

Fresh Water Plumbing Maintenance Guide

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1. Introduction

The quality of treated water from the Water Supplies Department (WSD) fully complies with the “Hong Kong Drinking Water Standards”. To ensure good quality of water at the taps and avoid/minimise failures in water supply, the maintenance of the fresh water plumbing systems in buildings has to be consistently kept at a high standard.

According to the Waterworks Ordinance, the responsibility for fresh water plumbing maintenance lies with the registered consumers (i.e. the customers) or the registered agents (i.e. the owners’ corporations or management agents). However, some registered consumers and registered agents are not aware of this. As a result, their fresh water plumbing systems are not properly maintained. The tap water may become discoloured or dirty. Choked or burst water pipes cause weak water flow or no water supply at taps. In extreme circumstances, leaking water pipes may cause water seepage at the ceiling or wall and nuisance to other parties. Please refer to Appendix 1 on how to deal with some of these problems. To avoid these problems, the fresh water plumbing systems have to be inspected regularly and any defects identified have to be rectified immediately. The sump water tanks and roof water tanks have to be cleansed regularly. Some examples of good and bad practices in relation to fresh water plumbing systems are shown in Appendix 2.

The purpose of this “Fresh Water Plumbing Maintenance Guide” is to provide the registered consumers and registered agents with advice on how to inspect and maintain their fresh water plumbing systems properly.

2. Recommended Practices

2.1 Cleansing of Water Tanks

The fresh water plumbing system in a building often includes a sump water tank and a roof water tank. The registered consumers or registered agents should cleanse all their water tanks regularly according to proper procedures to prevent accumulation of dirt, rust etc. which may lead to discoloured water.

i. Frequency of Cleansing

The sump water tanks and the roof water tanks should normally be cleansed at least once every 3 months or more frequently if necessary

ii. Preparation Work before Cleansing of Water Tanks

Before cleansing the water tanks, the registered consumer or registered agent should:

- (1) programme the cleansing in off-peak hours to minimise causing inconvenience to the occupants in the building;
- (2) serve notice to the occupants in conspicuous locations detailing the date and duration of water supply suspension necessary for facilitating water tank cleansing. The notice should also contain advice on what the occupants should do immediately before and after water tank cleansing (such as keeping all taps closed), and an emergency contact telephone number;
- (3) check that the relevant statutory requirements, such as the Factories and Industrial Undertakings (Confined Spaces) Regulations, Cap 59AE, are complied with; and
- (4) employ a person or agent who is conversant with the cleansing procedures and is capable of cleansing the water tanks to cleanse the water tanks °

(iii) Cleansing of Water Tanks

For details of the cleansing procedures, please refer to Appendix 3.

(iv) Post Cleansing Review

After cleansing the water tanks, the registered consumer or registered agent should review the whole process and working procedures taken. They should also address the problems encountered and complaints received due to the cleansing work and provide feedback to the occupants as appropriate.

2.2 Inspection of Fresh Water Plumbing Systems

(i) Inspection

Regular maintenance will help ensure that the fresh water plumbing systems will perform as intended. It may also avoid unplanned interruption of water supply and extend the service life of the systems by identifying and rectifying the defects at an early stage.

To facilitate plumbing inspection and emergency use, the registered consumer or registered agent should maintain an up-to-date record of the plumbing system layout. The registered consumer or registered agent should employ qualified persons (such as licensed plumbers, building services engineers or building surveyors) to inspect the plumbing system at least once every 3 months or more frequently if necessary. A typical inspection checklist for components of a fresh water plumbing system is in Appendix 4 for reference. The qualified persons should follow the manufacturer's recommendations or instructions regarding preventive maintenance of the water pipes, fittings, pumps, pressure reducing valves, taps, valves, etc. He/she should rectify any defects found during the inspection immediately.

(ii) Licensed Plumbers

A licensed plumber is a person licensed under the Waterworks Ordinance to construct, install, maintain, alter, repair or remove water supply plumbing. The licensed plumber directory is available on the WSD's website below-

https://www.esd.wsd.gov.hk/esd/aws/licensedPlumberDirectory/init.do?pageFlag=1&USER_LANG=LANG_ENG

For fresh water plumbing systems, a designated person¹ (e.g. licensed plumber) should be employed for:-

1. installing plumbing in connection with water meters;
2. installing water-using apparatus that requires backflow preventive devices; and
3. installing or removing pipes and fittings that will affect the efficiency of the water plumbing system.

It is an offence if any person, other than a designated person, carries out installation or modifications of the fresh water plumbing systems in buildings. However, alterations or repairs

¹ Please refer to Section 15(6) of the Waterworks Ordinance (Cap. 102) for the definition.

to plumbing systems which in the opinion of the WSD are minor in nature may be carried out by a person other than a designated person. Typical examples of minor works are repairs of leaking water pipes or fittings and rewashering of taps within a domestic flat. All plumbing works involving soldering for connecting copper pipes shall require permission from the Water Authority and shall be carried out by a designated person.

2.3 Replumbing

The quality of water is affected by the conditions of the fresh water plumbing systems, which are often related to the age of the buildings. Since December 1995, the use of unlined galvanised iron pipes and fittings as fresh water plumbing systems in new buildings or replumbing of existing buildings has been prohibited. As a result, new buildings constructed or existing buildings replumbed after 1995 should have used corrosion-resistant water pipes. The problem of discolouration due to rusting water pipes for these buildings is not common.

If the registered consumer or the registered/agent experiences water quality problems due to corroded water pipes or fittings, he/she should consider replacing the corroded water pipes and fittings by new ones. When replumbing is necessary, the registered consumer or registered agent should obtain approval of the WSD before carrying out the replumbing work.

The “Building Safety Loan Scheme” managed by the Buildings Department aims to provide loans to individual owners of all types of private buildings including domestic, composite, commercial and industrial buildings who may wish to obtain financial assistance in carrying out works (including replacing water supply pipes) for improving the safety of their buildings. The registered consumer or registered agent may apply for financial assistance from the scheme if applicable.

Choice of Pipe Materials

Pipes and fittings used in the fresh water plumbing systems shall comply with the latest version of the relevant standards and requirements in “Technical Requirements for Plumbing Works in Building”:

<https://www.wsd.gov.hk/en/plumbing-engineering/requirements-for-plumbing-installation/technical-requirements-for-plumbing-works-in-bldgs/index.html>

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2.4 Use of Filters or Purifiers

The quality of treated water supplied by the WSD to the customers at the connection points at the building lot boundary fully complies with the “Hong Kong Drinking Water Standards”. Provided

that the water is free from contamination within the plumbing system in a building, it is not necessary to use filter or purifier.

If the registered consumer or registered agent wishes to use filters or purifiers in the plumbing system, he/she should maintain the filters or purifiers properly by cleaning them or replacing the filter cartridges regularly according to the manufacturer's recommendations. Filters or purifiers which are not properly maintained will easily provide breeding grounds for bacterial growth and will give rise to health hazards.

2.5 Checking of Water Wastage

The registered consumer or registered agent can check if the fresh water plumbing system is leaking and wasting water by the following simple "Do-It-Yourself Method":

- i. Turn off all water taps in the premises.
- ii. Compare the water meter readings taken at the start and at the end of a 30-minute period (or longer if necessary) to see if the water meter is registering flow.
- iii. If the water meter registers flow when all water taps are turned off, it suggests that the plumbing system is leaking. The registered consumer or registered agent should employ a licensed plumber to conduct an investigation and to rectify the defects immediately.

It should be noted that the above method cannot detect very small leakage such as seepage. For seepage cases, the registered consumer or registered agent should employ a licensed plumber to conduct a thorough investigation and to rectify any defects found.

3. Quality Water Supply Scheme for Buildings – Fresh Water (Management System) and Water Safety Plan Subsidy Scheme

To encourage building owners and property management agents to maintain their plumbing systems properly, WSD launched “Fresh Water Plumbing Quality Maintenance Recognition Scheme” in July 2002, with the endorsement of the Advisory Committee on the Quality of Water Supplies (the predecessor of the Advisory Committee on Water Supplies (ACWS)). The said scheme was re-titled “Quality Water Recognition Scheme for Buildings”, “Quality Water Supply Scheme for Buildings – Fresh Water” and “Quality Water Supply Scheme for Buildings – Fresh Water (Plus)” (Q-Plus) in January 2008, March 2015 and December 2015 respectively to signify enhancement features.

Notwithstanding that the water supplied by WSD is safe to drink, the water quality can be affected in the internal plumbing systems due to various factors, such as the drinking water tank is not properly cleaned, or the internal water supply system is contaminated due to stagnation of water or use of inappropriate plumbing materials. Noting this, WSD developed a set of risk-management based guidelines and templates for the Water Safety Plan for Buildings (WSPB) in accordance with the recommendations of the World Health Organization (WHO) for the implementation by the property owners and management agents in their buildings to safeguard the quality of drinking water.

To encourage property owners and property management agents to implement WSPB and give recognition to property owners and property management agents who have implemented WSPB for safeguarding the quality of drinking water, WSD launched the scheme “Quality Water Supply Scheme for Buildings – Fresh Water (Management System)” (QMS) with support from the Advisory Committee on Water Supplies by integrating WSPB with the “Quality Water Supply Scheme for Buildings” on 6 November 2017.

Participation in the scheme is voluntary and the target groups to join the scheme are property owners, owners’ corporations and property management agents in general. WSD will award certificates to successful buildings to recognise proper maintenance of their internal plumbing systems with adoption of WSPB. The names of the buildings, the names of the owners’ corporations and building management agents are shown on the certificates to commend their contributions. The certificates or their copies could be displayed in those awarded buildings, stationeries and promotional materials, subject to the

WSD's guidelines. The certificates are classified into three grades according to the length of the continuous period for which a building has joined the scheme:

<i>Type of certificate</i>	<i>Length of continuous participation</i>	<i>Validity</i>
Blue – new application	-	2 years
Blue – renewal	Less than 4 years	
Silver – renewal	4 years or more but less than 6 years	
Gold – renewal	6 years or more	

Renewal applications submitted later than 3 months after the expiry date of the last certificates will be considered as new applications. The certificates are properties of the WSD, and their validity is subject to continuous satisfactory maintenance of the internal plumbing systems in accordance with the WSPB within the validity period.

Besides, the Chief Executive announced in the 2019 Policy Address the launch of the “Water Safety Plan Subsidy Scheme (WSPSS)” providing eligible property owners or management agents of private buildings with financial assistance to initiate the implementation of the WSPB at their premises. A funding HK\$440 million has been allocated over five years to subsidize the eligible applicant the adoption of WSPB. WSPSS has been opened for application from 13 July 2020.

Any enquiry about the above scheme can be made through the WSD telephone enquiry hotline or by fax or by e-mail. More details about the Scheme could also be found on our website.

Telephone Enquiry Hotline: 2824 5000
Fax: 2824 0578
E-mail: wsdinfo@wsd.gov.hk
Website: www.wsd.gov.hk

Appendix 1

Troubleshooting

The common water supply problems encountered are water quality problems, weak water supply and no water supply.

(1) Water Quality Problems

Drinking water should be clear with a very slight chlorine odour detectable only to those sensitive consumers.

Sometimes, tap water may appear milky white. One possible cause of this is the minute air bubbles trapped in the fresh water plumbing system. These minute air bubbles are air drawn in through the air valves installed in the plumbing system. This has nothing to do with the water quality. When the minute air bubbles escape from the water, the water will become clear again.

If the water remains stagnant in rusty water pipes for a long time, it may look cloudy and discoloured due to the presence of very fine suspension of iron oxide. In most cases, although the water may be aesthetically unpleasant, it is still suitable for drinking as the amount of iron is very minute.

If there are suspected water quality problems in the premises, the registered consumer is suggested to leave the water running for a moment to see if the water will become clear again.

If the problem persists, the registered consumer is suggested to check with the neighbours first. If the neighbours experience no water quality problem, the problem likely lies within the registered consumer's own plumbing system, in which case the registered consumer should employ a licensed plumber to check his/her plumbing immediately.

If water quality problem is also experienced by the neighbours, the registered consumer is suggested to check with the registered agent to see if the roof water tank and sump water tank have been cleansed recently or there is any corroded pipework in the plumbing system. If the registered agent still cannot find out the cause, please contact the WSD's Customer Telephone Enquiry Centre at 2824 5000.

Appendix 1(cont'd)

Troubleshooting

(2) Weak Water Supply

If a registered consumer experiences weak flow at the taps, he/she should check with the registered agent to see if the problem is due to any works in the building or due to defects of the pumps or the plumbing system such as the main control valve, stopcocks etc.

If the problem is not due to the above defects, the registered consumer is suggested to engage a licensed plumber to conduct an investigation. If the licensed plumber cannot find out the cause of the problem, please contact the WSD's Customer Telephone Enquiry Centre at 2824 5000 for assistance.

(3) No Water Supply





If a registered consumer has no water supply in his/her premises, he/she should check with his/her neighbours to see if they have normal water supply. If his/her neighbours have normal supply, the problem likely lies within the registered consumer's own plumbing system, in which case the registered consumer should employ a licensed plumber to check his/her plumbing immediately.

If neighbours also do not have water supply, the registered consumer should check with the registered agent to see if it is due to defects of the common sump-and-pump system or emergency maintenance works in the building. If the registered consumer still cannot find out the cause, please contact the WSD's Customer Telephone Enquiry Centre at 2824 5000.

Appendix 2

Examples of Maintenance Practices

Some common examples of good and bad practices in relation to fresh water plumbing systems are illustrated below:

Good Practices	Bad Practices
<p>(Diagram_Clean Water Tank)</p>  <p>Clean Water Tank</p>	<p>(Diagram_Dirty Water Tank)</p>  <p>Dirty Water Tank</p>
<p>(Diagram_Water Tank with Raised Neck & Double-sealed Cover)</p>  <p>Water Tank with Raised Neck & Double-sealed Cover</p>	<p>(Diagram_Defective Water Tank Cover)</p>  <p>Defective Water Tank Cover</p>

(Diagram_Overflow Pipe with Self-closing Lid)



Overflow Pipe with Self-closing Lid





(Diagram_Overflow Pipe without Lid)



Overflow Pipe without Lid

Appendix 2(Cont'd)

Examples of Maintenance Practices

Good Practices	Bad Practices
<p data-bbox="175 367 797 453">(Diagram_Water Tank with Proper Maintenance)</p>  <p data-bbox="175 947 662 982">Water Tank with Proper Maintenance</p>	<p data-bbox="824 367 1373 403">(Diagram_Poorly Maintained Water Tank)</p>  <p data-bbox="824 942 1224 978">Poorly Maintained Water Tank</p>
<p data-bbox="175 1008 743 1043">(Diagram_Properly Maintained Water Pipe)</p>  <p data-bbox="175 1533 594 1568">Properly Maintained Water Pipe</p>	<p data-bbox="824 1008 1247 1043">(Diagram_Corroded Water Pipe)</p>  <p data-bbox="824 1533 1097 1568">Corroded Water Pipe</p>

(Diagram_Proper Meter Box)



Proper Meter Box

(Diagram_Inaccessible Water Meters)



Inaccessible Water Meters

Appendix 3

Cleansing Procedures for Water Tanks

Guidelines for Cleansing Fresh Water Tanks

Registered agents or management offices should cleanse the fresh water tanks once every 3 months.

1. Display notice at conspicuous locations of the building to notify all the affected occupiers the date and the duration of water supply suspension. The notice should also contain reminders on what the occupants should do before and after water tank cleansing including keeping all taps closed until cleansing of the internal plumbing system has been completed.
2. Water tank is classified as confined space. To safeguard the safety of the working staff, it is required to ensure that the cleansing procedures comply with the relevant statutory requirements for safety, such as the Factories and Industrial Undertakings (Confined Spaces) Regulations, Cap 59AE. Attention should be paid to the safety measures and requirements on the aspects of lighting, ventilation, gas and personal protective equipment.
3. Empty the water tank(s) through the washout pipe(s) and/or drain(s).
4. Thoroughly cleanse and scrub the water tank(s) (including the bottom, internal walls, internal roof and bottom of the water tank cover) and the inlet/outlet pipes with fresh water. It is recommended to scrub manually or to use high pressure jet for cleansing.
5. Drain away the dirty water through the washout pipe(s) and/or drain(s) of the water tank(s) after cleansing, and remove the sediments and other impurities from the bottom of the water tank(s).
6. Scrub the water tank(s) thoroughly with a solution containing not less than 50 mg/L of chlorineⁱ. Proper personal protective equipment such as gloves should be used during preparation of the solution.
7. Rinse and scrub the water tank(s) thoroughly with fresh water to remove the residual chlorine water and sediments.
8. Drain away the rinsing water through the washout pipe and/or drain of the water tank(s).
9. Refill the water tank(s) with fresh water.
10. Notify affected occupiers to flush the taps for 2 minutes after resumption of supply before using water.

Notes:

- i. For bleaching powder containing about 33% of available chlorine in weight, a 50 mg/L chlorine solution can be prepared by mixing 15 grams of bleaching powder in 100 L of water. Bleaching solution with active chlorine in the range of 5% (50,000 mg/L) to 10% (100,000 mg/L) available in market can also be used for preparation of 50 mg/L of chlorine solution. A 50 mg/L chlorine solution can be prepared by mixing 100 mL of 5% bleaching solution or 50 mL of 10% bleaching solution in 100 L of water.

Appendix 4

Typical Inspection Checklists for Components of a Fresh Water Plumbing System

Components	Inspected by	Checklist	Findings	Recommendations / Follow up actions
Supply System Arrangement	Registered Agents	Is the fresh water tank connected to the fire service water tank?	Yes.	It gives rise to potential danger of contamination to the fresh water plumbing system. The registered agent should apply for an independent fire service connection immediately.
		Is the originally approved sump and pump system converted to direct supply system?	Yes.	It may give rise to weak water supply. A licensed plumber should be employed to restore the supply system to the originally approved sump and pump system.
Meter of Accounts	Registered Agents & Registered Consumers	Is the water meter registering normally?	The water meter does not register flow when the tap is opened. OR The flow registered by the water meter is fluctuating when the water is flowing steadily out of the taps.	The water meter may be defective. Please request the WSD to arrange for an inspection.

		Does the water meter register flow when all taps in the flat are closed?	Yes.	This is an indication that the water pipe is leaking. A licensed plumber should be employed to check.
		Is the water meter housed in a meter room or box?	No.	To protect the water meter against exposure to weather, falling objects and other undue external interferences, a licensed plumber should be employed to house the water meter in a meter room or box.
Water Pipes	Registered Agents & Registered Consumers	Are the pipes or fittings fixed properly?	The pipes or fittings are loosely fixed.	This may give rise to potential leakage at the pipe joints or fittings and vibration noise. A licensed plumber should be employed to fix the supports or fittings properly.
		Is there any vibration noise?	Vibration noise occurs when the water tap or valve is opened or closed quickly.	The water taps or valves should be opened or closed slowly to prevent vibration noise. If vibration noise still persists, a licensed plumber should be employed to check.
		Are the water pipes in good conditions?	Cracks are found on the surface of the water pipes.	The water pipes may leak or even burst. A licensed plumber should be employed to check and to replace them.

		Are the water pipes free of any sign of corrosion or leakage?	There are signs of corrosion or leakage in the water pipes.	A licensed plumber should be employed to check and to replace them.
		Are abandoned water pipes and fittings disconnected?	No.	A licensed plumber should be employed to disconnect the abandoned water pipes and fittings and to plug the ends of the disconnected pipes.

Appendix 4(Cont'd)

Typical Inspection Checklists for Components of a Fresh Water Plumbing System

Components	Inspected by	Checklist	Findings	Recommendations / Follow up actions
Water Pipes	Registered Agents & Registered Consumers	Are the fresh water pipe connected to the flushing water pipes?	Yes.	It gives rise to potential danger of contamination to the fresh water plumbing system. A licensed plumber should be employed to disconnect the connection immediately.
Water Taps	Registered Agents & Registered Consumers	Are the water taps watertight?	Water is leaking out of the water taps.	A licensed plumber should be employed to repair or replace them.
		Is there any attachment (including a hose pipe) fixed to a tap or outlet to cause backflow of water?	Attachment such as a hose pipe is fixed to a tap or outlet.	To prevent water from backflowing to the fresh water plumbing system, the attachment should be disconnected.
		Is the seal of the taps in good condition?	Water is leaking out of the water taps.	A licensed plumber should be employed to repair or replace them.
		Are there sufficient cleaning taps provided at the car parks for car or floor washing?	No.	Please apply for new water supply for car or floor washing from the WSD.

Valves	Registered Agents & Registered Consumers	Are the working parts of the valves operated properly?	The working parts of the valves cannot move freely. OR Water is leaking from the valves when they are being operated.	The valves are not functioning properly. A licensed plumber should be employed to repair or replace them.
Pressure Reducing Valves	Registered Agents	Is the water pressure at the downstream side set to the designed value?	No.	The pressure reducing valve is not working properly. A licensed plumber should be employed to check the pressure reducing valve and replace it if necessary.
Meter or Valve Chamber Rooms	Registered Agents	Is the access door or cover easy to open?	No.	To facilitate meter reading and maintenance of the water meters, the access door/cover should be kept easy to open.
		Is there adequate floor space, headroom, lighting, ventilation and drainage, satisfactory hygienic environment and an independent entrance to the water meter or valve chamber room?	No.	To facilitate meter reading and maintenance of the water meters, adequate floor space, headroom, lighting, ventilation and drainage, good hygienic environment and an independent entrance to the meter or valve chamber room should be provided.

Pumps	Registered Agents	Is the pump operating without abnormal noise?	The pump is operating with abnormal noise.	This is an indication that the pump is not working properly. A licensed plumber should be employed to check the pump and replace it if necessary.
		Are all components of the pump free of corrosion?	There are signs of corrosion in some components of the pump.	A licensed plumber should be employed to replace the corroded components with components that are not susceptible to corrosion.

Appendix 4(Cont'd)

Typical Inspection Checklists for Components of a Fresh Water Plumbing System

Components	Inspected by	Checklist	Findings	Recommendations / Follow up actions
Water Tanks	Registered Agents	Are the fresh and flushing water tanks connected?	Yes.	This gives rise to potential contamination to the fresh water tank. A licensed plumber should be employed to disconnect the connection immediately.
		Is the water tank free of leakage or overflow?	There are signs of leakage or overflow in the water tank.	This is an indication that the water tank is not working properly. A licensed plumber should be employed to inspect the water tank and rectify the defects.
		Are all components of the water tank free of corrosion?	There are signs of corrosion in some components of the water tank.	A licensed plumber should be employed to replace the corroded components with components that are not susceptible to corrosion.
		Are the supports of the water tank rigid and secured?	No.	The water tank supports should be fixed properly.
		Is the overflow or warning pipe working properly and kept free from obstructions?	The overflow pipe or warning pipe is blocked.	The blockage of the overflow or warning pipe should be cleared immediately.

		Is the overflow or warning pipe provided with a grating and self-closing non-return flap?	No.	A licensed plumber should be employed to provide the overflow or warning pipe with a grating and self-closing non-return flap.
		Is the access manhole provided with raised necks to prevent ingress of rain water etc.?	No.	The access manhole should be provided with raised neck.
		Is the access manhole cover double-sealed and locked to prevent ingress of water and insects etc.?	No.	A double-sealed cover under lock should be provided.
		Are all internal surface of floors, walls and ceilings of the fresh water tanks lined with a white non-toxic smooth finish such as ceramic tiles?	Not all internal surface of floors, walls and ceilings of the fresh water tanks are lined with a white non-toxic smooth finish.	To facilitate cleansing of water tanks, all internal surface of floors, walls and ceilings of the fresh water tanks should be lined with a white non-toxic smooth finish such as ceramic tiles.
		Is there any notice plate or board provided to record the dates when the water tanks are cleansed?	No.	A notice plate or board with the cleansing dates records should be provided. The notice plate/board should be securely fixed at a conspicuous location easily accessible and visible by the residents and the building management staff.

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