

PREVENTION OF
CONTAMINATION AND WASTE
OF DRINKING WATER SUPPLIES,
ERRONEOUS MEASUREMENT
AND THE CONSERVATION
OF WATER

SEPTEMBER 2003

Recreation and Sports Grounds

Guidance for designers and operators concerned with the installation, modification and maintenance of pitches, greens, all-weather surfaces and similar premises. The principles set out in this booklet also apply to Ice Rinks and Sports Centres

WRAS
Water Regulations Advisory Scheme



Prepared and Approved on behalf of
the UK Water Suppliers by the
Water Regulations Advisory Scheme
Technical Committee

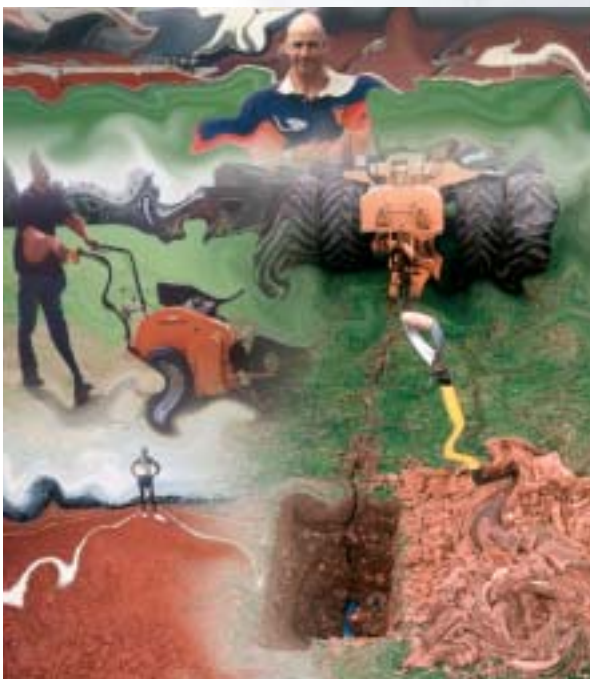
Recreation and Sports Grounds

PREVENTION OF CONTAMINATION AND WASTE OF DRINKING WATER SUPPLIES

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This Installation Guide was compiled on behalf of the UK Water Regulations Advisory Scheme Technical Committee. The Committee wishes to express its appreciation for the support and assistance given in preparing this Guide by the Institute of Groundsmanship, the British and International Golf Greenkeepers Association and the Greenkeepers Training Committee, the Sports Turf Research Institute and the Technical Committee of the British Turf and Landscape Irrigation Association.



Introduction

This Booklet is produced as guidance to the designers, owners or operators of recreation and sports grounds, which includes football, rugby and cricket grounds, race courses, bowling greens, tennis clubs (turf or hard court) and comparable establishments and any similar premises. These establishments are referred to in this booklet as 'grounds'. It should be pointed out that in the terms of the Water Fittings Regulations, all 'grounds' are regarded as 'premises'.

The principles set out in this booklet also apply to ice rinks, sports centres and similar establishments

Water Byelaws were used to protect and conserve public water supplies but they were replaced in England and Wales on the 1st July 1999 by the Water Supply (Water Fittings) Regulations (1999), and on the 4th April 2000 in Scotland by the Byelaws 2000. The Regulations and the Byelaws 2000 are technically similar and references to 'the Regulations' in this Installation and Operating Guide refer to both. Water Regulations in Northern Ireland are to be updated by 2004, resulting in the same technical requirements throughout the whole of the UK.

Where do the Regulations apply?

The Regulations apply from the point where the water enters the premises' underground supply pipe. From that point, the Regulations will apply to all types of premises and to all plumbing systems, pipes below or above ground, water fittings, appliances and equipment which is supplied, or is to be supplied, with water from the public water supply. If the public water supply is provided as a back-up supply to other water supply provisions within the grounds (eg. a private supply), the plumbing system must comply with the requirements of the Regulations.

Grounds not connected to a public water supply are not governed by these Regulations. The Regulations do not apply to plumbing systems supplied from private supplies but they should be referred to as a good practice guide for users and installers.

The Regulations do not require changes to plumbing systems installed before 1st July 1999 (England and Wales) or 4th April 2000 (Scotland) provided they were installed in accordance with the Water Supply Byelaws (or Regulations) in force at the time. However, if the Water Supplier has reasonable grounds for considering that there is a significant risk of contamination, misuse or excessive waste of water, it can still require improvements under other legislation.

What are the Regulations for and who has to follow them?

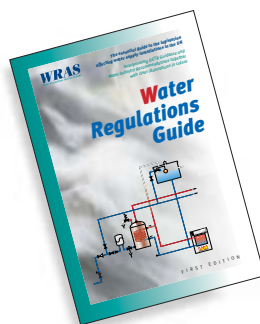
The main purpose of the Regulations is to prevent the waste, misuse, undue consumption, contamination and erroneous measurement (e.g. tampering with water meters) of public water supplies but they also encourage the efficient use of, and conservation of the supplies. All owners or occupiers of grounds which are connected to the public water supply are responsible for their water supply systems. They have a legal duty to comply with the Regulations or Byelaws (Scotland) and by following the requirements, will protect their water supplies from contamination, prevent waste of water (and avoid wasting money where supplies are paid for by means of a water meter) and ensure they have reliable and robust plumbing systems which will give good service.

It is important for the operators of grounds to ensure that the quality of the water provided for visitors is not impaired by the operational or 'commercial' use of the same supplies. It is the responsibility of the owner or occupier to ensure that their plumbing systems are installed correctly. If incorrectly installed fittings cause contamination of the water supply, it would leave those responsible open to prosecution.

The purposes of the Regulations are to prevent:

**CONTAMINATION,
WASTE, MISUSE AND
UNDUE CONSUMPTION AND
ERRONEOUS
MEASUREMENT OF
THE WATER SUPPLY**

The [Water Regulations Guide](#), published by WRAS, provides general guidance on how to meet the requirements of the Regulations. It is used throughout the Water Supply Industry and provides the information on which this summary is based. For a comprehensive understanding of the regulations, reference to the Guide must be made.





Scope of this Guide

This Guide is intended as an aid to designers and operators of grounds and has been produced with their assistance. The main aim of the Guide is to summarise the requirements of the Regulations or Byelaws (Scotland) as they affect all types of sports facilities, for the prevention of contamination and waste of drinking water and to encourage the efficient use and conservation of water. The Guide will assist the designers and operators of the various types of Recreational and Sports Grounds to comply with the Regulations when designing new systems, and when modifying and maintaining existing systems and in ensuring that the quality of water supplied is suitable for its intended purpose.

This Guide deals particularly with preventing contamination by backflow i.e. flow in a direction opposite to that intended, with the risk that contaminants may be drawn back into the pipework and consumed.

The Guide also promotes measures to reduce burst pipes and damage to fittings caused by freezing. It encourages good plumbing practice and supports efforts to establish common procedures and installation methods for water supplies in the Sports facilities industry.

The more comprehensive Water Regulations Guide, available from WRAS and approved by the Water Suppliers, provides guidance in greater detail on how to meet the requirements of the Regulations. It provides the information on which this Installation and Operating Guide is based (see *'Where to seek further information and advice, page 16*).



Responsibilities

The Water Supplier

It is the duty of the Water Supplier to supply wholesome water to the grounds (and related premises) for domestic purposes. The Water Supplier also has the duty to enforce the Regulations in its area of supply. These duties include checking plans to the extent that the Supplier considers necessary, and granting consent for proposed installations. The Water Supplier also inspects proportions of new and existing Recreational Sports facilities (or related premises) for the compliance of the plumbing systems with the Regulations.

The Customer

The Regulations require the installer and customer (referred to in the Regulations as the user, owner or occupier) to give the Water Supplier prior notification of proposed installations and to comply with any conditions attached to the Water Supplier's consent. Water systems must be designed, installed and maintained adequately to prevent the risk of contamination and waste of water must be minimised by the use of suitable backflow prevention devices and by using approved fittings and materials in contact with water. These requirements are described more fully below.



Some Useful Definitions

WATER FITTINGS

'Water fittings' includes all pipes, pipe fittings, joints, valves, cisterns, appliances and equipment which form the water supply system in premises or are connected to it. The supply pipe is included i.e. that part of the underground service pipe, connecting the premises to the water main, which is owned by and is the responsibility of the premises owner.

WHOLESOME WATER

Water supplied by the Water Supplier of suitable quality for drinking purposes.

CONTAMINATION

Contamination includes any reduction in aesthetic, chemical or biological quality of the water due to raising its temperature or the introduction of polluting substances – whether it is harmful to health or not.

BACKFLOW

Backflow is defined as 'flow in a direction contrary to the intended normal direction of flow.'

CROSS-CONNECTION

Any connection between the water supply system containing wholesome water supplied by the Water Supplier and pipes, fittings or equipment containing any other water.

PERMEATION

Permeation occurs when a substance penetrates the material of which a pipe is made and contaminates the water within the pipe.



Notification and consent is required for the installation of water fittings in connection with:-

- the construction of buildings or structures in any grounds.
- extensions or modifications to water systems in any grounds or a material change of use of any grounds or allied premises.
- the installation of the following water fittings in any grounds:-
 - a bath with a capacity of more than 230 litres;
 - a bidet with an ascending spray or flexible hose;
 - a pump or booster drawing more than 12 litres per minute;
 - a water treatment unit which produces a wastewater discharge or which requires the use of water for regeneration or cleaning;
 - a reduced pressure zone (RPZ) valve or other mechanical device for backflow protection against a fluid that is in Fluid Category 4 or 5;
 - a turf or garden watering system (except one designed to be operated by hand);
 - any water system laid outside a building and either less than 750mm or more than 1350mm below ground level and;
 - the construction of a pond or swimming pool over 10,000 litres capacity designed to be replenished automatically with water supplied by a public water supplier.

Notification and Consent

What installations have to be notified, and by whom?

Regulation/Byelaw 5 requires that the local Water Supplier must be notified in advance for most types of plumbing installations. Anyone installing or using the installation without the Water Supplier's consent could be **committing a criminal offence.**

What details have to be provided?

Notification can be sent to the local Water Supplier by the owner or operator of the grounds or someone acting on their behalf, and the details required are:

- (a) The name and address of the person giving notice and, if different, the name and address of the person to whom the consent should be sent.
- (b) A description of the proposed work or any significant change of use of the grounds
- (c) The location of the grounds and their use or intended use.
- (d) A plan of those parts of the grounds which relate to the proposed work and a diagram showing the pipework and fittings to be installed.
- (e) If an Approved Contractor* is to do the plumbing work, the Approved Contractor's name and address.

*See opposite page for the benefits of using Approved Contractors (also known as 'Approved Plumbers').

A note about plans and diagrams

The plan of the grounds and the pipework diagram (*see (d), above*) is required for all proposed water fittings to be installed or modified, which should include hot, cold, heating, fire prevention systems and any alternative water supplies not provided by the Water Supplier

The Water Supplier's consent. The Water Supplier has ten working days in which to review plans and diagrams and either refuse consent, or grant it, with or without conditions. If no response is made after ten working days, consent is deemed to have been unconditionally granted and work can start, but the installation must still be carried out such that it complies fully with the Regulations.

NB. It is a responsibility of the customer to ensure that the Water Supplier receives Notification before commencing work.

Notification requirements for grounds:-

You must notify the Water Supplier if you are proposing to install a water distribution infrastructure (for watering) as part of the development of new pitches, greens and courts, or where you are extending an existing distribution system involving the erection of additional buildings or structures. The extension of the infrastructure within existing grounds is also notifiable, unless it is carried out by an Approved Contractor. New installations or modifications to all other facilities such as restaurants, laundrettes, public facilities and general watering points within existing grounds will also require notification and consent.

As a separate matter, if the demand for water is increasing as a result of the creation of new pitches, greens, courts or other facilities, the operators should seek advice from their Water Supplier about the adequacy of the existing water supply to meet the additional demand.

Approved Contractors

The Regulations encourage suitably qualified installers to be accredited as Approved Contractors (also known as Approved Plumbers) by the Water Supplier or other recognised organisations. An Approved Plumber will give the customer a certificate stating that the installation work he or she has done satisfies the Regulations. In the event of breaches of the Regulations in connection with the certified work, the owner, manager or occupier can use the certificate as a legal defence against any resulting prosecution.

An Approved Plumber is permitted to undertake work on extensions or alterations of existing systems without prior consent from the Water Supplier and so can carry out work on the water system without prior notification and having to await consent before starting work.

Some Water Suppliers operate their own Approved Plumbers schemes, but most support the national Water Industry Approved Plumbers Scheme (WIAPS)(address p16). Approved Plumbers will have been appropriately assessed for their experience and knowledge of plumbing works in relation to the Regulations and most schemes require or request liability insurance evidence.



Sports grounds owners or managers may already employ or use the services of a plumber not currently registered as an Approved Plumber under either the local or a national scheme. Such Managers should find it of benefit to know that any plumber that they employ is an Approved Plumber. For further information on how an employed plumber can pursue Approved Plumber status please contact the relevant Association listed at the end of this booklet. Alternatively, contact your Water Supplier for a list of Approved Plumbers who are locally available or search websites for specific plumbing details (i.e. WRAS, 'Referenceline', Institute of Plumbing, etc).

The Causes of Contamination and Waste

Ensure that you know the precise location of your own stop-valve for isolating the water supply and that it is operated at least annually to ensure that it is free to function in the event of an emergency.

Any pipe or fitting containing water that is not wholesome (e.g. used mains water, rainwater, recycled water) or any water not supplied by a water undertaker, (such as a private supply) must not be connected to fittings or pipes containing wholesome water, unless an adequate backflow prevention device is installed.

Water supplies used for irrigation, fertiliser-dosing etc. (horticultural processes) and non-domestic



purposes must be provided with backflow protection devices appropriate to the contamination risk (the downstream Fluid Category).

To prevent ingress of contamination, no pipe or fitting should be installed near a cesspit, sewage effluent soak-away or in contact with contaminated material, regardless of any protection given. In order to prevent permeation by hydrocarbons, care should be taken to avoid installing plastic pipes in contaminated ground, or ground at risk of becoming contaminated, eg. where diesel, petrol or heating oil is stored or is likely to be spilled.

All underground pipes should be laid at a minimum depth of cover of 750mm (2' 6") and a maximum of 1350mm (4' 6"). Pipes may only be installed at other depths with the written consent of the Water Supplier and shallower pipes must be suitably protected to prevent damage – particularly by freezing. Guidance can be found in the WRAS 'Water Regulations Guide'.

Care must be taken to ensure that only 'lead free' solders are used in wholesome water supply systems. The installation of lead pipe, lead fittings and the use of solder containing lead for drinking water installations is prohibited. Where power fluxes are applied, excessive use should be avoided and following any installation, appropriate consideration should be given to disinfection, testing and flushing to ensure that water quality is retained.

Ensure that the water supply system of any franchise outlet within the grounds complies with the Regulations - responsibility lies with the owner or operator of the grounds, and the installer.

Float-operated valves for water storage cisterns must be manufactured to BS 1212 (to Parts 2, 3 or 4 for WC cisterns; to Parts 1 - 4 for other cisterns) or be approved by WRAS (listed in the 'Water Fittings and Materials Directory') and they must have a servicing valve upstream of the float-operated valve.

It is prudent to know where your water meter is located and to check its reading regularly. Unexplained increases in meter readings could indicate defective water fittings, either above or below ground.

Regular servicing and maintenance of water fittings will ensure that drinking water is not contaminated or wasted.

Contamination risks and fluid categories

Categorising contamination risks

An assessment is required of the risk of contamination by backflow for each water fitting or appliance that contains water or other liquids and that is connected to the grounds' plumbing system. The Regulations define five levels of contamination risk, called 'Fluid Categories', and for each category, backflow prevention devices are described below which provide an adequate level of protection. The Fluid Category should be assessed on the highest level of risk to which the water fitting is exposed.



Definition of Fluid Categories

Fluid Category 1

Wholesome water supplied by a water undertaker and meeting the quality requirements for drinking water.

Fluid Category 2

Water which would be in fluid category 1 except that its aesthetic quality is impaired owing to a change in its temperature, or 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:–

ethylene glycol, copper sulphate solution or similar chemical additives; or

sodium hypochlorite (chlorox 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:–

chemical, carcinogenic substances; or pesticides (including insecticides and herbicides); or

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:–

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

Examples of backflow risks and corresponding fluid categories

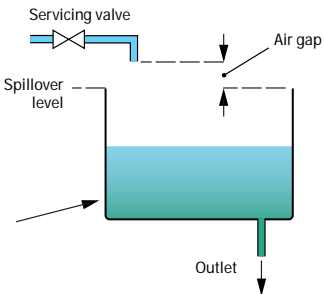
Equipment and Location	Fluid Category	Equipment and Location	Fluid Category	Equipment and Location	Fluid Category
WATER USED FOR DOMESTIC PURPOSES		FIRE FIGHTING EQUIPMENT AND SYSTEMS		41 Steaming ovens – atmospheric pressure 3	
1 Service bollards/stand posts for drinking water	3	19 Fire hose reels (but see Note 1)	5/4/3/2*	42 Steaming ovens – pressurised	5
2 Water heaters – point of use	2	20 Fire sprinkler systems – with additives	4	43 Water coolers	2
3 Washing machine – use for personal and household laundry	3	21 Fire hydrants – above ground outlets	2	44 Water heaters	2
4 WCs; bidets with submerged inlet or flexible hose; urinals	5	22 Fire sprinkler systems – no additives	2	45 Drinks vending machines – with ingredients or CO ₂ gas	3
5 Wash basins, baths and showers – normal domestic use	3	IRRIGATION		<i>* The Fluid Category is dependent on local circumstances and should be confirmed by the Water Supplier.</i>	
6 Sinks	5	23 Hose union taps – grounds watering	5/4/3*	Note 1: The Fluid Category should be assessed on the most serious potential contaminant. For example, if a fire hose reel is sited where it cannot reach other contaminants, it is rated as a fluid category 2 risk. If the outlet is capable of being immersed in a drain it is rated as a fluid category 5 risk and must be protected accordingly.	
7 Taps or other 'point of use' – chemical toilet disposal points, bin area wash-down, chemical store etc.	5	24 Irrigation system – at or below ground, with or without additives; greater than risk of domestic garden	5		
8 Disposal equipment – for sanitary towels, nappies etc.	5	25 Irrigation system – pop-up sprinklers or permeable 'seep hoses'; no greater risk than domestic garden	4		
9 Central heating primary circuit – all domestic-type premises and non-domestic premises with output up to 45kW; 150,000 Btu/h	3	26 Irrigation systems – fixed heads 150mm above ground; no additives	3		
10 Cisterns – flushing	3	27 Connection to private supply or recycled water ie. 'grey water' or rainwater	5		
11 Cisterns – feed and expansion (F and E)	4/3*	CATERING			
PLANT		28 Vegetable washing machine	5		
12 Cisterns – water storage for various purposes	5/4/3*	29 Potato peelers	5		
13 Central heating primary circuits – non-domestic with output greater than 45kW, 150,000 Btu/h.	4	30 Food waste disposers, with or without flexible spray head	5		
14 Swimming and paddling pools – automatic top-up and water treatment plant	5	31 Food waste pulpers	5		
15 Swimming and paddling pools – hose union taps	4	32 Pre-rinse spray units	5		
16 Softening plant (salt regeneration)	3	33 Wash-down hose reels	5		
17 Steam raising plant	3	34 Dishwashers – catering equipment	4		
18 Photographic processing equipment	4	35 Glass washers – restaurant/ bar/cafe	3/4*		
		36 Washing machine – use for catering laundry	4		
		37 Rinse-aid equipment (dishwashers)	4		
		38 Catering boilers	3		
		39 Beverage making equipment	3		
		40 Ice making machines	3		

Typical Backflow Prevention Arrangements and Devices

The air gap, i.e. the vertical distance of the discharge point of the inlet pipe above the spillover level, must be at least twice the bore of the inlet pipe and never less than 20mm.

The cistern contains the potentially contaminated fluid category five substances.

To increase the water pressure, a booster pump can be fitted on the distributing pipes from cisterns incorporating air gaps, but consent from the Water Supplier is required if the flow is greater than 12 litres/minute

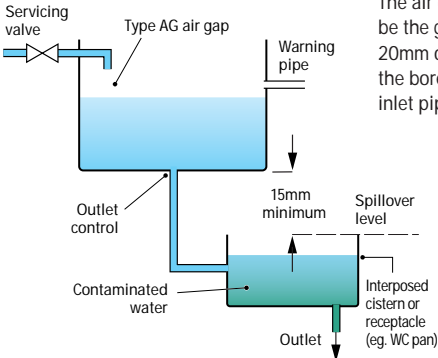


Fluid Category 5

Fed from storage via a Type AA, AUK1 or AD air gap

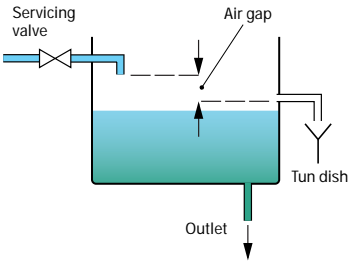
The Type AA air gap, with unrestricted discharge above the spillover level

The air gap is to be the greater of 20mm or twice the bore of the inlet pipework



Type AUK 1 air gap with interposed cistern, for gravity supply only

The air gap is to be the greater of 20mm or twice the bore of the inlet pipework. The overflow must be suitably sized for the appropriate type of air gap e.g. for a Type AF air gap, an overflow of cross-sectional area of at least four times that of the inlet pipe.



Fluid category 4

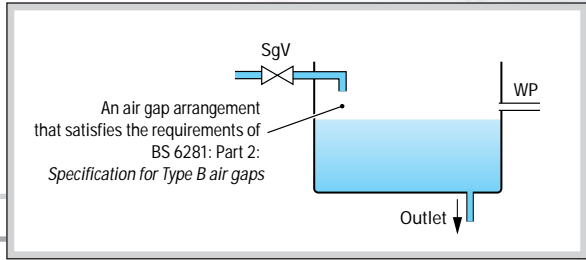
Fed via a Type AF air gap or a mechanical device

The Type AF air gap

Fluid category 3

Fed via a storage cistern with a Type AG air gap or via a mechanical backflow prevention device e.g. a double check (non-return) valve (Type EC or ED)

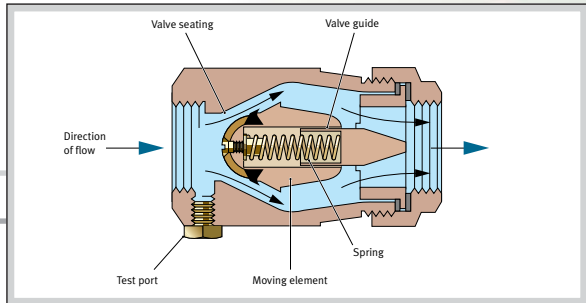
Type AG Air gap



Fluid category 2

Fed via a mechanical backflow prevention device, for example a single check (non-return) valve (Type EA or EB)

Type EA verifiable single check valve



NOTE:

All mechanical backflow prevention devices (i.e. not air gaps) can fail and therefore need planned inspection and maintenance or replacement.

Taps for Use with Hoses

The requirements for the backflow protection of taps to which hoses can be connected (hose union taps) apply whether a hose is actually connected or not. The level of protection is determined by the potential use and contamination risk.

Below-ground hose connections

The connection of hose pipes to below-ground taps, valves or hose connectors is not permitted if the pipe supplying the water is directly connected to the water supply pipe (i.e. the pipe is fed directly from the water main). This type of underground connection can only be made to a pipe which is supplied with water via a fluid category five backflow protection device (e.g. via a storage cistern or break tank with a suitable air gap).

Taps with connectors for hoses (Bibtap with Hose Union)

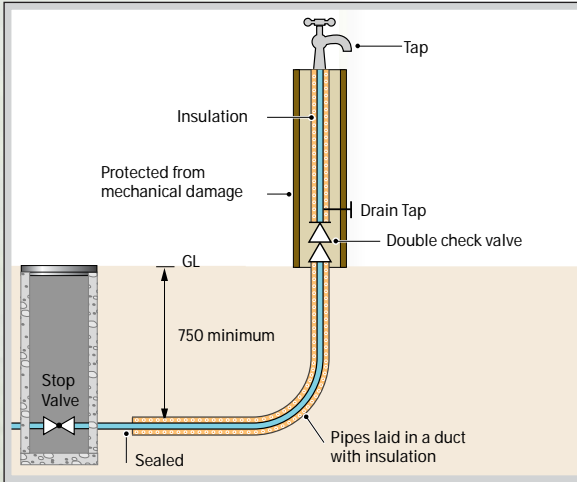
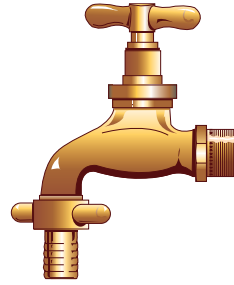
The end of the hose must not be allowed to be submerged because of the risk of backflow. Especially with hose union taps supplied directly from the mains rather than via a storage cistern, it is also a requirement to use a means of flow control with automatic shut-off e.g. a hand held trigger device.

If the location and use of a hose with automatic shut-off flow control poses a risk no greater than that in a domestic garden, the hose union tap can be protected by a double check valve. Elsewhere, it must be supplied through a backflow prevention device suitable for the highest risk to which the tap might be exposed, typically Fluid Category 5. The level of protection will be subject to confirmation by the water supplier.

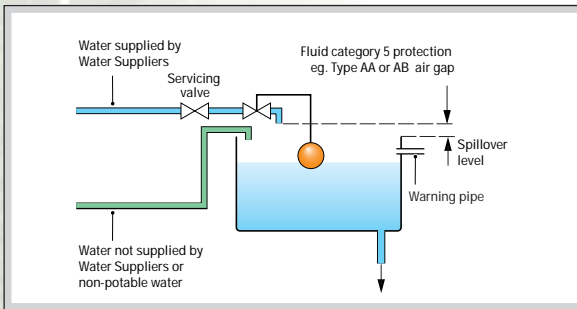
Bibtap with Hose Union

For hose union bibtaps which are outside buildings, to prevent damage from freezing, check valves or other mechanical backflow protection devices should be on the supply pipe within the heated part of the building or should be adequately insulated.

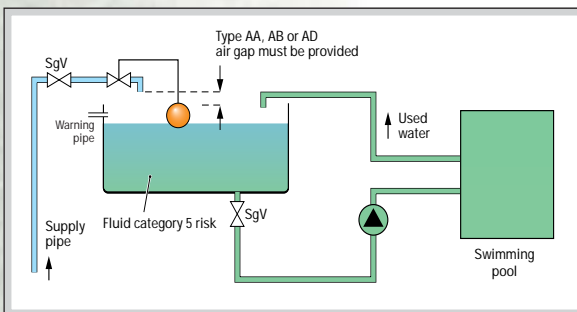
Examples of Plumbing Layouts



Example of a hose tap directly supplied from the water main, protected against backflow by a double check valve, which is only permitted where the water supplier agrees that the backflow risk is no greater than fluid category three.



Separation of mains supply from other supplies e.g. private water supply, recycled grey water, rainwater etc.



Separation of wholesome water in a supply pipe from water that has been used e.g. swimming pool recirculation



If You Want to Carry Out Modifications to Your Plumbing System

- You are legally obliged to notify your Water Supplier and have its consent in advance of any work you intend to carry out on your water supply system except for localised repairs, servicing and like-for-like replacements and alterations or extensions to the system in a domestic dwelling.
- Use approved materials and fittings only.
- Completely remove any redundant pipework or fittings to avoid creating stagnant water in 'dead legs'.
- Use a competent plumber to ensure that the work will comply with the Regulations.

Requirements for Water Fittings

The Regulations require that all water fittings are of an appropriate quality and standard and are suitable for the circumstances in which they are used. Fittings must be made of suitable materials, which will resist corrosion and will not contaminate the water supply. They must be designed and made to be sufficiently robust to have an adequate service life without failing or leaking prematurely. To achieve this they must be manufactured to meet relevant European or British Standards or the Government's Performance Specification.

Approved fittings

Fittings that have been extensively tested against the Government's Performance Specification and are approved by the Water Supply Industry are listed in the WRAS Water Fittings and Materials Directory. Use of WRAS Approved Products, fitted in accordance with any approval conditions, should comply fully with the Regulations and be readily accepted by the Water Suppliers' enforcement staff.



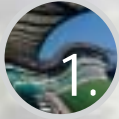
Water fittings with the British Standards 'Kitemark', which are manufactured to the relevant British Standards, can be accepted as complying with the Regulations and do not require testing. A list of these is also given in the Water Fittings and Materials Directory.

If you are unsure about the acceptability of any fitting, consult your local Water Supplier.

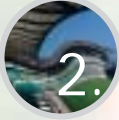
Water saving with toilet flushing – conservation

One of the requirements of the Regulations for fittings, is that for toilets (WCs) installed since January 2001, the maximum permitted flush volume shall be 6 litres (down from 7.5 litres). Dual-flush cisterns are now permitted, using up to 2/3 the volume of the full flush. These changes, coupled with the introduction of drop valves and flap valves in flushing cisterns and the continental-style pressure flushing valves – as alternatives to the syphon as flushing devices – offer potentials for saving water. WCs must comply with the Government's Performance Specification. Manufacturers or suppliers should be asked to provide evidence of this in the form of a certificate of compliance.

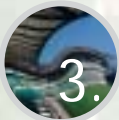
Points to Remember



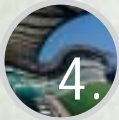
Backflow of contamination into the mains or the domestic water supply of Recreation and Sports grounds and related premises is unacceptable and may be harmful to health.



You **need to give notice of proposed installation** work and have consent from your Water Supplier before starting work. Full details of when notice must be given can be found in Regulation/Byelaw 5.



There is no requirement preventing the sale of fittings that do not comply with the Regulations but it is illegal to install or use them. Both the installer and user will be liable if fittings do not comply. Be safe by insisting that your supplier confirms that fittings are of an appropriate quality and standard. Suitable fittings may carry the WRAS Approved Product mark or the BSI 'Kite-mark'.



Insulation only delays freezing; it helps retain the very little warmth in 'cold' water – it does not 'keep out the cold'. Water supply pipes located in roof spaces and any other unheated space need to be insulated for frost protection. Pre-formed pipe insulation is better than loose bandage type insulation, which will require a greater thickness. Extra insulation will be required to delay freezing if prolonged low temperatures are likely to occur.



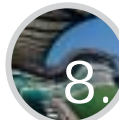
Turning off the water supply to out-lying areas of grounds and draining systems, including draining the heating system of any clubhouse, will prevent damage during periods when temperatures are anticipated to drop below freezing.



Float-operated valves to BS1212 Part 2, 3 or 4 or those that are approved by the Water Regulations Advisory Scheme are required for WC cisterns and they must have a servicing valve on the supply side of the device.



Pipework downstream of the Water Supplier's meter and stop-tap is usually the responsibility of the owner or occupier of the grounds. If any pipework serving or within your property is made of lead and you renew all of it, you can request your local Water Supplier to replace, free of charge, any remaining length of lead pipe for which it is responsible (usually in the highway).



Always use a reputable plumber. Details of Approved Plumbers are available from your local Water Supplier or the WRAS, or specialist websites, as previously mentioned. If you undertake plumbing work yourself, the finished work must comply with the Regulations.



You may wish to use equipment that requires a higher water pressure to operate than the incoming mains pressure. You can ask your local Water Supplier to advise you about local pressures and you must have its consent for the installation of any pumps delivering more than 12 litres per minute.



The regulations apply to all water systems capable of using mains water, including both hot and cold water supply systems, as well as central heating systems.



Other Water Supply Installation Guides published:

Agricultural Premises
Holiday and Residential Parks
Water and Waste Water Treatment Works

Where to Seek Further Information and Advice

Your Local Water Supplier

Your local Water Supplier will respond positively to enquiries about existing and proposed plumbing installations and may be able to provide helpful advice on the application of the Regulations. Contact details are given in Yellow Pages under 'Water' and on the WRAS website (www.wras.co.uk).

The Water Supply Industry's 'Water Regulations Advisory Scheme' (WRAS)

WRAS is funded by all the Water Suppliers in the UK to publicise the Regulations and to promote consistent interpretation of them. It offers an enquiry service for those who seek further information. Recent Water Industry interpretations of the Regulations and copies of all the current advice leaflets can be printed from the WRAS website (www.wras.co.uk), which also gives information about publications including the Water Regulations Guide and the Water Fittings and Materials Directory. There are also links to the wording of the Regulations and Government Guidance documents, which can be downloaded or printed. The website has contact details for the Water Suppliers' Regulations departments and addresses to which you should send notifications. The Water Industry Approved Plumbers Scheme is described and contact details of Approved Plumbers are given.

Addresses

The Water Regulations Advisory Scheme

30 Fern Close,
Pen-y-Fan Industrial Estate,
Oakdale, Gwent NP11 3EH
Tel: 01495 248454
Fax: 01495 249234
e-mail: info@wras.co.uk
Website: www.wras.co.uk

Water Industry Approved Plumber Scheme (WIAPS)

30 Fern Close,
Pen-y-Fan Industrial Estate,
Oakdale, Gwent NP11 3EH
Tel: 01495 248454
Fax: 01495 249234

Institute of Groundsmanship

19 – 23 Church Street,
The Agora, Wolverton
Milton Keynes MK12 5LG
Tel: 01908 312511

British and International Golf Greenkeepers Association (BIGGA) and the Greenkeepers Training Committee (GTC)

BIGGA House, Aldwark, Alne
York YO61 1UF
Tel: 01347 833800

Sports Turf Research Institute (STRI)

Bingley, West Yorkshire BD16 1AU
Tel: 01274 565131

