

**For discussion  
on 6 March 2017**

## **Legislative Council Panel on Housing**

### **Building Materials used for Public Rental Housing**

#### **PURPOSE**

This paper briefs Members on the risk assessment of building materials used in the construction of new public housing developments undertaken by the Hong Kong Housing Authority (HA).

#### **BACKGROUND**

2. 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 drinking water” incident in July 2015, HA has further implemented 35 new initiatives to enhance quality for building works, including risk management of building materials. The new initiatives are set out at Annex.

#### **RISK ASSESSMENT OF BUILDING MATERIALS**

3. In June 2016, HA started the systematic risk assessment exercise<sup>1</sup> on all building materials based on the principles of the international standard ISO 31000. On 5 December 2016, we briefed Members the approach and methodology of the risk assessment (vide Legislative Council Paper No.CB(1)217/16-17(05)).

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<sup>1</sup> 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 building 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”.

4. In December 2016, HA has completed the risk assessment of about 2 300 kinds of building materials used in architectural, building services, structural, civil engineering, geotechnical engineering and landscaping. In accordance with the principles of international standard ISO 31000, HA has identified the risk level of building materials and grouped them into categories according to the degree of risk. Building materials which may cause serious impact in cases of non-compliance with specifications or failure in function are classified into the category of materials having the highest risk. These materials generally involve the following circumstances –

- (a) affecting the safety of users and/or having adverse effect on health;  
or
- (b) compliance with statutory requirements is necessary; or
- (c) newly introduced or seldom used, hence the Housing Department/contractors have limited knowledge or understanding;  
or
- (d) requiring high-level technique or special skills to work on.

5. HA has invited contractors and other stakeholders including government departments, trade associations, institutions, academia, professional service providers, suppliers, etc. to participate in the risk assessment exercise. Feedbacks from the stakeholders on our proposed systematic risk assessment system were generally supportive.

## **RISK TREATMENT**

6. After completing the risk assessment of building materials, HA has started developing corresponding risk treatment measures based on the risk assessment results and the present known risk levels. These risk treatments 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 will be rolled out in the third quarter of 2017 for every works projects. Some materials, however, may require further study and experts' advice, and the other relevant risk treatments measures will be implemented in steps at appropriate time.

7. 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<sup>2</sup>.

8. At the same time, with a view to developing a consistent methodology on material control, HA will require the contractors –

- (a) to develop a project specific material risk assessment system for their subcontractors and suppliers with reference to HA's system, and incorporate into their Quality Control System and Subcontractor Management Plan; and
- (b) to appoint a third party to conduct annual audit on the Quality Control System for every HA project, and increase the frequency of compliance audits on materials by the contractors' in-house audit teams.

## **PROMOTION AND TRAINING**

9. HA has organised a series of promotion and training sessions in December 2016 and January 2017. Participants include external stakeholders (contractors, subcontractors and suppliers) and HA's project teams.

10. HA will also organise a large scale launching ceremony to announce the material controls measures, and will organise a partnering workshop and sign charter with the contractors, with a view to drawing in the contractors' commitment and raising the awareness among industry stakeholders such as government departments, trade associations, institutions, academia, professional service providers, suppliers etc.

## **CONTINUOUS IMPROVEMENT**

11. Risk assessment is an on-going process and may evolve and change over time. HA will keep on cooperating with relevant stakeholders and experts, and improve the quality control systems regularly to check and monitor whether the materials comply with the specifications, with a view to maintaining and improving the effectiveness of the system.

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<sup>2</sup> Meanwhile, HA will further strengthen the inspection on building materials –

- (a) conduct a project specific material risk assessment to identify risk treatment measures for each project; and
- (b) employ Material Monitoring Officers to assist HA's project teams in the checking and verification of all delivery notes of approved materials delivered to site in accordance with the information shown on the approved Sample Submission Forms.

**Transport and Housing Bureau  
March 2017**

**Enhancement Measures Adopted by  
the Hong Kong Housing Authority (HA) in Response to  
Recommendations by the Commission of Inquiry  
into Excess Lead Found in Drinking Water**

**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 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.
- 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**

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

<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.

- 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.

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