 2009

Getting the Waste out of Water and the Water out of Waste

Tools for the Building Professional

MGUG

Me Green You Green

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Under Main Street USA

What is going on under Main Street USA?

Steam Pipe Exposition Midtown Manhattan – July 2007

A firefighter walks past the scene of a steam pipe explosion on Lexington Avenue Thursday in New York City. Steam and mud were forced from the ground near Grand Central Station on East 41st street from Third to Lexington Avenue forcing people to evacuate the area and also causing subway delays.

Sourse - www.npr.org/.../07/as_you_probably_know_by.html






What is in our water?

Drugs in the drinking water

Tests have detected minute concentrations of pharmaceuticals in the drinking water supplies of at least 46 million people in two dozen major American metropolitan areas, an Associated Press investigation has found. The federal government does not regulate prescription drugs in water.

http://hosted.ap.org/specials/interactives/pharmawater_site/






Lead in Water

- On April 2, 2004, the Washing Post reported, “The D.C. Water and Sewer Authority violated federal law by failing to properly notify city residents of high lead levels in the drinking water and to adequately protect public health, regulators at the US EPA said yesterday.”

- David Nakamura and Carol D. Leonnig, “WASA Violated Lead Law, EPA Says Public Alert, Testing Called Inadequate, *Washing ton Post*, April 2, 2004.





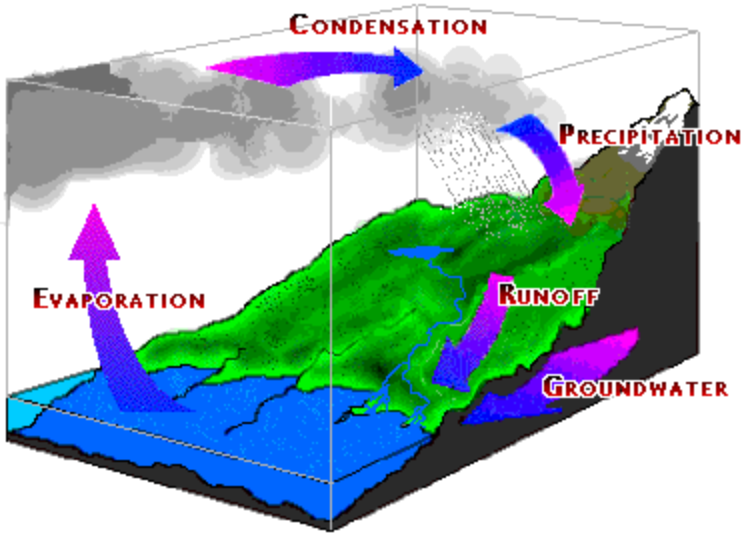

More on Lead

- According to the Washington D.C. City Chief Engineer, quoted in an article in the *Washington Post*, “A substitute must be found for lead pipes. The general fear that such pipes might cause lead poisoning under certain conditions. This makes them a menace to the health of the people”
- June 9, 1893






Biosphere Water Loop



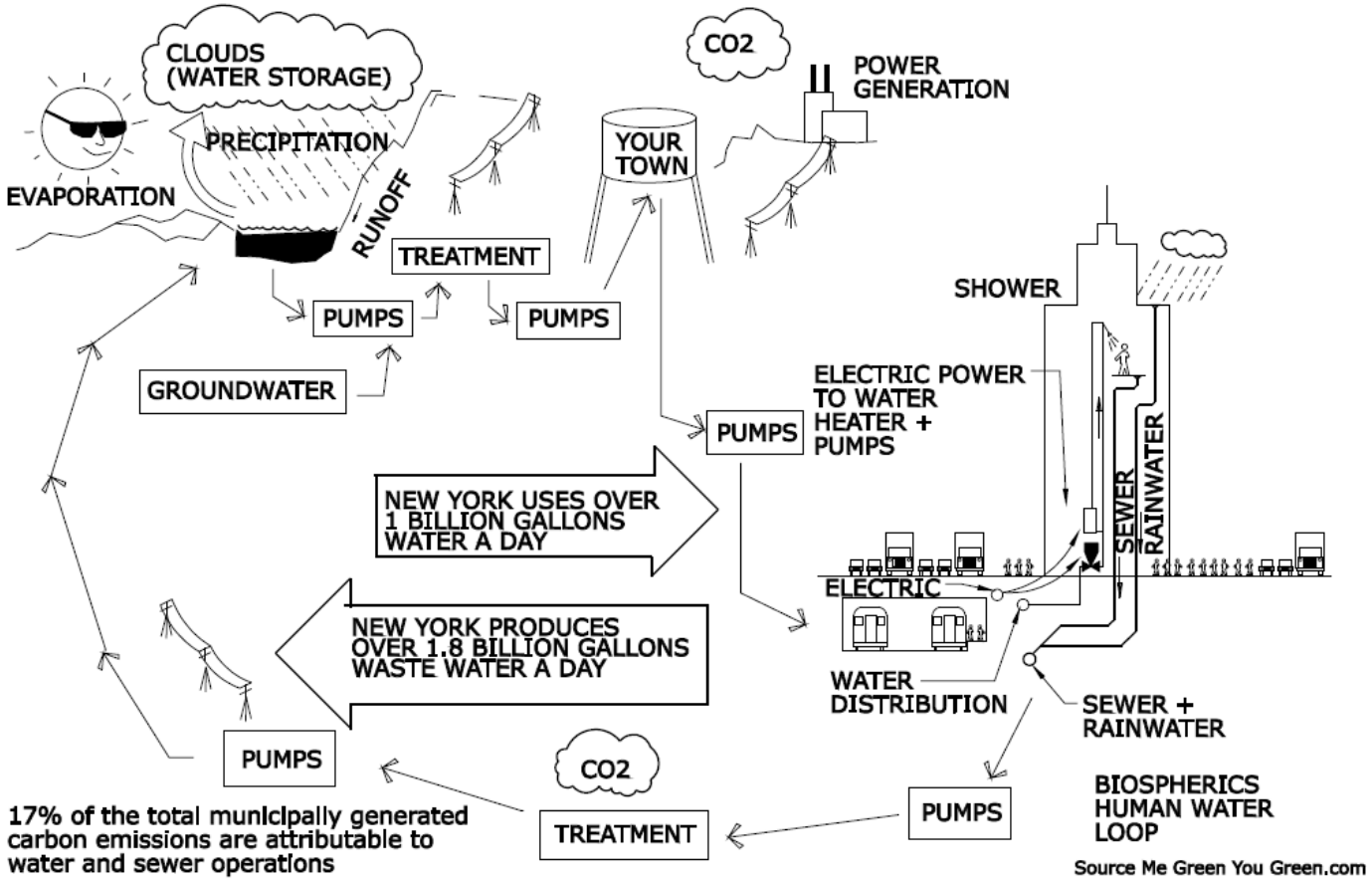
“Building systems should study, replicate and respect the earth’s biospheric systems to increase the quality of life.”

Source - www.scienceinteractive.net





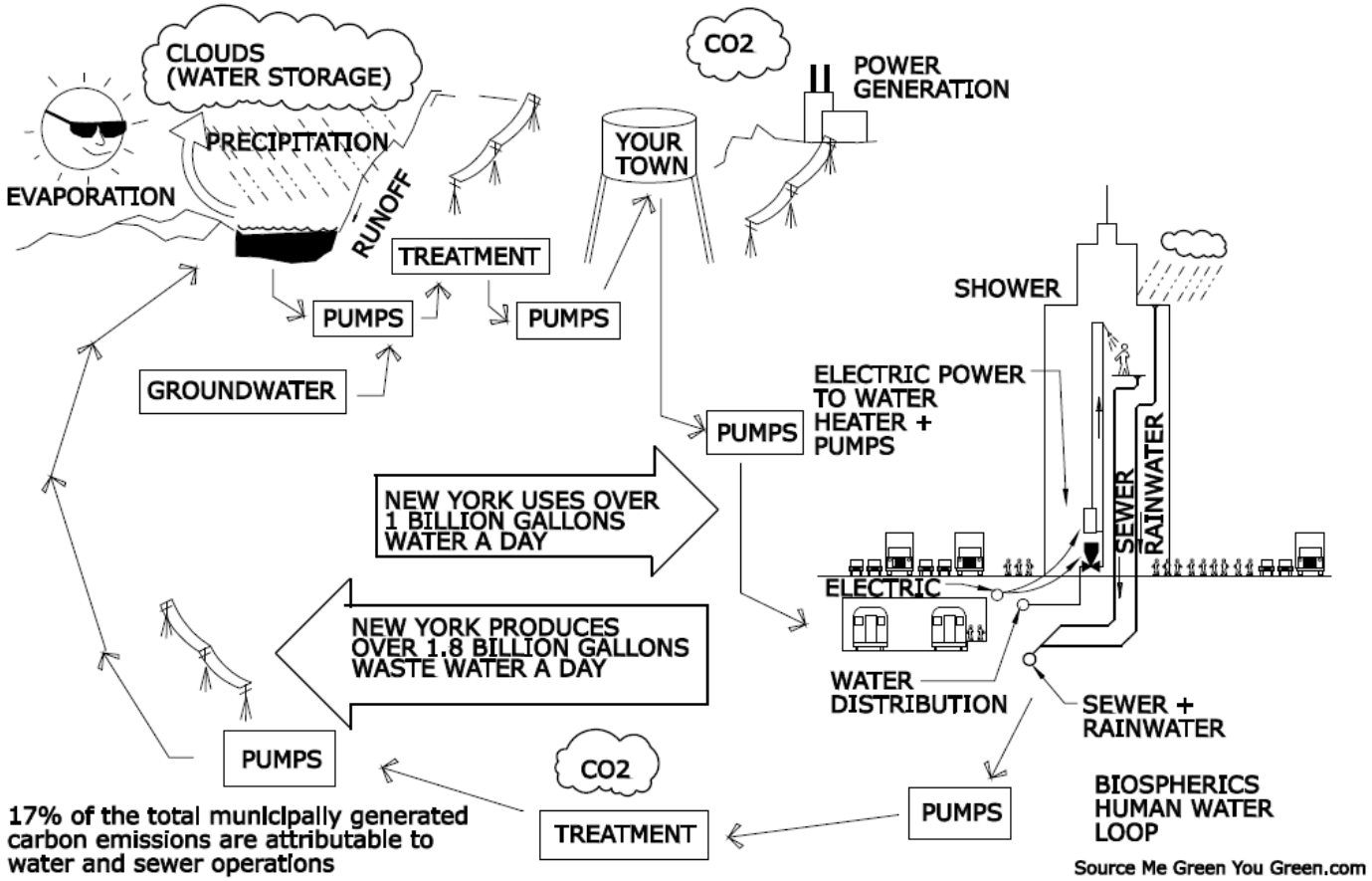

Our Biosphere








Our Biosphere








Decentralize

- Most communities have large, centralized water and wastewater systems.
- One possible option is to move to smaller systems that reduce the strain on centralized systems.
- Yet what would these systems look like?

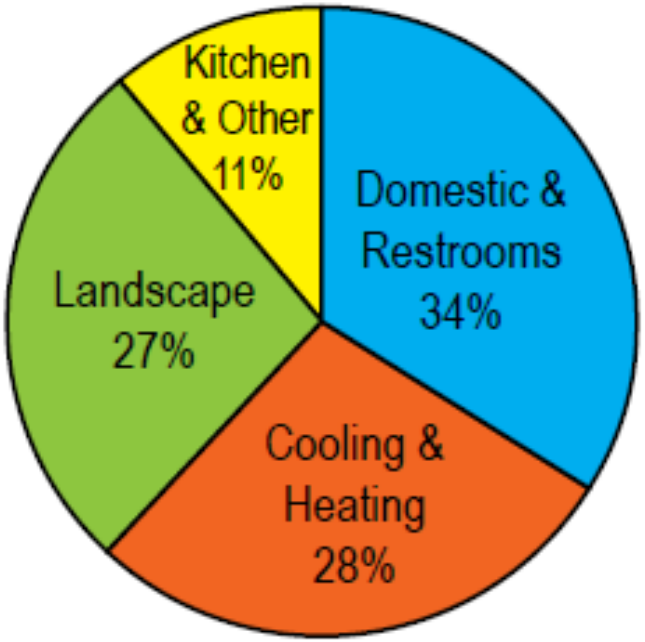





Typical building water systems

- Plumbing fixtures are not the only systems that use water and create waste water in a building.
- 28% of the water used in a typical office building serves the heating and cooling equipment.

Source – Water Smart Guide Book East Bay Municipal Utility District.

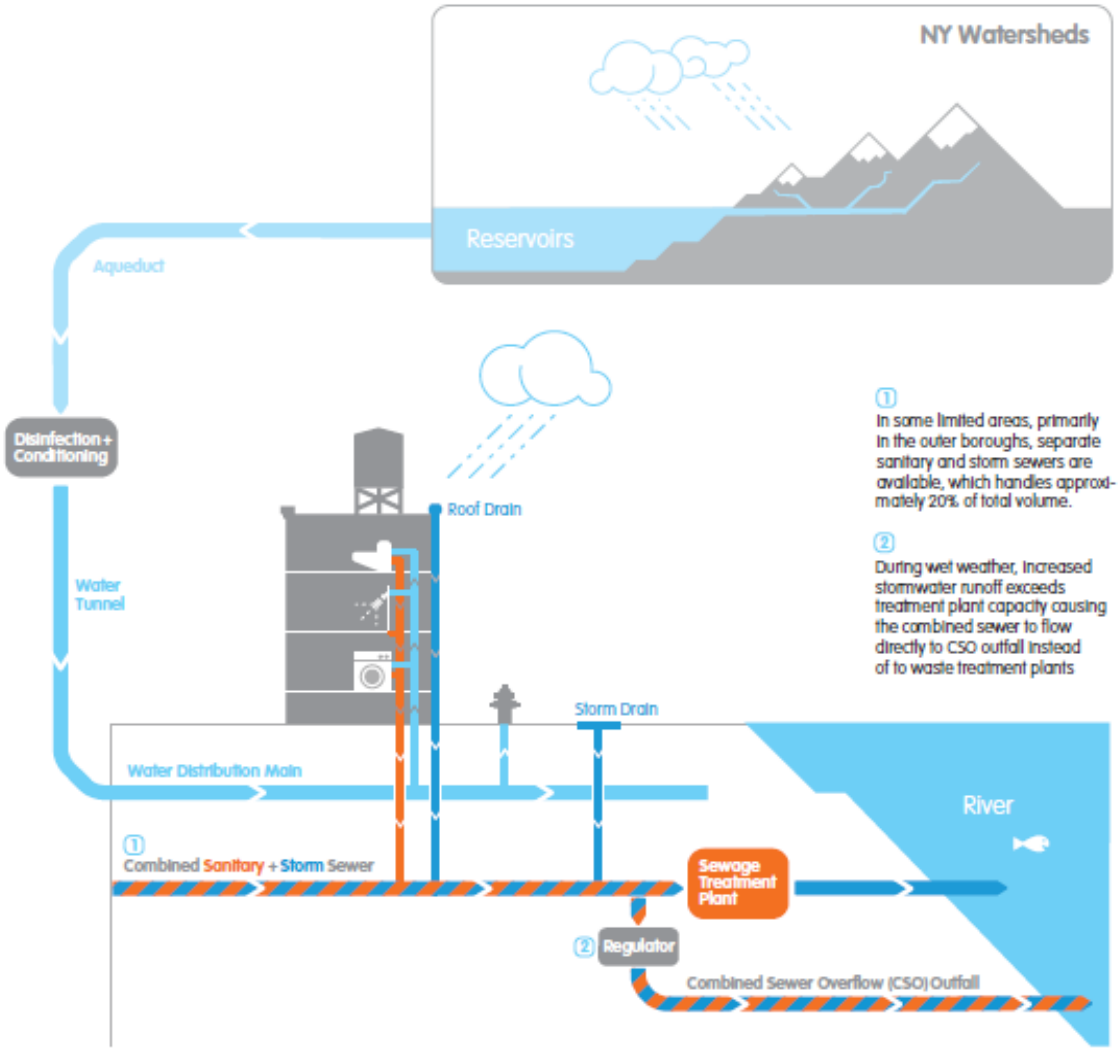


Typical water use in office buildings






Separate Storm and Waste

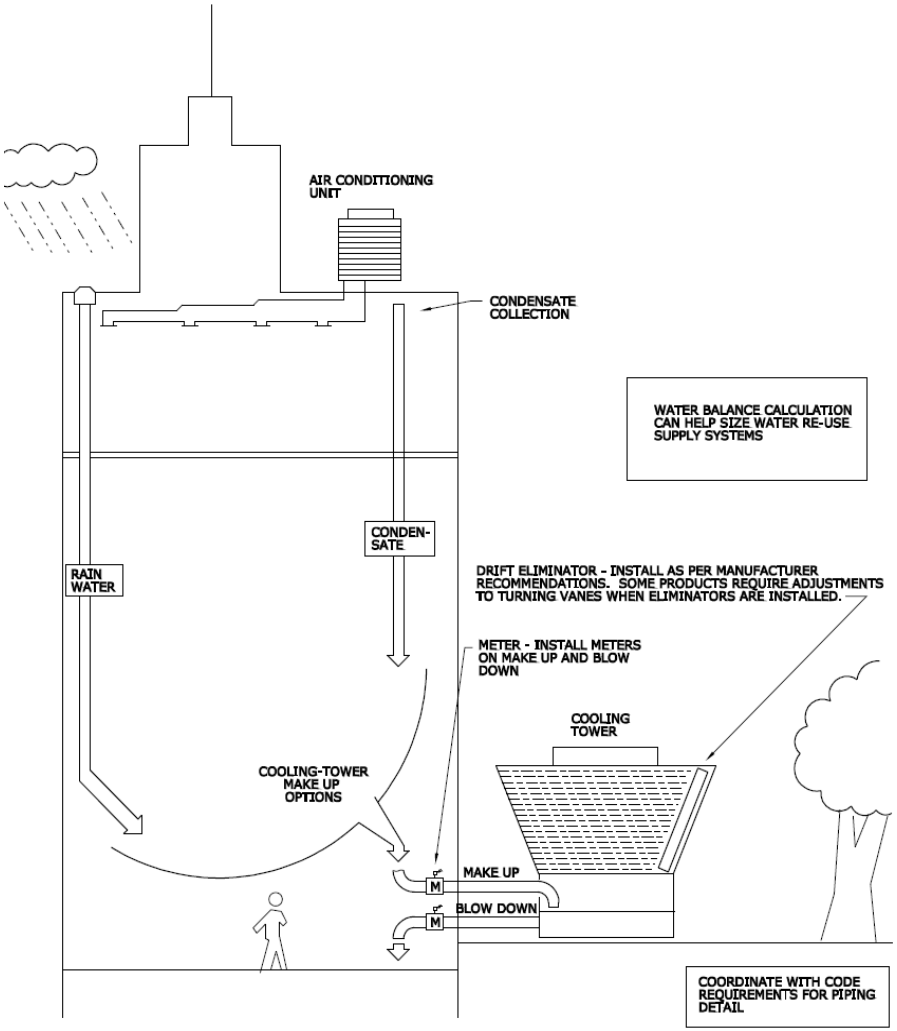


012 / Water Conservation Manual

Source – New York City Water Conservation Manual - http://www.nyc.gov/html/ddc/html/design/reports.shtml

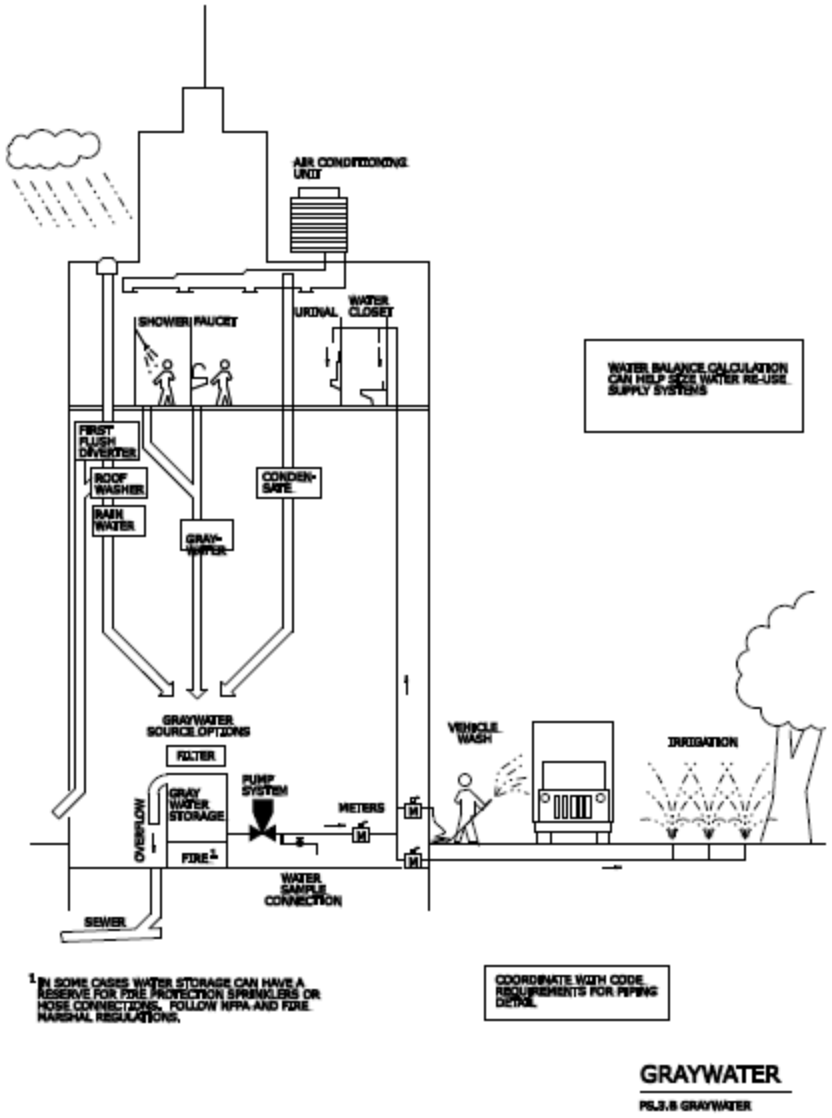
Cooling Tower Options

- Air Conditioning Condensate collection
- Rainwater Catchment



COOLING TOWER MAKE UP

Alternate Water



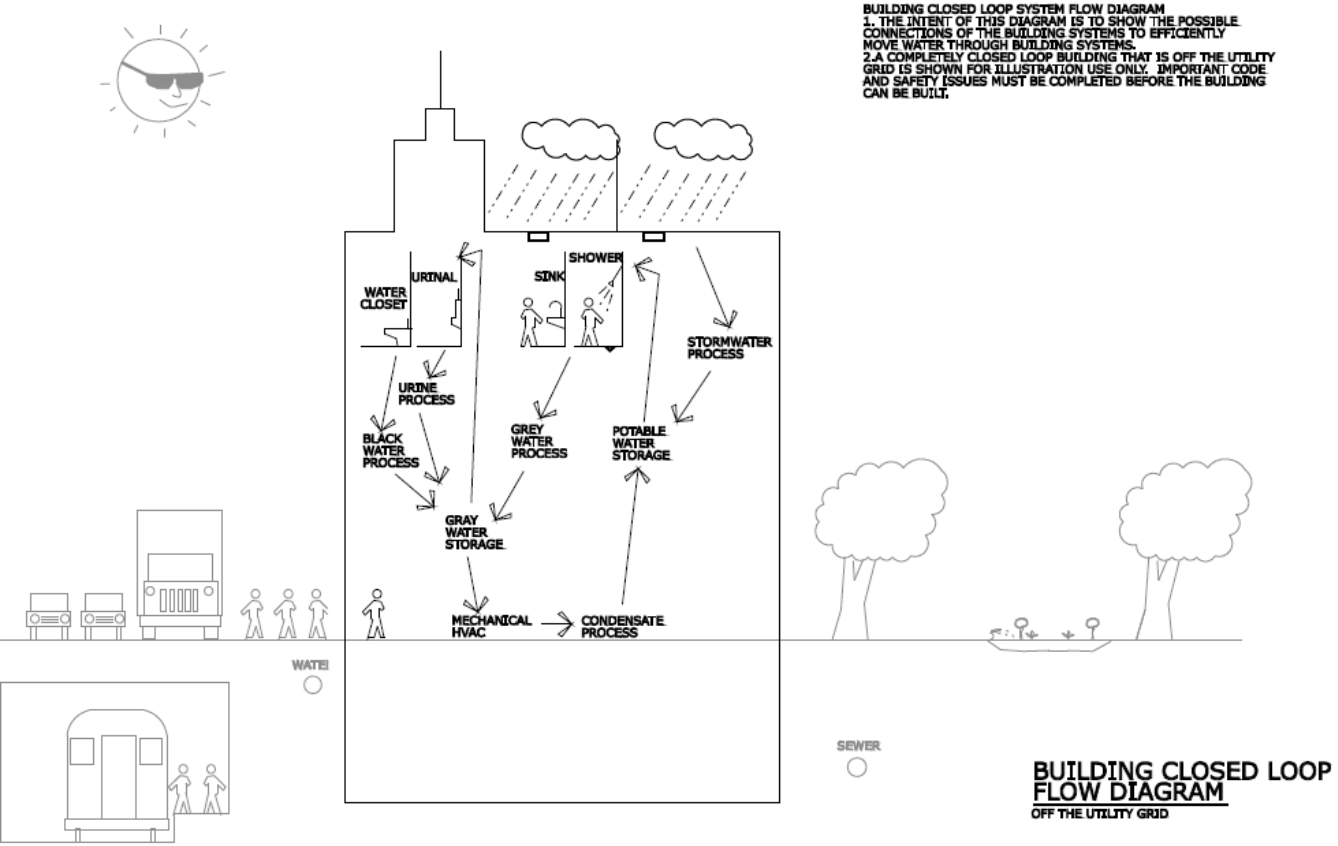
Source:

- Rainwater
- Plumbing fixtures
- Condensate

Supply:

- Irrigation
- Flush Fixtures
- Vehicle wash

What is in the Future?



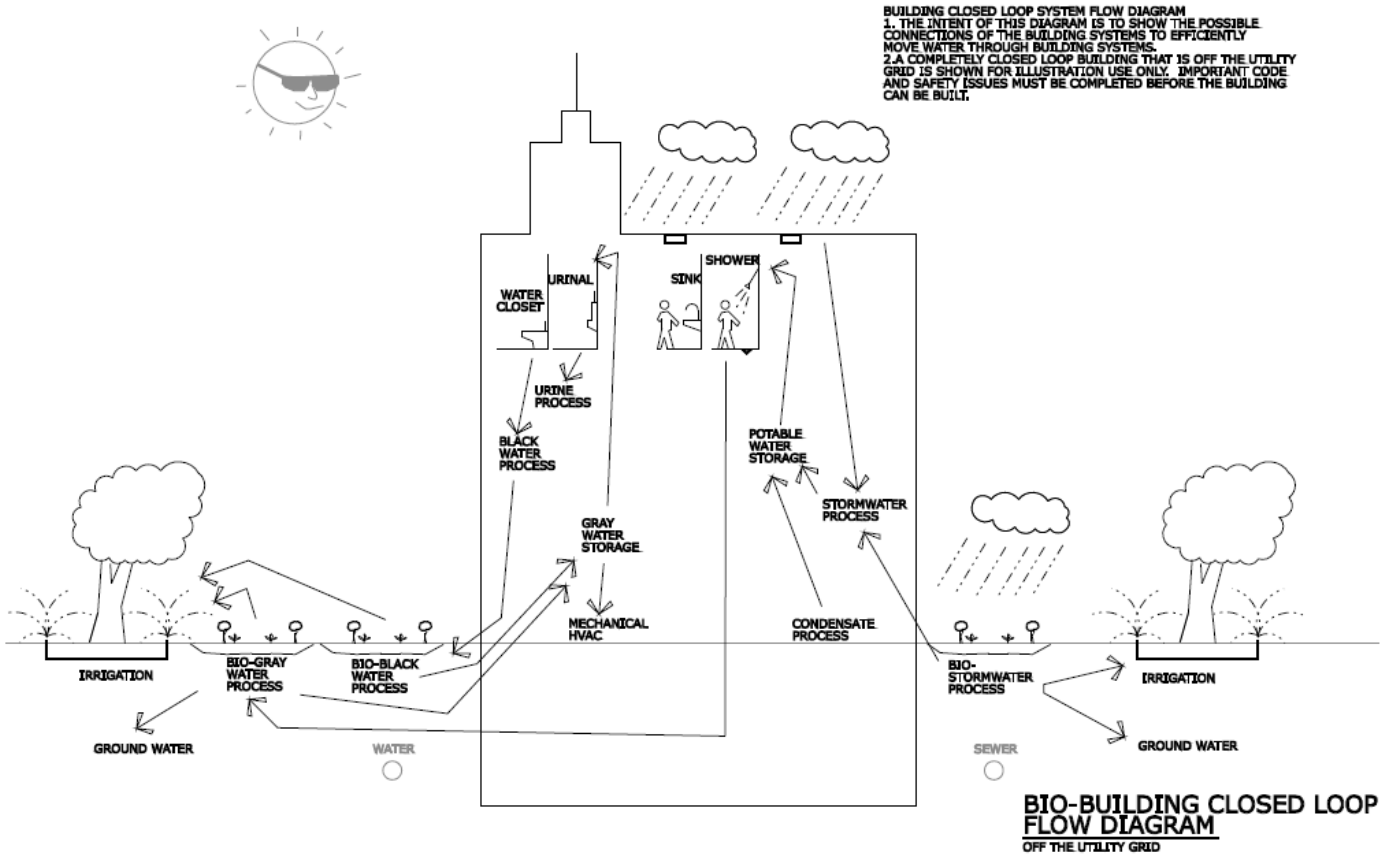
Closed Loop Water System

Technology is available to close the water and waste loops in a building. One way is with the use of mechanical systems.






Bio-System



Bio-Closed Loop Water System

Technology is available to close the water and waste loops in a building.

One way is with the use of Biological or plant based systems.






Water Quality

Current standards for potable water ensure the quality of the water as it leaves the water treatment facility.

- These standards have stood the test of time and have delivered many trillion gallons of safe water to the country's population every day.
- This is the result of the complex water standards that are now
- in effect in centralized water treatment facilities.
- What happens when these systems are decentralized and installed in hundreds of buildings?
  - Are there any water quality or testing standards?
  - What if a future building owner does not maintain the system?






Water Quality

Here are some of the important questions to be answered by design, construction, and regulatory professionals:

- Should the system be rated or approved by a sanitation or safety accreditation system, such as the National Sanitation Foundation?
- What are the water quality standards that cover these systems?
- Who is responsible for maintaining water quality?
- Who is responsible for testing the water quality and how often?






Rainwater and Graywater Check List

Here are some words of caution when proposing to design rainwater to flush or graywater systems:

- While local standards are changing, these systems are not legal in many areas of the country. Find this out first before spending time and effort designing a system.
- Determine water quality standards. Ask local and state regulatory agencies, including health departments, plumbing code officials, and building code officials, about their water quality standards.
- Get the approval of building operations. Even if the system is legal and approved by regulatory officials, the plumbing engineer must obtain a commitment from the building operations team to maintain the system.
- Like most plumbing systems, these systems can be harmful to the public if they are not maintained properly.






Check List

- Provide a domestic water bypass. Water systems in a building require maintenance. What if a future building operator does not maintain the system or a system fails?
- Use a packaged system. When designers are not familiar with designing the system they should use one of the packaged systems now on the market. These systems include tanks, filters, pumps, and controls for a complete system.






For more information, please contact:

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