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**Panel on Housing**

**Meeting on 5 February 2018**

**Background brief prepared by the Legislative Council Secretariat  
on building materials used for public housing**

**Purpose**

This paper provides background information regarding building materials used in the construction of public housing developments undertaken by the Hong Kong Housing Authority ("HA"), and gives a summary of the views and concerns expressed by members of the Panel on Housing ("the Panel") on the subject.

**Background**

2. Building materials form an essential part of public housing development projects, and their quality is pivotal to building quality. According to the Administration, it has been an established practice for HA to assess the risk factor of building materials when formulating the specifications and contract conditions to establish a prudent quality assurance system, including in the aspects of product certification, surveillance visits to factories of precast materials, Performance Assessment Scoring System for contractors, site verification checks and internal audits. This is to ensure the performance of the contractors and suppliers in material control. Since the "excess-lead-in-water" incident in July 2015, HA has commenced/implemented 35 new initiatives to enhance quality for building works, including risk management of building materials. The new initiatives are set out at **Appendix I**.

## **Risk assessment of building materials**

3. In the "Report of the Commission of Inquiry into Excess Lead in Drinking Water" issued in May 2016, paragraph 487 (12) states that "HA should, in consultation with Water Supplies Department, review all the materials to be used in the construction of public rental housing estates with a view to identifying the potential hazards and contamination in the drinking water, and revising the project specifications as necessary".<sup>1</sup>

4. In June 2016, HA started the systematic risk assessment exercise on all building materials based on the principles of the international standard ISO 31000. After completing the risk assessment of about 2 300 kinds of building materials in December 2016, HA developed corresponding risk treatment measures based on the risk assessment results and the known risk levels.<sup>2</sup> According to the Administration, the risk treatment measures will be implemented in phases with priority based on the degree of impact on construction quality caused by the relevant building materials. Major risk treatment measures for all materials were rolled out in the third quarter of 2017.<sup>3</sup>

## **Members' views and concerns**

5. At the meetings on 5 December 2016 and 6 March 2017, the Administration briefed the Panel on the risk assessment of building materials used in the construction of new public housing developments undertaken by HA. The major views and concerns expressed by members are summarized in the ensuing paragraphs.

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<sup>1</sup> [http://www.coi-drinkingwater.gov.hk/eng/pdf/COI%20Drinking%20Water\\_Report.pdf](http://www.coi-drinkingwater.gov.hk/eng/pdf/COI%20Drinking%20Water_Report.pdf)

<sup>2</sup> The proposed risk treatment measures will be applied to the five building construction work stages, namely, "sample submission", "purchasing", "delivery", "storage control" and "use (installation)", to ensure that effective control measures are in place for every stage. Such measures include increasing the number of materials for verification checks at the delivery stage, the frequency of sampling test, the number of times of inspection during installation and adding the requirements on random checking of materials at storage areas, etc. (LC Paper No. [CB\(1\)617/16-17\(07\)](#)).

<sup>3</sup> LC Paper No. [CB\(1\)19/17-18\(01\)](#)

### Quality management process

6. Panel members enquired about the procedures involved in the checking of building materials for use in HA's projects. Some members were concerned about the Administration's measures to strengthen the monitoring of materials used in public housing estates in response to the recommendations by the Commission of Inquiry into Excess Lead Found in Drinking water.

7. The Administration advised that HA had strictly implemented various applicable quality control procedures and measures at different stages of the construction process of building contracts, including the submission and approval of building materials, as well as their purchasing, delivery, storage and installation. These control measures included sampling check of test certificates, supplier's invoices, records of delivery and storage, as well as quality and standards of in-process materials and installations, etc. to ensure that all building construction materials used in public housing estates were in compliance with the material specifications and relevant statutory requirements. Since the "excess-lead-in-water" incident, the Water Supplies Department had introduced a series of new measures to enhance the regulatory control on the construction of inside service to ensure the safety of drinking water. As part of its measures to enhance the control mechanism on plumbing installations, HA requires the main contractors to submit and implement a subcontractor management plan covering stringent supervision and on-site monitoring on plumbing subcontractors and licenced plumbers. Moreover, HA would ensure that soldering materials must be under central procurement by the main contractors or the first tier domestic sub-contractors.

### Use of prefabricated components

8. In view that HA had been adopting precast construction technology in public housing projects, and precast concrete components ("PCCs") might be made outside Hong Kong such as in the Mainland, some members asked about the quality control and supervision of the production of PCCs.

9. The Administration advised that HA had commissioned independent service providers in Hong Kong for management of factory supervision of PCCs, which were usually manufactured in the Mainland. According to the service agreement, the service providers were required to deploy full-time resident supervisors in factories to inspect the production, and engineers to

carry out relevant audits to the factories at monthly intervals. The project's main contractor would pay visits once a month to each factory to review PCC quality issues. HA's central team, which was an in-house independent team, would also conduct quarterly factory visits to monitor the performance of the service providers. To facilitate the identification and tracking of PCCs produced in factories, radio-frequency identification technology was adopted.

#### Disposal of in-flat items by public rental housing tenants

10. Some members pointed out that there were cases where tenants of newly-completed public rental housing ("PRH") estates had disposed of in-flat items such as sink units after moving in, hence resulting in wastage, and enquired whether the cases reflected HA's quality assurance problems.

11. The Administration advised that HA all along attached importance to minimizing the chance of disposal and wastage when considering the in-flat items to be provided in new PRH units. Facilities such as bath tubs and kitchen cabinets were no longer provided in HA's public housing developments. Adjustable cooking benches were adopted for all new PRH projects so that it could be adjusted to appropriate height at tenants' request during intake. As not all families newly moved-in could afford the cost of fitting-out and equipping their flats, HA considered it appropriate to provide some basic fixtures and fittings, such as sink units for new PRH units.

#### **Latest development**

12. The Administration will brief the Panel on the quality management of products used in public housing developments at the Panel meeting on 5 February 2018.

#### **Relevant papers**

13. A list of relevant papers is set out in the **Appendix II**.

**Enhancement measures adopted by the Hong Kong Housing Authority  
in response to recommendations by the Commission of Inquiry  
into Excess Lead Found in Drinking Water  
(position as of March 2017)**

**Part I Plumbing Works**

**(A) Enhancing Control Mechanism on Plumbing Installation**

1. To require the main contractors to submit and implement a subcontractor management plan covering stringent supervision and on-site monitoring on plumbing subcontractor and Licensed Plumber("LP").
2. To mandate central procurement of soldering materials by the main contractor or first tier domestic subcontractor.
3. To require the main contractors to check the material purchase orders with regular audit checking.
4. To require the main contractors to verify soldering materials upon delivery to site, and to quarantine and store the materials properly before use.
5. To include soldering/brazing alloys, and copper pipes and fittings in the list of on-site delivery verification items.
6. To conduct surveillance tests to check the compliance of soldering, brazing and copper pipe materials.
7. To require the main contractors to ensure only materials approved by the Hong Kong Housing Authority ("HA") and the Water Supplies Department ("WSD") are used during construction.
8. To require the main contractors to record on-site movement and use of soldering materials by workers.
9. To provide on-site construction mock-up to explain the use of soldering materials, and display posters reminding workers of the proper procedures in using soldering materials for jointing pipes.
10. To require the main contractors and their LPs to monitor the compliance of the plumbing installations.

11. To require the main contractors to use quick test methods to check the presence of lead in soldering joints.
12. To test water samples for lead and the three other heavy metals for newly installed inside water supply system in accordance with the Water Authority's latest requirements, and to take water samples for additional tests to ensure the safety of drinking water.

**(B) Introducing List of Contractors for Plumbing Works**

13. To adopt the list of Plumbing Installation Category of Development Bureau's "Approved Suppliers of Materials and Specialist Contractors for Public Works" for plumbing and drainage (above ground) installation works in HA's new projects.
14. To adopt two-tier system to restrict sub-contracting of plumbing installations.
15. To introduce workload capping limits for plumbing subcontractor and LP.
16. To provide a qualified personnel with relevant qualification in English to support the plumbing and associated works handled by the LP.

**(C) Uplifting Professional Standard for Plumbing Workers**

17. To step up training for professional staff and site inspection staff on conducting inspection on plumbing works.
18. To require the main contractors to provide talk/demonstration on soldering work for workers upon commencement of each building contract.
19. To collaborate with training institutions (Construction Industry Council and Vocational Training Council) to enhance training programmes for LP and workers in the plumbing trade.

**(D) Enhancing Quality Assurance for Plumbing Works**

20. To update the contract requirements, specifications, technical guides and site inspection procedures with the latest international standards incorporated, and to enhance quality control system on materials.
21. To tighten the Performance Assessment Scoring System assessment, in order to cover the monitoring of material control by the main contractors.
- 22\* To adopt Kitemark surveillance scheme<sup>1</sup> for plumbing materials and develop HA's surveillance test requirements for products without Kitemark.
- 23\* To collaborate with WSD and other stakeholders to study the feasibility of implementing product certification for plumbing materials/components.

**(E) Collaborating with the Government**

24. To collaborate with government bureaus/departments for research studies and enhancement of regulatory standards.
25. To actively taking part in (i) WSD's Technical Committee on Plumbing and (ii) WSD's Advisory Committee on Water Supplies and its various working groups to understand the various research studies and measures put in place by WSD to improve water quality.

**Part II Risk Management of Building Materials**

**(F) Risk Assessment of Building Materials**

26. To conduct risk assessment of architectural (some 1100 types) and structural materials (some 250 types) with reference to International Standard ISO 31000 and government's practice with the participation of stakeholders.

\* Preparation work of the item is still on-going.

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<sup>1</sup> Kitemark is a product or service quality certification operated by the British Standards Institute of the United Kingdom to indicate that the product or service meets the requirements of the relevant British Standards or other international standards. The certified products or services are subject to regular audits and surveillance visits to ensure continuing compliance.

- 27\*. To conduct risk assessment of building services materials (some 600 types) with reference to International Standard ISO 31000 and government's practice with the participation of stakeholders.
- 28\*. To conduct risk assessment of civil, geotechnical, and landscaping materials (some 350 types) with reference to International Standard ISO 31000 and government's practice with the participation of stakeholders.

**(G) Risk Treatment based on Risk Assessment Results**

- 29\*. To incorporate risk assessment results of building materials, including architectural, structural, building services, civil, geotechnical and landscaping materials, into the enhanced quality control system for checking and monitoring of the compliance of materials. The enhanced system includes the updating of the contract requirements, specifications, technical guides and site inspection procedures.
- 30.\* To appoint a consultant to review and update the Specification Library.
- 31.\* To require main contractors to conduct risk assessment of building materials with reference to International Standard ISO 31000.
- 32. To set up Material Task Group with members comprising contractors, suppliers and in-house staff to review the current material checking and monitoring system and to propose enhancement measures to the system.
- 33.\* To employ Material Monitoring Officer on site to assist Contract Manager in the material compliance checking and monitoring.
- 34.\* To extend the scope and coverage of surveillance test on building materials.
- 35.\* To require regular audit on contractors' quality control system implemented in all HA sites.

\* Preparation work of the item is still on-going.



## Appendix II

### Building materials used for public housing

#### List of relevant papers

Committee	Date of meeting	Paper
Panel on Housing	7 March 2011	Administration's paper on "Implementation of Product Certification of Construction Materials in the Hong Kong Housing Authority's Projects" ( <a href="#">LC Paper No. CB(1)1447/10-11(05)</a> )  Minutes of meeting ( <a href="#">LC Paper No. CB(1)2397/10-11</a> )
Panel on Housing	5 December 2016	Administration's paper on "Updates on Issues Arising from the Excess Lead in Drinking Water in Public Rental Housing Estates Incident" (LC Paper No. <a href="#">CB(1)217/16-17(05)</a> ), and "Risk Assessment" (LC Paper No. <a href="#">CB(1)257/16-17(03)</a> )  Minutes of meeting (LC Paper No. <a href="#">CB(1)506/16-17</a> )  Administration's supplementary paper (LC Paper No. <a href="#">CB(1)425/16-17(01)</a> )
Panel on Housing	6 March 2017	Administration's paper on "Construction materials used for public rental housing" (LC Paper No. <a href="#">CB(1)617/16-17(07)</a> )  Minutes of meeting (LC Paper No. <a href="#">CB(1)900/16-17</a> )