

Unit 205: Cold water systems

Outcome 2

**Requirements of the cold water
supplies into domestic
dwellings**

Requirements

Incoming mains

Mains

Ferrule/isolation

Meter/isolation

Communication pipe

750-1,350mm

deep

Service pipe

25mm MDPE

(min)

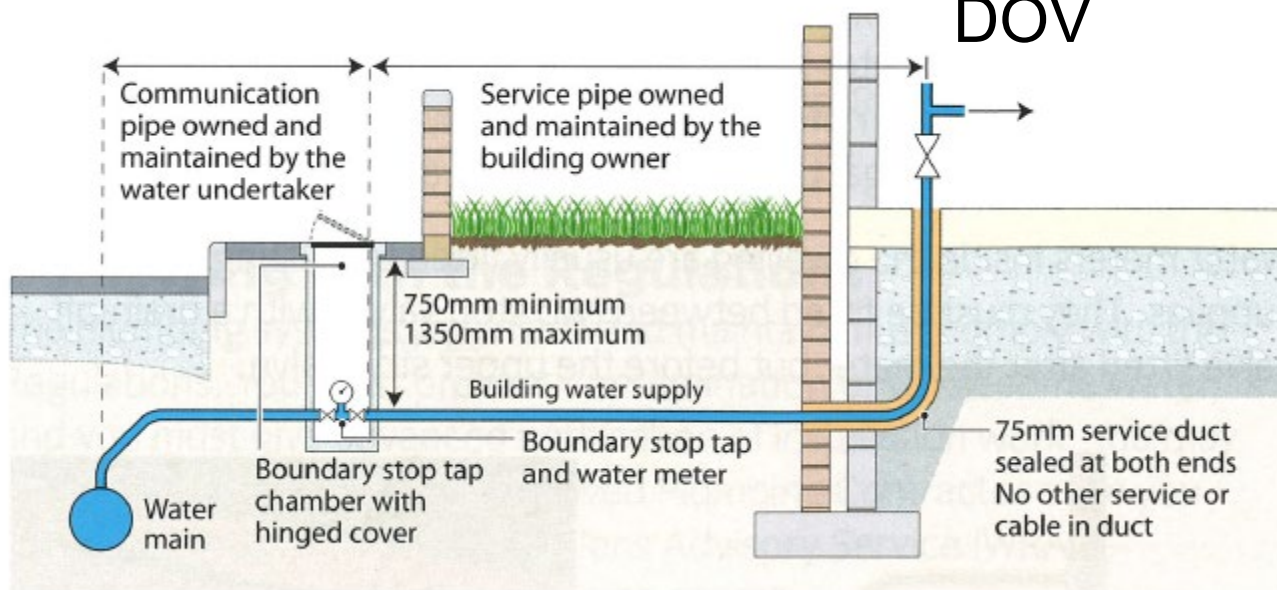
Ducted

Rising main

15mm (min)

Stop valve

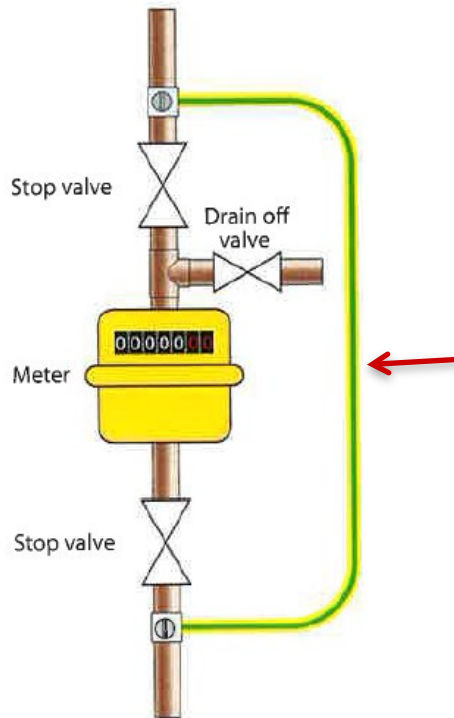
DOV



Requirements

Water meters

Internal and external meters



Internal
meter
needs to
be cross
bonded
for safety



A boundary
meter box

Requirements

- MDPE pipe is blue to identify wholesome water
- Minimum size to modern property is 25mm
- Soft copper can be used (R220)
- Meter is commonly installed at the property boundary in a chamber (protection, frost, reading)
- Some meters are internal and installed to rising main
- Water can be isolated in the road, at the meter, or at the point of entry to the property

Everything from the external stop valve at the meter is regulated under the Water Regulations 1999.

Requirements

The Water Regulations state:

As far as reasonably practicable, a stop valve should be located inside the building, above floor level, as near as possible to the point of entry. It should be installed so, when closed, will prevent water going to any point in the building.

Water undertakers recommend no more than 150mm of MDPE is above floor level (it degrades in sunlight). Either a screwdown (BS1010) or a level arm (BS6675) stop valve can be used.



Requirements

The stop valve works by the handle being turned. This in turn screws down a jumper with a washer attached. This washer is pushed against a seating to create a watertight seal. If the valve jams, a cost effective method of repair is to replace the head gear only.

The DOV works using a spanner or key on the square drive. This in turn screws down a jumper and washer onto a seating, to create the watertight seal. A DOV **must** be installed above the incoming stop valve and at every low point in the system.



Requirements

- Plumbing system **must** comply with the Water Regulations
- Every plumber **must** prevent contamination of wholesome water
- Advance notice **must** be given of installations
- Benefit from becoming an Approved Plumbing Contractor, after passing the Water Regulations training course
- WRAS has produced the guide to the Water Regulations, which is the essential guide for plumbers

Requirements

Two key tests with cold water systems:

- Pressure
- Flow rate



Pressure is normally first tested near to the point of entry



Flow rate is tested at each outlet

Requirements

Pressure

Pressure refers to the force behind water flow. Normally, in domestic situations, a visual check is suffice but when installing certain appliances, a more accurate reading needs to be taken – water softeners, combination boilers, un-vented cylinders, or if pipework is being altered dramatically.

Pressure in plumbing systems can be created by two basic means: either a pump can be fitted (mains water is also pumped water), or pressure can be created by the weight of water – the head.

Requirements

Flow rate

This is the **volume** of water discharging to an appliance, and is measured in litres per minute. So, if the flow rate was poor, the bath would take longer to fill up.

Normally, in a domestic situation, a visual check would suffice but you can always check by using a flow cup or weir cup (this would be critical when setting up a combination boiler or monitoring an unvented cylinder).

60 litres/min = 1l/sec

6 litres/min = 0.1l/sec

Requirements

Pressure and flow

These can be effected by:

- Daily demand (peak periods)
- Location
- Age of property
- Distribution main size
- Incoming main size
- Installation pipe size
- Materials used
- Number of elbows etc
- Blockages

Requirements

Direct system

This is a cold water system where all the cold water in the property is supplied directly to each outlet on **mains** pressure – **high pressure**.

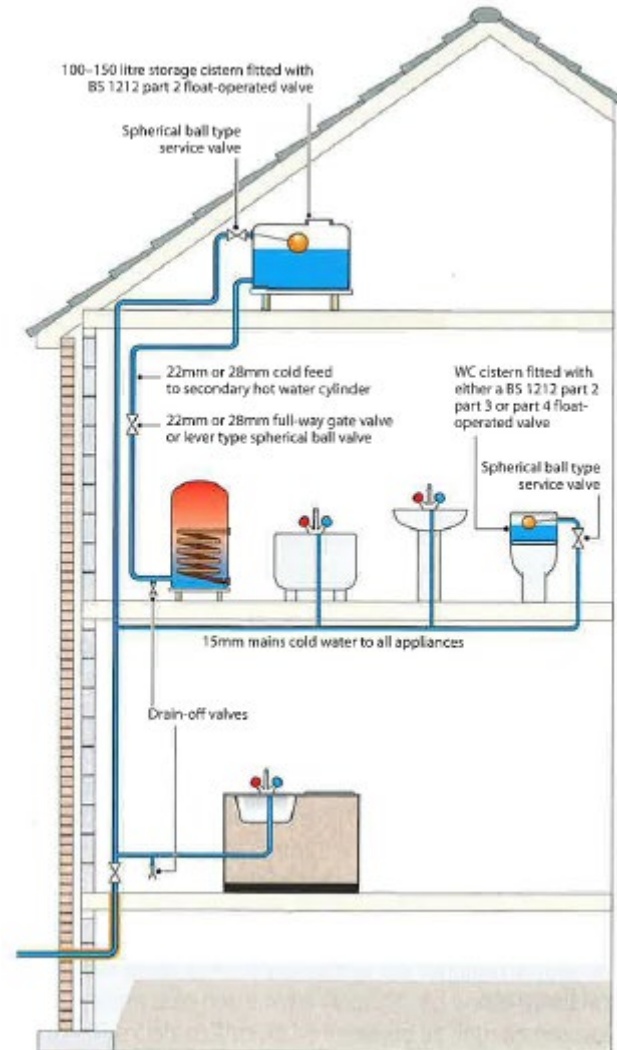
The size of service pipe to the house is usually 25mm MDPE, which is connected to 15mm copper in the house. Old houses may have 20mm MDPE copper or lead mains.

On a direct system, it is important to take precautions against backflow.

Requirements

Direct system

This is a cold water system where all the cold water in the property is supplied directly on top of each outlet on **mains pressure – high pressure.**

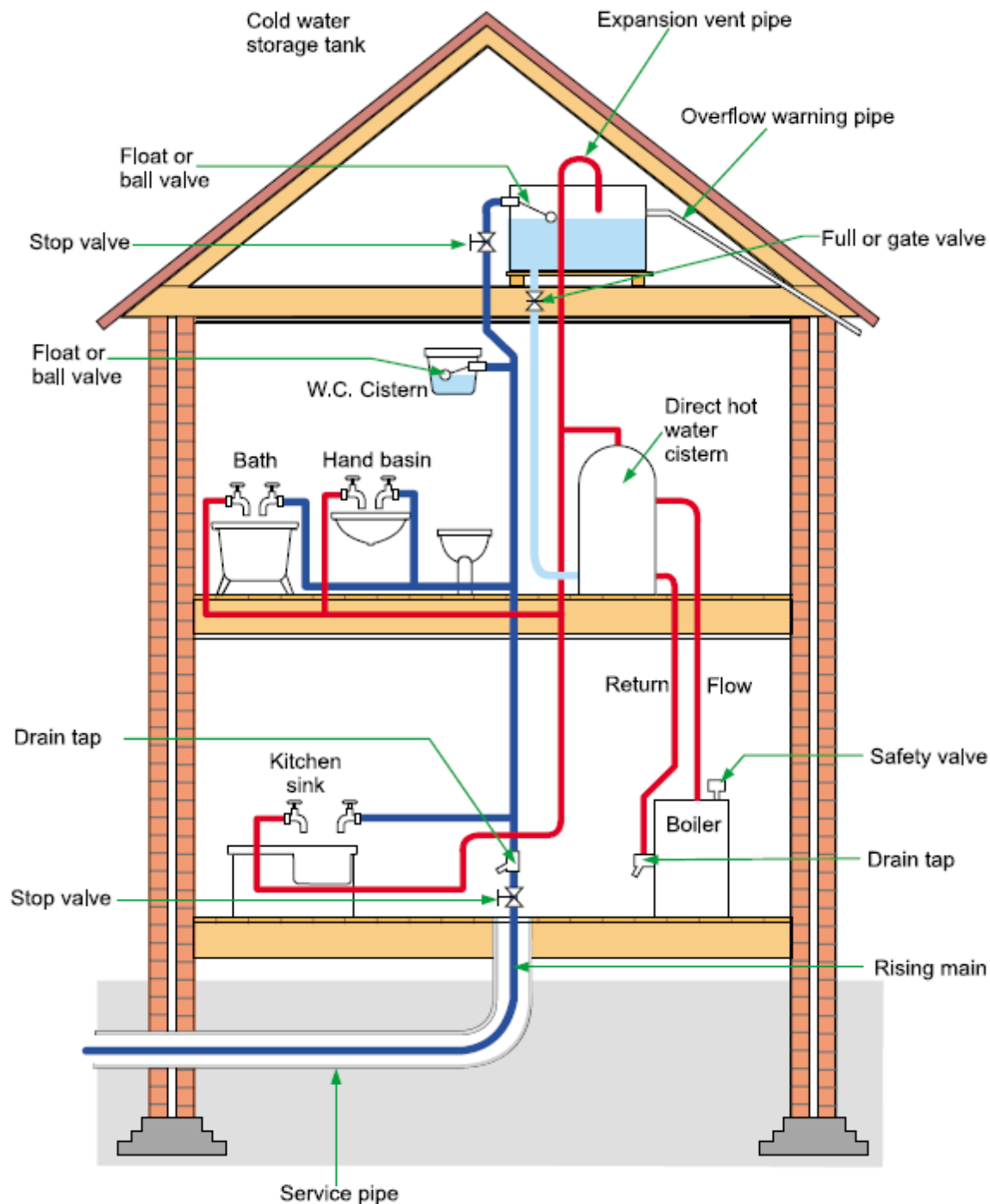


Direct system

The only stored water is for the hot water system via the cylinder.

Only one DOV is required to drain the system down.

All pipework can be 15mm due to the system being high pressure.



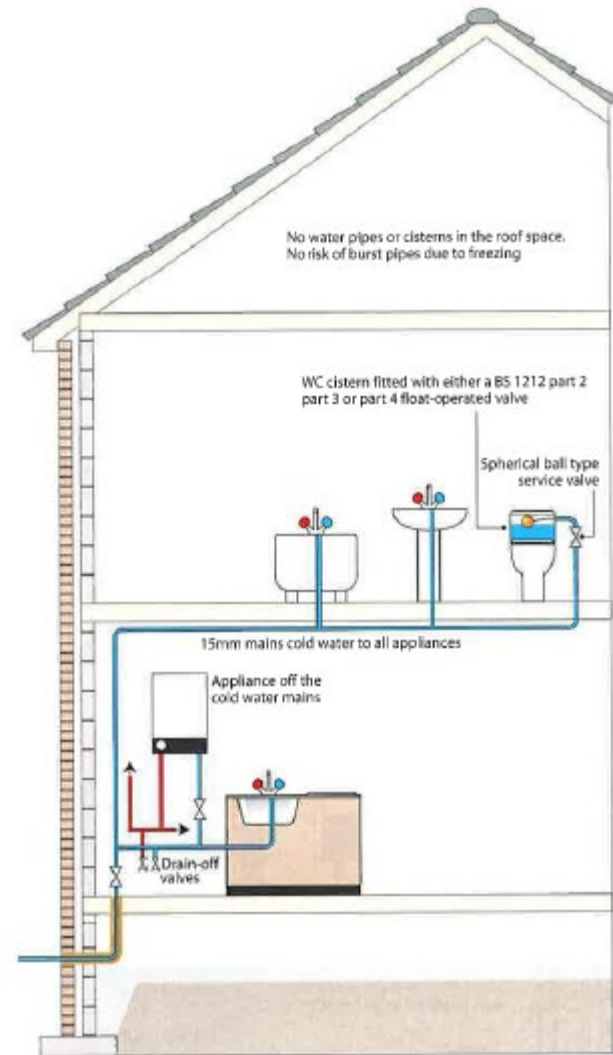
Requirements

Direct system

Another direct system is when a combination boiler is used, and both hot and cold are directly off mains.

In this case, there is not stored water at all.

An unvented or water jacket heater hot water system would be the same.



Requirements

Direct system

Advantages:

- Potable water at every draw off point
- Good pressure at all draw off points
- No concerns about storage cisterns in lofts

Disadvantages:

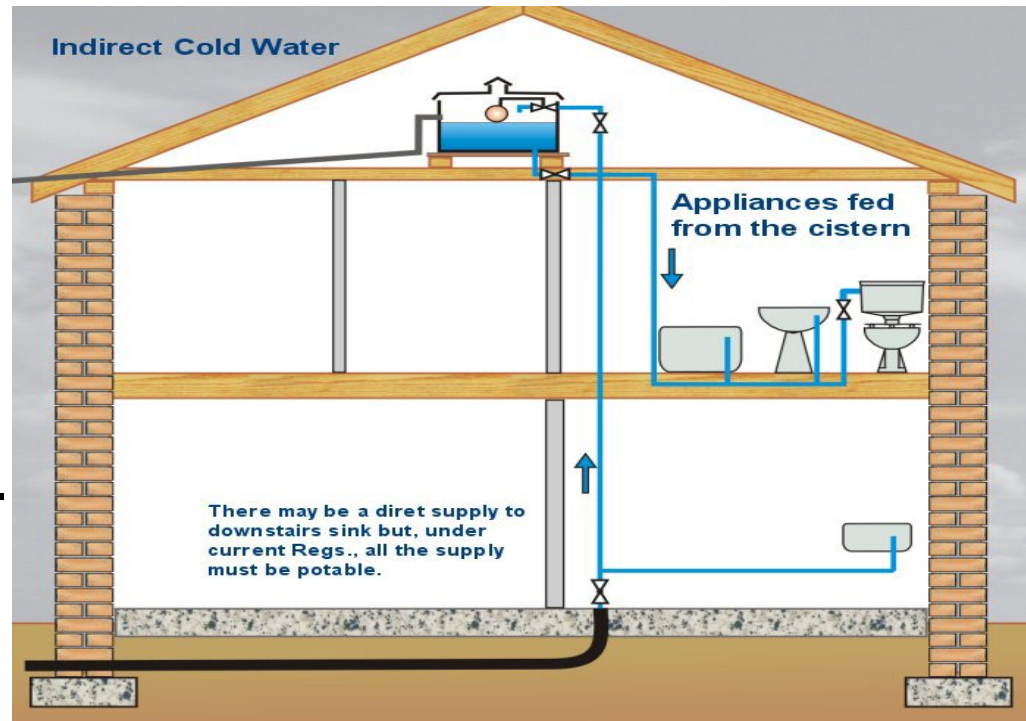
- If the mains is turned off you are without water
- Pressure varies during the day and at peak times pressure can be very low (6.30–8.30am and 5–7pm)
- Care when fitting showers/mixer taps

Requirements

Indirect system

This is a cold water system in which the cold water is taken via the rising main to a high-level storage cistern. From there, most of the cold water outlets are fed – **low pressure** – except the kitchen sink, which is mains-fed to supply wholesome water.

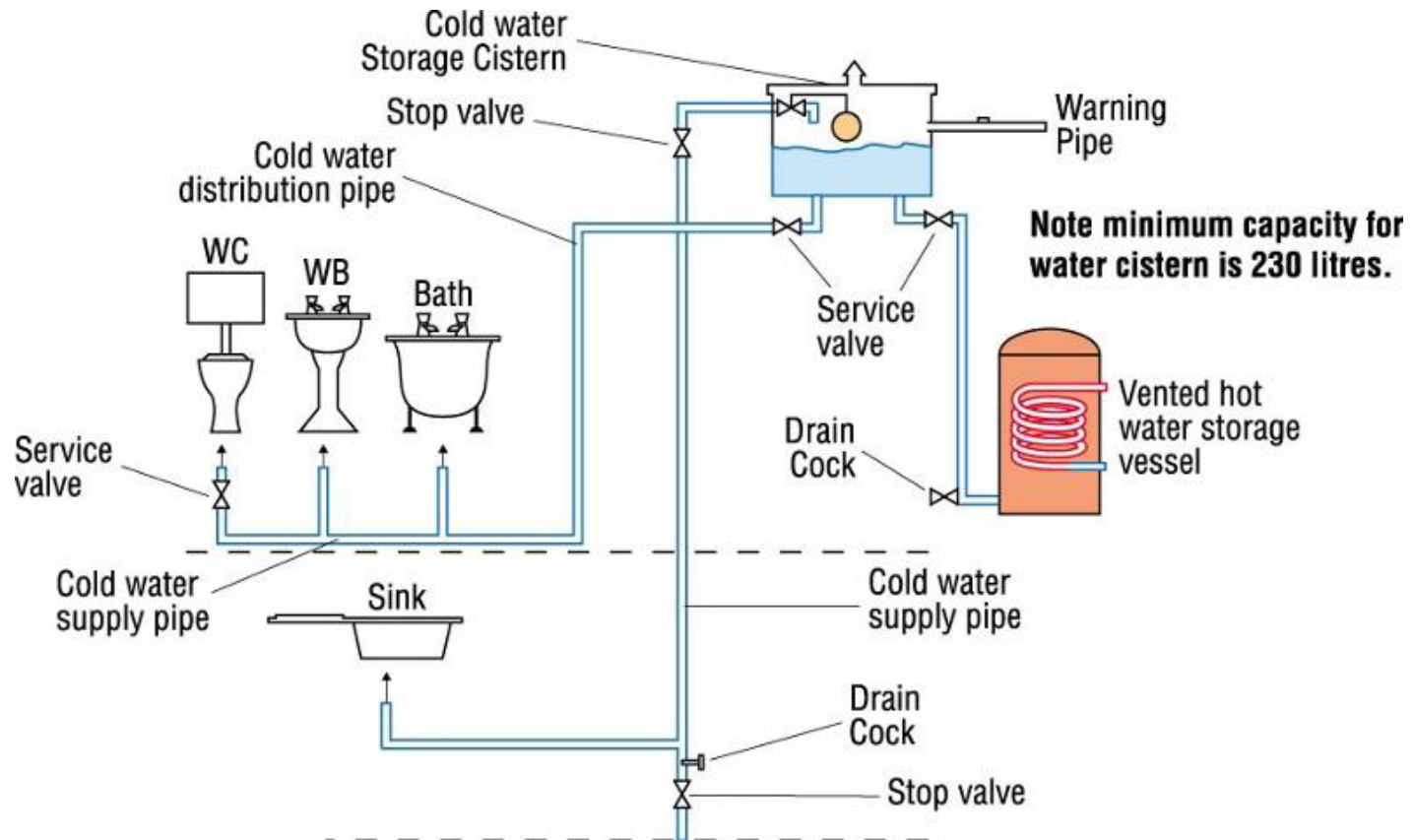
The distribution pipe from the storage cistern needs to be either 22mm or 28mm, and reduces in size as appliances are fed.



Requirements

Indirect system

A low pressure system feeding most outlets in the property.



Requirements

Indirect system

Advantages:

- Stored supply of hot water, should mains be turned off
- The system pressure is unaffected by peak time demand (constant pressure)

Disadvantages:

- More pipework in roof space – risk of freezing
- Possible contamination of water at draw-off points – storage cistern
- Only one draw-off point gives potable water
- More expensive

Requirements

Cold water storage

If a cold water storage cistern is required, both BS6700 and the Water Regulations outline:

If supplying either hot or cold	–	100-150lts
If supplying both hot and cold	–	230-250lts

By inspecting the loft to see the CWSC, or by testing the outlets, the system can be identified.

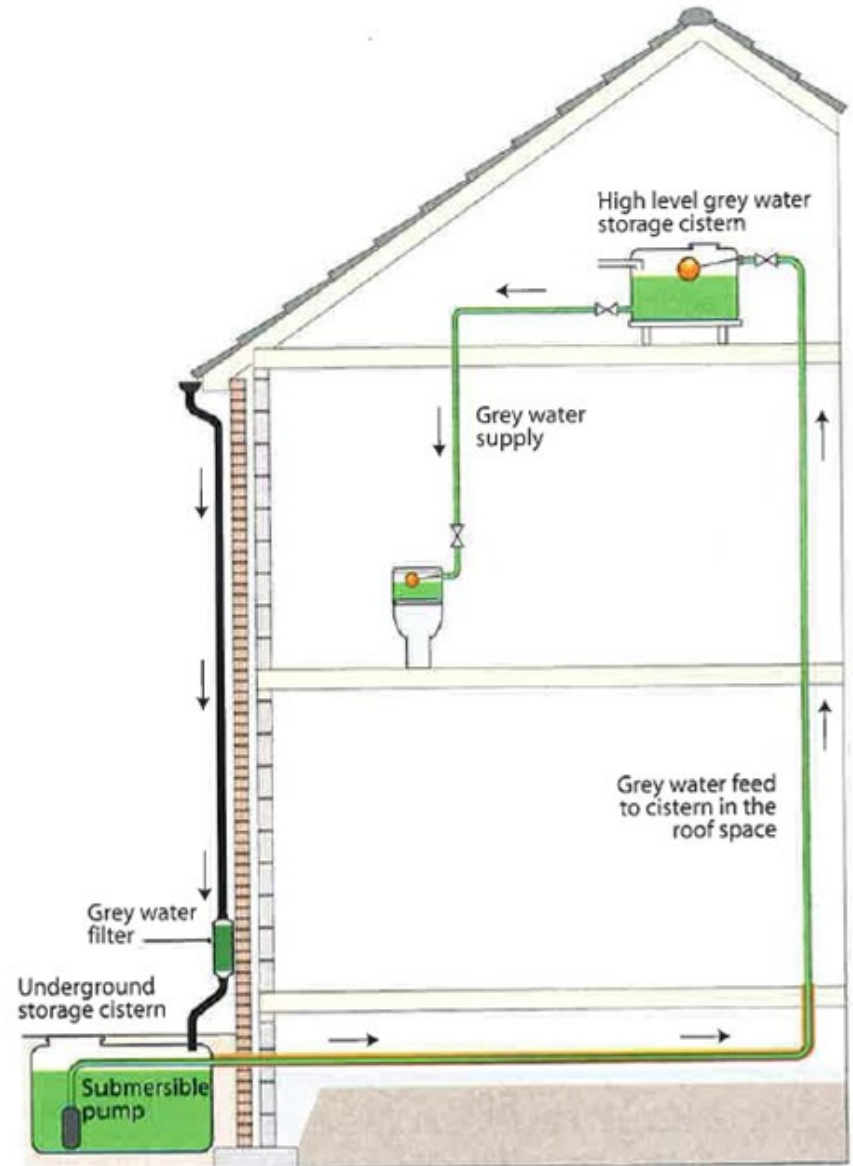


Requirements

Rainwater harvesting

This can save a householder large volumes of mains water and reduce the pressure on this resource.

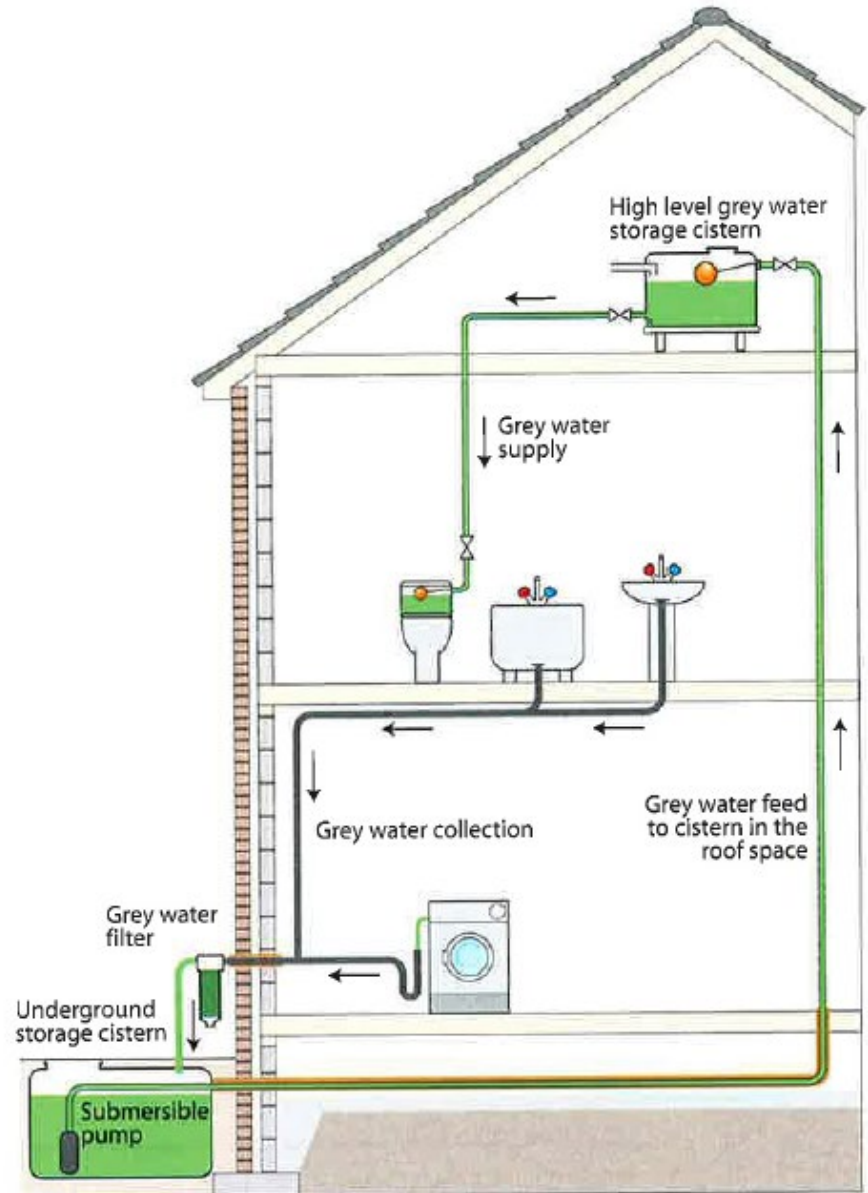
These storage cisterns are installed below ground and collect water from gullies. The average size may be 5,000 litres.



Requirements

Grey water recycling

This system collects waste water from baths, showers and washing machines. It is commonly used to flush WCs.



Requirements

- With both rainwater and grey water, it is important to prevent contamination of wholesome water
- These systems **must** be independent
- Pipework must be identified properly
- These systems are easier to install on new builds rather than retro-fit
- These also help with the increasing green demands of society

Requirements

To identify which system is installed in a property the plumber could:

- Take a pressure reading at various outlets
- Go up in the loft and identify the cistern sizes
- Turn off the incoming mains and identify the outlets that stop flowing

An important factor is, whichever system is installed, the outlet has sufficient pressure and flow for the appliance.