

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

Meeting with The Hong Kong Institution of Engineers

PURPOSE

----- On 2 November 2015, The Hong Kong Institution of Engineers
----- (“the HKIE”) published a “Report on Study of Lead in Drinking Water in Public
Housing Estates” (“the Report”) (**Annex A**). The HKIE also held a press
conference and issued a press release (**Annex B**) on the same day to announce
its key findings. This paper summarizes the key findings of the Report which
are relevant to the Housing Authority (“the HA”), with a view to facilitating
Members’ discussion with the HKIE at the meeting on 13 November 2015.

KEY FINDINGS

2. According to the Report, the HKIE set up a task force in response to the incident of excess lead found in drinking water in public housing rental (PRH) estates (“incident”), to look into the incident such that “the general public should be better and more accurately informed on the engineering aspect of this issue”. The key findings of the Report **relevant to the HA** are summarized below -

(a) On engagement of contractors and consultants -

- “....the management philosophy of [Housing Department] (HD) in managing risks was by tightening contractor entries and monitoring construction progress by documents with the control drafted at the top of the pyramid.” (paragraph 196)
- “Even when external [Mechanical, Electrical and Plumbing Engineering] consultants were engaged the same schematic design flows and material preference had to be followed.

There was no room for innovation and the skill and expertise of external professionals were not utilized.” (paragraph 198)

- “....such stringent control on contractors admission qualification does not necessarily guarantee quality and is not conducive to set down a competitive tendering platform.” (paragraph 218)
- HD should maintain a list of plumbing subcontractors (press release)
- Plumbing works should come under a separate contract (press release)

(b) On equipment specification -

- “....wondered why there was a need that reliability must be established with HD projects for electrical and mechanical equipment and why plumbing fittings were exempted. (paragraph 225)
- “The practice only brings about an exceedingly lengthy approval to discourage new comers and with the swift technology development, the models in the approval process might already well be obsolete by the time it was ultimate approved.” (paragraph 226)

(c) On the role of engineers -

- “The potential suppliers would have to pay for the examining organization for assessment, a duty that a project engineer should be responsible. With this arrangement, it appears that the HD engineers would just refer to the list for project acceptance.... had grave concern with this trend..... one of the important duties of BS engineers is to evaluate equipment, its design, availability and application for projects.” (paragraphs 233 to 234)

- “....HD has a team of [building services] (BS) professionals the expertise of them was not exploited to its fullness in supervising BS contracts in general and plumbing contracts in particular.” (paragraph 278)
- “The role of professionals should take up the dominant role in project management, not blanks, checklist and numerals. The impression that engineers were not accorded duties in line with their attainments and attributes must be demonstrated incorrect. The duty of building services section should be extended from the role as internal consultants to bear due responsibility in plumbing installation contracts.” (paragraphs 382 to 383)

(d) On plumbing installation works -

- “....the omission [referring to the use of leaded solder not being detected] could have been avoided if –
 - (a) BS engineers and inspectors are assigned to monitor plumbing installations; or
 - (b) Clerks of Works were thoroughly and diligently trained to inspect the plumbing installation; or
 - (c) An item covering lead-free tin-solder was included in a check-list form.” (paragraph 274)
- “the failure of on-site monitoring and inspection on the part of HD was a structural deficiency....” (paragraph 275)

(e) On Water Supplies Department (WSD)’s water sampling protocol -

- while flushed draws gave “a closer value of the status of the water quality in the system the public enjoy.... These results might not been able to alleviate the uncertainties of the tenants stalked by mounting mistrust.” (paragraphs 154 to 155)

- “....WSD Water Sampling Procedure was biased towards measuring the water quality as supplied to the premises and ignored the effects of plumbing materials, including any possible lead solder, on drinking water quality. If the purpose of water sampling is for identifying the presence of lead solder and non-compliant valves and fittings in the plumbing installations, then initial draw-off water samples should be used.” (paragraphs 323 to 324)
- “For those estates found with excessive lead, the engineering approach would be first to identify the floors with plumbing installations carried out by the ‘questionable’ workers with either repeated testing or a larger sampling size. It could be that some floors or some of the blocks installed by other team of workers were ‘clean’ within the same estate.” (paragraph 334)

Other Findings

3. The HKIE’s Task Force has made other observations including those **relevant to the Water Authority (WA)/WSD and its regulatory regime**.

- (a) On findings and recommendations made by the WSD’s Task Force -
- “....could not agree contribution of lead leaching from other components should be summarily dispensed with....was not convinced by just referring to Hung Fuk Estate it could be concluded tin-solder was the principal culprit for two estates with 6,700 some flats.” (paragraph 356)
 - “.... did not agree with the recommendation of changing to stainless steel pipers and fittings just because substandard tin-solder which had escaped due scrutiny for copper pipes was used.” (paragraph 359)
 - “Central procurement for tin-solder, a consumable item, is not practical and efficient for construction works.... central procurement could reduce errors but was mindful that it would not be the ultimate panacea.” (paragraph 362)

(b) On WA and its regulatory regime –

- “....the arrangement for [Licensed Plumber] (LP) to be solely responsible for all scopes of work is no longer adequate.” (paragraph 55)
- “....lead-free tin solder as not explicitly or implicitly stated as a specification in WSD various materials searched.” (paragraph 90)
- “....benefit and necessity to induct a strata system of licensing a workforce including professionals, supervisors and workers at different level of competence to cope with the complexity and scale of construction.’ (paragraphs 299 to 300)
- “....registration of plumbing and drainage contractors is also necessary to extend the statutory liability on the part of the employers for employees in breach of a statutory provision.” (paragraph 301)
- “The training of plumbers should be reinforced. The awareness of the seriousness of potential health impacts arisen from lead contamination and the skill of jointing should be stressed. The level of knowledge and competence of soldering joins performed by plumbers is to be adjusted within the Qualification Framework (QF) regime. The weight of the penalty points should also reflect in commensurate with the elevated QF classification.” (paragraphs 378 to 379)

HD’S OBSERVATIONS

4. We note that the Report did not discuss or elaborate on the following issues -

- (a) It only pointed out in paragraph 360 that there were private developments in which copper pipes and tin-solder had been used but no water sample containing excess lead had been found. However, the Report did not discuss the issue of private sector’s

awareness of the problem (i.e. risk of presence of lead in solder and its implications for water quality), as well as of private sector practice that may be relevant to minimizing the occurrence of excess lead in drinking water.

- (b) The Report did not mention whether the HKIE had been aware of the problem before the incident.
- (c) While the Report contained details on how pipes were physically joint by using solder, it did not contain findings as to whether, and to what extent, workmanship might have contributed to the problem.
- (d) The Report contained recommendations relevant to the WSD and HD, and on registration of plumbing contractors, monitoring of LPs as well as training of plumbers. But HKIE did not give any recommendation relevant to the performance of main contractors/ domestic subcontractors.

----- 5. HD's further responses to the Report are at **Annex C**.

6. The HKIE could be asked to share their findings/ observations on the above issues, if any, with the Review Committee at the meeting on 13 November 2015.

INFORMATION

7. This paper is issued for Members' information.

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HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

1. The HKIE Report on Study of Lead in Drinking Water in Public Housing Estates (the Report) covers the work of the Housing Authority (HA) / Housing Department (HD) and other organisations.
2. HD's response to the Report as set out in this Annex is confined to relevant parts relating to the work of the HA / HD.
3. We noted that the Report contains some statements which are not factually correct or are unrelated to quality of drinking water or the presence of lead therein. It appears that the HKIE did not have a full and accurate understanding of the systems of the HA. Their findings could have been partly based on such misunderstanding. It is regrettable that the HKIE did not seek confirmation nor offer an opportunity for the HA / HD to make clarifications before the Report was published.

HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

Item	Para. no	HKIE Findings	Response
(A) On List Management			
1.	204	The HD does not rely on the lists under the Development Bureau and keeps its own list of specialist M&E contractors. The contractors had to apply to be included in the "Lists of Works Contractors".	<ul style="list-style-type: none"> • Noted. • As a prudent risk management measure and to address the frequent need of inviting tenders of similar nature for works and to secure competent and reliable contractors, HA has established and maintained HA Lists of contractors and service providers to save resources for pre-qualification. The "Guide" is drawn up to promote transparency of the counterparty list management system and to make the rules clear to counterparties. HA adopts a guiding principle of fairness in determining the appropriate regulatory action to be imposed in given circumstances. • HA is not monitoring construction progress by documents only. HA conducts routine site inspection and assesses contractors' performance with PASS on a regular basis. This system is not prepared at the top of the pyramid as quoted but developed with full participation of the frontline staff of HA and the Contractors and in consultation with stakeholders in the industry. • HA has been maintaining a transparent and open system and always welcomes all interested contractors meeting the criteria to apply for admission onto the appropriate HA Lists. • We have regular dialogues with various stakeholders of the industry for continuous improvement of the admission requirements.
2.	206	The Conditions for initial application are quite reasonable.	
3.	221	The " <i>Guide to Registration of Works Contractors and Property Management Services Providers</i> " also listed out codified penalty terms in great details mostly based on strict measurement of quantifiable parameters.	
4.	218	The TF also opined such stringent control on admission does not necessarily guarantee quality and not conducive to setting down a competitive tendering platform. It would only narrow the field to fewer patrons.	
5.	196	The TF opined, since, the management philosophy of HD in managing risks by tightening contractor entries and monitoring construction progress by documents with the control drafted at the top of the pyramid.	

HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

Item	Para. no	HKIE Findings	Response
6.	202	HD did not keep a list of P&D contractors and due to the domestic contract format communication to P&D contractors were through the main contractor.	<p><u>P&D as domestic sub-contractor</u></p> <p>Despite their domestic subcontractor status, HA has always been maintaining regular dialogues with the relevant associations of plumbing contractors in the discussion of plumbing and drainage works.</p> <p><u>List of P&D contractor</u></p> <ul style="list-style-type: none"> HA does not have a list of plumbing installation contractors and will consider the use of the Government's List of "Plumbing Installation" (PI) Category under the List of Approved Suppliers of Materials and Specialist Contractors for Public Works, which is established in 2013 and administrated by the Development Bureau (DEVB) and managed by Architectural Services Department.
7.	212	The trade of air conditioning and refrigeration contractors outright declined registration and hence there was no list established for such specialists. HD refers to the Development Bureau registered list when needed.	<ul style="list-style-type: none"> HA dissolved the List of ACMV Contractors in 2006 due to the small number of ACMV works that did not warrant the maintenance of the List. To optimize the utilization of resources, HA makes use of the list maintained by DEVB for tendering of its ACMV works for pre-qualification to engage capable and competent contractors on the DEVB's list. The opportunities for contractors to tender for HA's ACMV works will not be affected as a result of the dissolution of the HA List.

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(B) On List Management Fees			
8.	207	But a one-off non-refundable application fee at about HK\$50K is required for initial applications. The successful applicant will be put on probation period.	<ul style="list-style-type: none"> • HA is a statutory body established under the Housing Ordinance and is a financially autonomous entity with HD as its executive arm. List management fees, which are calculated based on HA's full cost recovery policy since 1990s, for admission and annual retention for the HA Lists are to recover the administrative costs for processing the contractor's applications. Fees are paid to HA. • Pursuant to HA-Financial and Accounting Regulation (HA-F&AR) 440 and HA-Costing Policy (HA-CP) No.1, except where otherwise approved by the relevant authority or provided under any enactment to the Housing Ordinance, the full cost recovery principle should be adopted in determining the fees and charges of an activity or a service. • HA charges a one-off list admission fee and an annual renewal fee for listed contractors to cover the costs for vetting of financial, technical and corporate submissions at admission and annual renewal. The statement that annual fee is <i>"for assessing audit account"</i> is factually incorrect. • Review on the charging of list management fees reveals that it has not formed an unnecessary obstacle to the contractors and also complies with the requirements of WTO GPA.
9.	209	Annual fee of about \$9000 for assessing audit account is required.	
10.	213	The TF did not know whether the fees were paid to HD, a government department or to HA.	
11.	217	Without other provisions the TF questioned the legitimacy of HA charging contractors for the admission to and retaining of the approval list.	

HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

Item	Para. no	HKIE Findings	Response
(C) On Tendering			
12.	208	There are other requirements to meet before contractors were invited to tender. It is HD's absolute discretion according to a fair and just basis when sending out invitations to treat.	<ul style="list-style-type: none"> • To safeguard public housing production and quality of works, it is prudent for HA to invite capable and competent contractors with satisfactory past performance and proven track record to tender. All eligible contracts can be admitted onto the HA Lists. To encourage good performance, HA accords more tendering opportunities to contractors who perform well. • HA will strike a suitable balance between price and performance for tender evaluation. • Allocation of tender opportunities is exercised through an open and transparent mechanism continuously developed in consultation with the industry. Newly admitted contractor (on probation status) is restricted to undertake one contract to minimize the risks of HA in awarding a large number of contracts to an 'untested' contractor while enabling it to build up its track record. Contractor with probation status may apply for 'confirmed' status following satisfactory completion of on HA project or non-HA project after admission. • HA's Lists are open to all interested contractors on the market. HA conducts annual briefing to contractors to help them understand the rationale and operation of the mechanism. Interested contractors are welcome to apply for inclusion onto the HA Lists at any time. We do not agree with the statement <i>"This policy of managing contractors in this mode denies HD exposure to a larger pool of entrants."</i>
13.	209	In order to be continually retained on the list paying an annual fee of about HK\$9000 for assessing audit account is required. But the TF was informed even after satisfactory assessment of annual accounts listed contractor may still not be invited to tender due to lack of completed projects within a period prior to tender calling date.	
14.	211	This policy of managing contractors in this mode denies HD exposure to a larger pool of entrants.	

HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

Item	Para. No	HKIE Findings	Response
(D) On WTO GPA			
15.	219	The TF further noted due to provisions of WTO GPA “HA shall have their right to invite any party other than those in the lists” and the same conditions and requirements upon Hong Kong based contractors to retain on the approval list are not enforced on foreign firms.	<ul style="list-style-type: none">• HA, as a procuring entity, is subject to the WTO GPA and complies fully with the requirements of GPA.• In line with GPA, any interested contractor may apply for inclusion in the relevant Lists at any time. The same admission and retention requirements apply to both local and foreign firms without discrimination.• Tender invitations are generally restricted to the relevant HA Lists of Works Contractors. In circumstances where there are no suitable HA lists, HA will conduct pre-qualification exercise to identify suitable tenderers. Any suggestion that local firms are penalized is unfounded. We do not agree with the statement “...penalize local firms in tendering.”
16.	220	The National Treatment requirement of an international treaty does not demand the government to penalize local firms in tendering.	
(E) On Performance Assessment Scoring System (BSPASS)			
17.	244	It appears the tool could encourage the contractors ‘to improve the quality’ of the project at hands by scoring higher marks so as to be rewarded with a higher grade for future tendering.	<ul style="list-style-type: none">• Agreed.
18.	245	The TF hence noted and agreed to a certain extent with HA other statement that BSPASS “ <i>has been proven to be a useful tool for selecting the better performing contractors to tender for upcoming projects</i> ”.	

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Item	Para. No	HKIE Findings	Response
19.	237	The standardized report forms set up by the Bureau were to cover qualitative items weighting factors of which, where necessary, could be non-linear and to be supplemented by written comments. D1 to D3 involved when adverse reports arise. Adverse report was to be in writing.	<ul style="list-style-type: none"> HA accords priority and importance to monitor the performance of contractors. All adverse performance reports are discussed and rated in Contractor Review Committee (CRC) chaired by D2 officer. Procurement Review and List Management Board, chaired by D3 officer oversees and reviews the operation of CRC. All performance reports including ratings for different aspects of assessment and comments prepared by Project Team, whether adverse or not, are in writing. All performance reports are assessed objectively with transparency, in the presence of contractors' representatives.
20.	238	The essence was to prevent adverse performance of contractors in projects at hands. When an adverse report arises higher rankings, from D1 to D3 grades depending on circumstances, of officers must be involved. The adverse report was to be in writing.	
21.	240	The assessment form of BSPASS included numerous examples of calculating formulae with delineation of weighted scores " <i>to monitor the contractors' performance</i> ".	<p><u>For Items 21 to 31</u></p> <ul style="list-style-type: none"> As a general site inspection practice for HA's contract administration functions, we have been applying Building PASS for plumbing installation instead of BSPASS. BSPASS was developed to measure performance output directly against defined standards and to provide an objective means of comparing the performance of individual contractors. Assessments are conducted quarterly, i.e. 4 times evenly spread out each year for each project, in a consistent manner. In addition to the assessments carried out by inspectors and engineers in charge of projects, assessments are also conducted by an Independent Team to enhance impartiality of BSPASS.
22.	241	The assessment is further broken down into specific items which can be assessed against <i>pre-determined</i> assessment standards.	
23.	242	The TF found the weighting of assessment marks focused more on timely submission of documents as in equipment procurement & delivery and the completion progress than the workmanship.	

HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

Item	Para. No	HKIE Findings	Response
24.	246	Another objective "BSPASS assessments are not intended to replace the normal checks, inspections and tests to be carried out by the project team..." was not effectively materialized and was contrary to the statement that "BSPASS is, nevertheless, seen as a complementary, checking system for the various aspects."	<p><u>For Items 21 to 31 (cont'd)</u></p> <ul style="list-style-type: none"> • Different modules of assessment were developed to measure the contractor's performance during different stages of the contract. • Works Assessment (70%) measures contractor's work quality at location/spot based on random sampling at construction stage. • Input Assessment measures management capability including programme and progress (15%), management and resources (10%), safety and environment (5%). • Scores derived from BSPASS assessments are used in the allocation of tendering opportunities as well as in evaluation of tenders. • Results of BSPASS assessments are provided to contractors to draw their attention to the aspects which require improvement. • In view of the sheer volume of items incorporated in a construction contract, HA adopts a risk based approach in determining the items to be included in inspection forms. • New assessment items would be added if considered necessary for checking for presence of lead in soldering materials and in water samples. • Project Team will conduct normal checks, inspections and tests on daily basis in accordance with the progress of works, to be supplemented with BSPASS assessment, which is conducted quarterly. • As BSPASS is not applicable to plumbing installations, we cannot see the correlation between the comments on BSPASS and the quality of plumbing works.
25.	247	The assessments were carried out by inspectors and endorsed by the senior inspector and the project engineer in HD projects. The emphasis was to monitor items prescribed in the BSPASS.	
26.	248	The TF opined BSPASS is more about project progress monitoring. It accomplishes its purpose if the quality is more about timely completion than the quality of workmanship.	
27.	249	The process echoes the logic adopted in equipment approval with professional inputs being second fiddle to listed items. This is a prescriptive and quantitative management mode controlled by a form, in ink on a paper sheet.	

HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

Item	Para. No	HKIE Findings	Response
28.	251	The TF opined that HD devised a checklist-type form recording past data to compare with that of the future to extrapolate the quality or the trend of its accomplishment in the project management.	See Response for Items 21 to 31 above.
29.	252	The risks and monitoring management is by a quantitative approach with the belief quality will follow.	
30.	253	The HD form could serve its function if sufficient data were recorded. With one datum amiss, that particular sector would escape the scrutiny. With the tin-solder amiss, the rest is history.	
31.	254	The TF opined the checklist with so many items covered and in specific details distracted the needed professional attention to workmanship by patrolling inspectors.	

HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

Item	Para. no	HKIE Findings	Response
(F) On Innovations			
32.	197	Development of M&E designs became dormant and new products assessment was almost ceased, The expertise and skill of site staff and engineering professionals were bespoke in filling forms in monitoring the construction program.	<ul style="list-style-type: none"> • We do not agree with these two statements, which reflect a misunderstanding on the part of HKIE. • As a matter of fact, our designs and adoption of new products keep pace with the trend of the industry. Examples like use of stainless steel water pipe, LED bulkhead, micro climate study on odour dispersion, application of BIM on sun shading and reflection nuisance from PV panels to people nearby, rain water harvest system, hybrid ventilation, lighttube, two level lighting system, twin roof tank system, use of lift regenerative power, etc. have been introduced in recent years.
33.	198	Even when external MEP consultants were engaged the same schematic design flows and material preference had to be followed. There was no room for innovation and the skill and expertise of external professionals were not utilized.	<ul style="list-style-type: none"> • While MEP consultants are requested to follow our quality documents in the design, there are room for their innovation and expertise, including the adoption of new technologies appropriate to public housing developments. • Consultants who have introduced innovation into HA projects will be given due recognition in HA's performance appraisal system (COMIS), which will have positive impact on their bidding for HA jobs.

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(G) On Equipment Specification			
34.	223	The TF was informed there was a 'probation' requirement of successfully completion of HD projects before equipment was 'ultimately' approved.	<p><u>For Items 34 to 37</u></p> <ul style="list-style-type: none"> • As a matter of principle, it is imperative that the materials for these installations have been proven fit for purpose or else a lot of inconvenience and nuisance will be caused to users in case of failure. • The application and usage rate of building services installations in public housing estates are high. Their performance and reliability will affect a large number of residents. Therefore a proven track record is essential. • However, the requirement for proven reliability is only applicable to the more critical equipment only, such as lift equipment, emergency generator sets and main cubicle switchboards, not indifferently to all types of product. • We proceed along the principle with the prudence in specification and we carry out trial installation of new products and materials on limited scale before massive application. Recent examples are PV panels installation in three blocks at Lam Tin Phases 7 and 8 and trial installation of LED bulkhead at one block at Kai Tak Site 1A. Upon accruing successful experience from the trials, we have now incorporated the specifications for general application. • HA adopts a risk based approach to determine if proven track record is required for certain types of equipment. Plumbing materials are regarded as low risk items and they are subject to WSD approval, unlike E&M items that do not possess a pre-approval status given by EMSD, we do not consider proven track record necessary.
35.	224	The TF understood and agreed the rationale that choices of certain equipment have to be made with proven track records, but wondered the need of an indifferent application to all types of product:- normal & essential supplies, main & accessory components, safety & performance compliance and statutory & cosmetic supplements, in particular considering: (a) The construction is mostly about residential flats, (b) Specifications on some equipment already require quality assurance schemes, (c) Equipment used in the maintenance work two years after completion of projects would not need to follow the same.	
36.	225	The TF wondered why there was a need that reliability must be established with HD projects for electrical & mechanical equipment and why plumbing fittings were exempted.	

HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

Item	Para. no	HKIE Findings	Response
37.	226	The practice only brings about an exceedingly lengthy approval period to discourage new comers and with the swift technology development, the models in the approval process might already well be obsolete by the time it was ultimately approved.	See Response for Items 34 to 37 above.
38.	232	The TF was also informed HD had initiated the work of specifying LED bulkhead by seconding it to outside entities for compiling a list of suitable products.	<ul style="list-style-type: none"> As a matter of fact, BS engineers evaluate equipment, its design and application for public housing development projects. The specification for LED bulkhead was in fact developed by HA's BS professional staff in collaboration with industry stakeholders and regulators. For upstream quality assurance at source, the specification requires a third party product certification scheme and The Hong Kong Electronics Industries Association is the Scheme Owner. HA had successfully persuaded the industry to develop one. It is reasonable for manufactures to bear the cost of certification if they wish to make use of the service offered by the scheme operator.
39.	233	The potential suppliers would have to pay for the examining organization for assessment, a duty that a project engineer should be responsible. With this arrangement, it appears the HD engineers would just refer to the list for project acceptance. The TF had grave concern with this trend.	
40.	234	The TF opined one of the important duties of BS engineers is to evaluate equipment, its design, availability and application for projects.	

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Item	Para No.	HKIE Findings	Response
(H) On Plumbing Installation Works			
41.	264	The TF had compared the standards prescribed in HD specification. It has the most updated version, better than that from the private MEP consultants, better than that of ASD.	<ul style="list-style-type: none"> Agreed.
42.	274	<p>“....the omission [referring to the use of leaded solder not being detected] could have been avoided if –</p> <p>(a) BS engineers and inspectors are assigned to monitor plumbing installations; or</p> <p>(b) Clerks of Works were thoroughly and diligently trained to inspect the plumbing installation; or</p> <p>(c) An item covering lead-free tin-solder was included in a check-list form.”</p>	<p><u>For Items 42 and 43</u></p> <ul style="list-style-type: none"> As stated in the report on Interim Findings of the Hong Kong Housing Authority's Review Committee on Quality Assurance Issues Relating to Fresh Water Supply of Public Housing Estates, the “omission” referred to in HKIE Report is due to the lack of awareness in the construction industry, as well as HA/HD, of the risk of lead in solder and its implications for the drinking water quality and in turn, the associated health risks. The past mechanism of HA that was in place was consistent with the industry's practice, the law and other WSD's requirements, but had not focused on the presence of lead in the fresh water supply system or in the water, and failed to target soldering materials as a high risk item. Such inadequacies include – <ul style="list-style-type: none"> HA's system did not 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; In terms of in-process supervision, testing and commissioning, HA's system failed to check the presence of lead in soldering joints; and

HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

43.	275	<p>“the failure of on-site monitoring and inspection on the part of HD was a structural deficiency and not one particular to a specific projects”</p>	<p><u>For Items 42 and 43</u> (cont'd)</p> <p>(c) In terms of checks on completion of projects, HA's system followed the then WA's requirements on test of water samples for eight parameters, and did not include tests for lead.</p> <p>· Moreover, the general lack of awareness by other stakeholders in this incident are:</p> <p>(a) 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. But they have 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;</p> <p>(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-contractors.</p> <p>(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.</p>
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HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

			<p><u>For Items 42 and 43</u> (cont'd)</p> <p>(d) 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.</p> <ul style="list-style-type: none"> · Joint effort by different professionals and site inspection team within HA is essential to tackle such an industry-wide problem. According to the Interim Report of the Review Committee, the following measures were recommended by the Review Committee 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: <ul style="list-style-type: none"> (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. 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.
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HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

			<p><u>For Items 42 and 43</u> (cont'd)</p> <p>(c) 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</p> <p>(d) 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.</p>
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HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

Item	Para No.	HKIE Findings	Response
(I) On Recommendations			
44.	381	HA should revisit the tendering format & arrangement and the project controlling philosophy & programming of all types of contract.	<ul style="list-style-type: none"> • The HA continuously reviews its systems for improvement. • We work in close collaboration with the industry to review, enhance and refine its procurement systems while upholding the following principles – <ul style="list-style-type: none"> (a) Value for Money procurement; (b) Appropriate risk management in a holistic manner; (c) Continuous improvement at all levels; (d) Proper governance including accountability and transparency; (e) Provision of level playing field for open and fair market competition; and (f) Fair, reasonable and ethical procurement with due regard to probity.
45.	382	The role of professionals should take up the dominant role in project management, not blanks, checklists and numerals. The impression that engineers were not accorded duties in line with their attainments and attributes must be demonstrated incorrect.	<ul style="list-style-type: none"> • The HD's professionals (including BS engineers) have to make use of their professional knowledge and judgment in project delivery and in discharging their duties. • Public housing developments and public officers undertaking these projects must meet the aspirations of the public. Consistency in standards and procedures, fairness and transparency of management systems are prevalent considerations. To this end we have established a quality management system, with standards and procedures which are to be followed by all project team members. • In the continuous development of our quality management system, we have taken into account advice offered by the Independent Commission Against corruption to address concerns about probity issues that might arise if all decisions are solely left to individuals.

HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

Item	Para No.	HKIE Findings	Response
			<p><u>For item 45</u> (cont'd)</p> <ul style="list-style-type: none"> However, professionals are not expected to merely follow the standards and procedures laid down in the quality management system. These standards and procedures are the minimum requirements. In circumstances where these standards and procedures do not fit the circumstances of projects, project professionals, including BS engineers, have to make use of their knowledge and judgment for satisfactory delivery of the project.
46.	383	The duty of building services section should be extended from the role as internal consultants to bear due responsibility in plumbing installation contracts.	The HA will take into account the findings and recommendations of the Commission of Inquiry into Excess Lead Found in Drinking Water and the Housing Authority's Review Committee on Quality Assurance Issues Relating to Fresh Water Supply of Public Housing Estates.
47.	384	The TF submitted the PRH construction is basically a large scale repetitive work. Adequacy of equipment provision is paramount, not those proprietary and deviated from what are available in the general market.	<ul style="list-style-type: none"> Availability and adequacy have always been a key consideration of the HA in specifying construction materials and equipment. The HA will update the specifications from time to time and had commissioned two consultancies to comprehensively review the specifications for building services equipment/materials in 2009 and 2010. These specifications have already been aligned with the common practices of the industry.

HD's Response to Findings of HKIE Report on Study of Lead in Drinking Water in Public Housing Estates

Item	Para No.	HKIE Findings	Response
48.	385	Innovation should be allowed and encouraged in both civil and building services contract. A set of inviting criteria would be required.	<ul style="list-style-type: none"> • The HA encourages innovation of contractors. • We introduced the Three-envelope System in the Integrated Procurement Approach adopted for the tendering of Kai Tak Site 1B and Anderson Road Site A and Site B projects. The third envelope allowed for tenderers' innovations, which were given credits in tender evaluation. • For technically complex projects, the HA adopts a Two-envelope System for tendering of construction works. Tenderers are required to submit a technical proposal and are given opportunities to innovate in the aspects of design, construction processes, occupational health and safety, as well as environmental management. • For building contracts with tenders issued since May 2014 on the basis of the new General Conditions of Contract, the main contractor and building services nominated sub-contractors are encouraged to contribute innovative ideas through making of contractor's requested variation proposals for betterment of design and/or construction method, under which cost saving to the Contract Sum arising from implementation of innovative proposals will be shared with the main contractor and/or relevant building services sub-contractors.