

All Weather Field, persons per teams per hours used.
 Museums, Art Galleries, Libraries, One person per 30m² of the gross building floor area.
 Restaurants, One person per 1.0m² of the dining area.
 Bars, One person per 0.8m² of the public bar/seating area..

When the water supply companies, regulations, or client requirements do not specifically dictate the period to cover an interruption of a mains supply then Table 3 provides recommendations for reasonable periods of storage, expressed as a percentage of the daily water demand.

Table 3 Period of storage

Type of Building	% of the daily demand
Hospitals	50%
Nursing Homes	50%
Dwellings	0 - 50%
Hotels, Hostels	50%
Offices	0 - 50%
Shops	0 - 25%
Library, Museum, Art Galleries	0 - 25%
Cinema, Theatre	0 - 25%
Bars, night-club	0 - 25%
Sports Facilities	0 - 25%
Schools, Colleges, Universities	50%
Boarding Schools	50%

The type of water system will need to be one or a combination of the following:

- Direct mains fed
- High level storage with gravity down feed
- Pumped from a break cistern or storage provision.

Potentially a one or two storey building in a locality where an interruption of water supply is very infrequent and causing little inconvenience, there is an option for the water supply to be direct from the mains without storage being provided. If the provision of storage is possible at high level then the system could be enhanced to provide storage coupled with it becoming a gravity down feed system. See Figure 1.

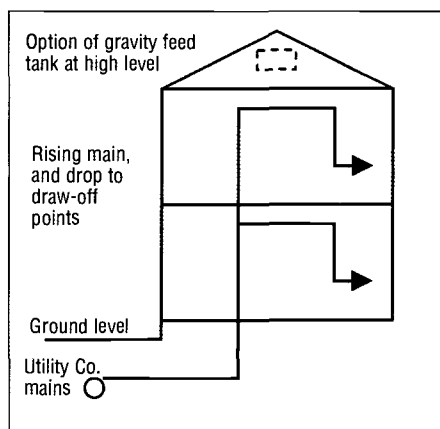


Figure 1 Supply to a two storey building

Water distribution

The water distribution installation requires to be able to deliver the correct flow and volume of hot and cold water when and where it is needed. The mains pressure can provide the initial means of delivering water into the building. The water supply companies are required to deliver their water to the boundary with a minimum pressure of 1.0 bar. Often their delivery pressure can be higher, however at times of high demand, the pressure will be closer to the minimum provision.

Type of system

The type and style of water distribution needed for a particular building will depend mainly on the building height and its use.

- The building height will determine whether pumping will be required to deliver water to the highest level
- The building use will determine the amount of storage that will be required.

Storage tanks

A building requiring a large water storage provision may not be able to accommodate it at high level, in which case a low level location will be needed, in conjunction with a pumped distribution system.

A combination of high and low storage can be considered if a gravity distribution is preferred for all or part of the building. This has an advantage of providing some storage in the event of an interruption of the water supply, or power supply to the pumps. A storage ratio of 2 : 1 low/high level is a typical arrangement.

Storage can comprise of two compartments or cisterns/tanks in order that maintenance can be carried out without interrupting distribution.

For small storage quantities one piece cisterns can be used, which generally are of a low height construction. For storage of 2500 litres or more, sectional panel tanks may be considered more appropriate with a centre divide.

Above 4000 litres storage twin cisterns/tanks may be considered appropriate. See Figure 2.

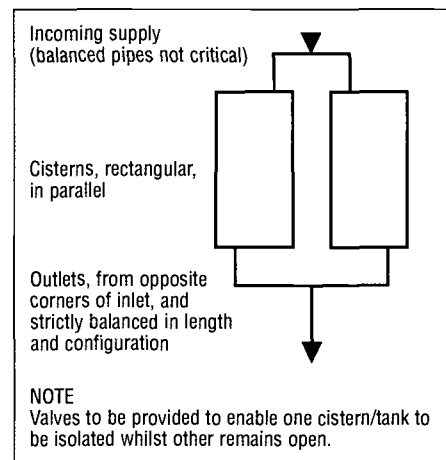


Figure 2 Storage cistern/tank layout

Sectional tanks commonly have flanges, being internal or external. External flanges permit tightening without needing to enter the tank, and on the base permit the tank to be self draining through a single drain point, without further draining of any entrapped water between flanges. Such a feature reduces maintenance and assists the prevention of water stagnation which can lead to harmful bacteria growth, including legionella.

In calculating the storage capacity a free board allowance is necessary to accommodate the float valve, over flow installations and any expansion from the hot water system. Depending on pipe sizes, commonly a 250 – 300 mm free board depth is required on cisterns/tanks having a capacity greater than 2500 litres. Raised ball (float) valve housings in conjunction with a weir overflow can provide an increased depth of water stored over the main area of the cistern/tank(s).

The location of the inlet and outlet connections is important. A cross flow through the cistern/tank needs to be achieved to assist the complete regular turn over of water throughout the storage period.

Sub divided, twin and multiple cisterns/tanks ideally should be installed in parallel to each other. The inlets require to be positioned at the same level to ensure they supply the cisterns/tanks in unison, and as far as possible the same flow rate to assist a balanced throughput. The outlet connections and manifold pipe work needs to be arranged with symmetrical and equal lengths, also to provide, as far as is possible a balanced flow from the tanks.

The use of a delayed action float valve may also be considered to ensure a greater turn over of water.