ACQWS Paper No. 8

Quality of Water in Buildings

(Supplementary Paper No.1)

Preamble

1. On 15 January 2001, Members discussed and deliberated ACQWS Paper No. 7 which presented possible strategies for enhancing the entire water supply system such that Hong Kong citizens can have the confidence to drink water direct from their taps. A summary of the strategies presented is in Appendix 1 and the key points are highlighted below:

Maintenance Aspects

- *WSD to encourage owners to include renovation of plumbing systems into their building maintenance programme*
- *WSD to require building management agents to carry out periodical checking of the plumbing system and submit inspection reports*
- *WSD to carry out repair for persistent non-compliance cases*

Other Aspects

- *WSD to continue efforts in upkeeping existing distribution systems*
- *Developers to adopt enhanced plumbing designs to protect water quality*
- *WSD to educate the public on the need to keep their plumbing systems well maintained*
- *WSD to amend accordingly the Waterworks Ordinance and Waterworks Regulations*

The Meeting had a good discussion on the maintenance aspects of plumbing systems. Members opined that it would be helpful to gather more information on the maintenance requirements and practices in other Asian cities for reference.

2. The purpose of this paper is to present to Members such information collected to develop the strategies further and to map out the proposed strategies for the development of implementation programmes for Members' consideration. Subject to further advice from Members, a detailed strategy and implementation plan will later be drawn up for public consultation.

Maintenance Requirements and Practices in Asian Cities

3. Questionnaires were sent to Shenzhen, Taipei, Singapore, Kuala Lumpur and Tokyo requesting for information on their maintenance requirements on plumbing systems. To understand better the Singaporean system, we also sent a senior engineer to interview the officials of the Water Department of the Public Utilities Board (PUB) of Singapore.

4. We have received returns from 4 cities. From these returns, we learn that Shenzhen imposes maintenance requirements in their statutory regulations while Singapore stipulates such requirements in a non-statutory Code of Practice. On the other hand, Taipei and Kuala Lumpur do not stipulate any specific requirements. A summary of the feedback received from the 4 cities is at Appendix 2.

5. In respect of maintenance requirements, the Shenzhen regulations require that :

(i) cleaning and satisfactory sterilisation of water tanks be carried out by a registered specialist contractor at least half-yearly,
(ii) testing on the water quality at inlets and outlets of water tanks be carried out by the "Shenzhen Water Quality Testing Centre" at the cost of the building management agent,
(iii) a penalty of ¥3,000 be imposed on those failing to carry out the above.

6. The Singaporean practice recommends building owners to arrange, at least once a year, for :

(i) inspection and cleaning of cisterns, and
(ii) sampling and examination of water by a water analyst (the tests to be carried out comprise pH, colour, turbidity, conductivity, residual chlorine, iron, Presumptive E. coli Count and Total Coliform Count).

We understand that the recommendations are adopted and followed in Singapore in all housing estates under the Housing Development Board and in all government buildings. For private estates, the recommendations are followed on a voluntary basis. From our interview with the PUB, we are given to understand that Singapore is now contemplating legislative amendments to make these requirements compulsory in order to step up control.

Situation in Maintenance of Plumbing System in Hong Kong

7. Looking back at Hong Kong, consumers are becoming increasingly aware of the need to maintain their plumbing systems properly. Buildings with good management are having their water tanks cleaned regularly. Building owners are now more willing to include replumbing as part of the renovation of old buildings. In the public sector, the Housing Authority has been implementing plumbing inspection and replacement programme to upkeep plumbing systems. They have completed substantial replumbing for 47 out of 177 estates.

8. Yet, there are still problems in many old buildings, where owners take an attitude of doing just the minimum (or somewhat less than the minimum) towards repair or maintenance of their plumbing system. Also, these buildings lack proper management and regular coordination amongst building owners and occupants. It is very common that the owners who should be responsible for maintenance may lack the money, coordination skill, knowledge or willingness to arrange maintenance. Therefore, particular attention has to be given to resolve this issue.

Considerations in Devising Strategies in Respect of Upkeeping of Plumbing System

9. From the feedback of the 4 cities to our questionnaires, different policy perspectives are seen, ranging from a highly regulatory arrangement to a laissez-faire policy allowing consumers to make their own choice in how to maintain their plumbing.

10. In the last meeting, Members deliberated on how far the maintenance requirements should cover the internal plumbing of buildings. Should the requirements be imposed on the whole plumbing system? Or should they be limited to the communal part of the system, leaving it to individuals to make their own choice in respect of the part of the system affecting supply only to themselves?

Revisiting of Proposed Strategies

Maintenance Aspects

11. Based on the information gathered from the 4 Asian cities, the following strategies on maintenance are revisited and modified where necessary:

a. WSD to Encourage Owners to Include Renovation of Plumbing Systems into their Building Maintenance Programme

(i) Building owners are to be encouraged to include the renovation of plumbing systems in their building maintenance programme

(ii) Where needed, use can be made of loans available for application from the BD's Building Safety Loan Scheme (BSLS)[1]

b. WSD to Require Building Management Agents to Carry Out Periodical Checking of the Plumbing System and Submit Inspection Reports

(i) A system should be established to register agencies/bodies for cleaning, inspection, checking and rectifying internal plumbing systems including water sampling and testing.

(ii) Consumers should be required to employ such registered bodies to arrange for periodical checking, water sampling and testing, rectification of defects and submission of inspection reports to WSD. In determining the frequency of sampling and testing, considerations can be given on desirable water quality requirements, the age of plumbing system and the type of plumbing materials. Having regard to the quality of water we supply to connection points, the testing requirements are as suggested in Appendix 3 (which are similar to the requirements imposed in Singapore).

(iii) A staged implementation approach should be considered to allow voluntary compliance in the first stage and to review the need of making the requirements statutory in the second stage.

(iv) A monitoring system is required for inspection of plumbing systems in old buildings

c. WSD to Carry out Repair for Persistent Non-compliance Cases (No change since the last meeting)

(i) WSD should be empowered to carry out necessary repair work when technically feasible for consumers at their costs with or without their consent for persistent non-compliance cases

(ii) WSD should be empowered to register by memorial in the Land Registry against the premises with outstanding reimbursement.

[1] The BSLS (known formerly as the Comprehensive Building Safety Improvement Loan Scheme) is a loan scheme with a commitment of $700 million to assist building owners to enhance building safety through timely/preventive maintenance. The scheme has commenced on 1 July 2001. Amongst other matters involving building safety, the maintenance and replacement of plumbing to prevent leakage are within the scope of the scheme because of potential safety concerns that may arise from leaking pipes.

Other Aspects

Developers to Adopt Enhanced Plumbing Designs to Protect Water Quality

12. To facilitate developers to adopt enhanced plumbing designs to protect water quality and ensure that the latest technology and best international practices in preserving drinking water quality in buildings are adopted, it is suggested that a code of practice should be developed for practitioners to follow. One important aspect of this code is to enhance the safety of drinking water for each consumer against possible contamination caused by a third party for example, as a result of backflow from the plumbing system of the third party. As inputs are required from various professions, an interdepartmental working group with trade representatives is needed.

The Proposed Strategies – a sum-up

13. Recapitulating from the above paragraphs and consolidating also previous discussions on the ACQWS Paper No. 7, the following possible strategies are proposed:

Maintenance Aspects

- *WSD to encourage owners to include renovation of plumbing systems into their building maintenance programme*
- *WSD to require building management agents to carry out periodical checking of the plumbing system and submit inspection reports*
- *WSD to carry out repair for persistent non-compliance cases*

Other Aspects

- *WSD to continue efforts in upkeeping existing distribution systems*
- *Developers to adopt enhanced plumbing designs to protect water quality*
- *WSD to educate the public on the need to keep their plumbing systems well maintained*
- *WSD to amend accordingly the Waterworks Ordinance and Waterworks Regulations*

14. When the new maintenance requirements are introduced, the Government should set an example as a responsible building owner and take the lead in adopting these requirements in government buildings. As instillation of drinking direct from the tap involves a change in habit or even culture, it takes time to root. Therefore, the following implementation strategies are also proposed:

(i) A staged approach is to be adopted. In the first stage, building owners are allowed to adopt the new requirements on a voluntary basis. In the second stage, a review is to be conducted to see whether there is any need to make such requirements mandatory by legislation.
(ii) To address the difficulties faced by some consumers, a coordinated approach bringing together assistance from relevant governments, including HAD, BD and WSD is to be adopted.

Proposed Implementation Programme

First stage –(3 years)

15. In this stage, the theme is to instil the drinking-direct concept and the ways to ensure drinking water quality. To ensure that the concerns and needs of consumers in the issue of drinking direct from the tap are taken into account, an opinion survey should be conducted. Based on the findings, promotional themes should be formulated to address the concerns and needs of consumers with particular emphasis on safety, convenience, energy-saving and cost-saving.

16. It is proposed that the new maintenance requirements be compulsorily adopted in all government and quasi-government buildings in a self-regulating manner.

17. To instil good practices in private buildings, private estates and management firms are encouraged to adopt the requirements and submit reports to WSD in return for recognition for adopting the good practices (eg in the form of an award scheme). As proper cleaning and sampling needs specialist skills, it is recommended only registered bodies under the control of a new register be qualified to carry out such work. WSD will set up a system to monitor the cleaning and send reminders on outstanding cleaning.

Second Stage - (5 years, subject to review)

18. If compliance rate to the new maintenance requirement is low or unsatisfactory, legislation to enforce annual inspection and testing of water samples for all buildings would be considered. In doing that, extensive consultation will be required, in particular in respect of the extent to which the statutory requirements should cover.

Advice Sought

19. Advice is sought from Members on the proposed strategies outlined above and on the way forward and any other proposals that Members might have. On the basis of such advice, a detailed first stage strategy and implementation plan will be developed for further advice from Members before public consultation is conducted.

Water Supplies Department
July 2001

Summary of Strategies Presented in the Meeting on 15 January 2001

WSD to Continue Efforts in Upkeeping the Existing Distribution Systems

- WSD to continue constant monitoring, replacement/rehabilitation of old water mains and regular flushing of dead-end mains

Developers to Adopt Enhanced Plumbing Designs to Protect Water Quality

- Developers to adopt plumbing designs with long term water quality at taps as the prime objective
- Requirements on high quality corrosion-resistant pipes and fittings to continue
- Pneumatic pumping systems to be used as a mandatory or voluntary requirement to minimise water quality problems

WSD to Educate the Public on the Need to Keep their Plumbing System Well Maintained

- Community publicity programmes to propagate the responsibility of consumers to properly maintain internal plumbing system
- Joint efforts with other government departments to instill to home owners the need to set up owners' corporations
- Publicity to strengthen public confidence in treated water quality and to combat prejudice against drinking water from taps provided the plumbing system is well maintained

WSD to Encourage Owners to Include Renovation of Plumbing Systems into their Building Maintenance Programme

- Owners to be encouraged to include the renovation of plumbing systems in the building maintenance programme
- Loans available from the BD's Comprehensive Building Safety Improvement Loan Scheme
- Inspection of plumbing systems to be included in BD's possible Preventive Maintenance of Buildings Scheme (PMBS)

WSD to Require Building Management Agents to Carry Out Periodical Checking of the Plumbing System and Submit Inspection Reports

- To require consumers to employ Licensed Plumbers to arrange for periodical checking, water sampling and testing, rectification of defects and submission of inspection reports to WSD.
- A system to be established to register plumbing contractors for cleaning and inspection of internal plumbing systems.
- A database to be set up for monitoring inspection of plumbing in old buildings.

WSD to Carry out Repair for persistent Non-compliance Cases

- WSD to be empowered to carry out necessary repair work when technically feasible for consumers at their costs with or without their consent for persistent non-compliance cases
- WSD to be empowered to register by memorial in the Land Registry against the premises with outstanding reimbursement.

Amend Waterworks Ordinance and Waterworks Regulations

- For strategies which requires amendments to the Waterworks Ordinance and extensive consultation would be carried out.

Summary of Questionnaire on the Maintenance Requirements in Internal Water Supply System

Country/City / Aspects	Shenzhen, China	Singapore	Malaysia	Taiwan
(a) Drinking habit direct from tap?	No.	No.	No.	No, except at drinking fountains of Taipei Rapid Transit Corporation Stations.
(b) Design of internal water supply systems in high-rise buildings?	Sump & pump system. No pneumatic pump / direct booster is allowed.	Sump and pump system.	Mostly sump and pump system.	Sump and pump system.
(c) Maintenance requirements of internal water supply systems?	The water company entrusted to clean and sterilize communal water tanks half-yearly for low-rise buildings; the management company to clean & sterilize communal water tanks for high-rise buildings.	Water storage cisterns are required to be inspected and certified annually by a licenced water service plumber engaged by the owner of the building.	The consumer is responsible for maintaining water quality within the private premises.	The consumer is responsible for maintaining water quality within the private premises. It is recommended to clean and sterilize tanks yearly.
(d) Are requirements statutory?	Yes. Management of Indirect Drinking Water Supply System by 'City Water Supply Ordinance of Shenzhen Special Economic Zone'.	Yes/No? The need for maintenance is stated in the regulations but not the specific requirements	No.	No.
(e) Enforcement tools?	- No cleaning (including sterilization): ¥3000 penalty + works arranged charged at the cost of consumer/agents. - Not by a specialist contractor: confiscate overall revenue illegally obtained + penalty of 3 times revenue. - Specialist contractor not using	-	No.	No.

Country/City / Aspects	Shenzhen, China	Singapore	Malaysia	Taiwan
	registered personnel: ¥ 1000 penalty.			
(f) Submission of water examination reports required?	Yes. Reports submitted to the water company and the Health Bureau.	Yes. Reports submitted to the Director, Water Department.	No.	No.
(g) Any standard forms or area to be covered in the examination reports?	Under the jurisdiction of the water company and the Health Bureau.	Yes. Inspection report form attached at Appendix 3.	No.	No.
(h) Is professional / specialist contractor required to carry out the works?	Yes, by specialist contractors	Yes, by Licensed Water Service Plumber.	No.	No.
(i) Examination frequency?	At least twice a year.	At least once annually.	-	-
(j) Accredited laboratories required to carry out the laboratory tests?	Yes, by Shenzhen Water Quality Testing Centre	Yes, by Government laboratory or laboratory accredited by Singapore Accreditation Council.	-	-
(k) The order of costs?	Fees to be approved by the relevant authority.	Not available.	-	-
(l) What other measures to ensure water quality in buildings?	Abandoning the use of GI pipes since June 2000 and to encourage use of high quality pipes.	To ensure corrosion-resistant tanks are used and properly sealed.	To ensure sufficient residual chlorine in water.	To publicize in the media the importance of regular cleaning water tanks and provide a list of specialist contractors for cleaning water tanks.

Appendix 3 to
ACQWS Paper No. 8

Proposed Testing Requirements

Analysis Parameters	**Estimated Cost on Individual Test Item based on market price (HK$)**
Chemical	
pH	110
Colour	250
Turbidity	140
Conductivity	130
Residual Chlorine	260
Iron	230
Bacteriological	
Presumptive E. coli Count	400
Total Coliform Count	400
Total	1920