

**Memorandum for the Review Committee on Quality Assurance Issues
Relating to Fresh Water Supply of Public Housing Estates of
the Hong Kong Housing Authority**

**Evidence by Contractors and Housing Authority's Additional Quality
Assurance Measures**

PURPOSE

This paper summarises for Members' information evidence submitted by the Main Contractors (MCs) to the Commission of Inquiry into Excess Lead Found in Drinking Water (COI) on how they controlled plumbing works for fresh water inside service, and how HA's new quality assurance measures are relevant to issues arising from such evidence.

BACKGROUND

2. As at 18 December 2015, the witnesses of three MCs, some plumbing subcontractors and Licensed Plumber (LP) involved with the Affected Estates had testified before the COI. The evidence they presented to the COI revealed some issues in their operations in the following six aspects –

- (a) MC's Sub-contracting , appointment of LP and role of LP;
- (b) Purchase of materials after MCs obtain CM's approval of materials;
- (c) MC's checking of materials on delivery and storage;
- (d) MC's supervision of plumbing installation work;
- (e) MC's Inspection and Testing on Completion; and
- (f) Competency of MC's staff and LP.

----- 3. These details are summarised at **Annex**, together with the additional quality assurance measures we have introduced after the incident or recommended by this Committee in the Interim Findings (Paper No. **SPC 42/2015** refers), as well as required by Water Supplies Department's

Circular Letters. We note that the additional quality assurance measures we have introduced are adequate to address the issues revealed in the evidence.

INFORMATION

4. This paper is for Members' information.

Miss Irene CHENG
Secretary, Review Committee
Tel. No.: 2761 6862
Fax No.: 2761 0019

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Summary of Evidence and Corresponding HA's Additional Quality Assurance Measures

Stage/Aspect of Work	Issues with Main Contractors' Control of Plumbing Works	HA's Additional Quality Assurance Measures	Ref. Paper No. BC 69/2015
(1) MC's Sub-contracting , Appointment of LP and Role of LP	<p>All main contractors (MC) sublet plumbing works to domestic subcontractor (DSC). However, MCs and DSCs revealed that :</p> <ul style="list-style-type: none"> a) Requirement for the appointment of LP is not included in the domestic sub-contract between MC and DSC; b) LP's scope of service is not specified. MC and DSC generally understand that LP should comply with the statutory duties imposed by Water Authority (WA), liaise with WA and submit the required WWO forms; c) LP's duty to copy the updating of Annex of WWO 46 Part I on pipes and fittings installed/to be installed to MC and HA is not specified; d) LP's inspection frequency and supervision role is not clearly stated; and e) LP's liaison record with Water Supplies Department (WSD) such as WSD's site inspections, taking of water samples and submission of test results to MC and HA is not specified. 	MC shall submit and comply with a Subcontractor Management Plan incorporating stringent supervision of plumbing subcontractor.	4(a)(ii) 6(b)(i)

Stage/Aspect of Work	Issues with Main Contractors' Control of Plumbing Works	HA's Additional Quality Assurance Measures	Ref. Paper No. BC 69/2015
(2) Purchase of Materials after MCs obtain CM's Approval of Materials	<p>MCs claim they inform DSC of Contract Manager's approval of materials but do not have records of such communication. There is no proof that what is approved by Contract Manager is passed down the line.</p> <p>a) All MCs sublet the procurement of water pipes, fittings and soldering materials to DSC. Most DSCs procure pipes and fittings but ask their sub-subcontractor to procure soldering materials;</p> <p>b) MCs do not know who actually purchase the soldering materials and what specification is used for the purchases.</p>	<p>MC shall submit and comply with a Subcontractor Management Plan incorporating stringent supervision of the plumbing subcontractor.</p> <p>MCs or DSC shall centrally procure soldering materials.</p>	<p>4(a)(ii)</p> <p>6(b)(i)</p>
(3) MC's Checking of Materials on Delivery and Storage	<p>a) MCs regard soldering materials as sundry items and do not check the materials delivered to site;</p> <p>b) MCs do not have a complete record of soldering materials delivered to site with regard to what is delivered and quantities delivered;</p> <p>c) MCs do not pay particular attention to the storage and consumption of soldering materials.</p>	<ul style="list-style-type: none"> ● MC shall check soldering/brazing materials upon delivery to site before putting them under quarantine; ● HA shall register the delivery of soldering materials; and ● HA shall conduct random audit checking upon material delivery. 	<p>6(b)(iii)</p> <p>4(b)(i)</p> <p>4(b)(ii)</p>

Stage/Aspect of Work	Issues with Main Contractors' Control of Plumbing Works	HA's Additional Quality Assurance Measures	Ref. Paper No. BC 69/2015
(4) MC's Supervision of Plumbing Installation Work	<p>a) MCs do not closely supervise the soldering process. They do not take note of the soldering materials actually used by workers and ensure that they are of the type approved by Contract Manager;</p> <p>b) MCs do not have records of soldering work completed by individual workers.</p>	<ul style="list-style-type: none"> ● MC shall submit and comply with a Subcontractor Management Plan incorporating stringent supervision and monitoring of the plumbing subcontractors and its workers to ensure lead-free solder is used; ● MC shall record on-site movement and usage of soldering materials by workers; ● MC shall record soldering works completed by individual workers; and ● HA shall conduct random checking at completed joints. 	<p>4(a)(ii)</p> <p>6(b)(i)</p> <p>6(b)(iv)</p> <p>6(b)(v)</p> <p>4(b)(ii)</p>
(5) MC's Inspection and Testing on Completion	MCs do not check solder joints for lead or test water samples for presence of lead.	<ul style="list-style-type: none"> ● MC shall declare that lead-free grade solder had been used as specified ● MC shall cleanse and disinfect the inside services ● MC shall arrange testing of water samples according to WSD Circular Letters Nos. 2/2012 and 1/2015 (including four heavy metals, i.e. lead, cadmium, chromium and nickel) 	<p>4(c)(i)</p> <p>4(c)(ii)</p> <p>4(c)(iii)</p>

Stage/Aspect of Work	Issues with Main Contractors' Control of Plumbing Works	HA's Additional Quality Assurance Measures	Ref. Paper No. BC 69/2015
(6) Competency of MC's Staff and LP	<ul style="list-style-type: none"> a) There is a lack of awareness in the industry including contractors, LP and plumbing workers of the risk of presence of lead in solder and its implications for the drinking water quality and hence, the associated health risk; b) Some plumbing workers on site lack the knowledge to differentiate which type of soldering material is "lead free"; c) LPs may not understand the "lead-free" requirement for pipes and fittings as stipulated under the WWR, or cannot tell the composition (including the lead content) from the appearance of different types of soldering material available in the market; d) Training courses for workers in the plumbing trade have not put as much emphasis on the adverse consequences arising from the presence of lead in the plumbing system as on practical soldering techniques to prevent water seepage or leakage. 	HA shall participate in work with industry to strengthen training of LP and workers	3(f)