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Water Supplies Department
總部 Headquarters
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48/F, Immigration Tower, 7 Gloucester Road, Wan Chai, Hong Kong

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27 June 2022

Distribution: To all Licensed Plumbers and Authorized Persons

Dear Sirs,

WSD Circular Letter No. 5/2022

Updated Water Sampling Requirements for Commissioning of Fresh Water Plumbing System

This Circular Letter updates the following water sampling requirements for commissioning of fresh water plumbing system:

(i) The sampling protocol for water tanks for commissioning test of fresh water plumbing system and the acceptance criteria of the parameters including pH at 25℃, Free Residual Chlorine and Conductivity at 25℃ for the water sampling tests in accordance with Appendix 19(B) of "Guide to Application for Water Supply" are updated as in **Appendix A**.

(ii) To enhance the comprehensiveness and completeness of submission test reports for water sampling, the requirements on test report for water sampling in commissioning of fresh water plumbing system are updated as in **Appendix B**. In particular, a checklist in **Annex III of Appendix B** should also be included in the submission of test report to ensure compliance with the stipulated requirements.

Effective Date

2. The above updated requirements will apply to the works covered by Form WWO 46 Part IV submitted on or after 30 June 2022.

Enquiry

3. Should you have any enquiry, please contact our Engineer/Technical Support(4) at telephone no. 2829 5657.

Yours faithfully,

(Original Signed)

(YAU Hau Yin)
for Water Authority

Encl.
(with Chinese translation)

c.c.
Housing Department (Attn: SM/QM)
Buildings Department
Architectural Services Department
Fire Services Department
The Hong Kong Housing Society
The Hong Kong Institute of Architects
The Hong Kong Institution of Engineers
The Hong Kong Institute of Surveyors
The Chartered Institute of Plumbing and Heating Engineering – Hong Kong Branch
Hong Kong Plumbing and Sanitary Ware Trade Association Ltd.
Hong Kong Licensed Plumbing Professionals Association Ltd.
Hong Kong Water Works Professionals Association Ltd.
The Hong Kong Institution of Plumbing and Drainage Ltd.
Plumbing Technology Student Association
The Association of Registered Fire Service Installation Contractors of Hong Kong Limited
Real Estate Developers Association of Hong Kong
Hong Kong Institute of Vocational Education
Hong Kong Institute of Construction, Construction Industry Council
The Hong Kong Construction Association, Ltd.

Hong Kong General Building Contractors Association Ltd.
The Hong Kong Federation of Electrical & Mechanical Contractors Ltd.
Contractor's Authorised Signatory Association Ltd.
Registered Minor Works Contractor Signatory Association Ltd.
Hong Kong Registered Contractors Association Company Ltd.
Hong Kong Licensed Plumbers Union Limited
Hong Kong Metropolitan University Li Ka Shing School of Professional and Continuing Education
The Association of Electrical and Mechanical Engineering (Hong Kong) Ltd.
Pipeman Engineering (International) Limited
Hong Kong Institute of Water and Sanitation Safety

WSD 3318/15/81

Sampling Protocol for Commissioning Test of Fresh Water Plumbing System

1 General

1.1 This sampling protocol is applicable for collection of water samples at water sampling tap, connection point and water tank for commissioning of newly installed or replaced inside services for fresh water supply in occupied or unoccupied buildings.

1.2 Site supervisors/testing laboratories shall take necessary measures and maintain relevant records to ensure that the water samples are:

a) taken by a competent person with proper training supported by relevant training records on the sampling procedures and handling of the water samples.
b) representativeness of the water quality of the new plumbing system at the time of sampling
c) free from contamination during the course of sampling, sample storage and transportation.

1.3 Sample Bottles

1.3.1 Sample for Metal Tests: Sample bottles shall be made of PE, PP, FEP, PE-HD or PTFE[1], with a capacity of 1 litre (L) each. Sample bottles and caps shall be: (i) thoroughly cleaned with a phosphate-free detergent solution; (ii) thoroughly rinsed with deionised water; (iii) soaked in dilute nitric acid (~10% volume dilution of concentrated HNO_3) or dilute hydrochloric acid (~25% volume dilution of concentrated HCl) for 24 hours; (iv) rinsed with deionised water several times; and (v) dried and kept tightly capped in storage.

1.3.2 Sample for Chemical and Physical Tests: Sample bottles shall be made of plastics or glass except soda glass with a capacity of 500 mL. The bottles shall be prepared in accordance with the ISO 5667-3.

1.3.3 Sample for Bacteriological Tests: Sample bottles shall be glass or plastics with a capacity of 250 mL and the recommendations for sample bottles given in ISO 19458 shall be followed. The bottles shall be prepared in accordance with the ISO 19458. Sufficient amount of sodium thiosulfate (7.1 mg of sodium thiosulfate (pentahydrate) can neutralise 1 mg of residual chlorine) shall be added into the sample bottle to remove the residual disinfectant present in the water sample.

[1] PE: polyethylene; PP polypropylene; FEP: perfluoro (ethylene-propylene) plastic; PE-HD: high density polyethylene; PTFE: polytetrafluoroethylene

1.4 Water samples shall not be taken at the following drinking water tap or sampling tap:

a) Leaking tap
b) Drinking water tap installed with an inline water filter or a point-of-use filter with no bypass switch
c) Insufficient space below the tap to accommodate the sampling bottle
d) Environment with high risk of contamination such as close to works site or dusty environment or dirty water tap

1.5 All information and observation regarding the sampling location shall be recorded, in particular, when a tap at a sampling location is considered not representative and rejected due to conditions mentioned in Clause 1.4 above.

1.6 Never rinse sample bottle prior to sample collection.

2 Collection of Water Sample from Potable Fresh Water Plumbing System (excluding fresh water flushing and fire service supply)

2.1 Collection of Water Samples for Heterotrophic Plate Count (HPC) Test at Water Tap/Connection Point*/Water Tank*.

2.1.1 For fresh water inside service in unoccupied buildings, before flushing, remove and cleanse the strainer. Flush the temporary sampling pipe/tap (for connection point*/water tank*) or water tap for at least 2 minutes. Close the sampling pipe/tap or water tap and reinstall the strainer after flushing. Disinfect the sampling pipe/tap or water tap in accordance with ISO 19458. Open the sampling pipe/tap or water tap and flush briefly[2] with a view to collecting a representative sample from the plumbing system for commissioning test. Place a sterile sample bottle under the sampling pipe/tap or water tap and take a 250-mL sample for testing of HPC. For fresh water inside service in occupied buildings, after collecting the water sample for testing of HPC as above, the strainer is removed and cleansed, followed by 3 minutes flushing at the sampling pipe/tap or water tap. Then the strainer is reinstalled to the water tap before commencing the 30-minute stagnation period in Clause 2.2.1.

2.2 Collection of Water Samples for Metal, Chemical, Physical and *E. coli* Tests after Water Stagnation.

[2] Flush briefly only to overcome influence of disinfection of the tap or to remove non-representative volume of sample trapped inside temporary sampling pipe and tap which is not part of the new plumbing system.

2.2.1 Always collect the water sample for metal testing first after the stagnation period (For fresh water inside service in unoccupied buildings, the stagnation period is minimum 6 hours. For fresh water inside service in occupied buildings, the stagnation period is minimum 30 minutes) followed by collection of water samples for analysis of chemical, physical parameters and *E. coli*. The start time of stagnation and the collection time of stagnation samples shall be recorded.

2.2.2 Sample Collection at Water Tap

2.2.2.1 At the end of the required stagnation period, place a 1-L sample bottle for metal testing under the tap. Collect 1 L of water with the tap opened as much as possible without spillage. Never rinse the sample bottle before sample collection.

2.2.2.2 Immediately after collection of the 1-L water sample, place a 500-mL sample bottle for chemical and physical testing under the tap and collect 500 mL of water. Close the tap after sample collection.

2.2.2.3 Disinfect the tap in accordance with ISO 19458. Open the tap and flush briefly[3] with a view to collecting a representative sample from the new plumbing system for commissioning test. Place a sterile sample bottle under the tap and take a 250-mL sample for testing of *E. coli*.

2.2.3 Sample Collection at Connection Point*/Water Tank*

2.2.3.1 For sample collected from temporary sampling pipe/tap, at the end of the required stagnation period, open the sampling pipe/tap and flush briefly[3] with a view to collecting a representative sample from the plumbing system for commissioning test. Place a 1-L sample bottle for metal testing under the sampling pipe/tap immediately after the brief flushing. Collect 1 L of water without spillage. Never rinse the sample bottle before collection.

2.2.3.2 Follow Clauses 2.2.2.2 and 2.2.2.3 to collect water samples for chemical, physical and *E. coli* testing.

2A Collection of Water Sample from Fresh Water Flushing and Fire Service Supply

2A.1 Collection of Water Samples for Physical, Chemical and Bacteriological Tests at Connection Point

[3] Flush briefly only to overcome influence of disinfection of the tap or to remove non-representative volume of sample trapped inside temporary sampling pipe and tap which is not part of the new plumbing system.

2A.1.1 Flush the temporary sampling pipe/tap for connection point for at least 2 minutes. Place a 500-mL sampling bottle for physical and chemical tests under the sampling pipe/tap and collect 500 mL of water. Close the sampling pipe/tap after sample collection.

2A.1.2 Disinfect the sampling pipe/tap in accordance with ISO 19458. Open the sampling pipe/tap and flush briefly[4] with a view to collecting a representative sample from the new plumbing system for commissioning test. Place a sterile sample bottle under the sampling pipe/tap and take a 250-mL sample for bacteriological tests (i.e. *E. coli* and HPC).

3 Sample Labelling and Transfer

3.1 All sample bottles shall be properly labelled immediately after sample collection to avoid inadvertent mislabelling and sample mix-up. Pack each water sample bottle in a plastic bag and store them in a cold box for transportation. Deliver the samples to an accredited laboratory for analysis as soon as possible after completion of the sampling. Care shall be taken to avoid sample contamination during sample collection, handling, storage and transportation.

4 Retesting Arrangement

4.1 The retesting arrangement in Table 1 shall be followed when any result(s) of parameter(s) fail(s) to comply with the acceptance criteria in Table 2.

Table 1: Retesting Arrangement

Parameters	**Scenarios**		
Metal parameters	fail	pass	pass
Physical and Chemical parameters	pass	fail	pass
Bacteriological parameters (*E. coli* and Heterotrophic Plate Count (HPC))	pass	pass	fail
Parameters to be retested	all parameters	all parameters other than metal	

[4] Flush briefly only to overcome influence of disinfection of the tap or to remove non-representative volume of sample trapped inside temporary sampling pipe and tap which is not part of the new plumbing system.

Table 2: Acceptance Criteria

Parameter	**Acceptance Criteria**
Chemical and Physical	
Turbidity	≤ 3.0 NTU
Colour	≤ 5 Hazen Unit
pH at 25ºC	≥ 6.5 and ≤ *9.5*
Free Residual Chlorine	≤ 1.5 mg/L
Conductivity at 25ºC	≤ *500* µS/cm
Metals	
Lead	≤ 10µg/L
Chromium	≤ 50µg/L
Nickel	≤ 70µg/L
Cadmium	≤ 3µg/L
Copper	≤ 2000µg/L
Antimony	≤ 20µg/L
Bacteriological	
HPC	≤ 20 cfu/mL
E. coli	0 cfu/100mL

5 Reference

5.1 ISO 5667-3:2018 “Water Quality -Sampling Part 3: Preservation and handling of water samples”

5.2 ISO 19458:2006 “Water Quality – Sampling for microbiological analysis”

Remarks: Extracted from Appendix 19(B) of Guide to Application for Water Supply, with updated parts in *italic*.

水務署 Water Supplies Department

Version 2
Issue Date: *June* 2022

Requirements on Test Report for Water Sampling in Commissioning of Fresh Water Plumbing System

1. An effective protective measure must be applied on all water sampling points for collecting stagnation water samples to ensure that the water tap will not be interfered with during the stagnation period. The protective measure must be applied before commencement of water stagnation and removed after the end of water stagnation by competent person with proper training on the sampling procedures and handling of the water samples. The water taps in close proximity of the sampling point (e.g. water taps for washing machine in the kitchen where water samples will be collected from the kitchen tap) must also be protected from interference.

2. The laboratories must ensure that the method adopted does not cause contamination and leaching of undesirable chemical to the water sampling point/water samples. The competent person must check and satisfy himself that whether the sampling points have been interfered with or contaminated during the stagnation period based on the protective measures. The accredited laboratories may refer to **Annex I** of this requirements for an example for the protective measures.

3. The following statement shall be provided on the Appendix of the test report if no interference and contamination is observed at the water sampling point:

   The prevailing "Sampling Protocol for Commissioning Test of Fresh Water Plumbing System" promulgated by WSD is followed. No interference and contamination to the water sampling point(s) is/are observed.

4. If it is found on site that there is interference with or contamination of the sampling point during the required stagnation period, the stagnation water sampling must be suspended.

5. The test report must state the time of commencement of water stagnation and time of collection of stagnation water samples. Photo records of the sampling points, protective measure applied and before removal *and all sampling bottle(s) and at the sampling point(s)* must also be provided on the Appendix of the test report, *using the template in* ***Annex II***.

6. *The test report must also state the test method reference and acceptance criteria for each testing parameters.*

7. *A unique sample ID must be assigned to each water sample in the test report.*

8. The existing arrangement for incorporating the compliance statement in the report should be followed.

9. *Checklist for Requirements on Test Report for Water Sampling in Commissioning of Fresh Water Plumbing System shown in* ***Annex III*** *should be included in the submission of water sampling test report.*

Remarks: The updated parts to the previous version are shown in *italic*.

Annex I

Examples of protective measures applied on water sampling points

1. One of the suggestion is to protect the water taps by using plastic bag and void label. The plastic bag should be capped on the outlet of the water tap and the void label should be stuck across the plastic bag and the tap body as shown in the illustration below.

2. The suggested specifications of the plastic bag and void label are as follows:

Specifications of no residue void label

Before Peeling

After Peeling

Non Transfer Effect

Size	:	100mm x 30mm
Colour	:	Characters in black colour under a red background
Material	:	No-residue type void label, water resistant ink and paper, "VOID" wording will appear on the label when after peeling off
Serial number	:	Serial number start with an alphabet and followed by a 5-digit number

Specifications of plastic bag

Size	:	70mm x 70mm (size should suit the design of the water tap)
Colour	:	Transparent
Material	:	LDPE that does not have leaching effect and cause contamination to the water samples
Adhesive effect	:	Void label can stick firmly on the plastic bag and to provide "VOID" wording when peel off.

3. Competent person shall record the serial number of the void label and take clear colour photo records both after applying the protective measures and after the required stagnation period. If there is no interference with the void label (e.g. no "VOID" text appears on the label) or no damage on the plastic bag or no water remains in the plastic bag, it is considered that the sampling point has not been interfered with.

For accredited laboratory reference only

Appendix to Test Report

Date of Issue: *dd/mm/yyyy* Report No.: XXXXXXXX

Sample Location *and Sample* ID	
Photo(s) (at the beginning of stagnation period)	*Insert photo(s) showing the protective measure applied at the sampling point (and at the water taps in close proximity of the sampling point).* Serial No. of Void Label applied: XXXXX *(if applicable)*
Date and time of commencement of water stagnation:	*dd/mm/yyyy, xx:xx*
Photo(s) (at the end of stagnation period)	*Insert photo(s) showing the protective measure before removal at the sampling point (and at the water taps in close proximity of the sampling point).*
Date and time of collection of stagnation samples:	*dd/mm/yyyy, xx:xx*

Sample Location *and Sample* ID	
Sampling Photo(s)	*Insert photo(s) showing all sampling bottle(s) and at the sampling point(s).*

Remarks:

1. The prevailing "Sampling Protocol for Commissioning Test of Fresh Water Plumbing System" (Sampling Protocol) promulgated by Water Supplies Department (WSD) is followed. No interference and contamination to the water sampling point(s) is/are observed.
2. The test results meet the acceptance criteria set by WSD regarding the test parameters set out in Table 2 of the prevailing Sampling Protocol promulgated by WSD.
   (For all test results complying the acceptance criteria based on the reporting value)
   OR
   The test result(s) do/does not meet the acceptance criteria/criterion set by WSD regarding the *[list the parameter(s) failed to comply with]* set out in Table 2 of the prevailing Sampling Protocol promulgated by WSD.
   (For some of the test result(s) not complying the acceptance criteria based on the reporting value)

Notes:
The sampling photos should be taken with a displaying board with the information of ASN, location, date and time.

Remarks: The updated parts to the previous version are shown in *italic*.

Checklist for Requirements on Test Report for Water Sampling in Commissioning of Fresh Water Plumbing System

I/We confirm that all requirements on the Test Report for Water Sampling in Commissioning of Fresh Water Plumbing System (Test Report) have been properly stated/provided as shown in the Test Report, failing which the application may be rejected by the Water Authority.

Item	Requirements on Test Report for Water Sampling in Commissioning of Fresh Water Plumbing System	Please tick (✓) if provided
The following requirements shall be stated in the Test Report:		
1.	Test method reference for each testing parameter	☐
2.	Acceptance criteria for each testing parameter	☐
3.	Unique sample ID assigned to each water sample	☐
4.	Time of commencement of water stagnation	☐
5.	Time of collection of stagnation water samples	☐
6.	Photo records at the sampling points: (i) protective measure applied and (ii) before removal and (iii) all sampling bottle(s) and at the sampling points	☐
7.	The compliance statement: "The prevailing 'Sampling Protocol for Commissioning Test of Fresh Water Plumbing System' promulgated by WSD is followed. No interference and contamination to the water sampling point(s) is/are observed."	☐
8.	The compliance statement: "The test results meet the acceptance criteria set by WSD regarding the test parameters set out in Table 2 of the prevailing Sampling Protocol promulgated by WSD." *(For all test results complying the acceptance criteria based on the reporting value)* *OR* "The test result(s) do/does not meet the acceptance criteria/criterion set by WSD regarding the *[list the parameter(s) failed to comply with]* set out in Table 2 of the prevailing Sampling Protocol promulgated by WSD." *(For some of the test result(s) not complying the acceptance criteria based on the reporting value)*	☐

(Accredited Laboratory's representative)

Signature : _____

Name : _____

Tel. no. : _____