Interim findings of the Hong Kong Housing Authority's Review Committee on Quality Assurance Issues Relating to Fresh Water Supply of Public Housing Estates

PURPOSE

This report summarizes the deliberations so far and interim findings of the Review Committee on Quality Assurance Issues Relating to Fresh Water Supply of Public Housing Estates (the Review Committee).

TERMS OF REFERENCE OF THE REVIEW COMMITTEE

2. The Review Committee was set up by the Hong Kong Housing Authority (HA) on 24 July 2015. Its composition is at **Annex A**. In accordance with its Terms of Reference (TOR), the Review Committee shall-

(a) comprehensively review the present arrangements for quality control and monitoring in relation to the installation of fresh water supply system in public rental housing (PRH) estates;

(b) in the process of (a), critically review various aspects of quality inspection relating to materials used (including pre-fabricated components), quality inspection and works supervision at different stages of construction; and

(c) report findings to the HA and recommend any improvement in procedures/ guidelines, and follow-up actions as necessary.

Separately, the Development Bureau has set up a Task Force on Excessive Lead Content in Drinking Water (Task Force)[1], and the Government has set up a Commission of Inquiry into Excess Lead Found in Drinking Water[2].

[1] The TOR of the Task Force is to: (a) carry out investigation to ascertain the causes of the recent incidents leading to presence of lead in water drawn by households; (b) recommend measures to prevent recurrence of similar incidents in future; and (c) follow up on a recent case of Legionnaires' disease found at Kai Ching Estate.

[2] The TOR of the Commission is to: (a) ascertain the causes of excess lead found in drinking water in public rental housing developments; (b) review and evaluate the adequacy of the present regulatory and monitoring system in respect of drinking water supply in Hong Kong; and (c) make recommendations with regard to the safety of drinking water in Hong Kong.

MEETINGS OF THE REVIEW COMMITTEE

3. So far, the Review Committee has held eight meetings. Main papers that have been reviewed by the Review Committee thus far are at **Annex B**. An overview of the discussion of the Review Committee is summarized in paragraphs 4 to 15 below.

First meeting - Quality control and HA's measures

4. At the 1st meeting on 30 July 2015, the Housing Department (HD) briefed Members on –

(a) the prevailing mechanism, including statutory and non-statutory requirements, which the Government (namely, the Water Authority (WA)) had been put in place before the "excess-lead-in-water" incidents to ensure the quality of fresh water supply for all buildings in Hong Kong; and

(b) the measures put in place by the HA for compliance with the prevailing statutory and related requirements to ensure the quality of fresh water supply in PRH estates.

Papers No. RC 2/2015 and RC 3/2015 are relevant. Members noted that independent administrative building control over all HA's developments in line with the Buildings Ordinance (BO) (Cap. 123) and related requirements are exercised by the HD's Independent Checking Unit without having to go through the sanction by the Buildings Department, whereas the water supply system in the developments are subject to the regulatory regime under the Waterworks Ordinance (WWO) (Cap. 102) exercised by the WA.

5. To facilitate Review Committee members to understand the existing mechanism, HD was requested to provide a comprehensive A to Z flow chart to illustrate the existing quality control mechanism for the fresh water supply system in PRH estates. Such a flow chart should outline the different stages of construction step-by-step, and illustrate the corresponding measures put in place by HD to comply with prevailing statutory and non-statutory requirements. The Review Committee planned to examine the different stages of construction in detail in subsequent meetings.

Second meeting – Flow Chart and the Pre-Contract Stage

6. At the 2nd meeting on 6 August 2015, HD briefed Members on –

(a) the major steps involved in building a fresh water supply system by way of a "Flow Chart for Design, Construction and Completion of Fresh Water Supply System in HA's PRH Developments" ("Flow Chart") (**Annex C**), which comprised 18 steps covering the entire process from the pre-contract design stage (steps 1 – 4), tendering stage (steps 5 – 6), post-contract construction stage (steps 7 – 13), and the completion stage (steps 14 – 18); and

(b) an overview of the pre-contract stage (i.e. steps 1 – 6 of the Flow Chart).

Papers No. RC 6/2015 and RC 7/2015 are relevant. In discussing RC 6/2015, HD briefed members that in the past the soldering materials of joints were not included in the list of over thirty types of material that were subject to on-site delivery checks by HD.

Third meeting – Design and Specifications, Contract Arrangements and the Post-Contract Stage

7. At the 3rd meeting on 17 August 2015, HD briefed Members on –

(a) details of the pre-contract stage, covering the design and specifications for plumbing installation in PRH estates (i.e. steps 1 – 4 of the Flow Chart) and HA's building contract arrangements (i.e. steps 5 – 6); and

(b) an overview of the post-contract stage (i.e. steps 7 – 18 of the Flow Chart).

Papers No. RC 10/2015, RC 11/2015 and RC12/2015 are relevant. In discussing RC 10/2015, Members noted that copper water pipes, fittings and soldering materials are governed by relevant British Standards as stipulated in HA's specifications and that upper limits for lead contents are stated in the respective British Standards. In discussing RC 11/2015, HD briefed members that there had been no contractual requirement in the HA's building contracts in regard of the procurement procedure of soldering materials. The main contractors can decide if they would procure the soldering materials themselves or would sublet the procurement responsibility to their domestic subcontractors. Being one of the cost-insignificant sundry material items in building contracts, soldering materials were not included in the monthly interim payment applications submitted by the main contractors to HD.

Fourth meeting – Presentation by the Water Supplies Department

8. At the 4th meeting on 24 August 2015, representatives from the Water Supplies Department (WSD) were invited to give a presentation on –

(a) an overview of the water supply system in Hong Kong; and

(b) monitoring and control of inside service, including (i) application procedures for water supply in new buildings under the WWO and Waterworks Regulations (WWR) (Cap. 102A); (ii) design standards for pipes and fittings; and (iii) the role of Licensed Plumbers (LP) and Authorized Persons (AP). In particular, WSD informed Members it is stipulated under the WWO that construction of inside service except works of a minor nature shall be carried out by an LP.

Fifth meeting – Procurement, Material submission, Site Supervision and Testing

9. At the 5th meeting on 7 September 2015, HD briefed Members on –

(a) details of the pre-contract stage, covering procurement matters (i.e. step 6 of the Flow Chart); and

(b) details of the post-contract stage, covering material submission (i.e. step 9 of the Flow Chart), site supervision (i.e. steps 12 – 13 of the Flow Chart), and testing, commissioning and final inspection (i.e. steps 14 – 18 of the Flow Chart) for plumbing installation in PRH estates.

Papers No. RC 13/2015, RC 14/2015, RC 15/2015 and RC 19/2015 are relevant. In discussing RC 14/2015, HD briefed members that soldering/brazing alloys for copper pipes and fittings were not included in the list of materials to be checked upon delivery to site. Besides, checking of soldering joints for lead was not included in the various inspection guides developed to assist HD's site inspection teams to conduct in-process inspection.

Sixth meeting – Precast Concrete Components and Meeting with the Main Contractors

10. At the 6th meeting on 14 September 2015, HD briefed Members on the quality control and supervision of off-site manufactured precast concrete components for use in HA's PRH projects. Paper No. RC 24/2015 is relevant.

11. Besides, the four main contractors involved in the PRH estates where excess lead content in drinking water was found in some of the samples tested, along with their plumbing subcontractors and some of their LPs, were invited to attend the meeting to exchange views with the Review Committee on the incident. In gist, all four main contractors considered that -

(a) there had been a lack of awareness within the industry of the risk of lead in soldering materials and its implications for drinking water quality, as soldering materials for pipe connections had been considered as only a minor and insignificant part of plumbing installations; and

(b) there was a general perception in the construction industry that the certificate on water supply connection (Form WWO 1005), issued by the WA, should have served as an assurance of the quality of the plumbing system and the drinking water having regard to the water sample test results.

The main contractors undertook to implement various improvement measures for future projects and projects still under construction, for example, central procurement of soldering materials, quarantine of soldering materials upon delivery to site, recording of the on-site movement of soldering materials, frequent on-site checks using quick test methods etc.

Seventh meeting – Maintenance and Improvement Works for Existing PRH, Observations on Water Sampling Tests and Draft Interim Findings

12. At the 7th meeting on 22 September 2015, HD briefed members on the maintenance and improvement (M&I) works carried out for the fresh water supply system in existing PRH estates. RC 29/2015 is relevant. Members noted that these M&I works involving fresh water supply systems were carried out during routine maintenance; during vacant flat refurbishment; during large-scale renovation of estates; and during large-scale replumbing works. Soldering for copper pipe connections was generally not used in these M&I works except at isolated locations in cases of site constraints or unavailability of more suitable joint components to match existing installations. Members generally agreed that there was a lesser risk for the presence of lead in drinking water in association with these M&I works. Members has also noted that following the "excess-lead-in-water" incidents, HD has put in place additional measures to ensure the quality of plumbing works and drinking water in connection with these M&I works, and these additional measures are not identical to those in connection with new PRH projects due to the different nature of these two types

of works. Details are set out in paragraph 35 below.

13. Members also took note of HD's observations about the results of the systematic water sampling tests conducted by HD and WSD for PRH estates completed in or after 2005 so far. RC 28/2015 is relevant. Members also discussed the draft report on the interim findings of the Review Committee.

Eighth meeting – Meeting with Professional Organizations and Industry Stakeholders, and Draft Interim Report

14. At the 8th meeting on 29 September 2015, relevant professional organisations/ bodies were invited to attend the meeting to exchange views with the Review Committee on the incident. They include The Hong Kong Institute of Architects, The Hong Kong Institute of Surveyors, The Hong Kong Construction Association Ltd., and Hong Kong Licensed Plumbers Association Ltd. The professional organizations shared their views on the future roles of different professional disciplines in quality assurance of plumbing works, whereas the industry representatives shared their views on how to enhance their awareness of the issue through more structured training and education. For example, professional organisations shared their views that APs assumed an overall coordination and supervisory role, whereas plumbing installations required specialised skills and knowledge, the supervision of which should be assumed by qualified persons (e.g. building services engineers). Industry representatives shared their views of the need to enhance the industry's awareness of the issue, and they would approach training institutions (e.g. the Construction Industry Council) to discuss how a more structured training regime could be put in place so that the industry could be better equipped with the professional knowledge and skills.

15. Members also discussed the revised draft report on the interim findings of the Review Committee.

HA'S QUALITY CONTROL MECHANISM FOR FRESH WATER SUPPLY SYSTEM IN PRH ESTATES

16. As outlined above, Members have examined the key parts of the mechanism that are relevant to how the HA has sought to ensure that the installation of fresh water supply system meets water safety and quality requirements. Details are highlighted in the paragraphs below.

17. In HA's public housing estates, the plumbing systems are installed by the main contractor, his domestic plumbing subcontractor and nominated water pump subcontractor, as well as and their LPs. The entire plumbing system is designed in accordance with the requirements stipulated in the WWO, WWR, as well as WSD's handbooks and guidelines. In order to ensure consistency among HA's projects in respect of statutory compliance, HD also promulgates in-house design and site inspection guidelines.

Pre-contract Stage

18. To ensure that the fresh water supply system installed in public housing projects comply with the statutory requirements, HD incorporates the requirements into contract specifications and effects quality control through contract management and site inspections. HD's Chief Architect serving the AP-equivalent role in the public housing project submits, to WSD, Form no. WWO132 applying for new water supply for the site. Separately, he submits plumbing installation plans to WSD for approval. All the specifications for plumbing materials, including soldering alloys for copper pipeworks, as specified by HD in the building contracts, comply with relevant international standards as stipulated in the WWO and the WWR.

Post-contract Stage

19. After award of the building contract, the main contractor employs a domestic sub-contractor for the execution of the plumbing installation works, and a nominated sub-contractor for the execution of water pump installations, in accordance with the WSD approved drawings. The main contractor's domestic sub-contractor and nominated sub-contractor appoint their LPs for respective installation works. The nature, size and quality of pipes and fittings shall comply with the WWO and WWR. The HD's AP-equivalent and LP notify the WA (via Part I of Form no. WWO 46) of the commencement date and the scope of plumbing works to be carried out.

Material approval

20. The main contractor then submits materials, including soldering materials and equipment (such as pumps and valves), of the plumbing system for HD's approval. Pursuant to the WWR and HA contract specifications, the main contractor shall use only lead-free category soldering materials, as soldering alloys with lead exceeding the upper limits stipulated in relevant British Standards are not permitted in any installations for water for human

consumption.

21. In processing the main contractor's material submission for approval, HD checks the specifications against the main contractor's submission documents, including catalogues, samples, certificates, test reports, approval documents from respective regulatory authorities (including approval documents from the WSD) etc., as well as an undertaking by the main contractor that the materials are in full compliance with HA's and other recognized requirements. In addition to statutory requirements, consideration is also given to whether the materials have been used in other public housing projects and whether they have ever been listed under the "Material Quality Alerts"[3]. The main contractor will only proceed to place order for the materials upon receipt of HD's approval.

Surveillance and control during construction

22. HD site staff will check the materials upon their delivery to site, including visual inspection and verification of materials against the approved samples, respective catalogues and certificates in accordance with the contractual requirements. HD also selects samples for checks on the appearance, construction, dimensions against relevant standards and whether there are visible defects. HD also conducts laboratory tests on samples for major components such as sink mixers and shower mixers to ensure compliance with the specified performance standards as stipulated in the contracts. If the tests fail, HD may reject the supply or re-test the same batch of components. HD will also post a "Material Quality Alert" for reference by other projects.

23. Pursuant to the BO, the main contractor is responsible for giving continuous supervision of the site works to ensure that the quality of works, including plumbing installations, complies with the statutory and contractual requirements. HD's AP-equivalent and technically competent persons (appointed by the AP-equivalent) exercise periodic supervision by carrying out surveillance checks and tests.

Contract Completion Stage

24. Upon the completion of fresh water plumbing systems, the main contractor, the sub-contractors and the LP conduct inspections and tests to

[3] A "Material Quality Alert" is a notification issued to project teams when a component or material under surveillance checking is found failed in a laboratory testing or failed to comply with the specification requirements.

ensure that the completed plumbing installation works comply with the approved drawings, statutory requirements and contract specifications. HD conducts the final inspection and testing of the water supply system with the main contractor who arranges for cleansing and disinfection of all fresh water tanks and fresh water supply pipeworks, pressure tests as well as checks for leaks etc. The LP applies to the WA for inspection and approval of the plumbing installations (via Part IV of Form WWO46). HD's AP-equivalent applies to the WA (via Part II of Form no. WWO 132) for connection of water supply, confirming that the plumbing installations are in full compliance with specified standards and requirements.

25. WSD will collect water samples from water connection points for testing and analysis. The main contractor will arrange for water samples to be collected for tests against the WSD's specified parameters[4] for drinking water quality. Upon WSD's satisfaction with the water test results, as well as the plumbing installations after site inspections, WSD connects permanent water supply to the premises and issues the certificate on water supply connection (Form WWO 1005). HD will only certify completion of the building works and apply for the Occupation Permit when all relevant tests have been completed with satisfactory results.

Other Measures

26. On top of measures for complying with the statutory requirements, HA/HD has also put in place additional measures to ensure the safety and quality of water supply -

(a) upon completion of new estates, in addition to conducting water sampling tests to meet WSD's specified parameters[4] for drinking water quality, HA/HD requires the main contractors to carry out additional water sampling tests. These additional tests are carried out to meet the assessment criteria for water quality under Building Environmental Assessment Method (BEAM) Plus version 1.2. For this purpose, the requirements specified in WSD's "Quality Water Supply Scheme for Buildings - Fresh Water" should be met. To achieve this, first, the water quality standard must meet the prescribed standards[5]. Secondly, all

[4] Before the promulgation of WSD's latest Circular Letter No. 1/2015 in July 2015, water samples had been tested against the eight parameters stipulated in WSD Circular Letter No. 2/2012, which include pH, colour, turbidity, conductivity, free residual chlorine, E.coli, total coliforms and heterotrophic plate count.

[5] The test parameters required under the Quality Water Supply Scheme for Buildings – Fresh Water are basically the same as those in WSD Circular Letter No. 2/2012 except there is one additional test parameter (iron) while two test parameters are omitted (free residual chlorine and heterotrophic plate count).

water samples should be taken in a manner described in ISO5667, i.e. they should be taken at all the farthest points of use in the distribution system from the storage tank of each zone, and should include samples from each water supply tank used in the building. Also, the water tests have to be conducted by a Hong Kong Laboratory Accreditation Scheme accredited laboratory or an HA recognised laboratory;

(b) to address the risk of Legionnaires' disease, HA/HD has also required the main contractor to carry out an additional disinfection to the water supply system of newly completed estates shortly before occupation; and

(c) during the course of the contract, HA/HD conducts quarterly Performance Assessment Scoring System (PASS) assessments with main contractors on-site to assess the quality of works including the main contractors' performance in plumbing installation works and management of his domestic sub-contractors. PASS scores affect the allocation of future tendering opportunities to main contractors and evaluation of their submitted tenders.

INTERIM FINDINGS OF THE REVIEW COMMITTEE

27. From the results of the systematic water sampling tests carried out by the HD and WSD for PRH estates completed in or after 2005, the Review Committee notes that -

(a) the "excess-lead-in-water" incidents are unlikely attributed to the use of prefabricated kitchens or bathrooms. With the exception of Kai Ching Estate, in all cases prefabricated kitchens and bathrooms do NOT have plumbing pre-installed; plumbing is installed on-site after the prefabricated components have been delivered to site, and plumbing is surface-mounted. Pre-installed plumbing in prefabricated kitchens and bathrooms was only used as a pilot in Kai Ching Estate. And even in the case of Kai Ching Estate, out of the seven flats from which water samples were found to contain excess lead content, only one involved a prefabricated component (a kitchen) with water pipes pre-installed;

(b) the incidence of "excess-lead-in-water" is not high. Only a small percentage of water samples tested was found to contain excess lead content. Nor are the incidents confined to individual contractors, subcontractors or LPs. The 11 estates with water samples containing

excess lead content involve four different main contractors, three different plumbing subcontractors and three different LPs;

(c) the 11 estates with water samples containing excess lead content are not confined to the most recently completed estates. In fact, the completion years for these 11 estates straddle a number of years from 2008 to 2014; and

(d) no sample taken from estates which did not use soldering joints has been found to contain excess lead content.

28. In the course of examining the HA's past quality control mechanism for fresh water supply (before the "excess-lead-in-water" incidents), the Review Committee notes that the mechanism, including the parts that sought to meet the statutory and WSD's administrative requirements, as well as the parts that were in addition to the statutory and WSD's requirements, had been geared towards **known issues about safety and quality of fresh water in the past**, which focused on –

(a) the physical performance of the water supply system, including the alignment of water pipes, position and quantity of brackets and whether they are firmly fixed, the adequacy and spacing of pipe sleeves, the connection of pipes, whether the materials used comply with contractual requirements, and whether there are water seepages or bursting of pipes in the system etc.;

(b) the eight water test parameters as stipulated under WSD Circular Letter No. 2/2012, including pH, colour, turbidity, conductivity, free residual chlorine, E.coli, total coliforms and heterotrophic plate count[4]; and

(c) the risk of Legionnaires' disease, for which HA/HD has been requiring the main contractors to carry out additional disinfection of the water supply system of newly completed estates before occupation.

Inadequacies of the mechanism before the "excess-lead-in-water" incidents

29. The Review Committee is of the view that the past mechanism for ensuring the quality of drinking water supplied to PRH estates has certain inadequacies.

Regulatory and industry-wide issues

30. The Review Committee notes that, as part of the overall regulatory regime in place to ensure the quality of the fresh water supply systems, it is stipulated in the WWO that construction of inside service except works of a minor nature shall be carried out by an LP, and that all pipes and fittings shall comply with the relevant British Standard in accordance with the WWR. The Review Committee also notes that, upon completion of inside service, WA conducts inspection before the inside service is connected to the Government mains. Besides, water samples from the completed inside service are tested against specified parameters before the WA issues the certificate on water supply connection (Form WWO 1005), but before the "excess-lead-in-water" incidents, no reference was made to the World Health Organisation's "Guidelines for Drinking – Water Quality" for the purpose of issuing Form WWO 1005. The Review Committee notes that the Task Force has found that, before the "excess-lead-in-water" incidents, the testing of water samples did not include lead or other heavy metals[4]; whether the soldering joints contain lead was not checked; and there had been inadequate knowledge about the consequences of leaded soldering material. The Task Force is of the view that, among other things, an enhanced system for site inspection and testing during construction of plumbing works has to be in place to prevent use of leaded soldering material in future.

31. With regard to the role of different stakeholders in the construction industry, the Review Committee has the following views –

(a) although the main contractors, who are responsible for continuous supervision and accountable to HA as the contractual party with HA, were well aware of HA's specification of using lead-free solder for copper pipe connection, they failed to pay due attention to the soldering materials used, and never put in place sufficient safeguards to ensure that the soldering materials used on-site conform to the approved samples;

(b) the plumbing subcontractors had also overlooked the significance of soldering materials used for pipe connections. On-site supervision in this respect had been lax before the "excess-lead-in-water" incidents. Purchase of soldering materials was sometimes left to their site supervisors or sub-subcontractors;

(c) it is not clear whether the LPs, who have a legal duty and liability under WWO to carry out the construction of inside service, understand

the "lead-free" requirement for pipes and fittings as stipulated under the WWR, or the composition, including the lead content, of different types of soldering material available in the market; and

(d) in general, there had been a lack of awareness in the construction industry, as well as the HD, of the risk of lead in solder and its implications for the drinking water quality and in turn, the associated health risks.

Quality control mechanism for HA's projects

32. The Review Committee notes the Task Force's findings that the cause of excess lead in water is lead in solder joints. As far as the quality control mechanism for HA's projects is concerned, the Review Committee notes that the past mechanism that was in place before the "excess-lead-in-water" incidents, was consistent with the industry's practice, the law (i.e. WWO and WWR) and other WSD's requirements, but **had not focused on the presence of lead (or other heavy metals) in the fresh water supply system or in the water, and failed to target soldering materials as a high risk item**. Such inadequacies include -

(a) in terms of the contract with the main contractor, HA's system was compliant with the law and the requirements of the WA, in that the contract specified that the main contractor must employ a LP, that only lead-free soldering materials could be used, etc. However, HA's system failed to specifically require the main contractor to put in place a management plan to control, inspect or supervise the use of soldering materials, including quarantine upon delivery of materials;

(b) in terms of in-process supervision, testing and commissioning, HA's system failed to check for presence of lead in soldering joints; and

(c) in terms of checks on completion of projects, HA's system followed the then WA's requirements on tests of water samples for eight parameters, and did not include tests for lead.

33. The Review Committee notes that the WA's requirements have been developing. In fact, the Task Force's recommendations on way forward for preventing recurrence of similar incidents include, among other things, that the WA should consider reviewing relevant legislation, and that an enhanced system involving qualified persons in site inspection and testing during

construction of plumbing works should be put in place. The Review Committee agrees that these are among the key areas which should be further looked into. It expects the HD to continue to keep in view such developments, ensure full compliance with new stipulations by the WA, take part in discussions on further changes to the WA's requirements, and continue to consider measures in addition to those stipulated by the WA.

Interim enhancement measures

34. Noting the inadequacies in the established system as mentioned in paragraphs 29 - 33 above, the Review Committee has agreed that certain measures need to be put in place by HA/HD, in respect of new PRH projects under construction, to immediately reduce the risk of occurrence of the presence of lead in solder on joints and of excessive lead content in fresh water –

(a) for projects which are approaching the completion stage, HA/HD will require the main contractor to test water samples for heavy metal content (including lead) in accordance with WSD's latest requirements[6]. Concurrently, HA/HD will require the contractor to take additional water samples for the above test plus an extra water quality test;

(b) HA/HD will contractually require the main contractor to submit and comply with a management plan covering stringent plumbing subcontractor supervision and on-site monitoring. Such a plan include measures such as central procurement of soldering materials by the main contractor, checking soldering/ brazing materials upon delivery to site before putting them under quarantine, recording on-site movement and usage of soldering materials by the workers, recording the works completed by individual workers so that they become more traceable etc. Contractors will also be encouraged to use mechanical jointing of water pipes. HA/HD will also require the main contractor to ensure that workers receive sufficient training on soldering joint requirements before work starts, and to involve the LP in supervising plumbing installation works, submitting regular reports and attending regular meetings, to ensure compliance with specifications; and

[6] On 13 July 2015, WSD issued Circular Letter No. 1/2015 to, among other things, remind about the use of lead-free solders for copper pipes at fresh water Inside Services as specified in the standard stipulated in the WWR, and promulgate additional test parameters of water samples covering the four heavy metals of lead, chromium, cadmium and nickel on top of the eight test parameters under WSD Circular Letter No. 2/2012.

(c) at any time during construction stage, the main contractor and HA/HD staff will use quick test methods to check for the presence of lead in soldering joints. HA/HD staff may order laboratory tests if deemed appropriate.

35. The Review Committee also agrees that certain enhancement measures need to be put in place by HA/HD, in respect of PRH projects that will undergo M&I works as mentioned in paragraph 12 above, and these enhancement measures are not identical to those applicable to the new works projects –

(a) HA/HD will continue with the practice and require the contractor to use copper pipes with compression joints. If the use of soldering joint is unavoidable at isolated locations, the contractor will be required to submit an application for the HA/HD's approval, with supporting documents proving that lead-free soldering material has to be used, and a site control plan to ensure that only approved materials will be used on-site;

(b) if soldering joints are approved for use at isolated locations, HA/HD will carry out checks for the presence of lead in soldering materials, by quick test methods upon material delivery to site, as well as when works are in progress; and

(c) HA/HD will require all contractors to re-submit materials for plumbing works for approval in accordance with WSD's Circular Letter No. 2/2015, which stipulates that WSD's acceptance of water supply pipes and fittings is valid for a maximum of five years from the date of issuance of the approval letter.

36. The HA/HD has already started to implement the above measures as a stop-gap to reduce the risk of the presence of excess lead in drinking water in newly completed PRH estates and in existing estates undergoing M&I works.

WAY FORWARD

37. So far, the Review Committee has been briefed on the details relating to how HA has ensured the quality and safety of the fresh water supply in public housing estates, and has noted that the HA/HD has already put in place new measures to immediately reduce the risk of occurrence of the presence of excess lead content in drinking water in PRH estates. At the next stage of study, the

Review Committee will conduct more exchanges with stakeholders, including professional organisations and industry representatives, to understand their views on the problem and possible solutions, and keep in view the development of how the law is enforced. It may also revise the above measures and consider additional ones. The Review Committee aims to submit a full report to the HA by end 2015.

Review Committee on Quality Assurance Issues
Relating to Fresh Water Supply of Public Housing Estates

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