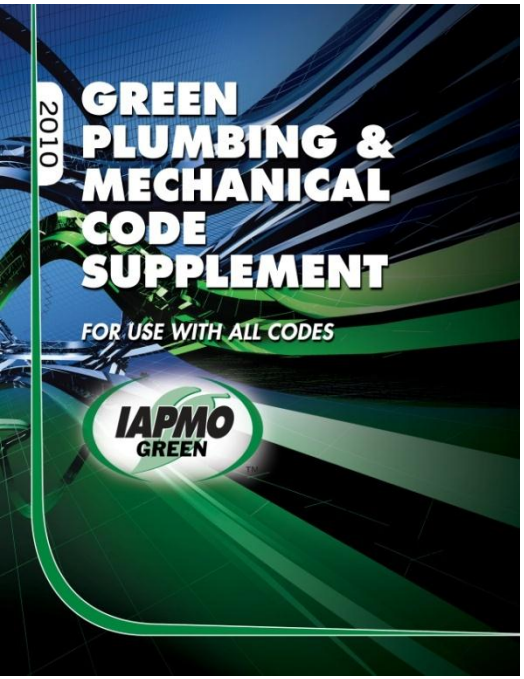
GREEN Plumbing and Mechanical Code Supplement



GP Russ Chaney

CEO,
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Chairman,
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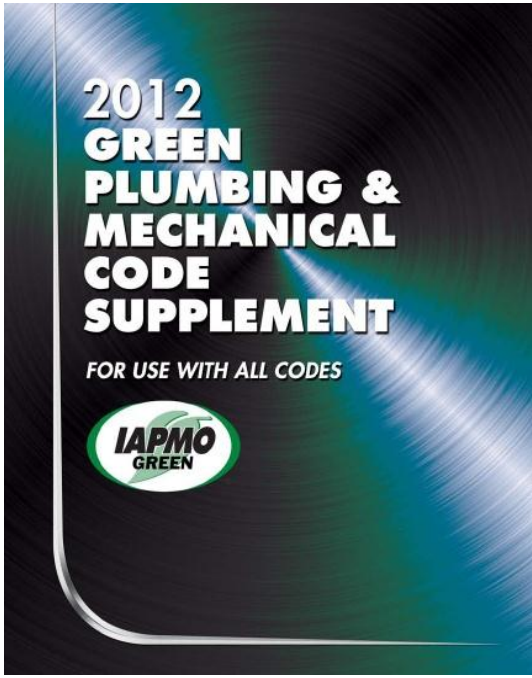
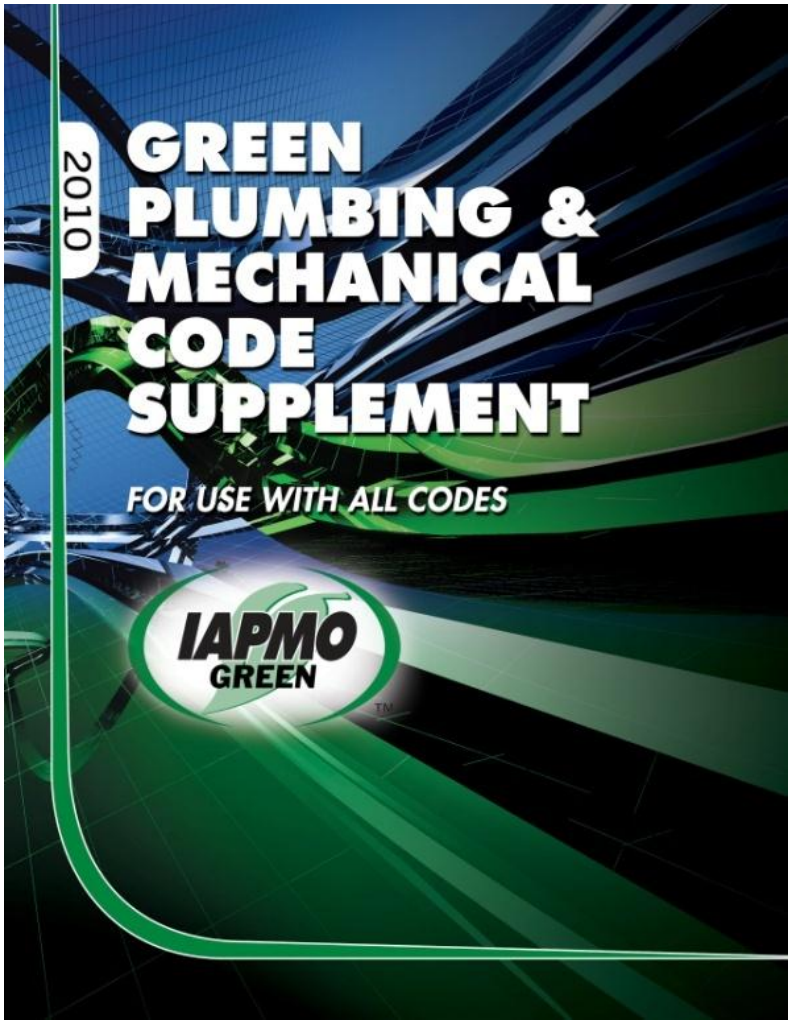


2012 NSPC, Appendix G

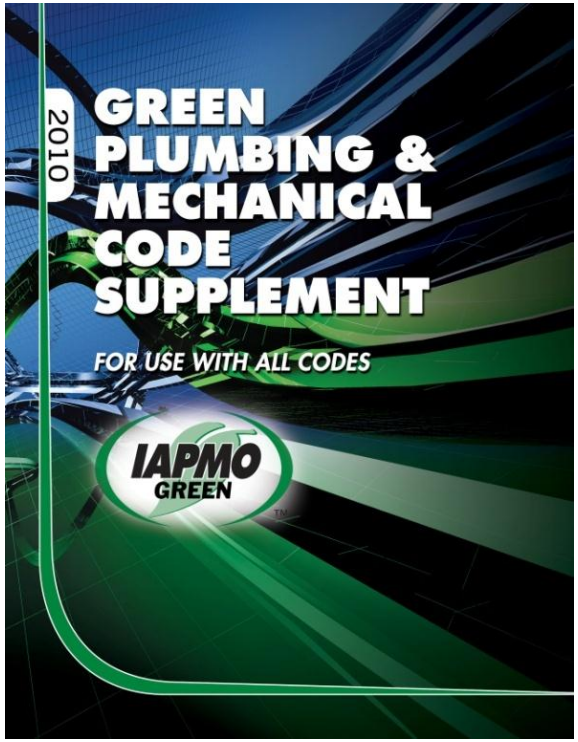
- Why include **GREEN** provisions in the National Standard Plumbing Code?
- Why partner with IAPMO to include verbatim provisions from the ***GPMCS***?
- Why should the NJ plumbing industry aggressively support ***Appendix G*** of the ***2012 NSPC***?
- What other choices are available?

What is the GREEN P&M Code Supplement?



GPMCS ~ Overview

- First **GREEN** Plumbing Code
  - Published in February 2010
- A turn-key document
  - ***Residential*** and commercial sustainable plumbing and mechanical systems
  - Covers all aspects of sustainability ~
    - Water and energy efficiency
    - Hot water system design
    - Alternate water source use
    - Indoor environmental quality



GPMCS ~ Overview

- Bridge between codes and **GREEN** building schemes
- Overlays ANY published plumbing code
- Baseline for sustainability
  - No tiers of compliance or rating system
- Repository for future code provisions
- Overlays Uniform Codes, including Plumbing, Mechanical and Solar Energy
- Introduces high efficiency products and systems

IAPMO GREEN ~ GPMCS

- Uniform Codes - developed with critical eye on sustainability and on consensus
- 2007- IAPMO BoD calls for a reduction in energy and water consumption in provisions contained within the Uniform Codes
  - Decision made to bring together the best and brightest minds our industry has to offer
  - Created ***GREEN Technical Committee*** (***GTC***) to accomplish this aggressive goal

GTC ~ A Diverse Group of GREEN Industry Experts

- 28 experts in **GREEN** plumbing and mechanical fields ~
  - Inspectors, contractors, plumbers and mechanics, engineers, manufacturers, trade associations, water utilities, water and energy conservation authorities
  - Meet three times per year, two to three days per meeting in an aggressive schedule to develop and maintain **GREEN** code provisions
  - Supported by numerous plumbing industry organizations known for their **GREEN** expertise

GTC ~ Task Groups

- 14 task groups (200+ people in total)
  - Largest concentration of P&M sustainability experts ever assembled
  - No other process comes close in sustainable P&M contact hours
    - 3 meetings per year
    - 20+ conference calls per year
    - 100+ contact hours on P&M issues
  - Our industry responds to the call to conserve!

GTC ~ Task Groups ~ Subjects

- Plumbing Fixtures and Fittings
- HVACR
- Hot Water Systems
- Water Pipe Sizing
- Alternate Water Sources
- Potable Rainwater Catchment Systems
- Life Cycle Assessment
- Irrigation
- Food Services
- Pools, Spas and Hot Tubs
- Natural Gas
- Hydronics
- Commissioning and Verification
- General/Administration
- Irrigation

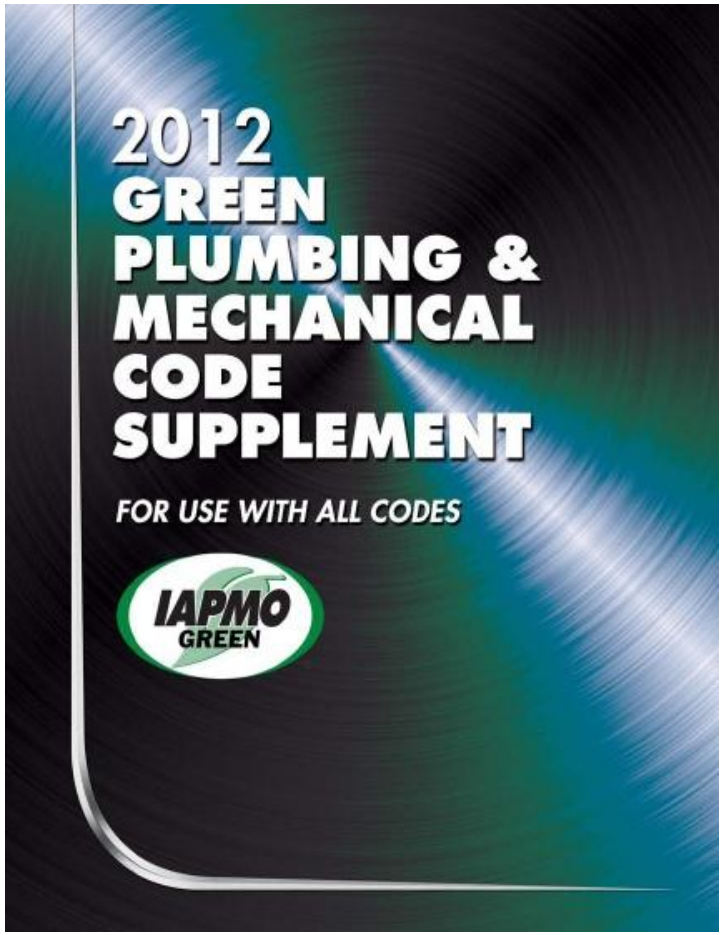
GTC ~ Objectives

- To develop and maintain ***GREEN*** *Plumbing and Mechanical Code Supplement*
- Identify opportunities to make Uniform Codes more sustainable
- To maintain a document that addresses emerging **GREEN** technologies
- To do so utilizing a broad-based industry approach in partnership with like minded associations ~ such as ...

Broad Based Industry Support ...

GPMCS ~ 2nd Edition

- Second edition published in April 2012
- Enhanced **GREEN** provisions addressing newer technologies for water and energy conservation.
- For more information visit: www.iapmogreen.org/publiccomment

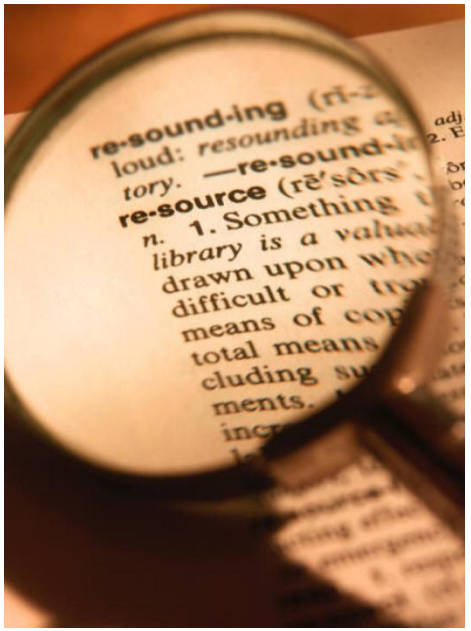


Why the GREEN Supplement?

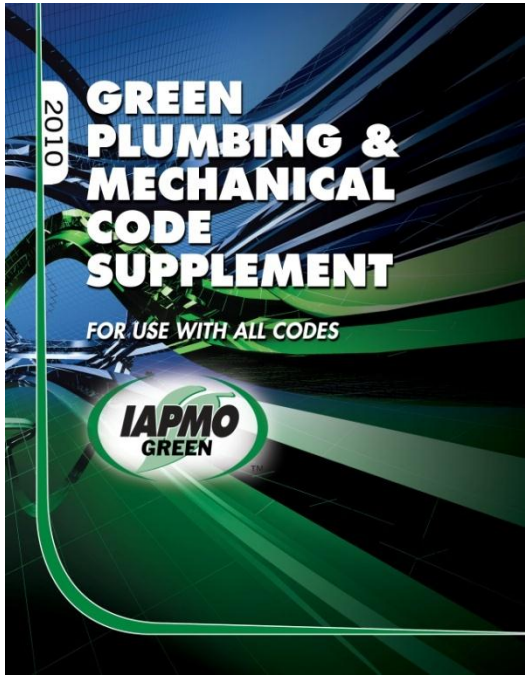
- Regulatory framework written in code language
  - elevate sustainable construction practices
  - maintain IAPMO's and likeminded partners high standards for protecting public health, safety and welfare
- Minimum baseline for sustainability
- Repository for provisions that can be integrated into ANY code
- The most advanced **GREEN** Code available today!

GPMCS ~ Our Response to Energy & Water Conservation?

- Valuable resource for:
  - Progressive jurisdictions looking to adopt more sustainable codes
  - Industry professionals that design, install and approve green plumbing and mechanical systems



Why the Need?


2010
GREEN
PLUMBING &
MECHANICAL
CODE
SUPPLEMENT
FOR USE WITH ALL CODES
IAPMO
GREEN

Why the Need for the GPMCS?

- Key industry stakeholders had never been brought together to properly vet sustainable P&M construction practices
  - A valuable reality check for our industry
  - Ensure that health and safety are first priority in achieving sustainable practices
  - Once assured, validate that sustainable technologies can be achieved and verified
  - To provide a vehicle for emerging technologies

Why the Need for the GPMCS?

- *Why the need continued …*
  - Tool to “hard wire” water and energy conservation together
  - To date nothing focusing solely on plumbing and mechanical systems
  - Nothing covering all aspects of sustainable construction for **Residential** **and** **Commercial** systems
  - Finally, to be responsive to legitimate concerns

Water Efficiency and Conservation

- 20%+ more efficient than current codes
- Coverage areas:
  - High efficiency plumbing fittings, fixtures and appliances
  - Water softening equipment
  - Boiler make-up water
  - Occupancy specific provision in restaurants and medical facilities
  - Cooling towers and evaporative coolers

High Efficiency Plumbing Fixtures and Fittings

- 1.28 gpf maximum toilets
  - Gravity
  - Pressure Assist
  - Dual Flush
- 1.6 gpf maximum flushometer valve

High Efficiency Plumbing Fixtures and Fittings

- 0.5 gpf or less urinals
- Non-water using urinals
  - Supply line rough-in at minimum height for backflow prevention device
  - Shut-off to isolate dead end
  - 1 water-supplied fixture upstream to address potential drainline blockage

High Efficiency Plumbing Fixtures and Fittings

Lavatory Faucets

- Residential Faucets
  ~ 1.5 gpm
- Commercial Faucets
  - 0.5 gpm
  - 0.25 gallons per metering cycle

High Efficiency Plumbing Fixtures and Fittings

- 2.0 gpm max showerheads
- Tub diverter leakage ≤ 0.1 gpm

High Efficiency Plumbing Fixtures and Fittings

- Multiple Showerheads in a compartment
  - 2.0 gpm max per 1,800 sq. in.
  - No limit on number of outlets

High Efficiency Plumbing Fixtures and Fittings

- Pre-rinse spray valves
  - Maximum flow rate of 1.6 gpm
  - Auto shut-off
  - Typical valves-
    - consume 2/3 of water used in a restaurant
    - exceed 3.0 gpm
    - operate for 5+ hrs/day

Sub-meters

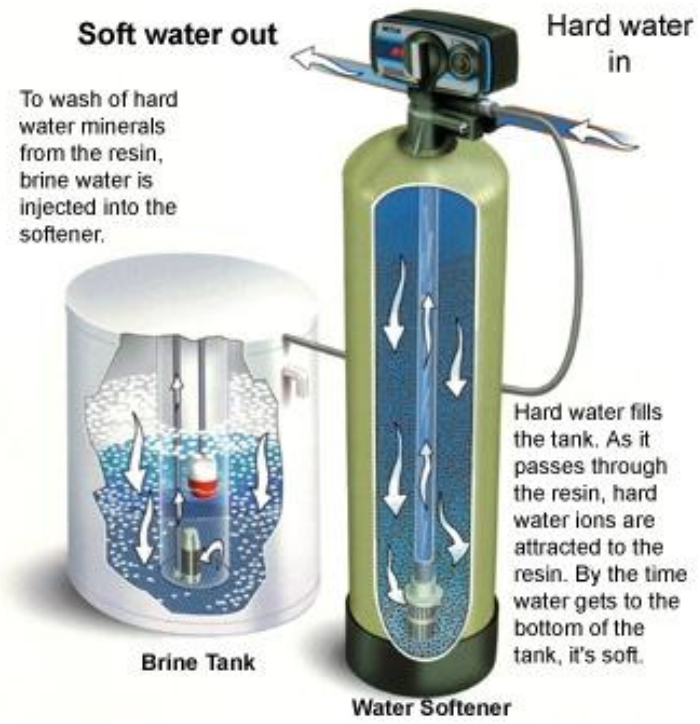
- Proven water efficiency tool
- No accountability without individual metering
- Behavior modification and system monitoring

Sub-meters

- Required in commercial applications
  - Tenant spaces
  - Landscape irrigation systems
  - High water-using processes
  - Make-up water to cooling towers, evaporative condensers, large boilers
  - Means of communicating data to consumer

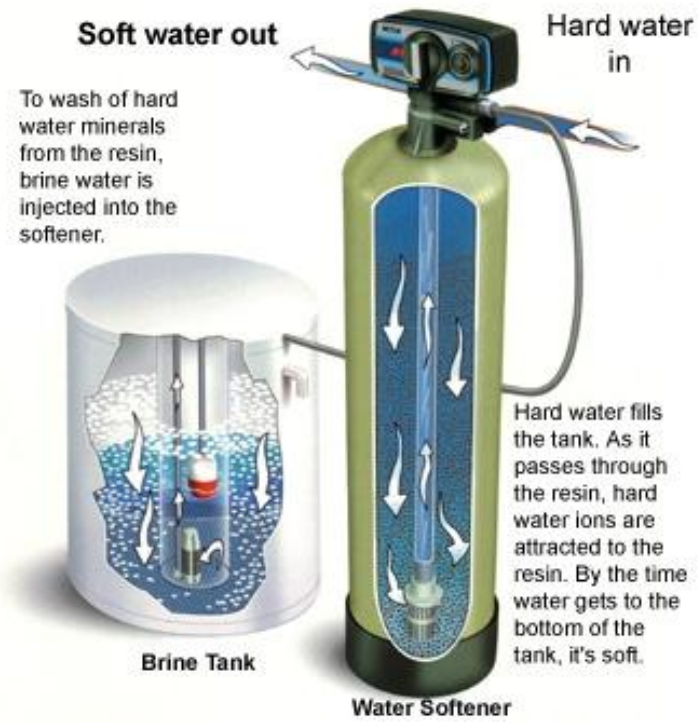
Water Softeners and Water Treatment Systems

- Timer regeneration prohibited
  - Demand initiation regeneration required
- Regeneration efficiency
  - Sets max salt consumption
  - Water (5 gallons/1000 grains)
- Auto shut-off for Reverse Osmosis discharge



Water Softeners and Water Treatment Systems

- Rough-in for homes with hard water (≥9 grains/gal)
- Required treatment for hard water supplied to heating equipment (≥9 grains/gal)
- Battelle study indicated that hard water reduces the efficiency of heating water by up to 24%



Alternate Water Sources

- Comprehensive provisions addressing
  - Rainwater harvesting (nonpotable and potable)
  - Reclaimed (recycled) water
  - Gray water
  - On-site treated non-potable water systems

Key Alternate Water Source Systems Provisions

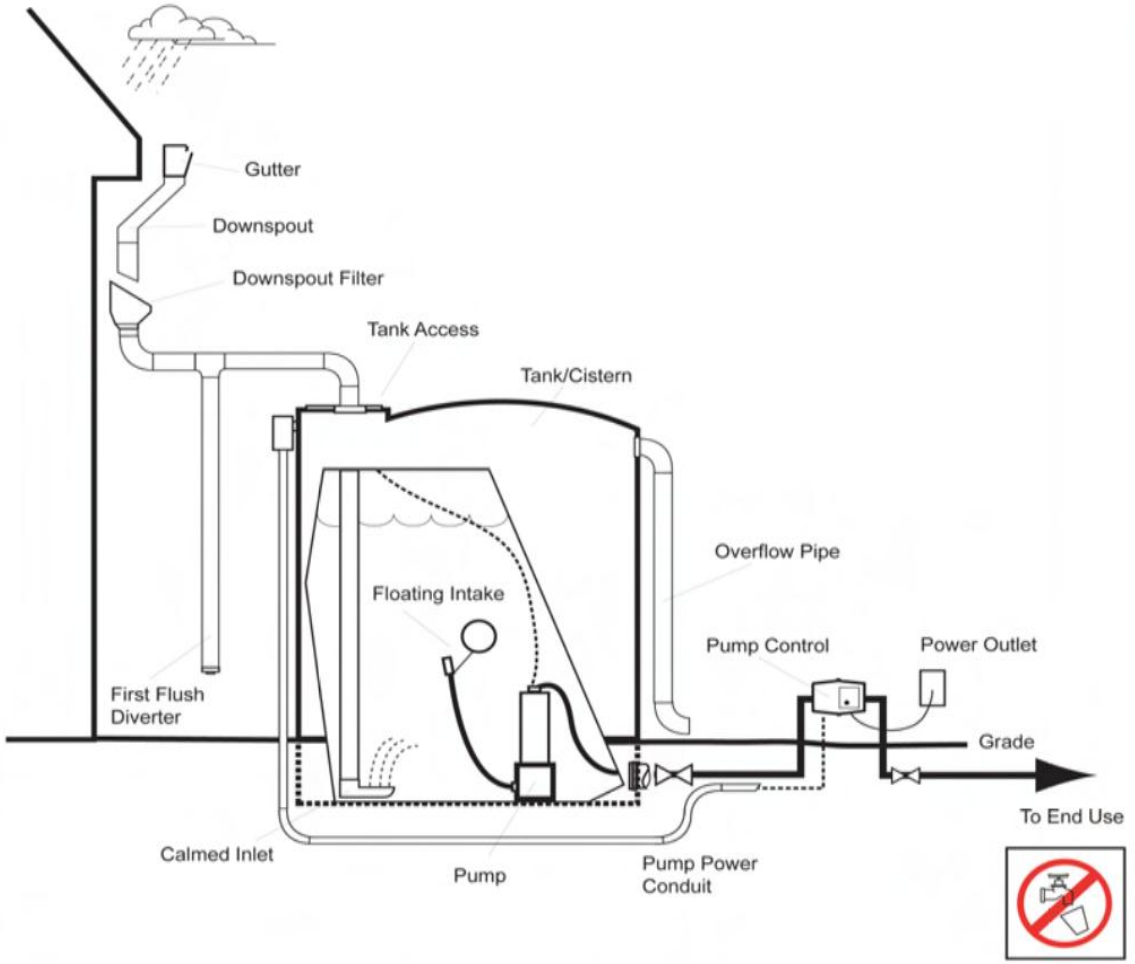
- Minimum water quality
  - Treatment/disinfection based on application
  - 100 micron filter required for fixture flushing and drip irrigation (except for reclaimed)
- Backflow prevention for potable water make-up
- Cross-connection test

Key Alternate Water Source Systems Provisions

- System design ...
  - person registered or licensed to perform plumbing design work
- Permitting – required for most systems
- Maintenance and inspection
- System marking and coloring

Rainwater Harvesting

- Irrigation, toilet and urinal flushing
- Treatment not required for irrigation applications

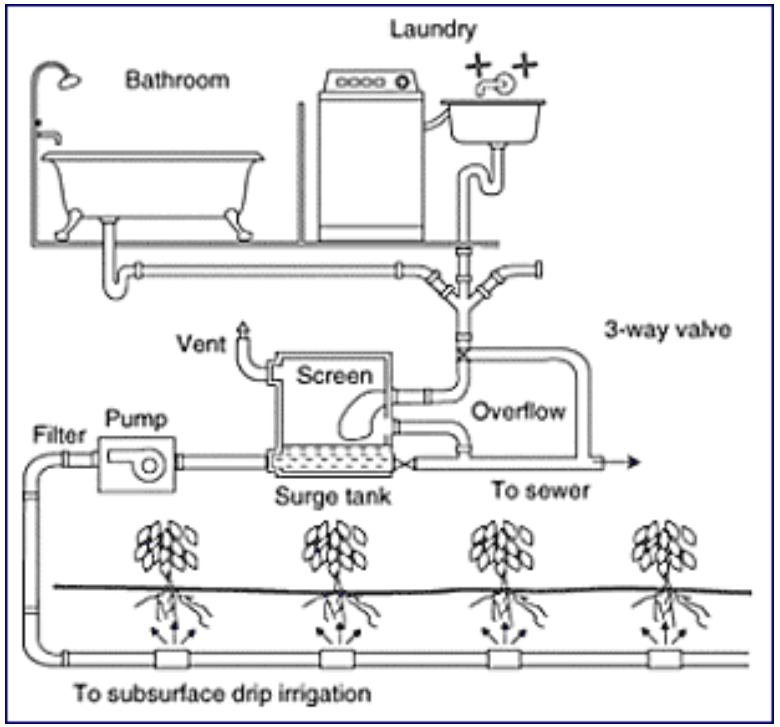


Reclaimed (Recycled) Water

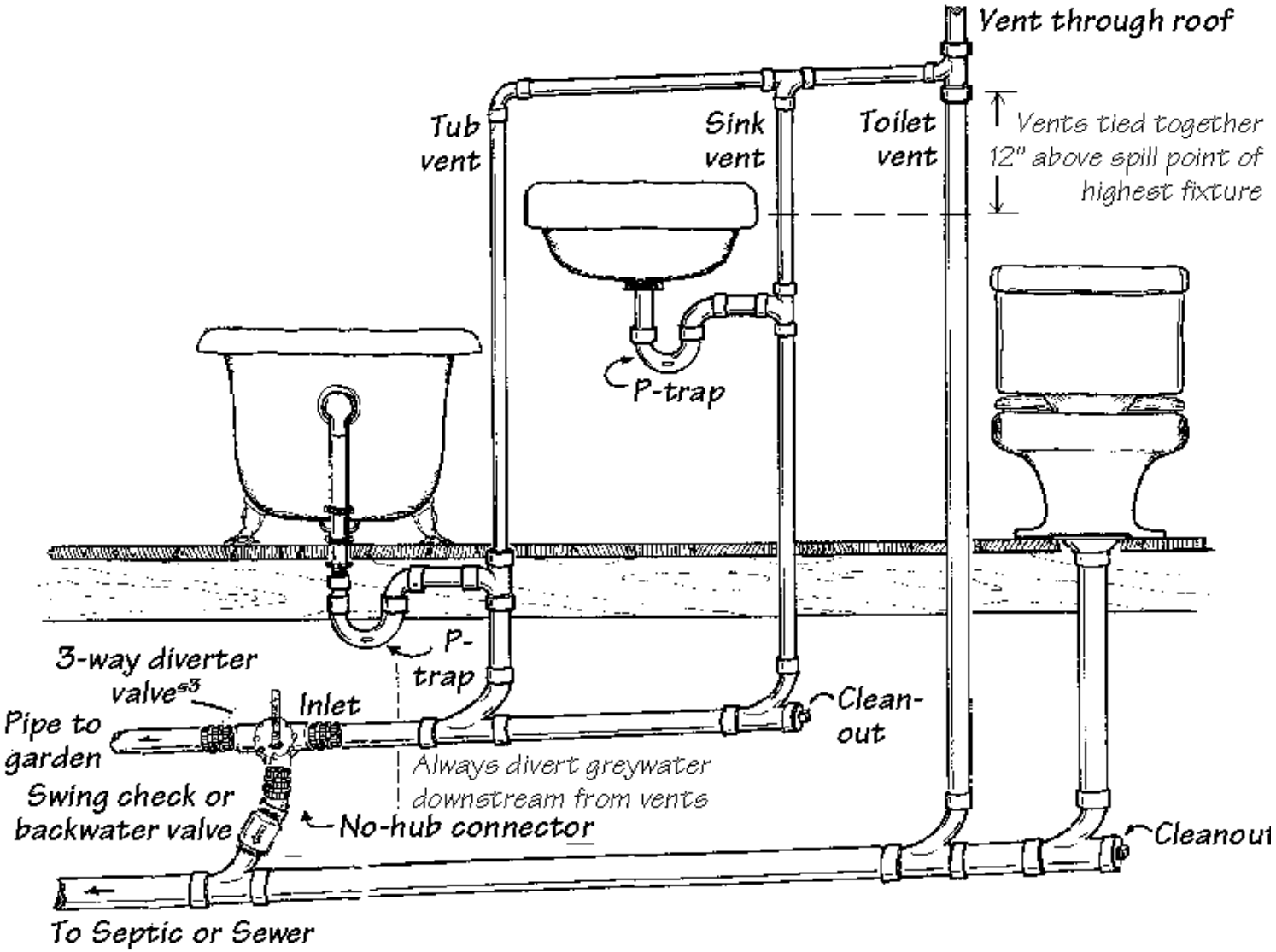
- Municipally treated
- High quality and reliability
- Irrigation, toilet and urinal flushing

Gray Water

- Untreated waste from:
  - bathtub
  - shower
  - lavatory
  - clothes washer
  - laundry tub
- Irrigation applications only

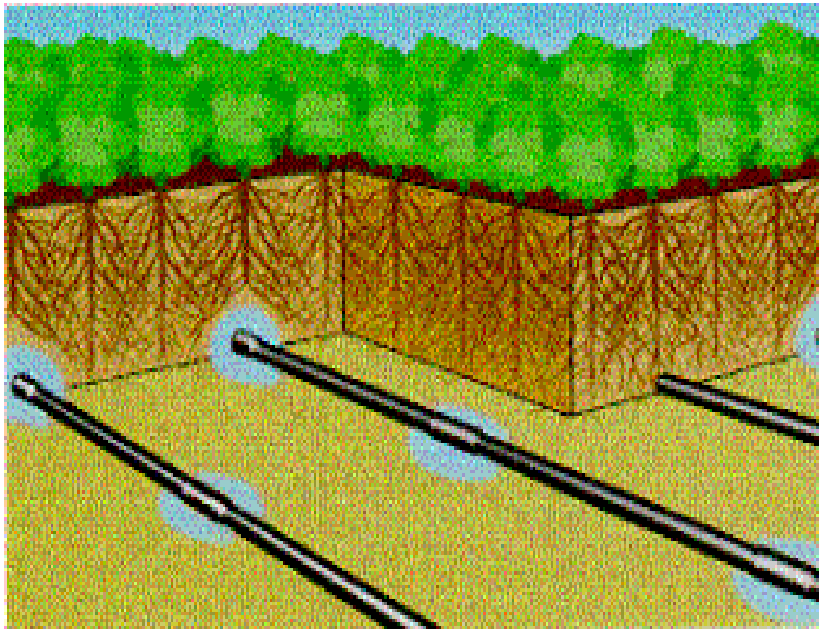


Diverter Valve Required



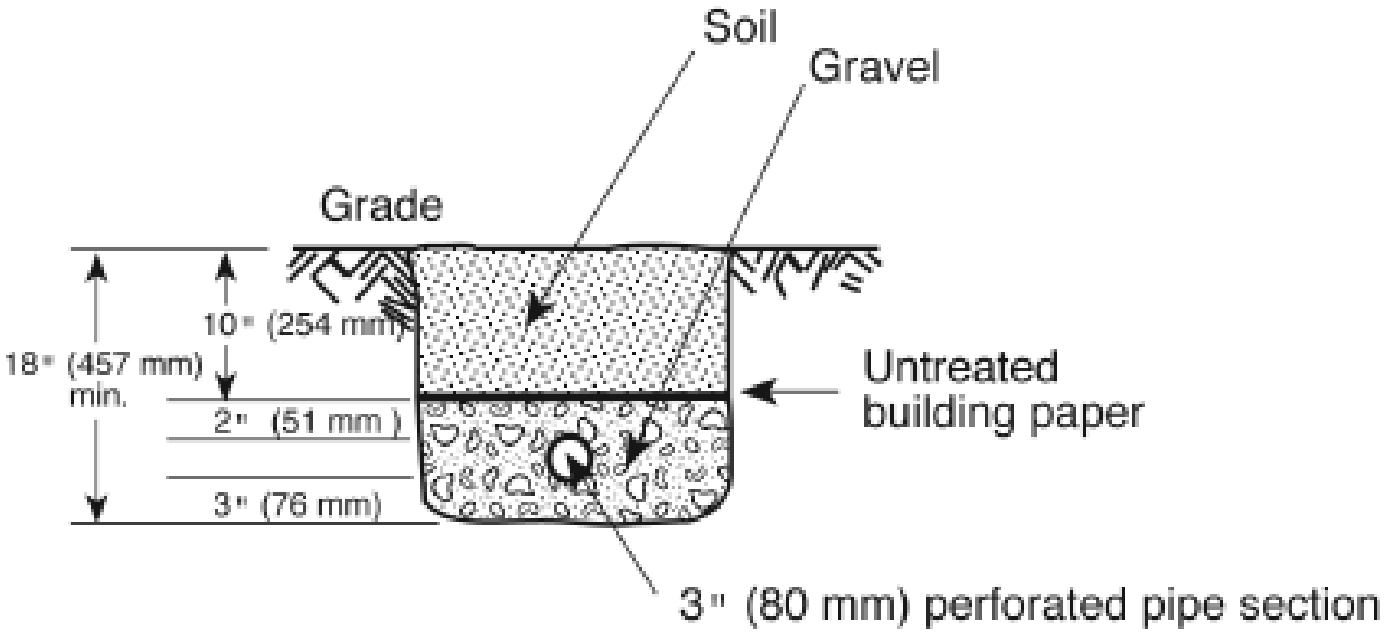
Three Types of Gray Water Systems

- **Subsurface Irrigation**
  - 2” minimum depth below grade
  - Drip feeders
  - Covered with mulch, rock or soil



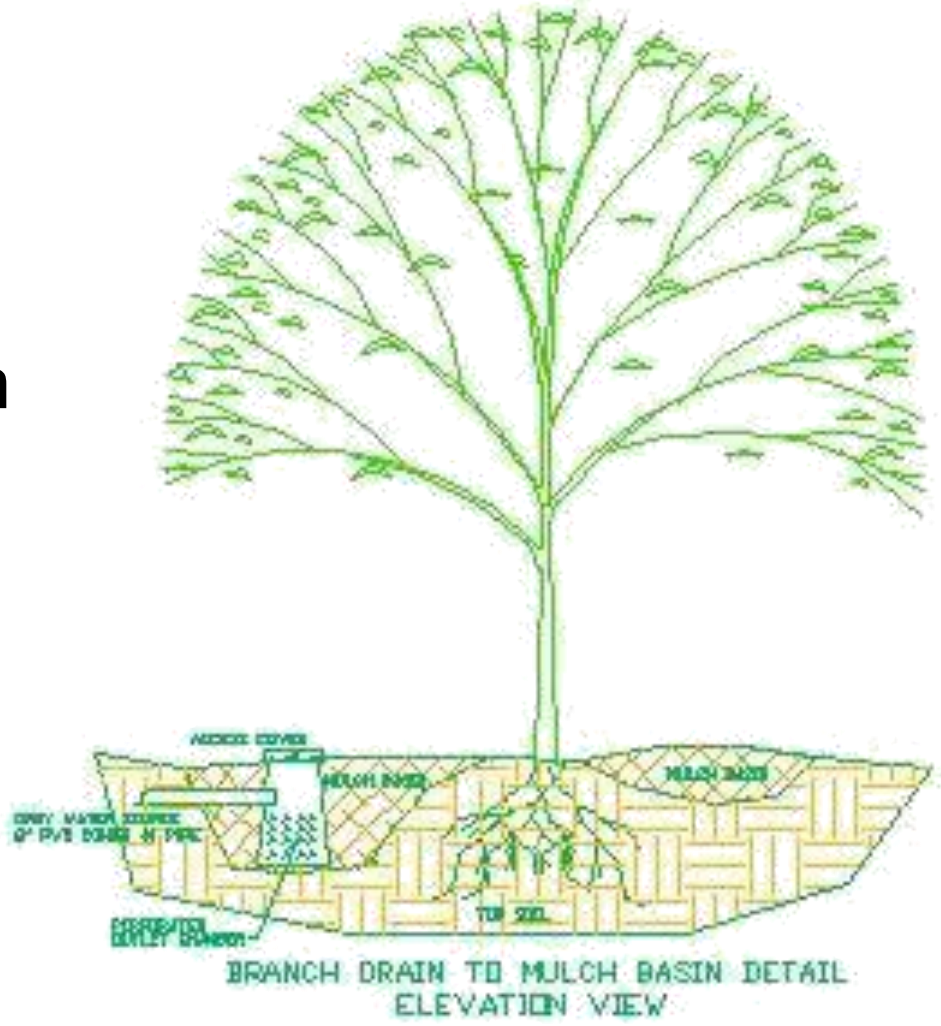
Three Types of Gray Water Systems

- **Subsoil Irrigation**
  - Deep root irrigation only
  - Also known as gray water disposal system



Three Types of Gray Water Systems

- **Mulch Basin**
  - Trench or pit
  - 10” minimum depth
  - Minimum volume
  - Filled with mulch



On-Site Treated Nonpotable Water

On-Site Treated Nonpotable Water

- Gray water, condensate, storm water can be used for:
  - Fixture flushing and irrigation
  - System must be third-party certified
  - Installed in accordance with system Listing
  - Required disinfection:
    - Chlorination
    - UV sterilization
    - Ozone

Water Heating System Design, Equipment and Installation

- Comprehensive provisions addressing water heating system efficiency include:
  - Equipment efficiency
  - Insulation
  - Recirculation
  - Maximum volume of hot water
  - System controls
- The US DOE advises energy used to heat water can account for 14 to 25% of the energy consumed in a home

Water Heating System Design, Equipment and Installation

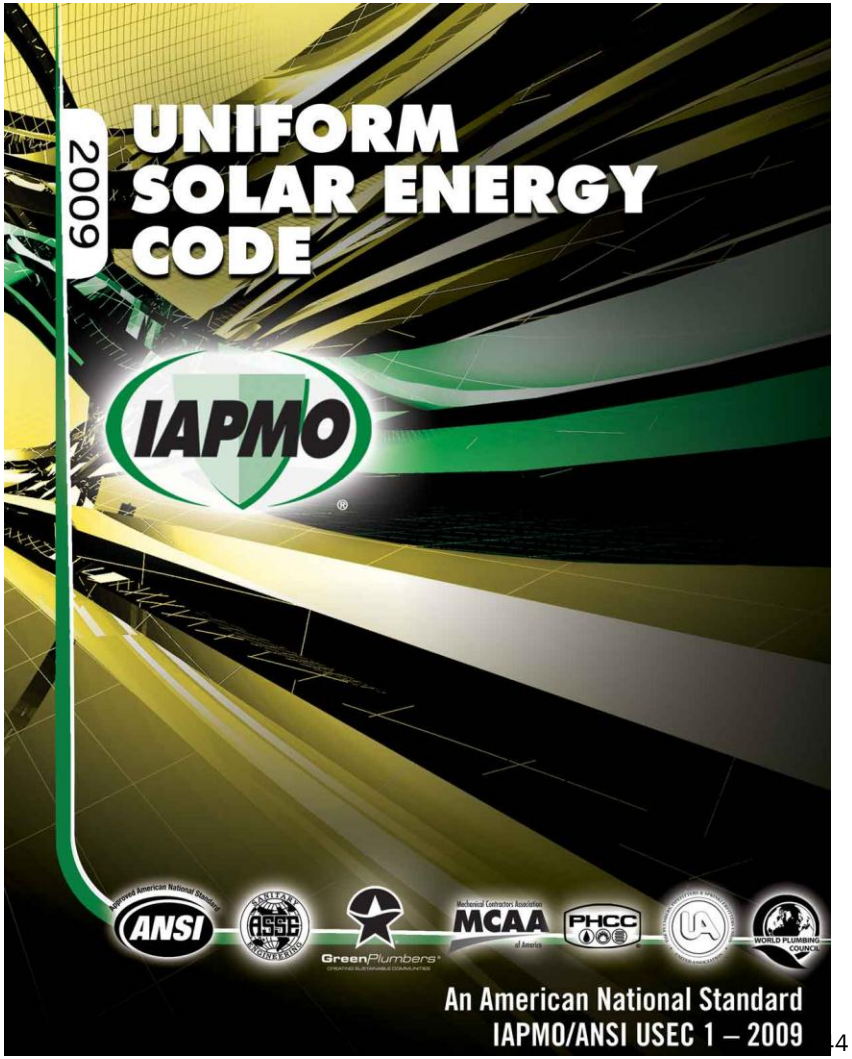
- Required Insulation for hot water pipe & returns
  - Min. thickness equal to pipe dia. ≤ 2”
  - Min. thickness of 2” for pipe dia. >2”
  - K factor ≤ 0.28

Water Heating System Design, Equipment and Installation

- Required maximum volume of hot water
  - 32 ounce max between heat source and shower valve, kitchen sink or lavatory faucet
  - 16 ounce max in run out of recirculation loop
- On-demand recirculation in residential occupancies
- Geothermal systems
  - Detailed design and installation criteria

Water Heating System Design, Equipment and Installation

- Solar thermal systems must comply with the USEC
- Governs the installation, inspection and certification of solar systems



Installer Qualifications

- Green systems require unique skills
  - AHJ granted authority to require a demonstration of competency

IAPMO Green Updates

Visit web page at:

www.iapmogreen.org

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Questions?

I thank you for your kind attention!!!