Department for Environment, Food and Rural Affairs

Water Supply (Water Fittings) Regulations 1999
Guidance Document relating to
Schedule 1: Fluid Categories and
Schedule 2: Requirements For Water Fittings
[See Regulation 4(3)]

This information has been taken from content first published on the Internet by Defra or its predecessors on 22 December 1999.

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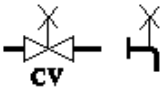
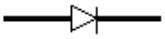
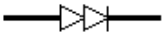
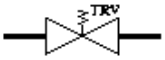
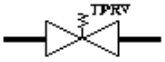
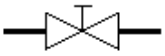
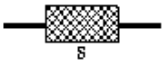
Tables in Regulator's Backflow Prevention Specification

Guidance Tables

Figures

Abbreviations and Symbols

GL	Ground level	
WC	Water closet	
WB	Washbasin	
SL	Spill-over level	
WP	Warning/overflow pipe	
SV	Stopvalve	
SgV	Servicing valve	
CV	Appliance control valve or tap	
DT	Drain tap	
T	Tundish with air gap	
SCV	Single check valve	
DCV	Double check valve	
FC	Siphonic or non-siphonic flushing cistern	
PFC	Pressure flushing cistern	
FV	Pressure flushing valve	
PRV	Pressure reducing valve	
TRV	Temperature relief valve	
TPRV	Combined temperature and pressure relief valve	
EV	Expansion valve	
ExVl	Expansion vessel	
S	Strainer	
AVV	Anti-vacuum valve	
PIDC	Pipe interrupter with permanent atmospheric vent	
PIDB	Pipe interrupter with atmospheric vent and moving element	

SECTION 1

Schedule 2: Paragraph 1: Interpretations

In this Schedule-

"backflow" means flow upstream, that is in a direction contrary to the intended normal direction of flow, within or from a water fitting;

"cistern" means a fixed container for holding water at atmospheric pressure;

"combined feed and expansion cistern" means a cistern for supplying cold water to a hot water system without a separate expansion cistern;

"contamination" includes any reduction in chemical or biological quality of water due to a change in temperature or the introduction of polluting substances;

"distributing pipe" means any pipe (other than a warning, overflow or flushing pipe) conveying water from a storage cistern, or from hot water apparatus supplied from a cistern and under pressure from that cistern;

"expansion valve" means a pressure-activated valve designed to release expansion water from an unvented water heating system;

"flushing cistern" means a cistern provided with valve or device for controlling the discharge of the stored water into a water closet pan or urinal;

"overflow pipe" means a pipe from a cistern in which water flows only when the water level in the cistern exceeds a predetermined level;

"pressure relief valve" means a pressure-activated valve which opens automatically at a specified pressure to discharge fluid;

"primary circuit" means an assembly of water fittings in which water circulates between a boiler or other source of heat and a primary heat exchange inside a hot water storage vessel, and includes any space heating system;

"secondary circuit" means an assembly of water fittings in which water circulates in supply pipes or distributing pipes of a hot water storage system;

"secondary system" means an assembly of water fittings comprising the cold feed pipe, any hot water storage vessel, water heater and pipework from which hot water is conveyed to all points of draw-off;

"servicing valve" means a valve for shutting off for the purpose of maintenance or service the flow of water in a pipe connected to a water fitting;

"stopvalve" means a valve, other than a servicing valve, used for shutting off the flow of water in a pipe;

"storage cistern" means a cistern for storing water for subsequent use, not being a flushing cistern;

"temperature relief valve" means a valve which opens automatically at a specified temperature to discharge fluid;

"terminal fitting" means a water outlet device; and

"vent pipe" means a pipe open to the atmosphere which exposes the system to atmospheric pressure at its boundary.

Guidance

G1.1 The interpretations shown in paragraph 1 of the Schedule are all used in the Regulations and Guidance clauses and Figures within this Guidance Document.

G1.2 A list of abbreviations and symbols is shown in the Contents List and Figure 4.1 shows their application as typical examples of water supply systems in houses.

SECTION 2

Schedule 2: Paragraph 2: Materials and substances in contact with water

2. (1) Subject to sub-paragraph (2) below, no material or substance, either alone or in combination with any other material or substance or with the contents of any water fitting of which it forms a part, which causes or is

likely to cause contamination of water shall be used in the construction, installation, renewal, repair or replacement of any water fitting which conveys or receives, or may convey or receive, water supplied for domestic or food production purposes.

(2) This requirement does not apply to a water fitting downstream of a terminal fitting supplying wholesome water where-

a. the use to which the water downstream is put does not require wholesome water; and
b. a suitable arrangement or device to prevent backflow is installed.

Guidance

General

G2.1 Materials or substances, either alone or in combination, which cause, or are likely to cause, contamination of water should not used in the construction, installation, renewal, repair or replacement of any water fitting which conveys or receives water supplied for domestic or food production purposes. Particular materials unsuitable for use in contact with water intended for domestic or food production purposes include lead and bitumastic coatings derived from coal tar.

G2.2 For non-metallic materials, this requirement is deemed to be met by compliance with the appropriate British Standard, BS 6920: 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of water'. No standard of any other EEA State includes the same suite of tests, although individual tests may be considered as providing evidence for an equivalent level of performance. Further advice on the equivalence of foreign standards is available from the Water Regulations Advisory Scheme.

G2.3 Water fittings and materials for water fittings complying with paragraph 2(1) of Schedule 2 should be tested by an approved test house and the results published in approved lists.

G2.4 When water fittings or materials are specified to a British Standard or other document, the reference is to the latest available edition of the document referred to.

G2.5 The following factors should be considered when determining the suitability of materials and fittings which are, or will be, in contact with the water supplied:

a. internal and external temperatures to which they will be subjected;
b. the effect of internal and external corrosion;
c. compatibility of different materials.
d. the effect of ageing, fatigue, durability and other mechanical factors; and,
e. permeability.

G2.6 Providing a suitable backflow prevention device is installed, sub-paragraph 2(1) of Schedule 2 does not apply to water fittings downstream of a terminal fitting supplying wholesome water, where the recipient use does not need to be wholesome, for example:

a. a hosepipe, used in connection with a clothes washing machine or dishwasher, or for watering a garden, or washing a vehicle, where the fitting to which the hosepipe is, or may be connected to, or incorporate, a suitable device to prevent backflow through the hosepipe; or,
b. a flushing cistern; or,
c. a feed cistern connected to a primary heating circuit; or,
d. a closed circuit; or,
e. an overflow or warning pipe.

Stopvalves, servicing valves and drain taps

G2.7 Draw-off taps, stopvalves, servicing valves and draining taps should be designed so that, where applicable, their seals can be readily renewed or replaced; do not incorporate a loose washer plate; be designed and manufactured so that they may be easily closed to shut off the supply of water; and be capable of operating at the appropriate water temperature and pressure.

G2.8 Stopvalves of 15 mm to 50 mm nominal size laid underground should be screwdown valves complying with BS 5433 or plug cocks conforming with BS 2580. Stopvalves for use above ground should be screwdown valves complying with BS 1010 or as for below ground use. Stopvalves of nominal size 50mm may, and larger sizes should be cast iron gate valves complying with BS 5163. Spherical type valves may also be used in all sizes for above and below ground.

Terminal fittings

G2.9 Taps and combination tap assemblies used in water supply installations should be appropriate for the residual pressure available and the flow required at a particular appliance.

G2.10 Low resistance taps and combination tap assemblies suitable for minimum inlet pressures of 0.1 bar (0.01 MPa) should comply with BS 5412,

or BS 1010 where appropriate, and high resistance taps and combination fittings suitable for minimum inlet pressures of 0.5 bar (0.05 MPa) with BS EN 200 and BS 6920.

Joining of different types of materials

G2.11 Except for plastics pipes, new pipework should not be connected to existing lead or other pipework without appropriate protection being provided against galvanic corrosion.

Jointing mterials and compounds

G2.12 Soft solder for capillary jointing of copper or copper alloy water fittings should consist of Tin/Copper, Alloy No. 23 or 24, or Tin/Silver, Alloy No. 28 or 29, complying with BS EN 29453.

G2.13 Silver solder or silver brazing filler metals and copper-phosphorus brazing filler metals for capillary jointing of copper or copper alloy pipes should conform to BS 1845, Table 2; Group AG (AG14 or AG20) or Table 3: Group CP (CP1 to CP6), respectively,

G2.14 Silver solder or silver brazing material for capillary jointing of stainless steel pipes should be cadmium free.

G2.15 Jointing compounds used for sealing screwed water fittings should comply with BS 6956: Part 5.

G2.16 Unsintered polytetrafluoroethylene (PTFE) tape for thread sealing applications should comply with BS 6974 and the material should also satisfy the requirements of BS 6920: Part 1.

SECTION 3

Schedule 2: Paragraphs 3, 4, 5, 6 and 7: Requirements for water fittings

3. Every water fitting shall-
    a. be immune to or protected from corrosion by galvanic action or by any other process which is likely to result in contamination or waste of water; and
    b. be constructed of materials of such strength and thickness as to resist damage from any external load, vibration, stress or settlement, pressure surges, or temperature fluctuation to which it is likely to be subjected.
4. Every water fitting shall-

a. be watertight;
b. be so constructed and installed as to-
    i. prevent ingress by contaminants, and
    ii. inhibit damage by freezing or any other cause;
c. be so installed as to minimise the risk of permeation by, or deterioration from contact with, any substance which may cause contamination;
d. be adequately supported.

5. Every water fitting shall be capable of withstanding an internal water pressure not less than 11/2 times the maximum pressure to which the fitting is designed to be subjected in operation.
6. No water fitting shall be installed, connected or used which is likely to have a detrimental effect on the quality or pressure of water in a water main or other pipe of a water undertaker.
7. (1) No water fitting shall be embedded in any wall or solid floor.

   (2) No fitting which is designed to be operated or maintained, whether manually or electronically, or which consists of a joint, shall be a concealed water fitting.

   (3) Any concealed water fitting or mechanical backflow prevention device, not being a terminal fitting, shall be made of gunmetal, or another material resistant to dezincification.

   (4) Any water fitting laid below ground level shall have a depth of cover sufficient to prevent water freezing in the fitting.

   (5) In this paragraph "concealed water fitting" means a water fitting which-
   a. is installed below ground;
   b. passes through or under any wall, footing or foundation;
   c. is enclosed in any chase or duct, or
   d. is in any other position which is inaccessible or renders access difficult.

Guidance

General

G3.1 Water fittings should be adequate for the purpose and satisfy the appropriate British Standard, or acceptable equivalent.

G3.2 Pipes of different metallic materials are not to be connected unless suitable precautions are taken to ensure that corrosion through galvanic action cannot take place.

G3.3 All water fittings including supply pipes, distributing pipes and discharge pipes connected to operational and safety devices in cold and hot water systems should be capable of withstanding temperatures to allow for malfunctions within the system and should comply with the requirements of BS 6700.

G3.4 The suitability and thickness of copper hot water storage vessels and other apparatus should not be determined exclusively on the basis of pressure considerations. A greater thickness of the walls of the vessel, together with the need or otherwise of protector rods or internal coating, should take into consideration the type of water supplied in the area and its possible effect in combination with other factors.

Watertightness of fittings

G4.1 Water fittings are to be watertight, suitable for the default pressures and temperatures likely to be encountered within the installation.

Protection against freezing

G4.2 All cold water fittings located within the building but outside the thermal envelope, or those outside the building should be protected against damage by freezing.

G4.3 If the frost protection provided is insufficient for exceptional freezing conditions, or the premises are left unoccupied or without adequate heating, damage and leakage can often be avoided by shutting off the water supply and draining the system before the onset of freezing.

G4.4 Where low temperatures persist insulation will only delay the onset of freezing. Its efficiency is dependant upon its thickness and thermal conductivity in relation to the size of pipe, the time of exposure, the location and possibly the wind-chill factor.

G4.5 In exceptional circumstances, and in those parts of the United Kingdom where very low temperatures are sustained during both day and night, unless the system is isolated and drained before the onset of freezing, additional measures may be required to ensure that freezing of water fittings does not occur. Other methods of preventing damage to water fittings that may be considered are the;

a. provision of froststats to activate the heating system when the air temperature drops to a preselected value; and,

b. provision of strategically placed thermostatically controlled shut-off and draining valves for isolating and draining sections of pipework.

G4.6 Thermal insulating materials should be of the closed cell type complying with BS 5422 and be installed in accordance with BS 5970.

G4.7 Some of the types of insulation materials relating to the thermal conductivities shown in Table 3.1 are as follows:

Less than 0.020 W/(m.K)	Rigid phenolic foam
0.020 to 0.025 W/(m.K)	Polisocyanurate foam and rigid polyurethane foam
0.025 to 0.030 W/(m.K)	PVC foam
0.030 to 0.035 W/(m.K)	Expanded polystyrene, extruded polystyrene, cross-linked polyethylene foam, expanded nitrile rubber and improved polyethylene foam
0.035 to 0.040 W/(m.K)	Standard polyethylene foam, expanded synthetic rubber and cellular glass.

G4.8 It is essential that:

a. there is no gap in the insulation at bends, valves, etc. as heat loss due to these conditions could freeze local pockets of the pipe system in less than one hour; and,
b. an external vapour barrier is provided and protected against mechanical or other damage; and,
c. where water pipes are located directly below ceiling or roof void insulation;
    i. the full calculated thickness; or,
    ii. a minimum thickness of 9mm, high emissivity surfaced, closed cell insulation, whichever is the greater, is installed around the water pipe to prevent condensation, saturation and subsequent failure of the ceiling insulation.

G4.9 Hot water fittings outside the thermal envelope, where water is likely to be static for a period, should be protected against freezing. The thickness of insulation applied to hot water pipes for energy conservation purposes is usually of insufficient thickness to protect against low temperature conditions.

G4.10 Stop valves, servicing valves and drain taps should be labelled so that the parts of the system which they control can be determined for maintenance purposes; also for isolation and draining when buildings are unoccupied during cold weather.

G4.11 For the purpose of protection against freezing of pipes two conditions are assumed:

a. **Normal conditions**

In domestic accommodation, and in other types of premises where applicable, where habitable rooms are normally heated for up to 12 hours each day; water fittings in unheated rooms need to be protected against freezing, particularly overnight, even though they are within the envelope of the heated accommodation. For example, water fittings in cloakrooms, store rooms, utility rooms, in roof spaces but located below the ceiling insulation, etc.

The recommended commercial thicknesses of insulation for minimum and practical protection against freezing in the unheated parts of normally occupied buildings when the heating is turned off in the remainder of the building, such as overnight, is shown in Table 3.1. Except where indicated otherwise, the insulation thicknesses shown under the respective thermal conductivity values are considered reasonable to provide a nominal minimum of 12 hours protection. An absence of more than 24 hours is not considered normal occupation.

b. **Extreme conditions**

Water fittings installed outside a building, or inside any building or part of a building which is unheated, or only marginally heated for less than 12 hours each day; or water fittings inside a building but located outside the thermal envelope. For example, water fittings located under suspended ground floors, above the level of ceiling insulation in a roof space, in a communal staircase or corridor in flats, domestic garages or other buildings, or externally above ground level.

It is recommended that for water fittings in these locations the thickness of insulation should be substantially increased and the advice of insulation specialists or manufacturers be obtained. Guidance on design methods can be obtained from BS 5422.

It should be noted that the principal criteria used in BS 5422 (water temperature, ambient temperature, time of exposure, percentage ice formation, thermal conductivity and thickness of insulation) cannot represent all circumstances or permutations, so that where it is necessary to avoid excessive ice formation it would be prudent to consult insulation suppliers or manufacturers.

G4.12 Self-regulating trace heating conforming to BS 6351, in conjunction with a nominal thickness of thermal insulation, is an acceptable method of protection against freezing.

G4.13 The thickness of insulation for the protection of cold water cisterns in roof spaces and other exposed locations should be calculated in accordance with BS EN 1057. Water fittings connecting to and from cold water cisterns are particularly vulnerable and all insulation should be closely sealed, except for the air vent to the cistern.

Plastics and permeable materials

G4.14 Water fittings should be installed to minimize any risk of contamination by permeation of fluids through the material or materials used.

G4.15 Water fittings that are made of a material which is susceptible to permeation by any fluid that causes, or is likely to cause, contamination of water passing through the fitting, should not be laid or installed in such a location, in relation to other services or contaminated ground, that permeation occurs.

G4.16 Water fittings made of plastics, or other material which are likely to be damaged by exposure to oil, petrol or any other contaminant, should not be laid in contaminated ground, or should be protected.

Fixing of water fittings

G4.17 Water fittings should be adequately protected against damage from any cause, including the environment through which they pass.

G4.18 Water fittings should be adequately supported, the spacing for support being dependent on the material of the pipes. Allowance should be made to accommodate any reasonable foreseeable movement, including thermal movement, in accordance with clause 3.1.7 of BS 6700.

Pressure requirements

G5.1 All water fittings should be capable of withstanding an internal water pressure of not less than 1.5 times the maximum operating pressure.

G5.2 In determining the maximum operating pressure to which the system is subjected, the increase in static pressure in the following instances should be taken into consideration:

a. the supply pipe during night periods when there may be little demand on the system; and,
b. in any water supply installation where pumps are installed.

Surge pressures

G5.3 The internal test pressure does not take into consideration any transient or surge pressures which may be generated within the system and the designer or installer should take the effect of any surge into consideration in determining the test pressure applied to an installation.

G5.4 Transient pressure increases or surge (water hammer) may be generated by the rapid closure of a valve; for example, float-operated valves, spherical valves or disc valves. When installed, attenuation devices or water hammer arresters may reduce the effects of surge.

Pumps or boosters

G6.1 Written approval should be obtained from the water undertaker before any pump or booster is connected to a supply pipe, unless the pump or booster is incapable of drawing more than 0.2 litres per second.

Pumped showers

G6.2 Showers, and other appliances, which are supplied with water through a pump located either upstream or downstream of the mixing valve, and capable of delivering more than 0.2 litres/second, may not be supplied with water direct from a supply pipe unless written approval has been obtained from the water supplier. (See Regulation 5).

G6.3 Irrespective of whether the water supply to a shower is pumped or the shower incorporates a pump, whether supplied with water from either a supply pipe or a distributing pipe, and is of a type specified by the regulator, consent to instal the shower should be obtained from the water undertaker. (See Regulation 5).

Location of water fitings

G7.1 Unless they are located in an internal wall which is not a solid wall, a chase or duct which may be readily exposed, or under a suspended floor which may, if necessary, be readily removed and replaced, or to which there is access, water fittings should not be:

a. located in the cavity of a cavity wall; or,
b. embedded in any wall or solid floor; or,
c. installed below a suspended or solid floor at ground level.

See Figure 3.1and 3.2 for typical details of acceptable arrangements.

[Note: Any notching or holes made within floor or roof joists should be within the limits shown in Building Regulations, Approved Document A, Section 1B6.]

G7.2 Pipes entering buildings at the approved depth should be passed through a duct and the ends of the duct sealed as shown in Figure 3.3 to prevent the ingress of gas or vermin into the building.

Concealed fittings

G7.3 A concealed pipe may be installed in a pipe sleeve or duct located under or within a solid floor provided that the pipe can be readily removed and replaced.

Dezincification resistant materials

G7.4 Water fittings are to be resistant to corrosion and, where specified, to dezincification.

G7.5 All concealed water fittings, except terminal fittings, (including those buried underground), together with backflow prevention devices, are required to be manufactured of gunmetal or other dezincification resistant materials.

G7.6 Dezincification resistant fittings should be of DRA quality, the depth of dezincification being not less than 200 microns in any direction. Each fitting should be marked with the symbol CR or DRA and should be tested in accordance with ISO 6509.

Water fittings laid underground

G7.7 Wherever practicable and except for pipes laid under a building, the vertical distance between the top of every water pipe installed below ground and the finished ground level should be:

a. not less than 750 mm; and,
b. not more than 1,350 mm.

G7.8 Where compliance with the minimum cover of 750 mm is impracticable, and with the written approval of the water undertaker, the water fittings should be installed as deep as is practicable below the finished ground level and be adequately protected against damage from freezing and from any other cause. For further information see Figure 3.4.

G7.9 Water fittings laid underground should be resistant to dezincification and be installed to accommodate any movement.

G7.10 Water fittings installed underground should not be jointed or connected to any other water fitting by adhesives.

Table 3.1: Recommended minimum commercial thicknesses of thermal insulation for copper water pipes of minimum wall thickness complying with BS EN 1057 in normal conditions of exposure.

External diameter of pipe	Thermal conductivity of insulation material at 0^0 C in W/(m.K)				
	0.02	0.025	0.03	0.035	0.04
mm	mm	mm	mm25* (45) 19 (15)	mm	mm

15 22 28 35 42 and over	20 (20) 15 (9) 15 (6) 15 (4) 15 (3)	30 (30) 15 (12) 15 (8) 15 (6) 15 (5)	13 (10) 9 (7) 9 (5)	25* (70) 19 (19) 19 (12) 9 (8) 9 (5)	32* (91) 25 (24) 22 (14) 13 (10) 9 (8)

Notes

1. Except for 15 mm pipes with thermal conductivities of 0.030, 0.035 and 0.040 W/(m.K), shown with a *, which are limited to 50% ice formation after 9, 8 and 7 hours respectively, the above recommended commercially available minimum thicknesses of insulation should limit ice formation to under 50% after 12 hours for the remainder of the pipe sizes, when based on an air temperature of -6^0 C and a water temperature of $+7^0$ C. The minimum calculated insulation thicknesses for 12 hours protection under the above conditions are shown in the appropriate location in brackets.

   Commercial thicknesses of insulation with the higher thermal conductivities are generally limited to a minimum of 9 mm. Materials with a lower thermal conductivity, such as rigid phenolic foam, polisocyanurate foam and rigid polyurethane foam are installed by specialist firms and are usually limited to a minimum thickness of about 15 mm.

2. Normal conditions to frost exposure are considered to be when water fittings are installed inside buildings within the thermal envelope, but within rooms or voids which are not heated for a minimum period of 12 hours each day for the whole of the winter period. Examples could include the following:

a. Unheated cloakrooms, store rooms, utility rooms, etc.
b. Below the ceiling insulation in a roof space

Figure 3.1: Location and accessibility of concealed water fittings in floors

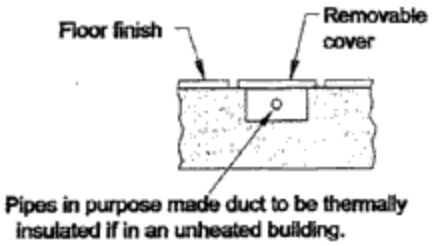


Figure 3.1a: Pipe in purpose made duct with removable cover.

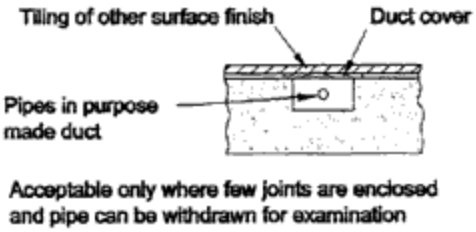


Figure 3.1b: Pipe in purpose made duct with no access.

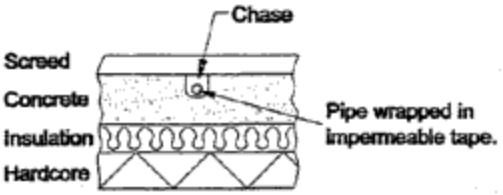


Figure 3.1c: Pipe located in chase in ground supported concrete floor.

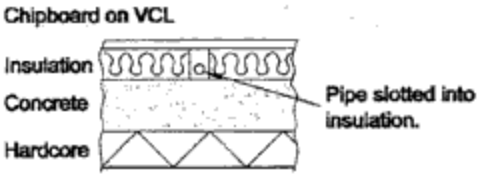


Figure 3.1d: Pipe located between insulation in ground supported concrete floor.

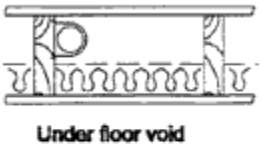


Figure 3.1e: Pipe located under insulated ground floor.

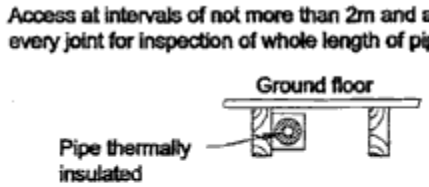


Figure 3.1f: Pipe located under non-insulated ground floor.

Note: Any notching or holes made within floor or root joists should be within the limits shown in Building Regulations 1991 - Approved Document A, 1B6.

Figure 3.2: Location and accessibility of concealed water fittings in walls and behind baths

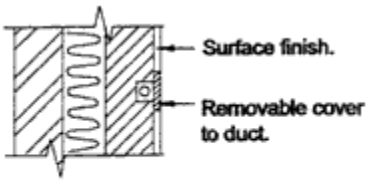


Figure 3.2a: Pipe in chase with removable cover in internal leaf of external wall.

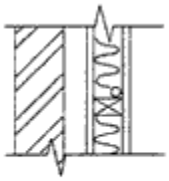


Figure 3.2b: Pipe clipped to nogging or stud in timber framed external wall.

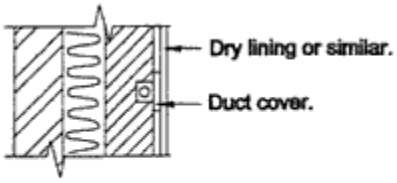


Figure 3.2c: Pipe in chase with non-removable cover in internal leaf of external wall.

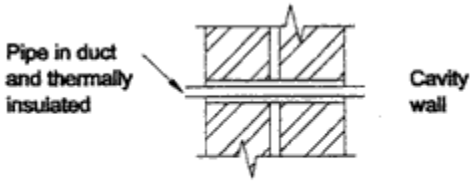


Figure 3.2d: Pipe passing through cavity wall

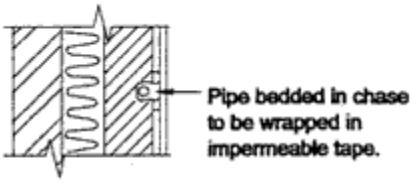


Figure 3.2e: Pipe bedded in chase in internal leaf of external wall.

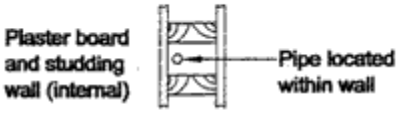


Figure 3.2f: Pipe located in an internal studded wall.

Figure 3.3: Details of pipes entries to buildings

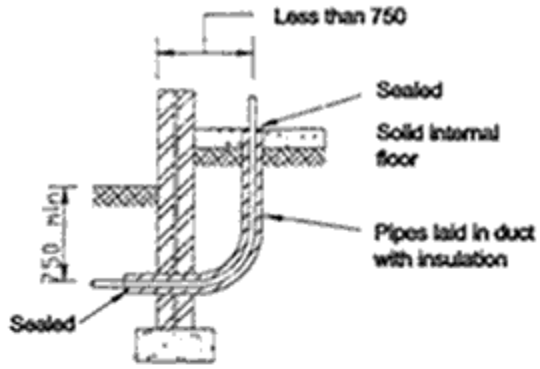


Figure 3.3a Vertical pipe in duct less than 750 from external face of wall.

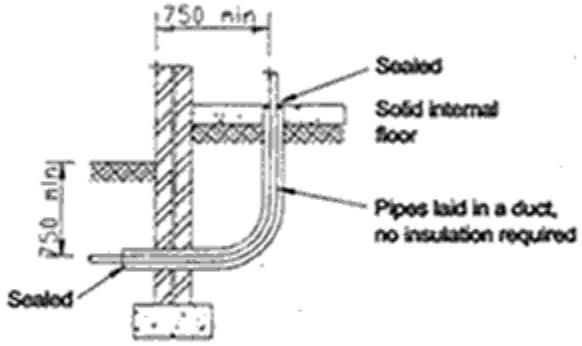


Figure 3.3b Vertical pipe in duct greater than 750 from external face of wall.

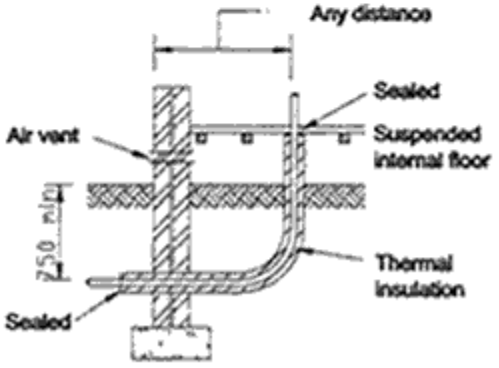


Figure 3.3c Vertical pipe in duct any distance from external face of wall where entry to building is through a suspended floor with air void below.

Figure 3.4: Depths of pipes below ground

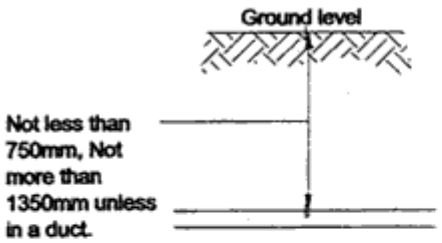


Figure 3.4a Normal case

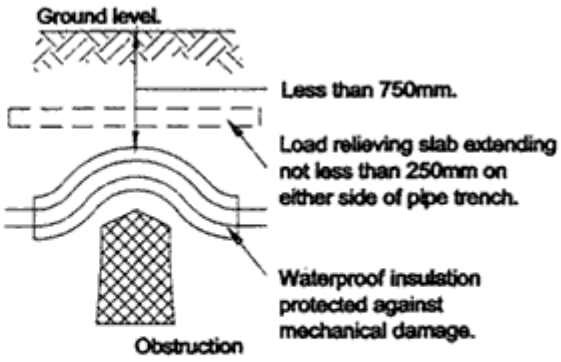


Figure 3.4b Pipe laid over an obstruction

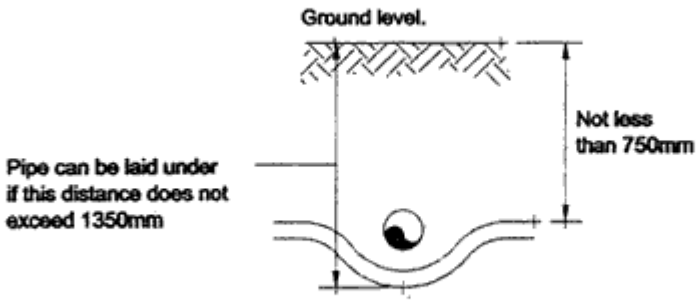


Figure 3.4c Pipe laid under an obstruction

SECTION 4

Schedule 2: Paragraphs 8, 9, 10, 11, 12 and 13: Water system design and installation

8. No water fitting shall be installed in such a position, or pass through such surroundings, that it is likely to cause contamination or damage to the material of the fitting or the contamination of water supplied by the water undertaker.

9. Any pipe supplying cold water for domestic purposes to any tap shall be so installed that, so far as is reasonably practicable, the water is not warmed above 25°C.

10. (1) Every supply pipe or distributing pipe providing water to separate premises shall be fitted with a stop valve conveniently located to enable the supply to

those premises to be shut off without shutting off the supply to any other premises.

(2) Where a supply pipe or distributing pipe provides water in common to two or more premises, it shall be fitted with a stop valve to which each occupier of those premises has access.

11. Water supply systems shall be capable of being drained down and be fitted with an adequate number of servicing valves and drain taps so as to minimize the discharge of water when water fittings are maintained or replaced. A sufficient number of stop valves shall be installed for isolating parts of the pipework.

12. (1) The water system shall be capable of withstanding an internal water pressure not less than 1½ times the maximum pressure to which the installation or relevant part is designed to be subjected in operation ("the test pressure").

(2) This requirement shall be deemed to be satisfied-

a. in the case of a water system that does not include a pipe made of plastics, where-

i. the whole system is subjected to the test pressure by pumping, after which the test continues for one hour without further pumping;

ii. the pressure in the system is maintained for one hour; and

iii. there is no visible leakage throughout the test;

b. in any other case, where either of the following tests is satisfied-

TEST A		TEST B	
iii.	the whole system is subjected to the test pressure by pumping for 30 minutes, after which the test continues for 90 minutes without further pumping;	vii.	the whole system is subjected to the test pressure by pumping for 30 minutes, after which the pressure is noted and the test continues for 150 minutes without further pumping;
iv.	the pressure is reduced to one third of the test	viii.	the drop in pressure is less than 0.6 bar

	pressure after 30 minutes;		(60kPa) after the following 30 minutes, or 0.8 bar
v.	the pressure does not drop below one third of the test pressure over the following 90 minutes; and		(80kPa) after the following 150 minutes; and
vi.	there is no visible leakage throughout the test.	ix.	there is no visible leakage throughout the test.

13. Every water system shall be tested, flushed and where necessary disinfected before it is first used.

Guidance

General

G8.1 The following factors should be taken into consideration in the design of a water supply system:

a. the estimated daily consumption and the maximum and average flows required, together with the estimated peak flow; and,
b. the location of the available supply main and minimum and maximum pressures available; and,
c. the quality, quantity and pressure required at outlets and the available pressures at various times during a typical day; and,
d. the cold water storage capacity required, if any; and,
e. the likelihood of ground subsidence due to mining activities or any other reason if it will have a detrimental effect on the supply; and,
f. the likelihood of existing contamination of the site; and,
g. transient or surge pressures that may arise during the operation of the system.

G8.2 Subject to specific requirements of the local water undertaker, water may be supplied to appliances and draw-off points:

a. from a distributing pipe deriving its supply from a storage cistern; or,
b. directly from and under pressure from a supply pipe; or,
c. a combination of 'a' and 'b' subject to necessary precautions being taken to prevent cross-connections and backflow; or,
d. from a pumped supply or distributing pipe, where this is necessary due to lack of pressure, .

See Figure 4.1 for examples of typical installations of a, b and c in a house.

Design flow rates

G8.3 Generally, installations incorporating cold water systems and hot water storage systems should be designed and installed so that the design flow rates given in Table 4.1, which is based on Table 3 of BS 6700, will be available at each outlet, and any group of outlets where the total demand does not exceed 0.3 litre/second, when only that outlet or group of outlets is discharging. When simultaneous discharge occurs the rate of flow of water at any outlet in use should not be less than the minimum rate shown.

G8.4 Where hot water systems are installed that incorporate instantaneous heaters or combination boilers the rates of flow shown in Table 4.1 may not be achievable and the system should be designed accordingly.

G8.5 Water fittings should not be laid or installed in, on, or pass through any contaminated environment; for example, foul soil, refuse or a refuse chute, ashpit, sewer, drain, cesspool, manhole or inspection chamber.

G8.6 Storage cisterns holding water for domestic purposes and other water fittings are to be installed in such positions that no surface, ground or foul water, or any other water that is unwholesome, may enter the cistern or fitting.

Distribution temperature of cold water

G9.1 So far as is reasonably practical the temperature of water within cold water pipes should not exceed 20^0 C and adequate measures should be taken to ensure that this temperature is not exceeded..

Operational fittings

G10.1 Operational fittings such as stopvalves, servicing valves and drain taps should be readily accessible for operation and maintenance.

G10.2 Operational fittings may be located in a duct, access chamber or cupboard provided with a hinged door or removable cover which is visible at all times. The door or cover should not be covered with any decorative material, such as carpet, wall or floor tiling or wallpaper, which requires removal to access the door or cover.

Stopvalves to premises

G10.3 Every supply and distributing pipe providing water to premises should be fitted with a stopvalve to control the supply to those premises only. See Figure 4.2.

G10.4 Every supply and distributing pipe providing water in common to two or more premises are to be fitted with a stopvalve (whether inside or outside premises) to which each occupier of premises has access. See Figures 4.2band 4.2c.

Location of stopvalve in buildings

G10.5 Stopvalves should, so far as reasonably practical, be installed inside the premises above floor level, near where the supply pipe enters the building and so installed that closure of the stopvalve will prevent the supply of water to all points of use.

Provision of servicing valves

G11.1 Inlets to all float-operated valves, cisterns, clothes washing machines, dishwashing machines, water heaters, water softeners and other similar appliances should be provided with a servicing valve to facilitate maintenance.

G11.2 Servicing valves should be fitted as close as is reasonably practical to float operated valves or other inlet devices of an appliance.

G11.3 Servicing valves may be of the screwdown or spherical type.

Provision of draining taps

G11.4 Sufficient draining taps should be provided to facilitate the draining of all supply and distributing pipes within the building.

G11.5 Draining taps should be of the screwdown type conforming to BS 2879 or, where located in a frost free location, of an approved spherical type.

G11.6 Draining taps should not be buried or covered with soil, or installed so that they are submerged, or likely to be submerged.

Redundant fittings and dead legs

G11.7 Any draw-off fitting that is permanently removed from the installation should have the branch pipe serving the fitting disconnected at its source.

Testing

G12.1 The whole installation should be tested hydraulically on completion by subjecting all supply and distributing pipes, fittings and connections to appliances, to an internal test pressure of 1.5 times the maximum operating pressure for the installation or the relevant part..

G12.2 For systems that do not include any plastics pipes (that is, rigid pipe materials such as copper, stainless steel, etc), the requirement shall be deemed to be satisfied if:

a. the whole of the system is subjected internally to the test pressure by pumping, after which the test continues without further pumping;
b. the pressure in the system does not drop below the test pressure over the next one hour period and there is no visible leakage,

in accordance with Clause 3.1.12.3.3 of BS 6700.

G12.3 For systems that include any plastics pipes, the requirement shall be deemed to be satisfied if, either:

Test A

a. the whole of the system is subjected internally to the test pressure which is maintained by pumping for 30 minutes, after which the test continues without further pumping; and
b. the pressure in the system is carefully reduced to one third of the test pressure; and
c. the pressure does not drop over the following 90 minutes and there is no visible leakage;

or in accordance with Clause 3.1.12.3.4 (Test procedure A) of BS 6700, or

Test B

a. the whole of the system is subjected internally to the test pressure and is maintained by pumping for 30 minutes, after which the pressure is noted and the test is continued without further pumping; and
b. the pressure drop is less than 0.6 bar after a further 30 minutes; and
c. the pressure drop is less than 0.2 bar after the next 120 minutes and there is no visible leakage,

or in accordance with Clause 3.1.12.3.4 (Test procedure B) of BS 6700.

Flushing

G13.1 Flushing of installations should be in accordance with Clause 3.1.10.1 of BS 6700.

Disinfection

G13.2 After testing and flushing, systems should be disinfected in the following instances:

a. new installations (except private dwellings occupied by a single family); or,
b. major extensions or alterations (except private dwellings occupied by a single family); or,
c. underground pipework (except localised repairs or insertion of junctions); or,
d. where it is suspected that contamination may have occurred, e.g. fouling by sewage, drainage, animals or physical entry by site personnel for interior inspection, painting or repairs; or
e. where a system has not been in regular use and not regularly flushed.

Table 4.1: Recommended design flow rates of cold and hot water to sanitary appliances		
Outlet fitting or appliance	Rate of flow - litres/second	
	Design rate	Min. rate
WC cistern (to fill in 2 minutes)	0.13	0.05
WC pressure flushing valve (DN 20)	1.5	1
WC flushing trough (per WC served)	0.15	0.1
Urinal cistern (each position served)	0.004	0.002
Urinal flushing valve	0.3	0.15
Washbasin (pillar or mixer taps)	0.15	0.1
Handbasin (pillar or mixer taps)	0.1	0.07
Handbasin (spray or spray mixer taps)	0.05	0.03
Bidet	0.2	0.1
Bath (G ¾)	0.3	0.2
Bath (G 1)	0.6	0.4
Shower head	0.2	0.1
Kitchen sink (G ½)	0.2	0.1
Kitchen sink (G ¾)	0.3	0.2
Kitchen sink (G 1)	0.6	0.4
Washing machine	0.2	0.15
Dish-washing machine	0.15	0.1

1. Flow rates required for washing and dish-washing machines for other than single dwellings should be obtained from the manufacturer.2. Mixer fittings or combination tap assemblies deliver less flow than two separate taps; it is suggested that 70 % of the above flow rates may be sufficient.

3. The rate of flow required to shower heads will depend on the type fitted; the advice of the shower manufacturer should be sought.

4 The above rates of flow to appliances are applicable where hot water centralised storage systems are installed. Where hot water systems incorporate instantaneous heaters or combination boilers the rates of flow shown in the Table may not be achievable and the system should be designed accordingly.

Figure 4.1: Typical examples of water supply systems in houses

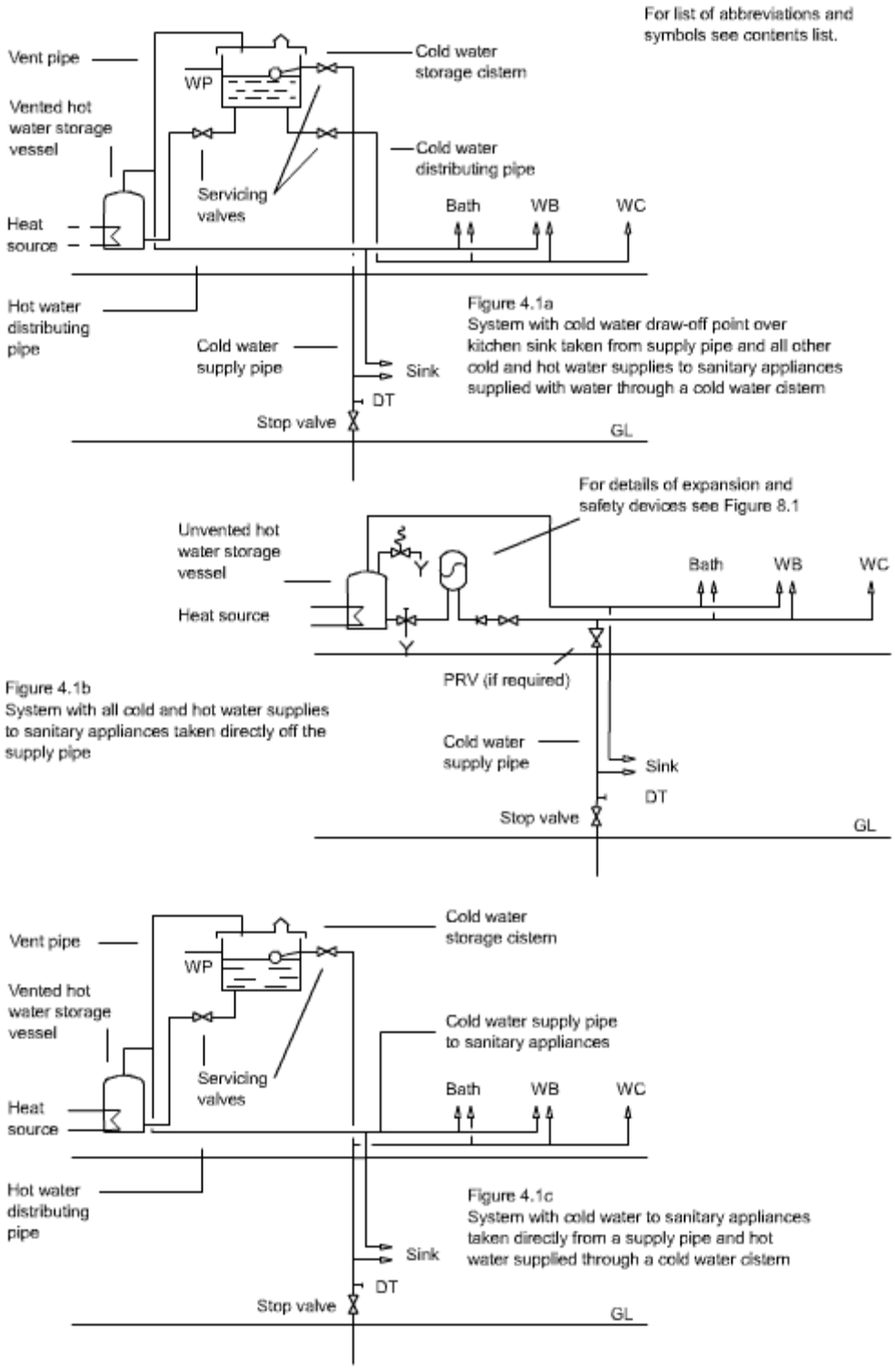


Figure 4.2: Examples of location of stopvalves

Building comprising several occupied parts (eg flats) each with separate supply pipes outside those parts

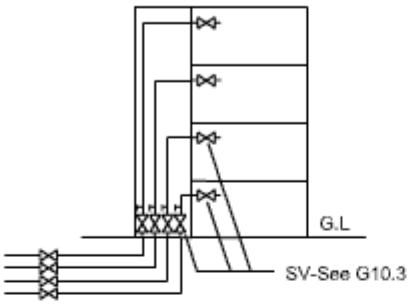


Figure 4.2a: Elevation

Building comprising several separately occupied dwellings (eg flats) on a common supply pipes outside those parts

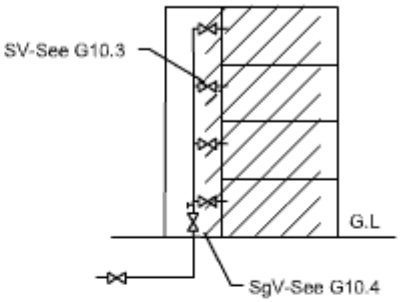


Figure 4.2b: Elevation

Building comprising several separately occupied dwellings (eg flats) with a common distributing pipe outside those parts

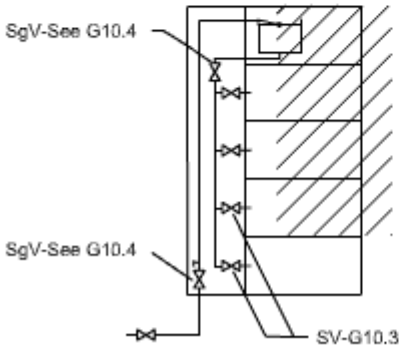


Figure 4.2c: Elevation

NOTE: Whole site backflow protection in accordance with Clause G3.14 should be provided to each of the separately occupied premises shown in Figures 4.2b and 4.2c.

SECTION 5

Schedule 2: Paragraph 14: Prevention of cross connection to unwholesome water

14. (1) Any water fitting conveying-

a. rain water, recycled water or any fluid other than

water supplied by a water undertaker; or

b. any fluid that is not wholesome water; shall be clearly identified so as to be easily distinguished from any supply pipe or distributing pipe.

(2) No supply pipe, distributing pipe or pump delivery pipe drawing water from a supply pipe shall convey, or be connected so that it can convey, any fluid falling within sub-paragraph (1) unless a device for preventing backflow is installed in accordance with paragraph 15.

Guidance

Colour coding of pipelines

G14 1 Pipes and cisterns conveying and holding water that is not wholesome should be marked or colour coded in accordance with BS 1710

G14.2 Any pipe conveying rainwater, recycled water or any other water from a source other than the water undertaker is not to be connected to any pipe carrying wholesome water supplied by the the water undertake unless a suitable backflow prevention device or arrangement is installed in accordance with the requirements of paragraph 15.

SECTION 6

Backflow protection: Schedules 1 and 2

SECTION 6.1

Schedule 1: Fluid categories

Fluid category 1
Wholesome water supplied by a water undertaker and complying with the requirements of regulations made under section 67 of the Water Industry Act 1991(a).

Fluid category 2
Water in fluid category 1 whose aesthetic quality is impaired owing to-

a. a change in its temperature, or
b. the presence of substances or organisms causing a change in its taste, odour or appearance, including water in a hot water distribution system.

Fluid category 3
Fluid which represents a slight health hazard because of the concentration of substances of low toxicity, including any fluid which contains-

a. ethylene glycol, copper sulphate solution or similar chemical additives, or
b. sodium hypochlorite (chloros and common disinfectants).

Fluid category 4
Fluid which represents a significant health hazard because of the concentration of toxic substances, including any fluid which contains-

a. chemical, carcinogenic substances or pesticides (including insecticides and herbicides), or
b. environmental organisms of potential health significance.

Fluid category 5
Fluid representing a serious health hazard because of the concentration of pathogenic organisms, radioactive or very toxic substances, including any fluid which contains-

a. faecal material or other human waste;
b. butchery or other animal waste; or
c. pathogens from any other source.

SECTION 6.2

Schedule 2: Paragraph 15 Backflow prevention

15. (1) Subject to the following provisions of this paragraph, every water system shall contain an adequate device or devices for preventing backflow of fluid from any appliance, fitting or process from occurring.

(2) Paragraph (1) does not apply to-

a. a water heater where the expanded water is permitted to flow back into a supply pipe, or
b. a vented water storage vessel supplied from a storage cistern, where the temperature of the water in the supply pipe or the cistern does not exceed 25°C.

(3) The device used to prevent backflow shall be appropriate to the highest applicable fluid category to which the fitting is subject downstream before the next such device.

(4) Backflow prevention shall be provided on any supply pipe or distributing pipe-

c. where it is necessary to prevent backflow between separately occupied premises, or
d. where the water undertaker has given notice for the purposes of this Schedule that such prevention is needed for the whole or part of any premises

(5) A backflow prevention device is adequate for the purposes of paragraph (1) if it is in accordance with a specification approved by the regulator for the purposes of this Schedule.

SECTION 6.3

Regulator's specification for backflow prevention arrangements and devices

S15.1 General interpretation of terms relating to backflow prevention

"An air gap" means a visible, unobstructed and complete physical air break between the lowest level of water discharge and the level of potentially contaminated fluid downstream (critical water level) within a cistern, vessel, fitting or appliance, hereinafter called a receptacle, that:

a. is not less than 20 mm or twice the internal diameter of the inlet pipe whichever is the greater; and
b. from which water discharges at not more than 15° from the vertical centreline of the water stream.

"Critical level" means the physical or piezometric level of the fluid in any part of the receptacle a minimum of two seconds after closing the water inlet, starting from maximum water level.

"Maximum level" means the highest physical or piezometric level of the fluid reached in any part of the receptacle when operated continuously under fault conditions,

"Spillover level" means the level at which the or fluid in a receptacle will first spill over the top edge of a receptacle if the inflow of water exceeds the outflow through any outlet and any overflow pipe.

"Tap gap" means the vertical distance between the lowest part of a tap outlet and the spillover level of the appliance or receptacle over which the tap discharges.

An "upstand" means either one of two alternative arrangements of water fittings to prevent backflow by backsiphonage:

Type A upstand An upward flowing supply or distributing pipe surmounted by an anti-vacuum valve (Type DA), or an anti-vacuum valve combined with a single check valve (Type DUK1), any part

	of the outlet of which is located not less than 300mm above the spillover level of an appliance.
Type B upstand	A branch pipe serving an appliance, where the height of any part of the branch connection to the vented distributing pipe is not less than 300 mm above: a. the spillover level of the appliance; or b. the highest possible discharge point served by the vented distributing pipe, whichever is the highest.

"A verifiable backflow prevention device" means a device, consisting of one or more backflow prevention elements, which can be tested in-situ; usually achieved by the provision of test ports immediately upstream, and between, the mechanical elements comprising the device.

S15.2 Interpretations of backflow prevention arrangements as listed in Table S6.1

"Type AA - Air gap with unrestricted discharge" means a non-mechanical backflow prevention arrangement of water fittings where water is discharged through an air gap into a receptacle which has at all times an unrestricted spillover to the atmosphere.

"Type AB - Air gap with weir overflow" means a non-mechanical backflow prevention arrangement of water fittings complying with Type AA, except that the air gap is the vertical distance from the lowest point of the discharge orifice which discharges into the receptacle, to the critical level of the rectangular weir overflow.

"Type AC - Air gap with vented submerged inlet and circular overflow" means a non-mechanical backflow prevention arrangement of water fittings with a vented, but submerged, inlet; the air gap being measured vertically downwards from the lowest point of the air inlet to the critical level.

"Type AD - Air gap with injector" means a non-mechanical backflow prevention arrangement of water fittings with a horizontal injector and a physical air gap of 20 millimetres or twice the inlet diameter, whichever is the greater.

"Type AF - Air gap with circular overflow" means a non-mechanical backflow prevention arrangement of water fittings with an air gap measured downwards from the lowest point of the discharge orifice, which discharges into the receptacle, to the critical level.

"Type AG - Air gap arrangement with minimum size circular overflow" means a non-mechanical backflow prevention arrangement of water fittings with an air gap; together with an overflow, the size of which is determined by measure or a vacuum test.

"Type AUK1 - Air gap with interposed cistern" means a non-mechanical backflow prevention arrangement consisting of a cistern with a Type AG overflow and an air gap; the spill-over level of the receiving vessel (WC pan or other receptacle) being located not less than 300 millimetres below the overflow pipe and not less than 15 millimetres below the lowest level of the interposed cistern.

"Type AUK2 - Domestic tap gap" means the height of air gap between the lowest part of the outlet of a tap, combination fitting, shower head or other fitting discharging over a domestic sanitary appliance or other receptacle, and the spillover level of that appliance, where a fluid category 2 or 3 risk is present downstream,

Type AUK3 - Higher risk tap gap" means the height of an air gap between the lowest part of the outlet of a tap, combination fitting, shower head or other fitting discharging over any appliance or other receptacle, and the spillover level of that appliance, where a fluid category 4 or 5 risk is present downstream,

"Type DC - Pipe interrupter with permanent atmospheric vent" means a non-mechanical backflow prevention device with a permanent unrestricted air inlet, the device being installed so that the flow of water is in a vertical downward direction.

S15.3 General interpretations of backflow prevention devices as listed in Table S6.2

"Type BA - Verifiable backflow preventer with reduced pressure zone" means a verifiable mechanical backflow prevention device consisting of an arrangement of water fittings with three pressure zones with differential obturators and that will operate when potential backflow conditions obtain or there is a malfunction of the valve.

"Type CA - Non-verifiable disconnector with different pressure zones" means a non-verifiable mechanical backflow prevention device which provides disconnection by venting the intermediate pressure zone of the device to the atmosphere when the difference of pressure between the intermediate zone and the upstream zone is not greater than 10% of the upstream pressure.

"Type DA - Anti-vacuum valve (or vacuum breaker)" means a mechanical backflow prevention device with an air inlet which is closed when water within the device is at or above atmospheric pressure but which opens to admit air if a vacuum occurs at the inlet to the device.

"Type DB - Pipe interrupter with atmospheric vent and moving element" means a mechanical backflow prevention device with an air inlet closed by a moving element when the device is in normal use but which opens and admits air if the water pressure upstream of the device falls to atmospheric pressure, the device being installed so that the flow of water is in a vertical, downward direction.

"Type DUK1 - Anti-vacuum valve combined with a single check valve" means a mechanical backflow prevention device comprising an anti-vacuum valve with a single check valve located upstream.

"Type EA - Verifiable single check valve" means a verifiable mechanical backflow prevention device which will permit water to flow from upstream to downstream but not in the reverse direction.

"Type EB - Non-verifiable single check valve" means a non-verifiable mechanical backflow prevention device which will permit water to flow from upstream to downstream but not in the reverse direction.

"Type EC - Verifiable double check valve" means a verifiable mechanical backflow prevention device consisting of two verifiable single check valves in series, which will permit water to flow from upstream to downstream but not in the reverse direction.

"Type ED - Non-verifiable double check valve" means a non-verifiable mechanical backflow prevention device consisting of two single check valves in series, which will permit water to flow from upstream to downstream but not in the reverse direction.

"Type HA - Hose union backflow preventer" means a mechanical prevention backflow device for fitting to the outlet of a hose union tap and consisting of a single check valve with air inlets that open if the flow of water ceases.

"Type HC - Diverter with automatic return" means a mechanical backflow prevention device used in bath/shower combination tap assemblies which automatically returns the bath outlet open to atmosphere if a vacuum occurs at the inlet to the device.

"Type HUK1 - Hose union tap incorporating a double check valve" means a hose union tap in which a double check valve has been incorporated into either the inlet or outlet of the tap.

"Type L - Pressurised air inlet valve" means an anti-vacuum valve or vacuum breaker, similar to Type DA but suitable for conditions where the water pressure at the outlet of the device under normal conditions of use is greater than atmospheric.

"Type LB - Pressurised air inlet valve combined with a check valve downstream" means a mechanical backflow prevention device comprising a Type LA anti-vacuum valve and a single check valve located downstream.

Table S6.1: Schedule of non-mechanical backflow prevention arrangements and the maximum permissible fluid category for which they are acceptable

Type	Description of backflow prevention arrangements and devices	Suitable for protection against fluid category

		Back-pressure	Back-siphonage
AA	Air gap with unrestricted discharge above spillover level	5	5
AB	Air gap with weir overflow	5	5
AC	Air gap with vented submerged inlet	3	3
AD	Air gap with injector	5	5
AF	Air gap with circular overflow	4	4
AG	Air gap with minimum size circular overflow determined by measure or vacuum test	3	3
AUK1	Air gap with interposed cistern (For example, a WC suite)	3	5
AUK2	Air gaps for taps and combination fittings (tap gaps) discharging over domestic sanitary appliances, such as a washbasin, bidet, bath or shower tray shall not be less than the following: Size of tap or combination fitting — Vertical distance of bottom of tap outlet above spill-over level of receiving appliance Not exceeding G ½ — 20 mm Exceeding G ½ but not exceeding G ¾ — 25 mm Exceeding G ¾ — 70 mm	X	3
AUK3	Air gaps for taps or combination fittings (tap gaps) discharging over any higher risk domestic sanitary appliances where a fluid category 4 or 5 is present, such as:a any domestic or non-domestic sink or other appliance; or b any appliances in premises where a higher level of protection is required, such as some appliances in hospitals or other health care premises, shall be not less than 20 mm or twice the diameter of the inlet pipe to the fitting, whichever is the greater.	X	5
DC	Pipe interrupter with permanent atmospheric vent	X	5

Notes:
1 X Indicates that the backflow prevention arrangement or device is not applicable or not acceptable for protection against backpressure for any fluid category within water installations in the UK.2 Arrangements incorporating Type DC devices shall have no control valves on the outlet of the device; they shall be fitted not less than 300 mm above the spillover level of a WC pan, or 150 mm above the sparge pipe outlet of a urinal, and discharge vertically downwards .3 Overflows and warning pipes shall discharge through, or terminate with, an air gap, the dimension of which should satisfy a Type AA air gap.

Table S6.2: Schedule of mechnical backflow prevention arrangements and the

maximum permissible fluid category for which they are acceptable			
Type	**Description of backflow prevention arrangements and devices**	**Suitable for protection against fluid category**	
		Back-pressure	**Back-siphonage**
BA	Verifiable backflow preventer with reduced pressure zone	4	4
CA	Non-verifiable disconnector with difference between pressure zones not greater than 10%	3	3
DA	Anti-vacuum valve (or vacuum breaker)	X	3
DB	Pipe interrupter with atmospheric vent and moving element	X	4
DUK1	Anti-vacuum valve combined with a single check valve	2	3
EA	Verifiable single check valve	2	2
EB	Non-verifiable single check valve.	2	2
EC	Verifiable double check valve	3	3
ED	Non-verifiable double check valve	3	3
HA	Hose union backflow preventer. Only permitted for use on existing hose union taps in house installations	2	3
HC	Diverter with automatic return (Normally integral with some domestic appliance applications only)	X	3
HUK1	Hose union tap which incorporates a double check valve. Only permitted for replacement of existing hose union taps in house installations	3	3
LA	Pressurised air inlet valve	X	2
LB	Pressurised air inlet valve combined with a check valve downstream	2	3

Notes:
1 X Indicates that the backflow prevention device is not acceptable for protection against backpressure for any fluid category within water installations in the UK.2 Arrangements incorporating a Type DB device shall have no control valves on the outlet of the device. The device shall be fitted not less than 300mm above the spillover level o f an appliance and discharge vertically downwards .3 Types DA and DUK1 shall have no control valves on the outlet of the device and be fitted on a 300 mm minimum Type A upstand.

4 Relief outlet ports from Types BA and CA backflow prevention devices shall terminate with an air gap, the dimension of which should satisfy a Type AA air gap.

SECTION 6.4

Guidance clauses relating to Schedule 1: Fluid categories; and Paragraph 15 of Schedule 2: Backflow prevention

Guidance

General

G15.1 Except where expanded water from hot water systems or instantaneous water heaters is permitted to flow back into a supply or distributing pipe, every water fitting through which water is supplied for domestic purposes should be installed in such a manner that no backflow of fluid from any appliance, fitting or process can take place.

G15.2 Avoidance of backflow should be achieved by good system design and the provision of suitable backflow prevention arrangements and devices, the type of which depends on the fluid category to which the wholesome water is discharged. A description of fluid risk categories is shown in Schedule 1 of the Regulations and some suggested examples relating to the fluid categories are shown in Tables 6.1a to e.

G15.3 The type of backflow protection for a given situation is related to the fluid risk categories downstream of the backflow prevention device.

G15.4 Schedules of backflow prevention arrangements and backflow prevention devices, and the maximum permissible fluid risk category for which they are acceptable, are shown in Table S6.1and Table S6.2. Details of the arrangements and devices are shown in Table 6.2and Table 6.3.

G15.5 Wherever practicable, systems should be protected against backflow without the necessity to rely on mechanical backflow protection devices; this can often be achieved by point of use protection such as a 'tap gap' above the spillover level of an appliance. Minimum air gaps for different sizes of taps and applications are shown in Table S6.1.

G15.6 In cistern fed systems secondary backflow prevention can often be achieved for appliances by the use of permanently vented distributing pipes. See Figure 6.2b.

G15.7 Mechanical backflow protection devices which, depending on the type of device, may be suitable for protection against backpressure or backsiphonage, or both, should be installed so that:

a. they are readily accessible for inspection, operational maintenance and renewal; and,
b. except for Types HA and HUK1, backflow prevention devices for protection against fluid categories 2 and 3, they should not be located outside premises; and,
c. they are not buried in the ground; and,
d. vented or verifiable devices, or devices with relief outlets, are not installed in chambers below ground level or where liable to flooding; and,
e. line strainers are provided immediately upstream of all backflow prevention devices required for fluid category 4. Where strainers are

provided, servicing valves are to be fitted upstream of the line strainer and downstream of the backflow prevention device; and,

f. the lowest point of the relief outlet from any reduced pressure zone valve assembly or similar device should terminate with a Type AA air gap located not be less than 300mm above the ground or floor level; and,

Note: For information on the installation and maintenance of reduced pressure zone devices (RPZ valve assemblies) see Installation and Guidance Note No. 9-03-02 published by the Water Regulations Advisory Scheme]

Appliances incorporating, or supplied with water through, pumps

G15.8 Where pumped showers, or other appliances supplied through or incorporating pumps, are installed, care should be taken in positioning branches from distributing pipes.

Bidets (including WCs adapted as bidets) with flexible hose and spray handset fittings and with submerged water inlets

G15.9 Bidets with flexible hose and spray handset fittings and/or water inlets below the spillover level of the appliance, are a fluid category 5 risk and should not be supplied with water directly from a supply pipe.

G15.10 Bidets of this type may:

a. be supplied with cold and/or hot water through Type AA, AB, or AD backflow prevention arrangements serving the bidet only; or,
b. be supplied with cold water from an independent distributing pipe serving the bidet only, see Figure 6.1a; or a common distributing pipe serving the bidet and which may also serve a WC or urinal flushing cistern only; or,
c. be supplied with hot water from a water heater, which is supplied from an independent distributing pipe, that serves the bidet only, see Figure 6.1a; or,
d. where the bidet is at a lower elevation than any other outlets or appliances, be supplied with water from a common cold and/or hot water vented distributing pipe providing that:
    i. the elevation of the spillover level of the bidet, if there is no flexible hose; or,
    ii. the elevation of the spray outlet, with the hose extended vertically above the spillover level of the bidet,

    whichever is the highest, is not less than 300 mm below the point of connection of the branch pipe serving the bidet to the main distributing pipe serving other appliances.

Bidets with water inlets above spillover level only

G15.11 Bidets in domestic locations with taps or mixers located above the spillover level of the appliance, and not incorporating an ascending spray inlet below spillover level or spray and flexible hose, may be served from either a supply pipe or a distributing pipe provided that the water outlets discharge with a Type AUK2 air gap above the spillover level of the appliance. See Table S6.1.

WCs and urinals

G15.12 The water supply to a manually operated WC or urinal flushing valve may be derived either from a supply pipe or a distributing pipe. The flushing valve should be located above the WC pan or urinal and must incorporate, or discharge through, a pipe interrupter with a permanent atmospheric vent; see Type DC in Table S6.1and Table 6.2. The lowest part of the vent opening of the pipe interrupter should be located not less than 300 mm above the spillover level of the WC pan or not less than 150 mm above the sparge outlet of a urinal. See Figure 6.1b for typical installation details.

Shower heads or tap inlets to baths, washbasins, sinks and bidets

G15.13 Except where suitable additional backflow protection is provided, all single tap outlets, combination tap assembly outlets, or fixed shower heads terminating over washbasins, baths or bidets in domestic situations should discharge above the spillover level of the appliance with a tap gap (Type AUK2) as scheduled in Table S6.1. For a sink in a domestic or non-domestic location, and for any appliances in premises where a higher level of protection is required, such as some appliances in hospitals or other health care premises, a tap gap (Type AUK3) is required, see Table S6.1.

Submerged inlets to baths and washbasins

G15.14 Submerged inlets to baths or washbasins in any house or domestic situation are considered to be a fluid category 3 risk and should be supplied with water from a supply or distributing pipe through a double check valve. Submerged inlets to baths or washbasins in other than a house or domestic situation, and sinks in any location, are considered to be a fluid category 5 risk and appropriate backflow protection will be required.

Drinking water fountains

G15.15 Drinking water fountains should be designed so that the outlet of the water delivery jet nozzle is at least 25 mm above the spillover level of the bowl. The nozzle should be provided with a screen or hood to protect it from contamination.

Washing machines, washer-dryers and dishwashers

G15.16 Household washing machines, washer-dryers and dishwashers are manufactured to satisfy a fluid category 3 risk. Where they are likely to be

used in a non-domestic situation, appropriate backflow protection for a higher fluid risk category should be provided.

Hose pipes for house garden and other applications

G15.17 Hand held hoses should be fitted with a self-closing mechanism at the outlet of the hose.

Commercial and other installations excluding house gardens

G15.18 Any taps and fittings used for supplying water for non-domestic applications, such as commercial, horticultural, agricultural or industrial purposes should be provided with:

a. backflow protection devices appropriate to the downstream fluid category; and,
b. where appropriate, a zone protection system.

G15.19 Soil watering systems installed in close proximity to the soil surface (that is, where the watered surface is less than 150 mm below the water outlet discharge point) for example, irrigation systems, permeable hoses etc., are considered to be a fluid category 5 risk and should only be supplied with water through a Type AA, AB, AD or AUK1 air gap arrangement.

House garden installations

G15.20 Taps to which hoses are, or may be connected and located in house garden locations are to be protected against backflow by means of a double check valve. The double check valve should be located inside a building and protected from freezing. (See Figure 6.3a).

G15.21 Where, in existing house installations, a hose pipe is to be used from an existing hose union tap located outside a house and which is not provided with backflow protection, either:

a. the existing hose union tap should be provided with a double check valve located inside the building; or,
b. the tap should be replaced with a hose union tap that incorporates a double check valve (Type HUK1); or,
c. a hose union backflow preventer (Type HA) or a double check valve should be continuously fitted to the outlet of the tap.

G15.22 Where fixed or hand-held devices are used with hose pipes for the application of fertilizers or domestic detergents the minimum backflow protection provided should be suitable for protection against a fluid category 3 risk. Backflow protection against a fluid category 5 risk should be provided where these devices are used for the application of insecticides.

G15.23 Where mini-irrigation systems, such as porous hoses, are installed in house garden situations only, a hose union tap with backflow protection in

accordance with clauses G15.20 or G15.21 combined with a pipe interrupter with atmospheric vent and moving element device (Type DB) at the connection of the hose to the hose union tap, or not less than 300 mm above the highest point of the delivery point of the spray outlet or the perforated surface of the porous hose, whichever is the highest, is acceptable. See Figure 6.3band Figure 6.3c.

Whole site and zone protection

G15.24 A whole-site or zone backflow prevention device should be provided on the supply or distributing pipe, such as a single check valve or double check valve, or other no less effective backflow prevention device, according to the level of risk as judged by the water undertaker where:

a. a supply or distributing pipe conveys water to two or more separately occupied premises (whether or not they are separately chargeable by the water supplier for a supply of water); or,
b. a supply pipe conveys water to premises which under any enactment are required to provide a storage cistern capable of holding sufficient water for not less than 24 hours ordinary use. See Figure 6.2band Figure 6.2c.

G15.25 The provision of zone or whole-site backflow protection should be in addition to individual requirements at points of use and within the system.

G15.26 Zone protection may be required in other than domestic premises where particular industrial, chemical or medical processes are undertaken.

Fire protection systems

G15.27 Wet sprinkler systems (without additives), first-aid fire hose reels and hydrant landing valves are considered a fluid category 2 backflow risk Wet sprinkler systems with additives to prevent freezing are considered a fluid category 4 risk..

G15.28 Fluids contained within large cylindrical hydro pneumatic pressurised vessels are considered to be fluid category 4 risk.

G15.29 Where fire protection systems and drinking water systems are served from a common domestic supply pipe, the connection to the fire systems should be taken from the supply pipe immediately on entry to the building and appropriate backflow protection devices should be installed.

Table 6.1a: Determination of fluid category 1
Fluid category 1: Wholesome water supplied by a water undertaker and complying with the requirements of regulations made under section 67 of the Water Industry Act

1991 (a).
Example Water supplied directly from a water undertaker's main.

Table 6.1b: Determination of fluid category 2
Fluid category 2: **Water in fluid category 1 whose aesthetic quality is impaired owing to:** **(a) a change in its temperature; or** **(b) the presence of substances or organisms causing a change in its taste, odour or appearance, including water in a hot water distribution system.**
Examples **Mixing of hot and cold water supplies.** **Domestic softening plant (common salt regeneration).** **Drink vending machines in which no ingredients or carbon dioxide are injected into the supply or distributing inlet pipe.** **Fire sprinkler systems (without anti-freeze).** **Ice making machines.** **Water cooled air conditioning units (without additives).**

Table 6.1c: Determination of fluid category 3
Fluid category 3 **Fluid which represents a slight health hazard because of the concentration of substances of low toxicity, including any fluid which contains:** **(a) ethylene glycol, copper sulphate solution, or similar chemical additives; or** **(b) sodium hypochlorite (chloros and common disinfectants).**
Examples **Water in primary circuits and heating systems (with or without additives) in a house.** **Domestic washbasins, baths and showers.** **Domestic clothes and dishwashing machines.** **Home dialysing machines.** **Drink vending machines in which ingredients or carbon dioxide are injected.** **Commercial softening plant (common salt regeneration only).** **Domestic hand held hoses with flow controlled spray or shut-off control.** **Hand held fertilizer sprays for use in domestic gardens.** **Domestic or commercial irrigation systems, without insecticide or fertilizer additives, and with fixed sprinkler heads not less than 150 mm above ground level.**

Table 6.1d: Determination of fluid category 4
Fluid category 4 **Fluid which represents a significant health hazard due to the concentration of toxic substances, including any fluid which contains:** **(a) chemical, carcinogenic substances or pesticides (including insecticides and herbicides); or** **(b) environmental organisms of potential health significance.**
Examples **General** **Primary circuits and central heating systems in other than a house.** **Fire sprinkler systems using anti-freeze solutions.** **House gardens** **Mini-irrigation systems without fertilizer or insecticide application; such as pop-up sprinklers or permeable hoses** **Food processing** **Food preparation.** **Dairies.** **Bottle washing apparatus.** **Catering** **Commercial dishwashing machines.** **Bottle washing apparatus.** **Refrigerating equipment.** **Industrial and commercial installations** **Dyeing equipment.** **Industrial disinfection equipment.** **Printing and photographic equipment.** **Car washing and degreasing plants.** **Commercial clothes washing plants.** **Brewery and distillation plant.** **Water treatment plant or softeners using other than salt.** **Pressurised fire fighting systems**

Table 6.1e: Determination of fluid category 5
Fluid category 5 **Fluid representing a serious health hazard because of the concentration of pathogenic organisms, radioactive or very toxic substances, including any fluid which contains:** **(a) faecal material or other human waste; or** **(b) butchery or other animal waste; or**

(c) pathogens from any other source.
Examples **General** **Industrial cisterns.** **Non-domestic hose union taps.** **Sinks, urinals, WC pans and bidets.** **Permeable pipes in other than domestic gardens, laid below or at ground level, with or without chemical additives.** **Grey water recycling systems** **Medical** **Any medical or dental equipment with submerged inlets.** **Laboratories.** **Bedpan washers.** **Mortuary and embalming equipment.** **Hospital dialysing machines.** **Commercial clothes washing plant in health care premises.** **Non-domestic sinks, baths, washbasins and other appliances.** **Food processing** **Butchery and meat trades.** **Slaughterhouse equipment.** **Vegetable washing.** **Catering** **Dishwashing machines in health care premises.** **Vegetable washing.** **Industrial and commercial installations** **Industrial and chemical plant etc.** **Mobile plant, tankers and gully emptiers.** **Laboratories.** **Sewage treatment and sewer cleansing.** **Drain cleaning plant.** **Water storage for agricultural purposes.** **Water storage for firefighting purposes.** **Commercial agricultural** **Commercial irrigation outlets below or at ground level and/or permeable pipes, with or without chemical additives.** **Insecticide or fertilizer applications.** **Commercial hydroponic systems.**
Note: The list of examples of applications shown above for each fluid category is not exhaustive.

Table 6.2: Details of backflow prevention arrangements

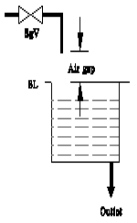
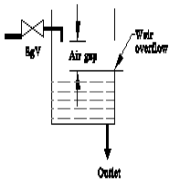
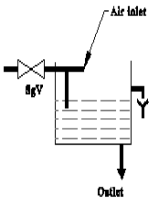
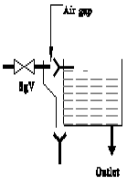
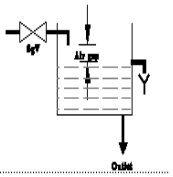
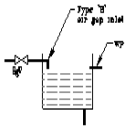
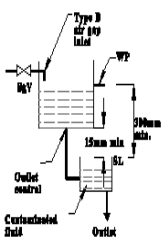
Type	Description of device	Installation
AA	Air gap with unrestricted discharge	
AB	Air gap with weir overflow	
AC	Air gap with submerged inlet and circular overflow Air gap with vented submerged inlet, the air gap being measured vertically downwards from the lowest point of the air inlet pipe to the critical water level.	
AD	Air gap with injector Often known as a 'jump jet'.	
AF	Air gap with circular overflow	
AG	Air gap device with minimum size circular overflow An air gap arrangement that satisfies the requirements of BS 6281: Part 2: Specification for Type B air gaps	
AUK 1	Air gap with interposed cistern The air gap in the interposed cistern is to conform with Type AG, that is, BS 6281: Part 2: Specification for Type B air gaps	

Table 6.3: Details of backflow prevention devices

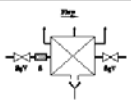
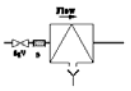
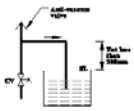
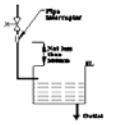
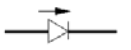
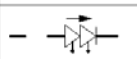
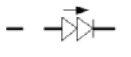
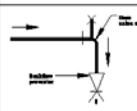
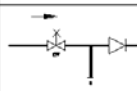
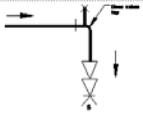
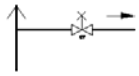
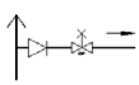
Type	Description of device	Installation
BA	Verifiable backflow preventer with reduced pressure zone This backflow protection device is commonly known as an 'RPZ Valve Assembly'. A Type AA air gap should be provided between the relief outlet port and the top of the allied tundish.	
CA	Non- verifiable disconnector with different pressure zones A Type AA air gap should be provided between the relief outlet port and the top of the allied tundish.	
DA	Anti-vacuum valve (or vacuum breaker) The device must be fitted on a Type A upstand so that the outlet is not less than 300 mm above the free discharge point, or spillover level, and have no valve, flow restrictor or tap on its outlet.	
DB	Pipe interrupter with vent and moving element The device is to be fitted with the lowest point of the air aperture not less than 300 mm above the free discharge point, or spillover level, and have no valve or restriction on its outlet.	
DC	Pipe interrupter with permanent atmospheric vent. Except for urinals, this device must be fitted with the lowest point of the air aperture not less than 300 mm above the free discharge point, or spillover level of an appliance, and have no valve, flow restrictor or tap on its outlet. In the case of urinals the device is to be fixed not less than 150 mm above the sparge outlet.	
DUK 1	Anti-vacuum valve combined with verifiable check valve The device must be fitted on a Type B upstand so that the outlet of the device is not less than 300 mm above the free discharge point, or spillover level, and have no valve, flow restrictor or tap on its outlet.	
EA	Verifiable single check valve	
EB	Non-verifiable single check valve	
EC	Verifiable double check valve	
ED	Non-verifiable double check valve	
HA	Hose union backflow preventer. Not to be used in new installations. Only permitted outside houses for fitting to existing hose union taps that do not incorporate any backflow prevention device.	
HC	Diverter with automatic return (Integral with some domestic appliance applications only).	
HUK 1	Hose union tap incorporating verifiable double check valve Not to be used in new installations. Only permitted outside houses for replacement of existing hose union taps that do not incorporate any backflow device.	
LA	Pressurised air inlet valve Use is limited to locations where operational waste is acceptable, eg. in gardens or similar.	
LB	Pressurised air inlet valve combined with a check valve downstream Use is limited to locations where operational waste is acceptable, eg. in gardens or similar.	

Figure 6.1: Water services to sanitary appliances

Note 1. If each floor comprises a separate dwelling, whole site protection should be provided as in Figures 6.2a, b or c.

Note 2. Bidets with water inlets below spillover level, or which are fitted with a flexible hose and spray, should be supplied with cold and hot water as described in clause G15.10

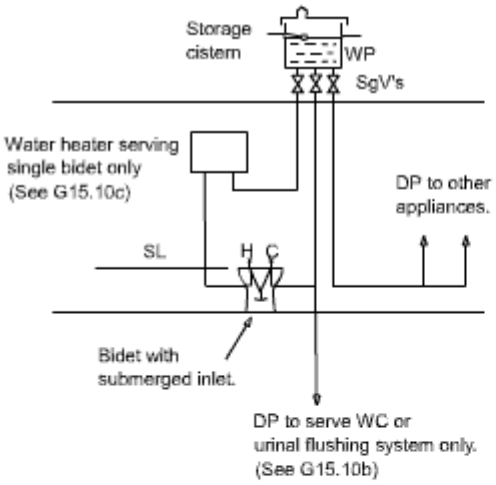


Figure 6.1a: Bidet with submerged water inlet

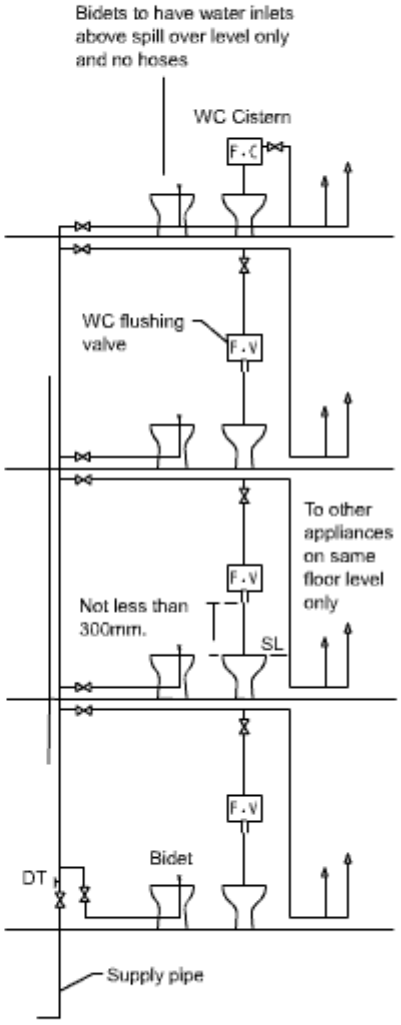


Figure 6.1b: Sanitary appliances served from a supply pipe in other than dwellings.

Figure 6.2: Whole site and zone backflow prevention

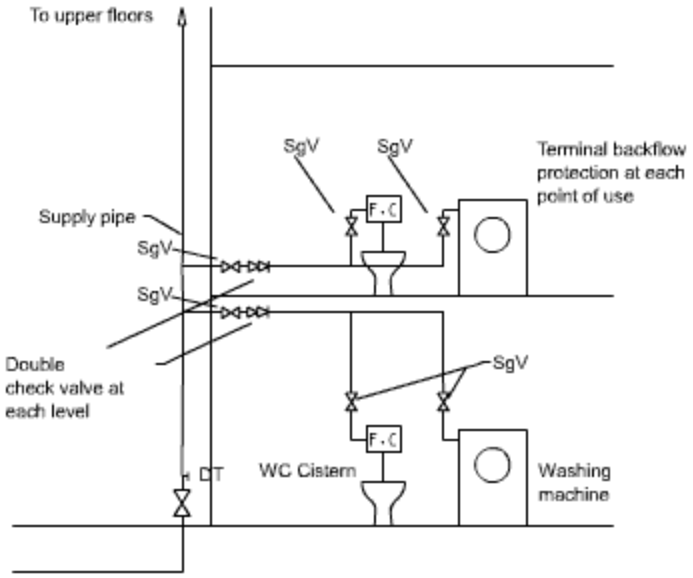


Figure 6.2a: Whole site backflow protection of supply pipes by use of double check valves.

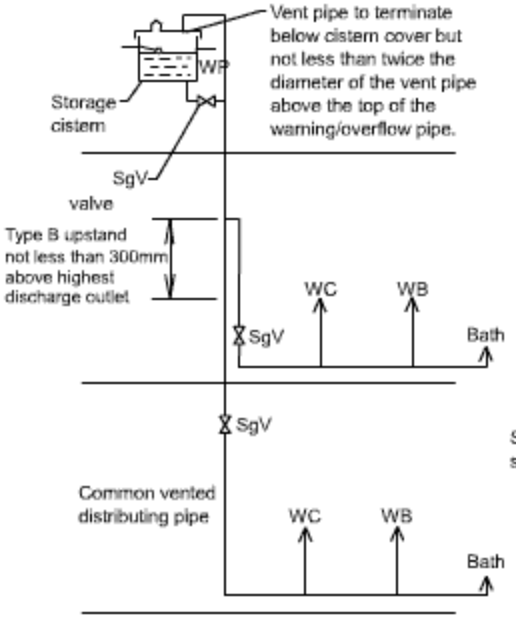


Figure 6.2b: Example showing principle of providing whole site protection to two storey flats with common storage cistern.

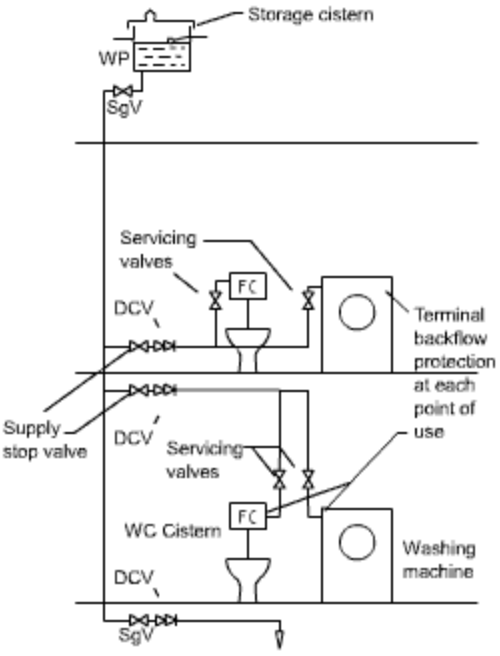


Figure 6.2c: Whole site backflow protection by use of double check valves.

Figure 6.3: Backflow protection to external taps in houses

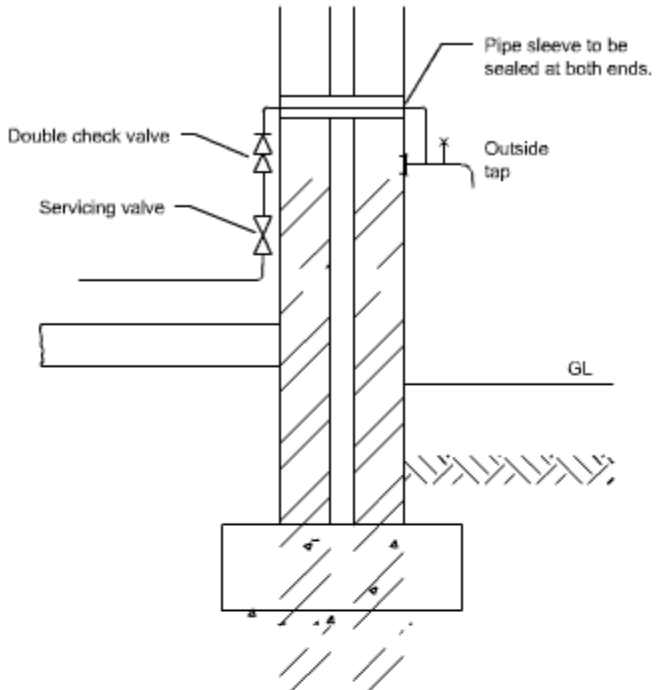


Figure 6.3a: Backflow protection to external hose taps in domestic premises only (thermal insulation omitted)

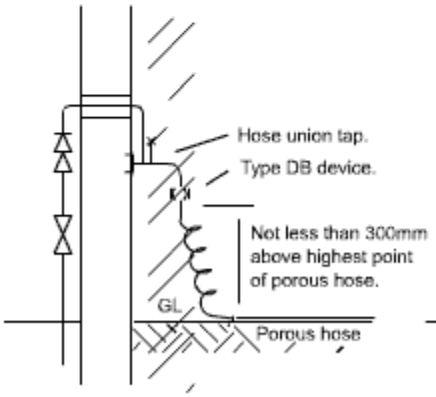


Figure 6.3b: Mini-irrigation or porous hose in house garden where ground is level or sloping away from building. (See G15.23)

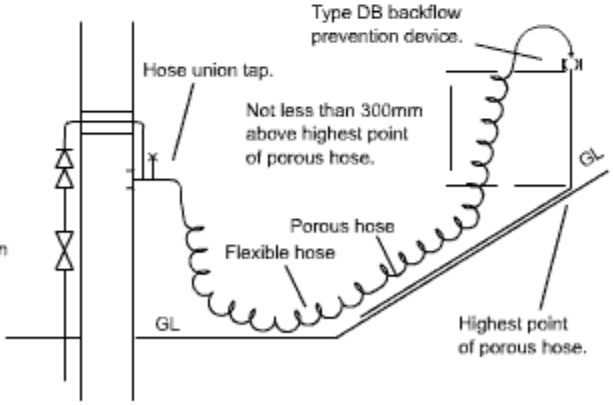


Figure 6.3c: Mini-irrigation or porous hose in house garden where ground is rising away from the building. (See G15.23)

SECTION 7

Schedule 2: Paragraph 16: Cold water services

16. (1) Every pipe supplying water connected to a storage cistern shall be fitted with an effective adjustable valve capable of shutting off the inflow of water at a suitable

level below the overflowing level of the cistern.

(2) Every inlet to a storage cistern, combined feed and ex[pansion cistern, WC flushing cistern or urinal flushing cistern shall be fitted with a servicing valve on the inlet pipe adjacent to the cistern.

(3) Every storage cistern, except one supplying water to the primary circuit of a heating system, shall be fitted with a servicing valve on the outlet pipe.

(4) Every storage cistern shall be fitted with-

a. an overflow pipe, with a suitable means of warning of an impending overflow, which excludes insects;
b. a cover positioned so as to exclude light and insects; and
c. thermal insulation to minimize freezing or undue warming.

(5) Every storage cistern shall be so installed as to minimise the risk of contamination of stored water. The cistern shall be of an appropriate size, and the pipe connections to the cistern shall be so positioned, as to allow free circulation and to prevent areas of stagnant water from developing.

Guidance

Float-operated valves

G16.1 Float-operated valves and other fittings for controlling flow to cisterns, including flushing cisterns, should:

a. be capable of controlling the flow of water into any cistern or apparatus and, when closed, be watertight and remain watertight; and,
b. incorporate, as applicable, a renewable seat and a washer which are resistant to both corrosion and erosion by water, or have some other no less effective valve closure assembly; and,
c. as applicable, have a float which is constructed of a material capable of withstanding without leaking any water temperature in which it operates or is likely to operate, and has a lifting effort such that when not more than half immersed, the valve is capable of drop-tight closure against the maximum operating pressure at that elevation in the building; and,
d. when acting via an operating lever, and when the valve is closed, will withstand without bending or distorting a force twice that to which it is

ordinarily subject and, in the case of a G 1/2 size valve, is constructed so that the water shut-off level may be altered or adjusted without bending the float lever; and,

e. where used in cisterns storing water other than for drinking purposes, the installation of the fitting should be such that it is capable of satisfying backflow prevention requirements when the water level in the cistern is level with the centreline of the float-operated valve.

G16.2 The requirements for float-operated valves may be satisfied as follows:

a. for use in WC cisterns - should comply with BS 1212. Parts 2, 3 or 4; and,
b. for use elsewhere - should comply with BS 1212: Part 1, 2, 3 or 4.

G16.3 Float-operated valves which are subject to hot water at the inlet should conform to clause G16.1 and be constructed of materials capable of withstanding without leaking any ordinary operating water temperature to which they are likely to be subjected. So far as is reasonably practicable, their operation should not be prevented or impaired by scale. Having regard to any scale which is likely to be deposited on the valve or float, the valve should be capable of being adjusted to prevent any flow through the valve above the required water level.

Inlets to cisterns

G16.4 Inlets to all cisterns should be provided with a servicing valve to facilitate maintenance, and a float-operated valve or some other no less effective device which is capable of controlling the flow of water into the cistern. The servicing valve should be fitted as close as reasonably practical to the float operated valve or other device. This does not apply to a pipe connecting two or more cisterns each of which has the same overflowing level.

G16.5 Float-controlled valves or equivalent inlet devices should be securely and rigidly attached to the cistern and installed so that the valve closes when the level of the water is not less than 25 mm below the overflowing level of the cistern. Where the cistern is fitted with an approved alternative to a warning pipe, such as an indicator instrument or a visual or audible alarm, the inlet valve is to close when the water level is not less than 50 mm below the overflowing level of the cistern.

Outlets from cisterns

G16.6 Where practicable all outlets from a cistern should be taken from the bottom of the cistern.

G16.7 Except for cisterns supplying water to primary circuits or heating circuits, all outlets other than vent pipes, overflow pipes, and warning pipes relating to storage cisterns supplying water to cold water taps and secondary

hot water systems, should be fitted with a servicing valve as close to the cistern as is reasonably practicable.

Warning and overflow pipes

G16.8 All cisterns, except automatically operated urinal flushing cisterns, should be provided with a warning pipe, or some other no less effective device, installed in such a manner that it discharges immediately the water in a cistern reaches the defined overflowing level. Where an alternative no less effective device is installed instead of a warning pipe, an overflow pipe should also be installed. The outlet end of a warning or overflow pipe is not to be at a higher level than the inlet end; it should be installed on a downward inclined plane, and not comprise, include, or have connected to it, any flexible hose.

G16.9 Warning or overflow pipes from any cistern should not be installed to discharge into any other cistern.

G16.10 A warning/overflow pipe should be not less than 19 mm internal diameter, but the actual internal diameter of the pipe(s) installed should be capable of taking any possible flow in the pipe arising from any failure of the inlet valve.

G16.11 When determining the size of an overflow pipe account should be taken of any insect or vermin screen installed, which may reduce the nominal flow capacity of the overflow pipe.

G16.12 When two or more cisterns have a common warning pipe the pipework should be arranged so that the overflow from any cistern cannot enter another. The location of the cistern overflowing must be readily identifiable and the discharge should be in a conspicuous position.

Cold water storage cisterns

G16.13 Cisterns storing water for domestic purposes should be watertight and, where required, be lined or coated with a suitable impermeable material; they shall be provided with warning and overflow connections, as appropriate, which are so constructed and arranged as to exclude insects. They should have a rigid, close fitting and securely fixed cover which is not airtight but which excludes light and insects from the cistern; be made of a material or materials which do not shatter or fragment when broken and which will not contaminate any water which condenses on its underside; and, in the case of a cistern storing more than 1,000 litres of water, be constructed so that the cistern may be inspected and cleansed without it having to be wholly uncovered. See Figure 7.1.

G16.14 Every cistern should be adequately supported to avoid distortion or damage and only installed in a place or position where the inside may be readily inspected and cleansed, and any float-operated valve or other controls may be readily installed, repaired, renewed or adjusted. The cistern should

have a minimum unobstructed space above of not less than 350 mm. See Figure 7.2.

G16.15 Where the required capacity of water is provided by the use of two or more cisterns, the inlets and the outlets of the cisterns should be located so that water passes through the whole of the cisterns and short-circuiting does not occur.

Figure 7.1: Requirements for storage cisterns

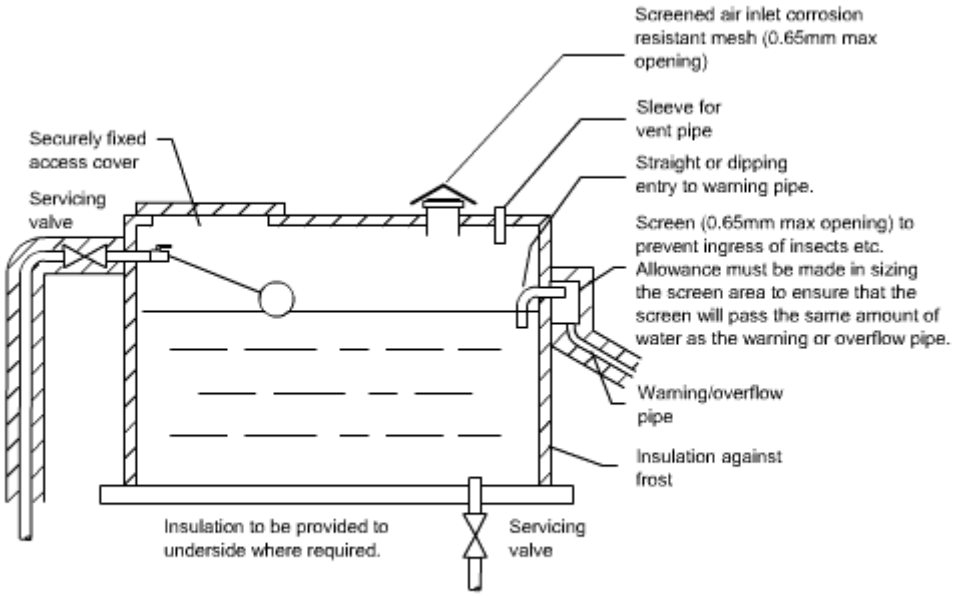


Figure 7.1a: Principal details of cistern for storing

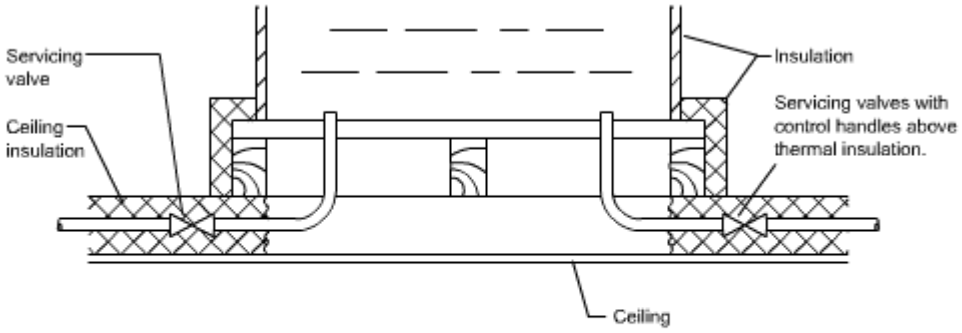


Figure 7.1b: Details of lower part of cistern for storing water for domestic purposes..
Typical for a house with ceiling thermal insulation omitted below cistern.

Figure 7.2: Minimum clear space required above storage cisterns

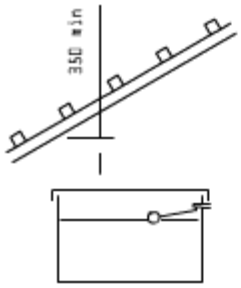
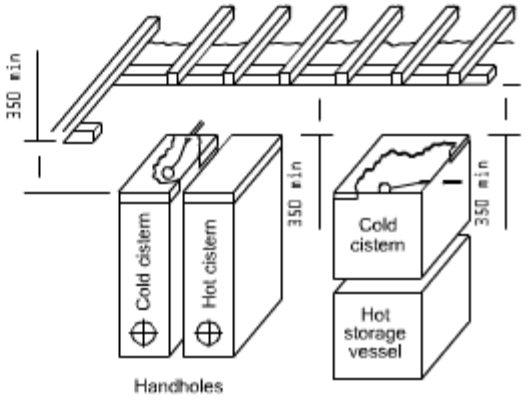
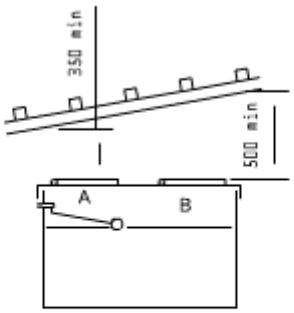


Figure 7.2a: Conventionally shaped cistern 1000 litres or less up to overflow levels.



NOTE: Acceptable sizes and positions of handholes are given in clause 3 of BS 3198 : 1981

Figure 7.2c: Hot water combination units.



NOTE: A provides access to float valve
B provides access for inspection

Figure 7.2b: Cistern with bolted on lid for use with cisterns greater than 1000 litres up to overflowing levels.

SECTION 8

Schedule 2: Paragraphs 17, 18, 19, 20, 21, 22, 23 and 24: Hot water services

17. (1) Every unvented water heater, not being an instantaneous water heater with a capacity not greater than 15 litres, and every secondary coil contained in a primary system shall-
    a. be fitted with a temperature control device, and either a temperature relief valve or a combined pressure and temperature relief valve; or
    b. be capable of accommodating expansion within the secondary hot water system.

(2) An expansion valve shall be fitted with provision to ensure that water is discharged in a correct manner in the event of a malfunction of the expansion vessel or system.

18. Appropriate vent pipes, temperature control devices and combined temperature pressure and relief valves shall be provided to prevent the temperature of the water within a secondary hot water system from exceeding 100°C.
19. Discharges from temperature relief valves, combined temperature pressure and relief valves and expansion valves shall be made in a safe and conspicuous manner.
20. (1) No vent pipe from a primary circuit shall terminate over a storage cistern containing wholesome water for domestic supply or for supplying water to a secondary system.

    (2) No vent pipe from a secondary circuit shall terminate over any combined feed and expansion cistern connected to a primary circuit.

21. Every expansion cistern or expansion vessel, and every cold water combined feed and expansion cistern connected to a primary circuit, shall be such as to accommodate any expansion water from that circuit during normal operation.
22. (1) Every expansion valve, temperature relief valve or combined temperature and pressure relief valve connected to any fitting or appliance shall close automatically after a discharge of water.

    (2) Every expansion valve shall-

    a. be fitted on the supply pipe close to the hot water vessel and without any intervening valves; and
    b. only discharge water when subjected to a water pressure of not less than 0.5 bar (50 kPa) above the pressure to which the hot water vessel is, or is likely to be, subjected in normal operation.
23. (1) A temperature relief valve or combined temperature and pressure relief valve shall be provided on every unvented hot water storage vessel with a capacity greater than 15 litres.

    (2) The valve shall-

a. be located directly on the vessel in an appropriate location, and have a sufficient discharge capacity, to ensure that the temperature of the stored water does not exceed 100°C; and
b. only discharge water at below its operating temperature when subjected to a pressure of not less than 0.5 bar (50 kPa) in excess of the greater of the following-
    i. the maximum working pressure in the vessel in which it is fitted, or
    ii. the operating pressure of the expansion valve.

(3) In this paragraph "unvented hot water storage vessel" means a hot water storage vessel that does not have a vent pipe to the atmosphere.

24. No supply pipe or secondary circuit shall be permanently connected to a closed circuit for filling a heating system unless it incorporates a backflow prevention device in accordance with a specification approved by the regulator for the purposes of this Schedule.

Guidance

Unvented hot water systems:

G17.1 Every unvented water heater or storage vessel, and every secondary coil contained in a heater and not being an instantaneous water heater or a thermal storage unit of 15 litres or less capacity, should be fitted with:

a. a temperature control device; and
b. either a temperature relief valve or combined temperature and pressure relief valve; and
c. an expansion valve; and
d. unless the expanded water is returned to the supply pipe in accordance with Regulation 15(2)(a), either;
    i. an expansion vessel; or
    ii. contain an integral expansion system, such that the expansion water is contained within the secondary system to prevent waste of water.

G17.2 An expansion valve should be fitted to all unvented hot water storage systems, with a capacity in excess of 15 litres, to ensure that expansion water is discharged in a correct manner in the event of a malfunction of the expansion vessel or system. See Figure 8.1.

G17.3 Where expansion water is accommodated separately the expansion vessel should preferably be of an approved 'flow through type' and should comply with the requirements of BS 6144 and BS 6920.

Temperature of hot water within a storage system

G18.1 Irrespective of the type of fuel used for heating, the temperature of the water at any point within a hot water storage system should not exceed 100^{o}C and appropriate vent pipes, temperature control devices and other safety devices should be provided to prevent this occurring.

Hot water distribution temperatures

G18.2 Hot water should be stored at a temperature of not less than 60^{o}C and distributed at a temperature of not less than 55^{o}C. This water distribution temperature may not be achievable where hot water is provided by instantaneous or combination boilers.

G18.3 The maintenance of acceptable water temperatures may be achieved by efficient routing of pipes, reducing the lengths of pipes serving individual appliances and the application of good insulation practices to minimise freezing of cold water pipes and to promote energy conservation for hot water pipes. For references, see Comments and Recommendations of Clause 2.6.4 of BS 6700.

Temperature of hot water supplies at terminal fittings and on surfaces of hot water pipes

G18.4 Where practicable the hot water distribution system should be designed and installed to provide the required flow of water at terminal fittings to sanitary and other appliances at a water temperature of not less than 50^{o} C and within 30 seconds after fully opening the tap. This criteria may not be achievable where hot water is provided by instantaneous or combination boilers.

G18.5 Terminal fittings or communal showers in schools or public buildings, and in other facilities used by the public, should be supplied with water through thermostatic mixing valves so that the temperature of the water discharged at the outlets does not exceed 43^{o}C.

G18.6 The temperature of water discharged from terminal fittings and the surface temperature of any fittings in health care premises should not exceed the temperatures recommended in HS(G)104 - Safe hot water and surface temperatures.

Energy conservation

G18.7 All water fittings forming part of a primary or secondary hot water circulation system and all pipes carrying hot water to a tap that are longer

than the maximum length given in Table 8.1 should be thermally insulated in accordance with BS 5422.

Table 8.1 Maximum recommended lengths of uninsulated hot water pipes	
Outside diameter of pipe in millimetres	Maximum length in metres
12	20
Over 12 and up to and including 22	12
Over 22 and up to and including 28	8
Over 28	3

Discharge pipes from safety devices

G19.1 Discharge pipes from expansion valves, temperature relief valves and combined temperature and pressure relief valves should be installed in accordance with the guidance given in this document and should also comply with the requirements of Building Regulation G3.

G19.2 Where discharge pipes pass through environments outside the thermal envelope of the building they should be thermally insulated against the effects of frost.

G19.3 The discharge pipe from a temperature relief valve or combined temperature and pressure relief valve should:

a. be through a readily visible air gap discharging over a tundish located in the same room or internal space and vertically as near as possible and in any case within 500 mm of the point of outlet of the valve; and,
b. be of non-ferrous material, such as copper or stainless steel, capable of withstanding any temperatures arising from a malfunction of the system; and,
c. have a vertical drop of 300 mm below the tundish outlet, and thereafter be laid to a self draining gradient; and,
d. be at least one size larger than the nominal outlet size of the valve, unless its total equivalent hydraulic resistance exceeds that of a straight pipe 9 metres long. Where the total length of the pipe exceeds 9 metres equivalent resistance, the pipe shall be increased in size by one nominal diameter for each additional, or part of, equivalent 9 metres resistance length. The flow resistance of bends in the pipe should be taken into consideration when determining the equivalent length of pipe; and,
   [Note: Alternatively, the size of the discharge pipe may be determined in accordance with Annex D of BS 6700.]

e. terminate in a safe place where there is no risk to persons in the vicinity of the point of discharge. See Building Regulation G3.

Discharge pipes from expansion valves

G19.4 The discharge pipe from an expansion valve may discharge into the tundish used for the discharge from a temperature relief valve or from a combined temperature and pressure relief valve as described in G19.1; or:

a. discharge through a readily visible air gap over a tundish located in the same room or internal space and vertically as near as possible and in any case within 500 mm of the point of outlet of the valve; and,
b. be of non-ferrous material, such as copper or stainless steel; and,
c. discharge from the tundish through a vertical drop outlet and thereafter be laid to a self draining gradient; and,
d. not be less than the nominal outlet size of the expansion valve and discharge external to the building at a safe and visible location.

Vent pipes

G20.1 Vent pipes from primary water systems should be of adequate size but not less than 19 mm internal diameter. They may terminate over their respective cold water feed and expansion cisterns, or elsewhere providing there is a physical air gap, at least equivalent to the size of the vent pipe, above the top of the warning pipe, or overflow if there is one, at the point of termination.

G20.2 Vent pipes from hot water secondary storage systems should be of adequate size but not less than 19 mm internal diameter and be insulated against freezing.

G20.3 Where vent pipes, from either a primary or secondary system, terminate over their respective cold water feed cisterns, they should rise to a height above the top water level in the cistern sufficient to prevent any discharge occurring under normal operating conditions. See Figure 8.3 for determination of minimum height required to prevent discharge.

Hot water systems supplied with water from storage cisterns

G20.4 In any cistern-fed vented or unvented hot water storage system the storage vessel should:

a. be capable of accommodating any expansion water; or
b. be connected to a separate expansion cistern or vessel; or
c. be so arranged that expansion water can pass back through a feed pipe to the cold water storage cistern from which the apparatus or cylinder is supplied with water. See Figure 8.2.

G20.5 Where the cold water storage cistern supplying water to the hot water storage vessel is also used to supply wholesome water to sanitary or other appliances, any expansion water entering the cistern through the feed pipe should preferably not raise the temperature of the wholesome water in the cistern to more than 20^0 C.

Vented systems requiring dedicated storage cisterns or mechanical safety devices

G20.6 Every vented and directly heated hot water storage vessel, single feed indirectly heated hot water storage vessel, or any directly or indirectly heated storage vessel where an electrical immersion heater is installed, should be supplied with water from a dedicated storage cistern unless:

a. where the energy source is gas, oil or electricity, a non-self-setting thermal energy cut-out device is provided in addition to the normal temperature-operated automatic-reset cut-out; or,
b. where the energy source is solid fuel, a temperature relief valve complying with BS 6283: Part 2, or a combined temperature and pressure relief valve complying with BS 6283: Part 3, is provided complete with a readily visible air-break to drain device and discharge pipe as described in G19.3.

G20.7 Every double feed indirectly heated hot water storage system which is heated by a sealed (unvented) primary circuit, or the primary circuit heating medium is steam or high temperature hot water, or where an electric immersion heater is installed, should:

a. be supplied with water for the secondary circuit from a dedicated cold water storage cistern; or,
b. be provided with a non-self-setting thermal energy cut-out device to control the primary circuit, and any electric immersion heaters, in addition to any temperature-operated automatic-reset cut-out.

G20.8 No water in the primary circuit of a double feed indirect hot water storage vessel should connect hydraulically to any part of a hot water secondary storage system.

G20.9 Vent pipes from primary circuits should not terminate over cold water storage cisterns containing wholesome water for supply to sanitary appliances or secondary hot water systems.

G20.10 Vent pipes from secondary hot water systems should not terminate over feed and expansion cisterns supplying water to primary circuits.

G20.11 No water in the primary circuit of a single feed indirect hot water storage vessel, under normal operating conditions, should mix with water in the secondary circuit. Single feed indirect hot water storage vessels should be installed with a permanent vent to the atmosphere.

Primary feed and expansion cisterns

G21.1 Every expansion cistern, and every cold water combined feed and expansion cistern connected to a primary or heating circuit should be capable of accommodating any expansion water from the circuit and installed so that the water level is not less than 25 mm below the overflowing level of the warning pipe when the primary or heating circuit is in use. See Fig. 8.4.

Expansion and safety devices

G22.1 Expansion valves, temperature relief valves or combined temperature and pressure relief valves connected to any fitting or appliance should close automatically after an operational discharge of water and be watertight when closed.

G22.2 Expansion valves should comply with BS 6283: Part 1. They should be fitted on the supply pipe close to the hot water vessel and without any intervening valves, and only discharge water when subjected to a water pressure of not less than 0.5 bar (50 kPa) above the pressure to which the hot water vessel is, or is likely to be, subjected to in normal operation.

Temperature and combined temperature relief valves

G23.1 Except for unvented hot water storage vessels of a capacity of 15 litres or less, a temperature relief valve complying with BS 6283: Part 2, or a combined temperature and pressure relief valve complying with BS 6283: Part 3, should be provided on every unvented hot water storage vessel. The valve should:

a. be located directly on the storage vessel, such that the temperature of the stored water does not exceed 100°C; and,
b. only discharge water at below its operating temperature when subjected to a pressure not less than 0.5 bar (50 kPa) greater than the maximum working pressure in the vessel to which it is fitted, or 0.5 bar (50 kPa) greater than the operating pressure of the expansion valve, whichever is the greater.

Non-mechanical safety devices

G23.2 If a non-mechanical safety device such as a fusible plug is fitted to any hot water storage vessel, that vessel requires a temperature relief valve or combined temperature and pressure relief valve designed to operate at a

temperature not less than 5°C below that at which the non-mechanical device operates or is designed to operate.

Filling of closed circuits

G24.1 No primary or other closed circuit should be directly and permanently connected to a supply pipe unless it incorporates an approved backflow prevention arrangement.

G24.2 A connection may be made to a supply pipe for filling or replenishing a closed circuit by providing a servicing valve and an appropriate backflow prevention device, the type of which will depend on the degree of risk arising from the category of fluid contained within the closed circuit, providing that the connection between the backflow prevention device and the closed circuit is made by:

a. a temporary connecting pipe which must be completely disconnected from the outlet of the backflow prevention device and the connection to the primary circuit after completion of the filling or replenishing procedure (Figure 8.1b shows an acceptable method, of filling a closed circuit, providing that the fluid in the closed circuit is not a greater hazard than fluid category 3) ; or
b. a device which in addition to the backflow prevention device incorporates an air gap or break in the pipeline which cannot be physically closed while the primary circuit is functioning; or
c. an approved backflow prevention arrangement.

Figure 8.1: Diagrams of unvented hot water storage systems

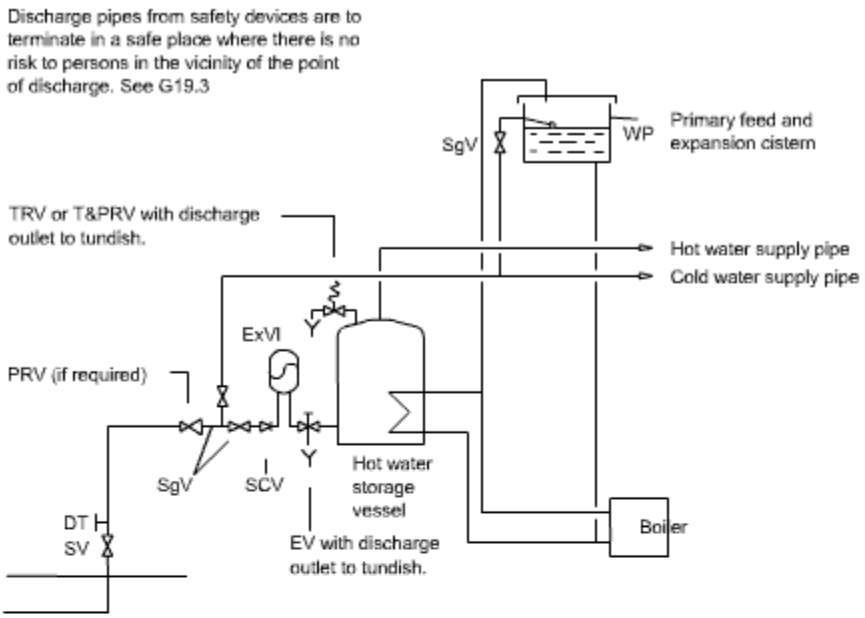


Figure 8.1a: Unvented hot water storage system of capacity greater than 15 litres with vented primary circuit

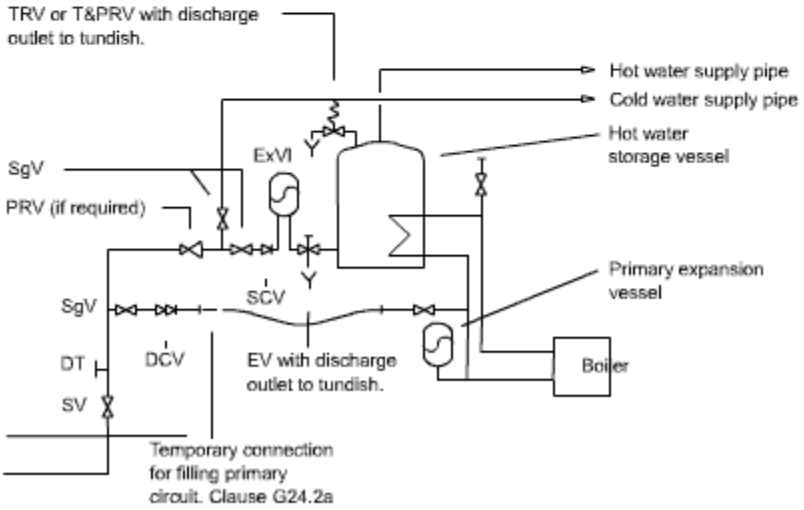


Figure 4.4b: Unvented hot water storage system of capacity greater than 15 litres with sealed primary circuit

Figure 8.2: Direct and indirect hot water storage systems

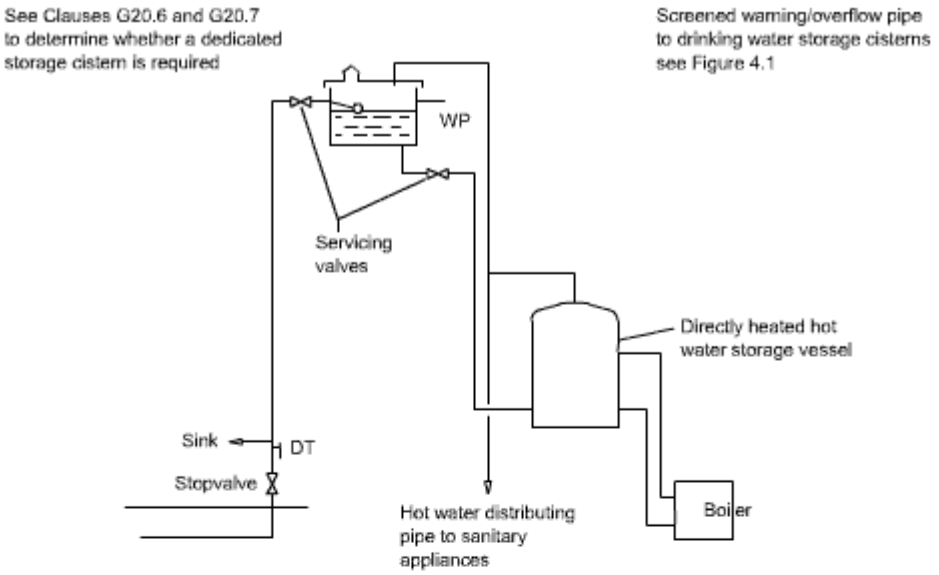


Figure 8.2a: Directly heated and vented hot water storage system

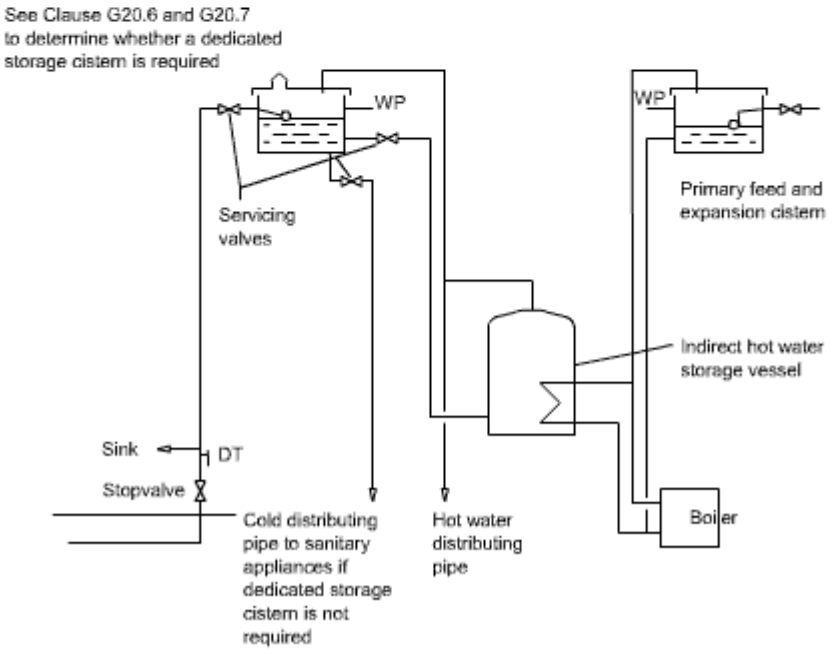
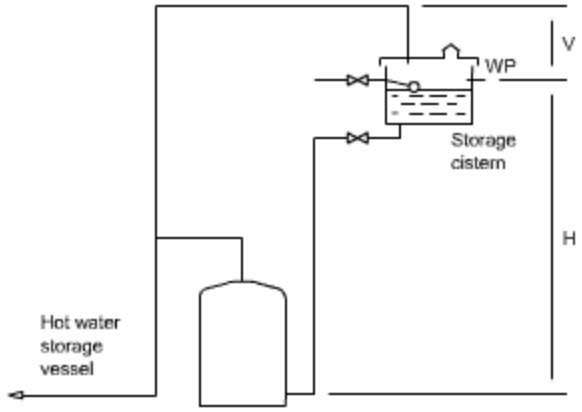


Figure 8.2b: Indirectly heated and vented hot water storage system

Figure 8.3: Determination of minimum height of top of vent pipe



1. Minimum height of top of vent pipe above top of overflow pipe to be determined by
   $V = 0.04H + 0.15$
   where V and H are in metres.
2. The above minimum height relates to gravity circulation systems. If a circulation pump is installed due allowance should be made for any induced head.
3. The above method can also be used for determination of the height of a vent pipe in a vented primary circuit.

Figure 8.3: Minimum height of top of vent pipes in hot water systems

Figure 8.4: Details of feed and expansion cisterns

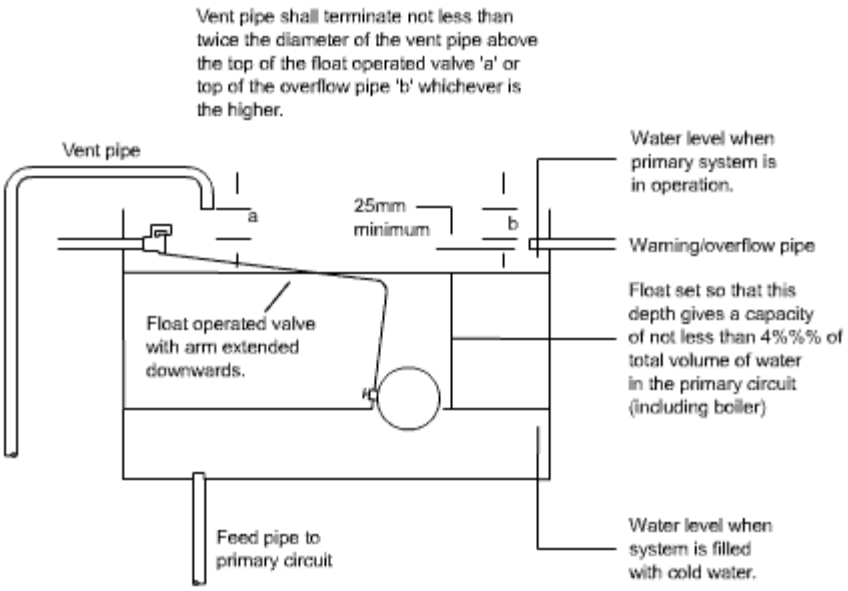


Figure 8.4: Sketch showing relative water levels in feed and expansion cisterns.

SECTION 9

Schedule 2: Paragraph 25: WC's, flushing devices and urinals

25. (1) Subject to the following provisions of this paragraph-
    a. every water closet pan shall be supplied with water from a flushing cistern, pressure flushing cistern or pressure flushing valve, and shall be so made and installed that after normal use its contents can be cleared effectively by a single flush of water, or, where the installation is designed to receive flushes of different volumes, by the largest of those flushes;
    b. no pressure flushing valve shall be installed-
        i. in a house, or
        ii. in any building not being a house where a minimum flow rate of 1.2 litres per second cannot be achieved at the appliance;
    c. where a pressure flushing valve is connected to a supply pipe or distributing pipe, the flushing arrangement shall incorporate a backflow prevention device consisting of a permanently vented pipe interrupter located not less than 300mm above the spillover level of the WC pan

or urinal;

d. no flushing device installed for use with a WC pan shall give a single flush exceeding 6 litres;
e. no flushing device designed to give flushes of different volumes shall have a lesser flush exceeding two-thirds of the largest flush volume;
f. every flushing cistern, other than a pressure flushing cistern, shall be clearly marked internally with an indelible line to show the intended volume of flush, together with an indication of that volume;
g. a flushing cistern designed to give flushes of different volumes-
    i. shall have a readily discernible method of actuating the flush of different volumes; and
    ii. shall have instructions, clearly and permanently marked on the cistern or displayed nearby, for operating it to obtain the different volumes of flush;
h. every flushing cistern, not being a pressure flushing cistern or a urinal cistern, shall be fitted with a warning pipe or with a no less effective device;
i. every urinal that is cleared by water after use shall be supplied with water from a flushing device which-
    i. in the case of a flushing cistern, is filled at a rate suitable for the installation;
    ii. in all cases, is designed or adapted to supply no more water than is necessary for effective flow over the internal surface of the urinal and for replacement of the fluid in the trap; and
j. except in the case of a urinal which is flushed manually, or which is flushed automatically by electronic means after use, every pipe which supplies water to a flushing cistern or trough used for flushing a urinal shall be fitted with an isolating valve controlled by a time switch and a lockable isolating valve, or with some other equally effective automatic device for regulating the periods during which the cistern may fill.

(2) Every water closet, and every flushing device designed for use with a water closet, shall comply with a specification approved by the regulator for the purposes of this Schedule.

(3) The requirements of sub-paragraphs (1) and (2) do

not apply where faeces or urine are disposed of through an appliance that does not solely use fluid to remove the contents.

(4) The requirement in sub-paragraph (1)(i) shall be deemed to be satisfied-

k. in the case of an automatically operated flushing cistern servicing urinals which is filled with water at a rate not exceeding-
   i. 10 litres per hour for a cistern serving a single urinal;
   ii. 7.5 litres per hour per urinal bowl or stall, or, as the case may be, for each 700mm width of urinal slab, for a cistern serving two or more urinals;
l. in the case of a manually or automatically operated pressure flushing valve used for flushing urinals which delivers not more than 1.5 litres per bowl or position each time the device is operated.

(5) Until 1st January 2001 paragraphs (1)(a) and (d) shall have effect as if they provided as follows-

m. "every water closet pan shall be supplied with water from a flushing cistern or trough of the valveless type which incorporates siphonic apparatus;"
n. "no flushing device installed for use with a WC pan shall give a single flush exceeding 7.5 litres;".

(6) Notwithstanding sub-paragraph 1(d), a flushing cistern installed before 1st July 1999 may be replaced by a cistern which delivers a similar volume and which may be either single flush or dual flush; but a single flush cistern may not be so replaced by a double flush cistern.

(7) In this paragraph-
"pressure flushing cistern" means a WC flushing device that utilises the pressure of water within the cistern supply pipe to compress air and increase the pressure of water available for flushing a WC pan;
"pressure flushing valve" means a self-closing valve supplied with water directly from a supply pipe or a distributing pipe which when activated will discharge a pre-determined flush volume;

"trap" means a pipe fitting, or part of a sanitary appliance, that retains liquid to prevent the passage of foul air; and
"warning pipe" means an overflow pipe whose outlet is located in a position where the discharge of water can be readily seen

Guidance

General

G25.1 Every WC pan should be flushed and its contents cleared effectively by a single flush of water or, where alternative volumes of flush water are available, by the largest of the available flushes.

Methods of flushing WC pans

G25.2 Except in a house, or any other building where a minimum flow rate of 1.2 litres per second cannot be achieved at the appliance, a WC pan may be flushed by a manually operated pressure flushing valve directly connected to a supply or distributing pipe, provided that the flushing arrangement incorporates a backflow prevention arrangement or device appropriate to fluid category 5. (See Section 6).

G25.3 Flushing apparatus for use with a WC pan should be designed to deliver a maximum flush volume not exceeding 6 litres and the lesser volume of water for a dual flush apparatus should not exceed two-thirds of the large flush volume.

G25.4 Except in the case of a pressure flushing cistern, a clearly marked line should indicate the water level and the volume of flush.

G25.5 Every flushing mechanism designed or adapted to give flushes of different volumes should have instructions for operating and obtaining the different volumes of flush clearly and permanently marked on the cistern, or displayed near the flushing mechanism.

Warning pipes

G25.6 Except for pressure flushing cisterns, all WC flushing cisterns should be provided with a connection for a warning pipe, the outlet of which is to discharge in a prominent position, or other equally effective device.

G25.7 Where a warning pipe(s) discharge over a tundish, the tundish must be visible.

G25.8 A warning pipe may be installed to discharge water into a WC pan providing it discharges into the air not less than 150 mm above the top edge of the WC pan.

Urinal cisterns

G25.9 Urinals may be flushed with either:

a. a manual or automatically operated cistern; or,
b. a flushing valve directly connected to a supply or distributing pipe which is designed to flush the urinal, either manually or automatically, provided that the flushing arrangement incorporates a backflow prevention arrangement or device appropriate to fluid category 5. (See Section 6).

G25.10 Unless a urinal cistern is manually operated, or fills and flushes by a device operated by an electronic sensor, pressure pad or no less suitable device which ensures that the urinal is only flushed after it is used, the inlet to the flushing cistern is to be controlled by a time switch opening an inlet valve or some other equally effective automatic device which regulates the periods during which the cistern may fill.

WC pans and WC flushing devices

G25.11 All WC pans and all flushing devices for WC pans should conform to a specification approved by the Regulator.

Automatic urinal cistern filling rates

G25.12 An automatically operated flushing cistern serving urinals should be filled with water at a rate not exceeding:

a. 10 litres per hour per urinal bowl for a cistern seving a single urinal; or,
b. 7.5 litres per hour per urinal bowl or position, or, as the case may be, for each 700 mm width of urinal slab for a cistern serving two or more urinals.

G25.13 Where manually or automatically operated pressure flushing valves are used for flushing urinals, the flushing valve should deliver a flush volume not exceeding 1.5 litres per bowl or position each time the device is operated.

Limitation of capacity of WC flushing cisterns and method of flushing

G25.14 Until January 2001:

a. every wc pan should be flushed with water from a flushing cistern of the valveless type, that is, one that incorporates siphonic apparatus for providing the means of flushing: and
b. no flushing apparatus for use with a WC pan should give a single flush volume greater than 7.5 litres.

Renewal of existing WC cisterns

G25.15 Notwithstanding G25.14, where any existing flushing cistern installed before 1 July 1999 needs to be replaced without changing the WC pan, the new cistern should be of the same flush volume as the one being replaced, which may be a single or dual flush. A single flush cistern may not be replaced with a dual flush cistern. Where dual-flush cisterns are renewed the lesser flush volume is not to be greater than 2/3 of the total flush volume.

SECTION 10

Schedule 2: Paragraphs 26, 27 and 28: Baths, sinks, showers and taps

26. All premises supplied with water for domestic purposes shall have at least one tap conveniently situated for the drawing of drinking water.
27. (1) A drinking water tap shall be supplied with water from
    a supply pipe;
    b pump delivery pipe drawing water from a supply pipe; or
    c distributing pipe drawing water exclusively from a storage cistern supplying wholesome water.
28. (1) Subject to paragraph (2), every bath, wash basin, sink or similar appliance shall be provided with a watertight and readily accessible plug or other device capable of closing the waste outlet.

    (2) This requirement does not apply to-

    a. an appliance where the only taps provided are spray taps;
    b. a washing trough or wash basin whose waste outlet is incapable of accepting a plug and to which water is delivered at a rate not exceeding 0.06 litres per second exclusively from a fitting designed or adapted for that purpose;
    c. a wash basin or washing trough fitted with self-closing taps;
    d. a shower bath or shower tray;
    e. a drinking water fountain or similar facility; or
    f. an appliance which is used in medical, dental or veterinary premises and is designed or adapted for use with an unplugged outlet.

Guidance

Drinking water points

G26.1 All premises supplied with water for domestic purposes should have at least one conveniently situated tap for supplying drinking water directly from the supply pipe..

G26.2 In houses, a drinking water draw-off tap should normally be sited over the kitchen sink.

Drinking water supplies

G27.1 All taps supplying drinking water should be fed from a source of wholesome water and preferably be supplied with water directly of a supply pipe. Where insufficient water pressure is available in the supply pipe and:

a. the demand is less than 0.2 litres per second; or
b. if a larger demand is required and the water undertaker agrees, drinking water may be pumped directly from the supply pipe.

G27.2 Where it is impracticable to supply drinking water from the supply pipe, the water should be taken from a distributing pipe drawing wholesome water from a storage cistern.

G27.3 Water that has been softened on site should only be used for drinking purposes when the treated water is wholesome.

G27.4 Except in a house, all taps that are supplied with cold water that is not wholesome should be labelled 'Not Drinking Water'.

G27.5 Except for the following appliances, all baths, wash basins, sinks and similar appliances should be provided with a watertight and readily accessible plug or some other device capable of closing the water outlet:

a. an appliance where the only taps provided are spray taps;
b. a washing trough or wash basin where the waste outlet is incapable of accepting a plug and to which water is delivered at a rate not exceeding 0.06 litres per second exclusively from a fitting designed or adapted for that purpose;
c. a wash basin or washing trough fitted with self-closing taps;
d. a shower bath or shower tray;
e. a drinking water fountain or similar facility; or
f. an appliance which is used in medical, dental or veterinary premises and is designed or adapted for use with an unplugged outlet.

SECTION 11

Schedule 2: Paragraph 29: Washing machines,

dishwashers and other appliances

28. (1) Subject to paragraph (2), clothes washing machines, clothes washer-driers and dishwashers shall be economical in the use of water.

    (2) The requirements of this paragraph shall be deemed to be satisfied in the case of machines having a water consumption per cycle of not greater than the following-

    a. for domestic horizontal axis washing machines, 27 litres per kilogram of washload for a standard 60°C cotton cycle;
    b. for domestic washer-driers, 48 litres per kilogram of washload for a standard 60°C cotton cycle;
    c. for domestic dishwashers, 4.5 litres per place setting.

Guidance

G28.1 Domestic horizontal axis washing machines should not have a water consumption per cycle greater than 27 litres per kilogram of washload in accordance with Annex 1 of EU Directive 95/12/EC.

G28.2 Domestic washer-driers should not have a water consumption per cycle greater than 48 litres per kilogram of washload in accordance with Annex 1 of EU Directive 99/60/EC.

G28.3 Domestic dishwashers should not have a water consumption per cycle greater than 4.5 litres per place setting in accordance with Annex 1 of EU Directive 97/17/EC.

SECTION 12

Schedule 2: Paragraphs 30 and 31: Water for outside use

30. Every pipe which conveys water to a drinking vessel for animals or poultry shall be fitted with-
    a. a float-operated valve, or some other no less effective device to control the inflow of water, which is-
        i. protected from damage and

contamination; and

ii. prevents contamination of the water supply; and

b. a stop valve or servicing valve as appropriate.

31. Every pond, fountain or pool shall have an impervious lining or membrane to prevent the leakage or seepage of water.

Guidance

Animal drinking troughs or bowls

G30.1 The supply to drinking apparatus for animals or poultry should be fitted with a float-operated valve or other no less effective device to control the inflow of water.

G30.2 A servicing valve should be provided on the inlet pipe adjacent to every drinking appliance for animals or poultry.

G30.3 Water supplies to animal drinking bowls should be provided with an appropriate backflow protection device on the inlet pipe or an airgap at the discharge point.

G30.4 Agricultural water troughs should comply with BS 3445.

G30.5 Water supplies to farm buildings housing pigs should comply with:

BS 5502: Building and structures for agriculture:
Part 42: Code of practice for design and construction of pig buildings:
Section 7.2 - Drinking arrangements; and,
Section 8.3 - Water

Ponds, fountains or pools

G31.1 Any pond, fountain or pool filled or supplied with water by the water undertaker should have an impervious lining and be watertight.

G31.2 No supply or distributing pipe should be permanently or directly connected to a pond, fountain or pool. Where temporary connections are used they should comply with the requirements of Paragraph 15 of Schedule 2.