

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

**Measures taken by the Housing Authority to ensure
Quality of the Fresh Water Supply System**

PURPOSE

This paper aims to brief members on the measures taken by the Housing Authority (HA) to comply with the prevailing statutory requirements enforced by the Government to ensure the quality of fresh water supply in public housing estates.

**CURRENT HA's PRACTICE TO ENSURE COMPLIANCE WITH
BUILDINGS ORDINANCE AND ITS SUBSIDIARY REGULATIONS,
CODES OF PRACTICE AND GUIDELINES**

2. The HA is committed to compliance with the statutory requirements of the Buildings Ordinance (BO), its subsidiary regulations, codes of practice and guidelines issued from time to time by the Buildings Department (BD), despite that building works and buildings on land wholly vested with or owned by the HA are exempted from the provisions of the BO under its section 41(1)(aa) and section 18(2) of the Housing Ordinance.

3. To this end, the HA agreed in 2000 to establish the Independent Checking Unit (ICU) to carry out compliance checking (administrative building control) of the building work proposals of the HA in accordance with the requirements of the BO and the prevailing practice of BD (Paper No. BC 161/2000; QH 19/2000 refers). ICU reported to the Permanent Secretary of Transport and Housing (Housing) (PSH) directly. ICU has eventually been detached from the organization of the Housing Department (HD) since 1 June

2015 and was placed directly under the Office of the PSH to emphasize its independence and impartiality. From 2005 onwards, ICU has also been delegated by BD with the authority to carrying out statutory building control for the HA and ex-HA buildings which are subject to the BO. The Memorandum of Understanding between Housing Authority/Housing Department and Buildings Department dated 22 August 2013 is at **Annex 1**.

4. To ensure that ICU's checking on the HA's projects is consistent with BD's prevailing policy and practice, two Senior Professionals have been seconded from BD to ICU to give advice on BD's policy and practices related to the compliance checking. They report to the Directorates of BD in respect of the work of ICU regularly and help to bring issues of complicated/discretionary nature back to BD for jurisdiction, if necessary. The corresponding Chief Professional in ICU will also be appointed by BD as Member of their Building Committee and Structural Engineering Committee respectively to ensure proper exchange of experience in checking practice of complicated/discretionary cases.

5. To simulate the application of accountability under the BO, HD has adopted parallel administrative practice by nominating the Chief Architect, Chief Structural Engineer and Chief Geotechnical Engineer to assume the equivalent roles¹ of Authorized Persons (AP), Registered Structural Engineers, and Registered Geotechnical Engineers correspondingly to coordinate and supervise the building works and make such inspections as may be necessary. HD has also been engaging qualified professionals and technically competent persons (TCPs) who possess equivalent qualification and experience as required under the BO and who are conversant with the BO and related requirements as projects staff to ensure that the design and construction of all HA buildings and building works are in compliance with the BO and related requirements at all times.

6. The HA has been employing Registered General Building Contractors registered under the BO (hereinafter referred to as 'Registered Contractors') to carry out and continuously supervise the building works and these Registered

1 Building works and buildings on land wholly vested to/owned by the HA are exempted from the Building Ordinance (BO). Therefore, the in-house Chief Architects serving as APs in HD do not have the statutory liabilities as stipulated in the BO and are only "equivalent APs". They are effecting the similar tasks without the statutory liabilities under the BO.

Contractors would ensure that the execution of construction works are in compliance with the BO and related requirements at all times. TCPs appointed by AP and Registered Contractor give supervision as required under the supervision plan on each site.

7. **On top of compliance with the statutory requirements**, the HA, as a procuring entity governed by the Agreement on Government Procurement of the World Trade Organisation, adopts selective tendering procedures in procuring most of our construction services from works contractors. In general, we invite those contractors on the HA List to tender for the new works building contracts. Past performance of the contractors will affect the allocation of tendering opportunities to contractors and evaluation of their submitted tenders. The HA may impose regulatory actions on contractors with poor performance, including but not limited to restriction and suspension from tendering. The List Management and Related Regulatory Action is at **Annex 2**.

CURRENT HA'S PRACTICE TO ENSURE COMPLIANCE WITH WATERWORKS ORDINANCE AND REGULATIONS

Pre-contract Stage

8. To ensure that the fresh water supply system installed in public housing projects comply with the statutory requirements, HD effects quality control through contract specifications. HD's Chief Architect serving the AP role of the public housing project submits Form no. WWO132 to the Water Supplies Department (WSD) applying for new water supply to the site, and plumbing installation plans for WSD's approval. All the plumbing materials, including soldering alloys for copper and copper alloy capillary fittings, specified by HD in the building contracts, comply with relevant international standards as stipulated in the Waterworks Ordinance (WO) (Cap.102) and the Waterworks Regulations (Cap.102A).

Post-contract Stage

Building Contract Provisions

9. Pursuant to the current General Conditions of Contract for Building

----- Works Clause 5.23 (**Annex 3**)², the Contractor has to conform in all respects with the provisions of any enactment, the regulations or by-laws of any local or duly constituted authority, and the rules and regulations of such public bodies and statutory authorities.

10. After award of the building contract, pursuant to Section 15 of the WO, the Registered Contractor employs a domestic sub-contractor who appoints a licensed plumber (LP) for execution of the plumbing installation works in accordance with the WSD approved drawings, and the nature, size and quality of pipes and fittings shall be prescribed by the WO and Waterworks Regulations. The HD's AP and LP notify the Water Authority (Part I of Form no. WWO 46) of the commencement date and the scope of plumbing works to be carried out in accordance with the WSD approved drawings.

Material approval

11. The Registered Contractor shall submit materials, including solders, and components of equipment, such as pumps and valves, of the plumbing system for HD's approval. Pursuant to Regulation 19, 20 and Schedule 2 of the Waterworks Regulations, the Registered Contractor can use only lead-free category solders, as soldering alloys with lead are not permitted in installations for water for human consumption³.

----- 12. In processing the Contractor's material submission for approval, HD checks the specifications (current 2014 version of HD Specification for plumbing works is at **Annex 4**) against the Contractor's submission documents/samples, including catalogues, samples, certificates, test reports, approval documents from respective regulatory authorities (including approval documents from the WSD, etc.), and an undertaking by the contractor that the materials are in full compliance with HA's and other recognized requirements.

2 Projects with tender issue before promulgation of 2013 edition of General Conditions of Contract have adopted the 1993 edition (corresponding Clause 30 refers).

3 Clause 17 of Schedule 2 of the Waterworks Regulations stipulates compliance with BS 864, Part 2. This British Standard was superseded by BS EN 1254-1: 1998, which states in Table 6 that soldering alloys with lead are not permitted in installations for water for human consumption, whereas different extents of lead content are permissible according to the international standards governing the various components of equipment, such as pumps and valves, in the water supply chain.

On top of compliance with the 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”⁴. The Contractor can only proceed to order the materials upon receipt of HD’s approval in prescribed form no. DCMP F716 (**Annex 5**).

Surveillance and control during construction

13. Pursuant to the current HD’s Site Inspection Guide, HD site staff will check the materials upon their delivery to site in prescribed form no. DASM-F6210 (**Annex 6**), including visual inspection and verification of materials against the approved sample, the respective catalogues and certificates in accordance with the contractual requirements. HD also selects samples for checking of the appearance, construction, dimensions against relevant standards and whether there are visible defects. HD’s “Component and Materials (C&M) Team” also conducts laboratory tests of major components such as sink mixers and shower mixers to ensure compliance with the specified performance standards of the contract specification. If the tests fail, HD can reject the supply or carry out re-tests of the same batch of components. HD’s C&M team will also post a material quality alert on the Material Data Base for reference by other projects⁵.

14. Pursuant to Regulation No. 41 of the Building (Administration) Regulations, the Registered Contractor is responsible for giving continuous supervision of the site works to ensure that the quality of works, including plumbing installation, complies with the statutory and contractual requirements. HD’s AP and TCPs exercise periodic supervision by carrying out surveillance checks and tests (HD Site Inspection Guide and relevant site inspection forms

4 A “Material Quality Alert” is a notification issued to project teams via email when a component or material under surveillance checking is found failed in a laboratory testing or failed to comply with the specification requirements. There are 25 building components and 28 building services materials under surveillance checking and all “Material Quality Alerts” are posted onto the Materials Database in the HA’s e-Housing Portal for ease of reference by project teams.

5 A deficiency in track record of a material is regarded as (i) any laboratory test failures without passed results of retests on such material; or (ii) two or more failed test reports within the past three years, irrespective of their passed results of retests, issued with or without Alerts. The Contract Manager may consider rejecting a material with a deficiency in the track record.

----- are at **Annex 7**). **On top of compliance with the statutory requirements**, HD conducts quarterly Performance Assessment Scoring System (PASS) assessments with contractors on site to assess the quality of works including the contractor's management of its domestic sub-contractors (PASS assessment documents are at **Annex 8**).

Precast Concrete Construction

15. For precast concrete construction in factories, the HA follows the Buildings Department's requirements on quality control and supervision as stipulated in the "Practice Notes for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers" (i.e. PNAP-APP 143). **On top of compliance with the statutory requirements**, the HA also commissions Independent Professional Service Providers (PSPs) to provide inspection services, including full-time deployment of resident supervisors to inspect the production of precast concrete components in factories. The Independent PSPs are required to appoint Registered Electrical Workers to audit the electrical conduit installation. A duly signed statutory Form WR1(A) certifying that the conduit installation is in full compliance with the Specification and the Code of Practice for the Electricity (Wiring) Regulations will be provided by the main contractor upon delivery of the precast elements to site. Moreover, the HD will conduct regular visits to the factories to audit the performance of resident personnel as well as the production process. For construction of volumetric precast bathrooms and kitchens, the resident supervisors carry out inspection and checking of the installation of the aluminum window frames and waterproofing, as well as fixing of wall and floor tiles according to contractual requirements. Only finished products will be delivered to the construction site where HD's site inspection personnel will carry out relevant tests such as water spray tests for leakage, pull-out tests for tile adhesion, and checks for whether sanitary fittings and partially installed pipes have been properly fixed (Quality Assurance of Precast Concrete Components manufactured in Mainland China is at **Annex 9**).

16. Regarding plumbing installation works, regular site surveillance is mainly done through visual inspection of for example, the alignment of water pipes and brackets, sound installation, adequate pipe sleeves and spacing etc. In the past, we do not inspect the joints between pipes (including the soldering material) for lead content. The reason is the construction industry has all along

believed that this widely accepted and broadly applied soldering material complies with relevant requirements. However, with the recent discovery of lead in water, HD has formulated follow-up actions. The contract specifications will be revised to require regular inspection and intensifying spot checks of soldering materials at pipe joints of fresh water plumbing systems to ensure that the material is lead-free. For associated water pump installations by building services nominated sub-contractor, no copper pipe is used within pump rooms while similar site surveillance and related functional tests are conducted for the works involved.

Contract Completion Stage

17. Upon the completion of fresh water plumbing systems, the Registered Contractor, the sub-contractor and the LP inspect and test to 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 Contractor who arranges for cleansing and disinfection of water tanks and pipes, conducting pressure tests and check for leaks etc. The LP applies to the Water Authority for inspection and approval of the plumbing installation (Part IV of Form WWO46). For associated water pump installations, the LP of the building services nominated sub-contractor, if different from that for plumbing installation, reports separately to WSD for the completion of the works and apply to WSD for inspection and approval of the installations. HD's AP applies to the Water Authority (Part II of Form no. WWO 132) for connection of water supply and confirm that the plumbing installation is in full compliance with Waterworks standards and requirements.

18. WSD will collect water samples from water connection points for testing and analysis. Quality of water samples shall comply with WSD's requirements. After WSD's site inspection of both the plumbing and water pump installations with satisfactory result, WSD connects permanent water supply to the premises and issues the Certificate regarding Water Supply Connection to the HA. HD can only certify completion of the building works and apply for the Occupation Permit when all relevant tests have been completed with satisfactory results.

19. Since 2003, the HA has also participated in the “Quality Water Supply Schemes for Buildings – Fresh Water” administered by WSD, under which fresh water tanks have to be cleaned at least once every three months. Random water samples will also be collected regularly for testing. Items tested include pH, colour, turbidity, conductivity, iron, E. Coli and total Coliform.

20. **On top of compliance with the statutory requirements**, HD incorporated the assessment criteria for water quality survey under Building Environmental Assessment Method (BEAM) Plus version 1.2 in the 2012 version of specifications that water samples as described in ISO5667 should be taken at all the farthest points of use in the distribution system from the storage tank, and should include sampling for each water supply tank used in the building. All the water samples have to meet the requirements in the WSD Guidelines.

21. To address the risk of Legionnaires’ disease, since 2012, HD has also required the water supply system of newly completed public rental estates to be disinfected with chlorinated water with a concentration of 50mg/L for two hours. After disinfection, the chlorinated water is drained away and the water supply system is flushed with fresh water.

INFORMATION

22. This paper is issued for Members’ information.

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MEMORANDUM OF UNDERSTANDING
BETWEEN
HOUSING AUTHORITY / HOUSING DEPARTMENT
AND
BUILDINGS DEPARTMENT

HONG KONG SPECIAL ADMINISTRATIVE REGION,
PEOPLE'S REPUBLIC OF CHINA

Recognizing that establishing and maintaining an independent regulatory control on Housing Authority (HA) buildings will continue to give public assurance of the built quality of public housing, the Housing Authority / Housing Department (HA/HD) and the Buildings Department (BD) have the following mutual understanding:

1. **Compliance with the Buildings Ordinance on design and construction standards**
- 1.1 HA/HD is committed to adhering to the statutory requirements under the Buildings Ordinance (BO), its subsidiary legislation, codes of practice and guidelines issued by BD, including Practice Notes for Authorized Persons, Registered Structural

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Engineers and Registered Geotechnical Engineers (hereinafter referred to as “the BO and related requirements”) at all times. Although HA buildings are exempted from the provisions of the BO under section 41(1)(aa) of the BO and section 18(2) of the Housing Ordinance, HA/HD has been taking measures, and will continue to do so, to ensure that HA buildings are designed and constructed to standards consistent with those set under the BO and related requirements for private developments.

- 1.2 HA/HD has been engaging and will continue to engage qualified professionals and technically competent persons who possess equivalent qualification and experience as that required under the BO and who are conversant with the BO and related requirements as projects staff and consultants to ensure that the design and construction of all HA buildings and building works (including alterations and additions) are in compliance with the BO and related requirements at all times.
- 1.3 HA/HD has been employing and will continue to employ contractors registered under the BO (hereinafter referred to as ‘Registered Contractors’) to carry out the construction works and these Registered Contractors would ensure that the execution of construction works are in compliance with the BO



and related requirements at all times.

- 1.4 HA/HD has been adopting and will continue to adopt the established system and practice whereby works procedures to meet standards commensurate to the BO and related requirements are subsumed under the quality management system, including internal guidelines and manuals. These system and practice will continue to enable the HA/HD projects staff and consultants to design, execute and supervise the works carried out by Registered Contractors, in compliance with the BO and related requirements under self-regulation.

2. **Independent Regulatory Control of HA and Former HA Buildings**

- 2.1 HD has established and will continue to maintain an Independent Checking Unit (ICU) to exercise independent administrative building control over HA buildings in line with the BO and related requirements.
- 2.2 The establishment of ICU is to ensure that the independent checking on HA projects is consistent with BD's practice. The emphasis is on establishing a comprehensive and independent administrative building control system. The ICU reports

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directly to the Permanent Secretary for Housing and is independent of other business divisions of the HD that carry out the building works, in order to achieve impartiality.

2.3 ICU control measures for HA buildings cover, among others, plan approvals, granting of consents to the commencement of works, site monitoring, final inspections for the issue of occupation permits or acknowledgement of completion.

2.4 Apart from the control of HA buildings, ICU exercises statutory building control, under a delegated authority from the Director of Buildings, to former HA buildings sold or otherwise disposed of under sections 4(2)(a) and 17A of the Housing Ordinance.

3. **Mechanism to uphold ICU's standards of checking by BD**

3.1 BD has been seconding and will continue to second senior professional officers to ICU to underpin the vetting teams by providing expert advice on plan processing, performing bridging functions like making referrals to BD and its committees on policy and principles, and channeling guidelines from BD on interpretation of the BO and related requirements

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and alignment of practices. The independent role and profound experience of the BD seconded officers have ensured and will continue to ensure that the standards of checking and independency of ICU are upheld. Chief professional officers of ICU are appointed as members of the Building Committee and the Structural Engineering Committee of BD.

- 3.2 BD has been reviewing and will continue to review regularly the delegation of authority and power to ICU, and to oversee ICU's delegated duties by receiving six-monthly reports. BD may conduct audit checks on ICU when necessary to ensure that the standards of checking by ICU are consistent with those of BD.

4. **Referral to BD to Take Disciplinary Actions against Registered Contractors under BO**

- 4.1 For HA building projects, apart from the sanctions under contract administration and list management, HD may make referral to BD for consideration of taking disciplinary actions against Registered Contractors who perform poorly in matters pertaining to the BO.

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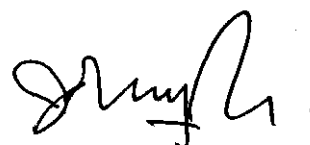
5. **Review of the Memorandum of Understanding (MOU)**

5.1 HD and BD will review the contents of this MOU biennially.

Signed by



D. W. PESCOD, JP
Director of Housing



AU Choi-kai, JP
Director of Buildings

Date : 22 AUG 2013



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

**Supplementary Information on List Management
and Related Regulatory Action**

A. List Admission and Retention Requirements

1. Corporate Requirements

- Statutory registration requirements –
Registered General Building Contractor under Buildings Ordinance (Cap. 123)
- Shall have company Code of Ethics and Code of Conduct
- Registered office –
Shall have a certification of incorporation, a valid business registration and a registered office in Hong Kong

2. Technical Requirements

- Quality Certification Requirements –
Possess ISO 9001, 14001, 50001 and OHSAS 18001 certification
- Relevant Work Experience and Technical Competency –
Relevant past work record of company, and minimum number, qualification and experience of key staff

3. Financial Capital Requirements

- Minimum working capital and employed capital requirements

[Ref.: **Appendix A** – Para. 2.3 of Part I and Part II, Specific Guidelines for Building Contractors in the “Guide to Registration of Works Contractors and Property Management Services Providers” (the “Guide”)]

B. Regulatory Action

1. Restriction or Suspension from Tendering
Regulatory action will be imposed if **contractor fail to meet HA's contractual requirements** or adverse performance.
[Ref.: **Appendix B** – Para. 4.1.8 of Part I of the “Guide”]

2. Removal from the List
In the event that a contractor has been involved in **serious incidents** of wages in arrears, **quality** or safety problems which had brought disrepute to the HA, it will be **removed from relevant or all HA Lists**.
[Ref.: **Appendix C** – Para. 4.10.1 of Part I of the “Guide”]

3. Removal from Premier League Status (PLS)
Should a Premier Contractor, after admission, be subject to regulatory actions, imposed by HA in the form of suspension, downgrading and/ or removal from the HA list of Building Contractors, **it will be removed from the PLS immediately**.
[Ref.: **Appendix D** – Para. 4, Section 11 of Part I of the “Guide”]

4. Action on Domestic Sub-contractors under Contract
The HA does not have a direct contractual relationship with the domestic sub-contractor. However, in accordance with the contract provisions of the Contract between the HA and the main contractor, the Contract Manager, if in his opinion he considers it necessary, has full power to order the **removal of any sub-contractor** from the Site and/or the Works, which power shall not be exercised unreasonably.

Moreover, the Contract Manager has liberty to object to, and can require the main contractor to **remove from the Works, any person employed** by the main contractor or **by the sub-contractor** for execution of the Works if such person **misconducts** himself or is **incompetent** or **negligent** in the proper performance of his duties, or if his employment is

otherwise considered to be **undesirable**.

[Ref.: **Appendix E** – GCC Clauses 4(3) and 18(2) or HA GCC Clauses 3.2(3) and 5.9(2)]

C. Quarantine Action

HA will put those tenderers (one of the top three scorers) who have been involved in circumstances that are defined as serious incidents under “Quarantine”, if they are one of the top three scorers, regardless of whether or not they have marks deducted, for any serious incidents occurring within the six-month period preceding the tender closing date or within the tender assessment period preceding the tender award date.

Major aspects to consider during quarantine

- (a) Contractor’s understanding in the root causes of the problem to be identified;
- (b) Contractor’s commitment for remedial measures to avoid recurrence in HA contracts (comprehensive implementation in completed, ongoing and future contracts);
- (c) To assess the risk to HA in awarding the contract (low risk if (a) and (b) are fully addressed to HA’s satisfaction).

[Ref.: **Appendix F** –Para. 4.10.1 in Part I and Section 13 of Part II of the “Guide”]

2.3 LIST ADMISSION / RETENTION CRITERIA

Applicants shall provide information as required in the following paragraphs for admission. After admission onto the List, the contractors shall have the obligation to ensure the continuous compliance of all criteria stipulated below (except those “for Admission only”) and to notify HA immediately if there is any change to the submitted information. Failure in meeting the requirements and/or notifying HA on any updated information may lead to the taking of regulatory actions as in Section 4.

2.3.1 Statutory Registration

In order to be admitted and retained on a List for defined Category of Works or Services, a contractor needs to possess the prescribed statutory registration as set out in **Part II (WC)** and **Part III (PMSP)** of the Guide.

2.3.2 Ethical Integrity

The contractor shall have a company Code of Ethics and Code of Conduct. In preparing a suitable Code of Ethics and/or Code of Conduct, advice is available from the Advisory Services Group (Hotline: 2526 6363) of the Corruption Prevention Department, Independent Commission Against Corruption (website: <http://www.icac.org.hk>).

2.3.3 Quality, Environmental and Safety Management System

A contractor shall already possess its own quality management policy and system and demonstrate commitment to deliver quality service and/or product to its customers.

Except for the HA List of Soft Landscape Contractors, a contractor shall operate recognized quality, environmental and safety management systems and shall be certified as a firm of “assessed capability” to the current edition of ISO 9001 (when applicable), ISO14001 (when applicable), OHSAS18001 (when applicable) and ISO 50001 (when applicable) by a certification body which is either accredited by the Hong Kong Accreditation Services (HKAS) or by an accreditation body considered as having equivalent standard by the Development Bureau (when applicable). HA will only accept the certificates bearing the Hong Kong Certification Body Accreditation Scheme (HKCAS) Accreditation Marks or accreditation marks of other equivalent accreditation bodies mentioned above (when applicable). The certification in support of such application must be in the name of the applicant and with a Scope of Certification relevant to the Category of the List being applied for. Laboratories on the HA List of Materials Testing Laboratories for Pile Testing shall have in operation a quality management system conforming to the Hong Kong Laboratory Accreditation Scheme (HOKLAS) 002 and 003 and be certified and approved by HOKLAS. Relevant information of a contractor on the Lists and its performance in HA contracts may be shared with the relevant certifying body for the purpose of reviewing its certification. The minimum scope of certification for a List is stated in **Part II (WC)** and **Part III (PMSP)** of

the Guide.

2.3.4 Registered Office and Work Experience

A contractor shall have a certification of incorporation, a valid business registration and a registered office in Hong Kong.

A contractor applying for admission onto a List shall have an appropriate proven work record as set out in **Part II (WC)** and **Part III (PMSP)**. The suitability of the contractor for admission onto the List is assessed on the basis of both its business activity in Hong Kong and global activity.

Application for admission from a Joint Venture of several companies will also be considered. The Joint Venture may be in the form of either companies joining together as partners which are jointly and severally liable; or companies forming a limited liability Joint Venture Company, each company concerned being a shareholder of the company. A Joint Venture has to be admitted onto a List before it is allowed to tender HA projects subject to other tendering eligibility criteria. Partners or shareholders in a Joint Venture may or may not be HA listed contractors. A Joint Venture and its partners and shareholders are not permitted to be concurrently included in the same category. In addition, the past performance of a Joint Venture and its partners/shareholders on government bureaux and departments projects and HA projects may affect the tendering eligibility of the Joint Venture and vice versa.

2.3.5 Financial Capability

A contractor shall have a sound financial background and satisfy the capital requirements under **Part II (WC)** and **Part III (PMSP)** in accordance with the financial evaluation requirements as shown at **Annex 1**.

2.3.6 Organization and Resources

A contractor shall have adequate full-time managerial, supervisory and operational staff with an appropriate level of experience both at head office and on site and meet the requirements on the minimum qualifications, experience and quantities of personnel stated in **Part II (WC)** and **Part III (PMSP)**. On-site management staff need to be given a high level of delegated authority such that they can make decisions including those involving expenditure.

A contractor shall also have its own training policies, and develop its training schemes, and/or send employees to recognized training institutions to develop their management and/or trade skills.

A contractor shall have suitable plant and equipment available for delivering its service and output. Where specified, a contractor shall have sufficient plant available to it at

all times commensurate with the works being undertaken. The minimum requirements for WCs for such plant are stated in **Part II (WC)**. Besides, a contractor shall have adequate head office facilities, off-site depot and workshop facilities, technical support, agency authorisation etc. commensurate with the works being undertaken and as stated in **Part II (WC)**.

In addition, a WC should be increasingly implementing the practice of directly employing its own workers who are qualified tradesmen. At the time of application, the contractor must have sufficient number of core staff capable of initiating work promptly upon commencement of the contract.

From time to time, a contractor may change its directorate and managerial staff. When there is a substantial change of key personnel, HA may review its capability to participate tender or to retain on the List.

2.3.7 Safety, Health and Environment

A contractor shall have policies and practices to ensure safe and healthy working conditions for all site personnel and to provide adequate protection for the public at large.

A contractor shall undertake to-

- Ensure a healthy and safe work space on site at all times;
- Meet and maintain the highest standards of site safety;
- Strive for continuous improvement in safety performance; and
- Commit to promoting a safety culture during the work process.

A contractor shall also have its own environmental policies and demonstrate its commitment to environmental protection, including waste reduction, re-use and recycling as applicable to its business as well as prevention of pollution and compliance with the relevant environmental legislation and regulations.

2.3.8 Fees and Charges

In addition to the other requirements for admission onto a List, admission is conditional on an applicant paying an application fee. The application fee must accompany the completed application questionnaire when it is submitted and will not be refunded even if admission onto the List is rejected.

Subsequent annual renewal of status on the List is subject to satisfactory compliance with the requirements stated in the **Guide** as well as the related **Sections**, and payment of an application fee for annual renewal. All application fees paid for annual renewal are not refundable in whole or in part irrespective of whether a contractor applies for withdrawal from the List, elects voluntary restriction from tendering as in Sub-section 3.2 or is involuntary removed from the List.

Application for change of company name as in Sub-section 2.5 shall be accompanied with payment of a non-refundable application fee as specified at **Annex 2**.

The fees and charges are subject to periodic adjustment by HA. The fees and charges for **2015/16** are set out at **Annex 2**. The prevailing fees and charges can be obtained through the *Counterparty Management Information System (COMIS)* at the following website: <http://comis.housingauthority.gov.hk>.

1. GROUP TENDER LIMITS

The List of Building Contractors is divided into the following Categories and Groups. A contractor may be included in one or more Categories but is restricted to be included in only one Group of each Category -

New Works Category

Group NW1	- Contractors are eligible to tender for new works contracts with a value of up to \$550M.
Group NW2	- Contractors are eligible to tender for new works contracts of unlimited value.

Maintenance Works Category

Group M1	- Contractors are eligible to tender for maintenance and improvement contracts with a value of up to \$50M and for term maintenance and improvement contracts with an average annual expenditure of up to \$50M.
Group M2	- Contractors are eligible to tender for maintenance and improvement contracts of unlimited value.

2. STATUTORY REGISTRATION REQUIREMENTS

A contractor shall possess the prescribed statutory registration as follows -

Registration	- Registered General Building Contractor under Buildings Ordinance (Cap.123)
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3. MINIMUM SCOPE OF CERTIFICATION

A contractor shall possess the following certificates with respect to its own category. The minimum scopes of certification for various categories are as follows :-

New Works Category

ISO 9001, ISO 14001, ISO 50001 and OHSAS 18001 Certificates –

Scope	- To carry out the construction of building works
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Note: With effect from 1 January 2014, all contractors on the List of Building Contractors shall be certified to Energy Management System (EnMS) ISO 50001 certification. A grace period of 24 months, i.e. until 31 December 2015, is granted to contractors already on the List of Building Contractors for acquiring ISO 50001 certification. For new applicants, the following arrangements shall apply-

(i) **Application for admission made before 1 January 2014**

For all new applications applied before the implementation date, i.e. 1 January 2014, the application for admission will be subjected to the existing criteria (i.e. without the ISO 50001 certification requirements). After successful admission to the List of Building Contractors, a grace period up to 31 December 2015 is granted for acquiring ISO 50001 certification.

(ii) **Application for admission made after 1 January 2014**

For all new applications applied after the implementation date, i.e. 1 January 2014, the ISO 50001 certification will be one of the listing requirements for admission to the List of Building Contractors. No grace period will be allowed.

Maintenance Works Category

ISO 9001, ISO 14001 and OHSAS 18001 Certificate –

Scope	- To carry out building activities to keep, restore and improve the facilities of buildings and surroundings
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4. MINIMUM WORK EXPERIENCE REQUIREMENTS

(For Admission Only)

New Works Category

A contractor should have the following past work record in building construction contracts :-

	NW1	NW2
Work Record		
Min. value (in HK\$M) :		
At least one satisfactorily completed project as main contractor in HKSAR within the past three years. The project should be a residential bldg. similar in size and complexity of HD projects.	275	550

Note :

- (1) In case of joint-venture projects, the contract value is calculated on pro-rata basis, depending on the percentage of the joint-venture.

Maintenance Works Category

A contractor should have the following past work record in building maintenance/improvement contracts :-

<u>M1</u>	<u>M2</u>
Contractor shall have completed, as main contractor, maintenance/improvement projects within the past <i>three</i> years for Housing Department, other government departments or private sector.	Contractor shall have completed, as main contractor, maintenance/improvement projects within the past <i>three</i> years for Housing Department, other government departments or private sector.
<i>Two</i> of those completed projects stated above shall each cost not less than HK\$15M with records of satisfactory performance.	<i>Two</i> of those completed projects stated above shall each cost not less than HK\$30M with records of satisfactory performance.

5. FINANCIAL CAPABILITY

CAPITAL REQUIREMENTS

A contractor shall satisfy the capital requirements as follows :-

New Works Category

1. Employed and Working Capital

Group	Status	Working Capital Required	Employed Capital Required
NW1	Probationary	\$4.9M OR 10% of outstanding works, whichever is higher	\$4.9M + \$2.9M for every \$43M of o/s works or part thereof above \$73M (subject to a max. of \$10.6M); OR 10% of Total Assets, whichever is higher
If total value of outstanding works reaches \$148M or above, then the following criteria will apply :			
		\$14.8M OR 8% on first \$950M of outstanding works & 10% on remainder, whichever is higher	\$14.8M + \$2M for every \$100M of outstanding works or part thereof above \$950M; OR 10% of Total Assets, whichever is higher
NW1	Confirmed	\$10.1M OR 10% of outstanding works, whichever is higher	\$10.1M + \$5.8M for every \$86M of o/s works or part thereof above \$150M (subject to a max. of \$21.7M); OR 10% of Total Assets, whichever is higher
If total value of outstanding works reaches \$188M or above, then the following criteria will apply :			
		\$18.8M OR 8% on first \$950M of outstanding works & 10% on remainder, whichever is higher	\$18.8M + \$2M for every \$100M of outstanding works or part thereof above \$950M; OR 10% of Total Assets, whichever is higher

Group	Status	Working Capital Required	Employed Capital Required
NW2	Probationary	\$14.8M OR 8% on first \$950M of outstanding works & 10% on remainder, whichever is higher	\$14.8M + \$2M for every \$100M of outstanding works or part thereof above \$950M; OR 10% of Total Assets, whichever is higher
NW2	Confirmed	\$18.8M OR 8% on first \$950M of outstanding works & 10% on remainder, whichever is higher	\$18.8M + \$2M for every \$100M of outstanding works or part thereof above \$950M; OR 10% of Total Assets, whichever is higher

- Note :** (1) Outstanding works represents the annualised value of outstanding works (including HA, Government and private sector contracts on a world wide basis) and any tenders under consideration.
- (2) The issued & paid-up capital and shareholders' funds should both meet the level of minimum employed capital applicable to his highest group and status.
- (3) The effective dates of the revised financial capital requirements are:
- for list admission (including promotion, confirmation and change of name) - application on or after 16 October 2014;
 - for tendering - tender issued on or after 16 October 2014; and
 - for list retention – 1 December 2014 (i.e. all management accounts or audited accounts with accounting periods ending on or after 1 December 2014)

2. Profitability Trend Analysis

A Building Contractor under Group NW1 or NW2 categories with either confirmed or probationary status is required to demonstrate its financial performance based on its Profitability Trend Analysis.

The Profit / Loss Ratio is calculated to reflect the weighted average of the annual ratios of the operating profit/loss over the opening balance of the shareholders' funds or net worth (as per audited accounts) for each of the past three years, with weights of 3:2:1 (higher weight being given to the more recent year).

If a contractor has a Loss Ratio greater than 30%, sufficient capital should be injected. Subsequent capital injection by a contractor to strengthen the shareholders' funds or net worth will be taken into account in determining the revised Loss Ratio.

Maintenance Works Category

1. Employed and Working Capital

Group	Status	Working Capital Required	Employed Capital Required
M1	Probationary	\$2.1M OR 15% of outstanding works, whichever is higher	\$2.1M + \$1.2M for every \$12M of o/s works or part thereof above \$21M (subject to a max. of \$4.4M); OR 10% of Total Assets, whichever is higher
If total value of outstanding works reaches \$32M or above, then the following criteria will apply :			
		\$4.9M OR 10% of outstanding works, whichever is higher	\$4.9M + \$2.9M for every \$43M of o/s works or part thereof above \$73M (subject to a max. of \$10.6M); OR 10% of Total Assets, whichever is higher
If total value of outstanding works reaches \$148M or above, then the following criteria will apply :			
		\$14.8M OR 8% on first \$950M of outstanding works & 10% on remainder, whichever is higher	\$14.8M + \$2M for every \$100M of outstanding works or part thereof above \$950M; OR 10% of Total Assets, whichever is higher

Group	Status	Working Capital Required	Employed Capital Required
M1	Confirmed	\$4M OR 15% of outstanding works, whichever is higher	\$4M + \$2.2M for every \$22M of o/s works or part thereof above \$40M (subject to a max. of \$8.3M); OR 10% of Total Assets, whichever is higher
	If total value of outstanding works reaches \$67M or above, then the following criteria will apply :		
		\$10.1M OR 10% of outstanding works, whichever is higher	\$10.1M + \$5.8M for every \$86M of o/s works or part thereof above \$150M (subject to a max. of \$21.7M); OR 10% of Total Assets, whichever is higher
	If total value of outstanding works reaches \$188M or above, then the following criteria will apply :		
		\$18.8M OR 8% on first \$950M of outstanding works & 10% on remainder, whichever is higher	\$18.8M + \$2M for every \$100M of outstanding works or part thereof above \$950M; OR 10% of Total Assets, whichever is higher

Group	Status	Working Capital Required	Employed Capital Required
M2	Probationary	\$4.9M OR 10% of outstanding works, whichever is higher	\$4.9M + \$2.9M for every \$43M of o/s works or part thereof above \$73M (subject to a max. of \$10.6M); OR 10% of Total Assets, whichever is higher
If total value of outstanding works reaches \$148M or above, then the following criteria will apply :			
		\$14.8M OR 8% on first \$950M of outstanding works & 10% on remainder, whichever is higher	\$14.8M + \$2M for every \$100M of outstanding works or part thereof above \$950M; OR 10% of Total Assets, whichever is higher

Group	Status	Working Capital Required	Employed Capital Required
M2	Confirmed	\$10.1M OR 10% of outstanding works, whichever is higher	\$10.1M + \$5.8M for every \$86M of o/s works or part thereof above \$150M (subject to a max. of \$21.7M); OR 10% of Total Assets, whichever is higher
If total value of outstanding works reaches \$188M or above, then the following criteria will apply :			
		\$18.8M OR 8% on first \$950M of outstanding works & 10% on remainder, whichever is higher	\$18.8M + \$2M for every \$100M of outstanding works or part thereof above \$950M; OR 10% of Total Assets, whichever is higher

Note :(1) Outstanding works represents the annualised value of outstanding works (including HA, Government and private sector contracts on a world wide basis) and any tenders under consideration.

- (2) The issued & paid-up capital and shareholders' funds should both meet the level of minimum employed capital applicable to his highest group and status.
- (3) The effective dates of the revised financial capital requirements are:
 - for list admission (including promotion, confirmation and change of name) - application on or after 16 October 2014;
 - for tendering - tender issued on or after 16 October 2014; and
 - for list retention – 1 December 2014 (i.e. all management accounts or audited accounts with accounting periods ending on or after 1 December 2014)

2. Profitability Trend Analysis

Same requirements as for New Works Category item 2 above.

6. MINIMUM NUMBER, QUALIFICATIONS AND EXPERIENCE OF FULL-TIME STAFF TO BE EMPLOYED FOR ADMISSION/RETENTION ON THE HA LISTS

A contractor shall submit an organization chart for vetting. The chart shall indicate the functions of each department, details of different levels of staff and line of responsibilities, and etc. The Contractor shall directly employ* the minimum number of full-time staff in accordance with the requirements of its own category/group as follows. Unless otherwise, specified, each of the full-time staff employed shall only take up one particular role of staff as required below in the list or in different category/group of the list.

New Works Category

Staff	Required Qualification and Experience	Minimum No.	
		NW1	NW2
Technical Director	(Registered in BD and not to be the same person as Contract Manager/Project Manager)	1	1
Contract Manager/Project Manager	(HKIA/MHKIS/MHKIE or equivalent with 3 years relevant local managerial experience and capacity in the construction field) or (Degree in Architecture, Building Surveying, Building Technology & Management, Civil/Struct. Eng. or equivalent with 5 years relevant local managerial experience and capacity in the construction field) or (Higher Diploma/Higher Certificate/Diploma in Architecture, Building Surveying, Building Technology & Management, Civil/Struct. Eng. or equivalent with 8 years relevant local managerial experience and capacity in the construction field) and (Registered as Authorised Signatory in BD and not to be the same person as the Technical Director)	1	2
Site Agent	(MHKICW/MICWCI or equivalent with 5 years relevant local experience in construction industry) or (Higher Diploma/Diploma/Higher Certificate in Building Studies or Civil/Struct. Eng. or equivalent with 8 years relevant local experience in construction industry)	1	2

Maintenance Works Category

Staff	Required Qualification and Experience	Minimum No.	
		<u>M1</u>	<u>M2</u>
Technical Director	(Registered in BD and not to be the same person as the Contract Manager/Project Manager)	1	1
Contract Manager/Project Manager	(HKIA/MHKIS/MHKIE/MHKICM or equivalent with 3 years relevant local managerial experience and capacity in the construction or maintenance field) or (Degree in Architecture, Building Surveying, Building Technology & Management, Structural Engineering or equivalent with 5 years relevant local managerial experience and capacity in the construction or maintenance field) or (Higher Diploma/Higher Certificate/Diploma in Architecture, Building Surveying, Building Technology & Management, Structural Engineering or equivalent with 8 years relevant local managerial experience and capacity in the construction or maintenance field) and (Registered as Authorised Signatory in BD and not to be the same person as the Technical Director)	1	2
Site Agent	(MHKICW/MICWCI or equivalent with 5 years relevant local experience in construction industry) or (Higher Diploma/Diploma/Higher Certificate in Building Studies or Civil/Struct. Eng. or equivalent with 8 years relevant local experience in construction industry)	1	2

* "Directly employ" shall mean staff employed by the Contractor or by the Contractor's parent company for the exclusive use of the Contractor.

7. MINIMUM PLANT REQUIREMENTS

No specific requirement on self-owned plant.

8. FACILITIES AND SUPPORT SERVICES REQUIREMENTS

No specific requirement.

9. TENDER RESTRICTION ON PROBATIONARY STATUS

A contractor on probationary status shall be restricted to undertake contracts of its own category/group as follows :-

New Works Category

Group NW1	- Contractors are restricted to undertake not more than one Group NW1 contract at any one time.
Group NW2	- Contractors are restricted to undertake not more than one Group NW2 direct contract at any one time.

Maintenance Works Category

Group M1	- Contractors are restricted to undertake not more than <i>three</i> Group M1 direct contracts at any one time provided that the total value of outstanding works being undertaken does not exceed \$50M or for term contracts the total value of annual expenditure does not exceed \$50M.
Group M2	- Contractors are restricted to undertake not more than <i>three</i> Group M2 direct contracts at any one time.

10. CONDITIONS FOR APPLICATION FOR CONFIRMED STATUS

Subject to being able to meet other requirements, probationary contractors may apply for confirmed status in a Category and/or Group at the expiry of the following periods :-

New Works Category

For Group NW1 Contractor, on satisfactory completion or a minimum period of 24 months (for on going project) after commencement of a NW1 contract as main contractor awarded after inclusion in the Group. In case there is no relevant HA contract available, the following shall apply -

on satisfactory completion or a minimum period of 24 months (for on going project) after commencement of a relevant local non-HA building contract of comparable size and complexity with other major clients such as DEVB, public organizations or private developers^{Note 1 & Note 2} as Main Contractor in HKSAR awarded after inclusion in the Group.

The completed NW1 contract or the relevant building contract shall be within the past three years from the date of application of confirmed status.

For Group NW2 Contractor, on satisfactory completion or a minimum period of 24 months (for on going project) after commencement of a NW2 contract as main contractor awarded after inclusion in the Group. In case there is no relevant HA contract available, the following shall apply -

on satisfactory completion or a minimum period of 24 months (for on going project) after commencement of a relevant local non-HA building contract of comparable size and complexity with other major clients such as DEVB, public organizations or private developers^{Note 1 & Note 2} as Main Contractor in HKSAR awarded after inclusion in the Group.

The completed NW2 contract or the relevant building contract shall be within the past three years from the date of application of confirmed status.

Note 1

Non-HA contracts of "comparable size and complexity" should comprise the construction of high rise domestic blocks or other high-rise buildings such as offices, hotels, etc. involving mechanical construction and using large panel formwork, placement of precast elements, wage monitoring system for payment to workers, health and safety management etc. with similar contract sums to a typical HA contract and similar complexity, in order to demonstrate the contractor's technical capability, overall coordination and site management skills.

Note 2

Contractors without HA job experiences should submit details of all relevant projects with other major clients (active or completed within three years) for qualitative assessment and the assessment team will make a selection for assessment.

Maintenance Works Category

Subject to being able to meet other requirements, probationary contractors may apply for confirmed status in a Category and/or Group at the expiry of the following periods :-

For Group M1 Contractor, on satisfactory completion of one M1 contract after inclusion in the Group. In case there is no relevant HA contract available, the following shall apply -

on satisfactory completion of a relevant local non-HA building maintenance and improvement contract of comparable size and complexity^{Note 3} with other major clients such as DEVB, public organizations or private companies^{Note 5} as Main Contractor in HKSAR awarded after inclusion in the Group.

The completed M1 contract or the relevant local non-HA building maintenance and improvement contract shall be within the past three years from the date of application of confirmed status, subject to a minimum probationary period of six months.

For Group M2 Contractor, on satisfactory completion of one M2 contract after inclusion in the Group. In case there is no relevant HA contract available, the following shall apply -

on satisfactory completion of a relevant local non-HA building maintenance and improvement contract of comparable size and complexity^{Note 4} with other major clients such as DEVB, public organizations or private companies^{Note 5} as Main Contractor in HKSAR awarded after inclusion in the Group.

The completed project M2 contract or the relevant local non-HA building maintenance and improvement contract shall be within the past three years from the date of application of confirmed status, subject to a minimum probationary period of 12 months.

Note 3 For application for Group M1 confirmed, non-HA contract of “comparable size and complexity” means building maintenance and improvement contract of latest contract sum not less than \$25M.

Note 4 For application for Group M2 confirmed, non-HA contract of “comparable size and complexity” means building maintenance and improvement contract of latest contract sum not less than \$50M.

Note 5 Contractors without HA job experience should submit details of all relevant contracts with other major clients (active or completed within three years) for a Contract Management Assessment (CMA) and a General Management Practice Assessment (GMPA) adopted in the QMC admission. The assessment team will make a selection of the contracts for assessment. The selected contract will be considered as satisfactorily completed if it achieves a threshold score in both CMA and GMPA.

11. CONDITIONS FOR APPLICATION FOR PREMIER LEAGUE AND QUALITY MAINTENANCE CONTRACTOR STATUS

New Works Category

PREMIER LEAGUE STATUS (PLS)

Admission Criteria

1. The admission procedure includes two assessment stages, i.e. a first stage assessment of basic entry criteria and project performance history with the Housing Authority and a second stage assessment of the applicant's management system in terms of client management, human resources management and other best practice requirements detailed below :-

First Stage Assessment –

- (a) Basic entry criteria
 - (i) Listing status must be Building Group NW2 confirmed in the HA List of Building Contractors; and
 - (ii) Not subject to any regulatory action and/or tender restriction at the time of assessment; and
 - (iii) To accept tender invitations and submit a competitive tender (i.e. a tender price not exceeding 25% above the average of tenders received for a contract) for New Works Building Contract(s) over the past two-year period (applicable for new admission and retention applications on or after 1 October 2011.)
- (b) Satisfactory project performance history performance
 - (i) All contractors' Contractor Scores derived from the performance record for the past 3 years are above the Lower Quartile Score of the PASS Contractors Score League, OR
relevant equivalent standard of performance and quality achieved in similar building contracts of comparable size and complexity^{Notes 6&7} with other major clients such as DEVB, public organizations and private developers in the same period. Qualitative assessment would be made to the reported contract works as detailed in item 1(b)(iv) below;
 - (ii) Maximum number of Adverse Reports attracted during the past 3 years is less than 10% of total number of PASS project quarterly reports and project Maintenance Period Assessment reports received in such period, round up to the

^{Note 6} Non-HA contracts of "comparable size and complexity" should comprise the construction of high rise domestic blocks or other high-rise buildings such as offices, hotels, etc. involving mechanical construction and using large panel formwork, placement of precast elements, etc. with similar contract sums to a typical HA contract and similar complexity, in order to demonstrate the contractor's technical capability, overall coordination and site management skills.

^{Note 7} Contractors without recent or with inadequate HA job experience should submit details of all relevant projects with other major clients (active or completed within three years) for assessment and the assessment team will make a selection for assessment.

- nearest whole number, OR
 relevant equivalent assessment of similar building contracts of comparable size and complexity^{Note 1&2} with other major clients such as no adverse report in DEVB contracts, no adverse comments and/or contractual disputes in contracts with public organizations and private developers in the same period;
- (iii) Contractors which have been suspended for more than once during the past 3 years are not eligible for accreditation under the PLS, OR
 relevant equivalent assessment of similar action by other major clients such as suspension by DEVB, blacklisting or legal action by public organizations and private developers in the same period;
- (iv) Minimum number of PASS project quarterly reports (including MPA reports) received in the past 3 years is 24, assuming there are 12 quarterly reports for a typical New Works projects, OR
 relevant equivalent experience in similar building contracts of comparable size and complexity^{Notes 6&7} with other major clients such as DEVB, public organizations and private developers in the same period. Technical Assessment would be carried out through site visits and/or record check of both the process and the product of the reported contract works; and
- (v) Minimum number of New Works contracts completed in the past 3 years is two, OR
 completion of similar number of relevant building contract of comparable size and complexity^{Note 1&2} with other major clients such as DEVB, public organizations and private developers in the same period.

Second Stage Assessment –

(c) **Capital Requirements for PLS**

Group	Working Capital Required	Employed Capital Required
PLS	\$38M OR 10% of outstanding works, whichever is higher	\$38M + \$2M for every \$100M of outstanding works or part thereof above \$950M; OR 10% of the total assets, whichever is higher

Note : (1) Outstanding works represents the annualised value of outstanding works

^{Note 6} Non-HA contracts of “comparable size and complexity” should comprise the construction of high rise domestic blocks or other high-rise buildings such as offices, hotels, etc. involving mechanical construction and using large panel formwork, placement of precast elements, etc. with similar contract sums to a typical HA contract and similar complexity, in order to demonstrate the contractor’s technical capability, overall coordination and site management skills.

^{Note 7} Contractors without recent or with inadequate HA job experience should submit details of all relevant projects with other major clients (active or completed within three years) for assessment and the assessment team will make a selection for assessment.

- (including HA, Government and private sector contracts on a world wide basis) and any tenders under consideration.
- (2) The issued & paid-up capital and shareholders' funds should both meet the level of minimum employed capital applicable to his highest group and status.
- (3) The implementation dates follow those for New Works Group NW2.
- (d) **Claim history**
No unreasonable claims in the past 3 years.
- (e) **Best practice requirements**
- (i) **Corporate Management**, including quality plan, supervision plan and customer service plan, to ensure client's needs are being met;
 - (ii) **Human Resources Management** to ensure the scarce resources in contracting firms, i.e. human resources, be available to meet client's need;
 - (iii) **Supply Chain Management** including management of sub-contractors and suppliers to deliver quality products and services;
 - (iv) **Environment, Occupational Health and Safety Management** to ensure there is a sound practice beyond mere compliance with regulatory requirements;
 - (v) **Monitoring of Wages Payment to Workers Availability and Effectiveness** to ensure there is effective system in monitoring Wages Payment;
 - (vi) **Corporate Social Responsibility** to ensure contractor's commitment to improve construction practice and uplift the image of the local construction industry;
 - (vii) **Financial Management**, including assessment of financial strength and soundness, financial control; and
 - (viii) **Office Assessment**, for verification on the availability of the required systems are in place.
- (f) **Experience in Open Book/GMP contract**
Willingness to be committed to Open Book/GMP contracts.

Retention in PLS

2. Minor fluctuations in the performance of contractors after their admission to PLS, such as their PASS Contractor Score being below the Lower Quartile Score, will not affect their status for retention.
3. Premier Contractors should continue to meet all the admission criteria as stated above, and the second stage assessment should be conducted in the form of surveillance checks and focused largely on changes, if there are any, of the management systems of the contractors, as well as the claim history since their admission to the PLS.

Removal from PLS

4. Should a Premier Contractor, after admission, be subject to regulatory actions imposed by HA in the form of suspension, downgrading and/or removal from the HA List of Building Contractors, it will be removed from the PLS immediately.

Re-admission to PLS

5. After a contractor is removed from the PLS, it may apply for re-admission and follow the same procedures as admission.

6. Should the contractor removed from the PLS be imposed with a sanitization period, request for re-admission by the removed contractor will not be considered during the sanitization period.

Incentives to Premier League Contractors

7. A Premier League Contractor will –

- (i) be given a leading position in the Partnering Charter and be issued with a certificate stating that the contractor is admitted to PLS;
- (ii) have the prevailing List Capping Limit for building works being extended by 25% to the nearest thousand; and
- (iii) be given an unqualified opportunity to participate in restrictive tendering for “special projects” of high financial and/or technical risks, along with other pre-qualified contractors.

Maintenance Works Category

**ADMISSION CRITERIA FOR
QUALITY MAINTENANCE CONTRACTOR (QMC) STATUS**

Admission Criteria

The admission procedure includes assessment of basic entry criteria and the applicant's contract performance history and management system, as detailed below-

(A) Basic Entry Criteria

- (1) Listing status be Group M2 confirmed in the HA List of Building Contractors; and
- (2) Not subject to any regulatory action and/or tender restriction/suspension imposed by HA due to poor performance at the time of assessment.

(B) For contractors in HA Contractor Score Banding League (the League) established in May and November of the preceding year-

- (1) The contractors shall attain Contractor Scores higher than Band C of the League in both May and November of that year; and
- (2) The total number of adverse reports rated by the Contractors Review Committee (Building - Maintenance) on the contractor's performance in the preceding year must be less than 10% of the total number of Maintenance Assessment Scoring System (MASS) quarterly reports received in that year.

(C) For contractors not in the HA Contractor Score Banding League established in May or November of the preceding year-

- (1) If the contractor has completed one or more DTCs within the past three years from the date of invitation for application for QMC status, the contractor can only apply by submitting all these completed DTC(s) for assessment-
 - (a) The contractor must attain an average Contractor Score in the Contractor Score Banding League in May and November of the last 12 months of each of the DTCs higher than the average Lower Quartile Score of the Contractor Score Banding League in May and November of the year before the validity period of QMC status being applied for; and
 - (b) The total number of adverse reports rated by the Contractors Review Committee (Building - Maintenance) on the contractor's performance in these 12 months must be less than 10% of the total number of Maintenance Assessment Scoring System (MASS) quarterly reports received in the 12 months.

- (2) If the contractor has not completed a DTC within the past three years from the date of invitation for application for QMC status, the contractor can submit a local non-HA term general building maintenance and improvement contract for assessment-
- (a) The contract must be a main contract of latest contract sum not less than \$330M and average annual contract expenditure not less than \$110M, with major clients such as DEVB, public organizations and private companies awarded after the contractor was included in the Group M2 List;
 - (b) The contract must have commenced for at least one year or be completed within the past three years from the date of invitation for application for QMC status;
 - (c) The contractor must act as the Main Contractor for the contract;
 - (d) The contractor must not have received any adverse reports in the contract with DEVB and any adverse comments and/or contractual disputes relating to unsatisfactory performance in the contract with public organization or private company, during the contract period;
 - (e) The contractor must not have been suspended for more than once during the past three years from the above invitation date;
 - (f) Two stages of assessment will be conducted. The first stage consists of a Qualitative Assessment (QA). QA consists of two parts: Works Assessment (WA) and Contract Management Assessment (CMA);
 - (g) The WA will be conducted by an assessment team of HD. Site inspection will be conducted to examine whether the following key performance aspects are comparable to the standards of typical HA contracts-

Workmanship
Site Management
Customer Service

- (h) The CMA will be conducted by the Client's Representative of the submitted contract. The following key performance aspects will be examined-

Standard of Organization
Compliance with General Obligations
Adequacy of Resources
Workmanship
Progress

- (i) In the second stage, a General Management Practice Assessment (GMPA) will be conducted if the contractor achieves the threshold scores in the QA-

- (i) The assessment focuses on the contractor's general management practice and the following key performance aspects will be examined-

Corporate Management
Human Resources Management
Sub-contractor Management
Environment, Occupational Safety and Health Management
Monitoring of Wage Payment to Workers
Customer Service

- (ii) Any fatal or serious accidents^{Note 8} occurring in any of the applicant's construction sites in Hong Kong in the past six months from the above invitation date and during the assessment period of the application will be taken into consideration in the assessment.

- (j) An interview with the contractor will be conducted after all the above assessments to examine the application holistically, to ensure that the contractor is capable of delivering quality maintenance services in HA contracts. Serious incidents^{Note 9} relating to the contractor or any of the contractor's sites in Hong Kong within the past six months from the above invitation date and during the assessment period of the application will also be examined.

(D) Removal from OMC Status

If a contractor, after being admitted as a OMC, is subject to any regulatory action taken by the HA, it will be removed from the OMC list.

Note 8 "Serious Accident" means an incident involving either one or a combination of the following—

- (i) serious bodily injury at a construction site:
 - resulting in a loss or an amputation of a limb; or
 - which has caused or is likely to cause permanent total disablement to the injured;
- (ii) dangerous occurrence or incident at a construction site leading to or resulting in an injury that is considered serious (but not up to the extent as described in sub-paragraph (i) above), or damage to works or property on or adjacent to the construction site that posed a potential threat to public safety as identified/notified by DEVB, Labour Department or Marine Department.

Note 9 The meaning of serious incident(s) would be determined on a case by case basis and would include but not limited to the following —

- (a) Serious misconduct or criminal offences;
- (b) Serious incidents of wages in arrears, quality or safety problems which had brought disrepute to the HA;
- (c) Contractors' bankruptcy or inability to complete the contracts which had brought financial losses to the HA; and
- (d) Other serious incident that has aroused grave concern of the Government and members of the public.

12. LIST/GLOBAL CAPPING LIMITS AND TENDER AWARD RESTRICTION

Types of Workload Capping Limits for New Works

- 1) Two types; namely, List Capping & Global Capping
- 2) List Capping Limits - applicable to a company or a group of related companies which is on one of the HA List of Contractors
- 3) Global Capping Limits - applicable to a company or a group of related companies which is on more than one HA Lists of Contractors

HA List of Contractors	Building (New Works)		Electrical	Fire Services & Water Pump	Lift & Escalator	Piling
	1 st stage Implementation ⁺	2 nd stage Implementation ⁺⁺				
List Capping Limit (FC)	15,000/ 19,000*	17,000/ 21,000*	17,000	17,000	17,000	11,000**/ 13,000***
Global Capping Limit (FC)	1 st stage Implementation ⁺	41,000				
	2 nd stage Implementation ⁺⁺	45,000				

FC Flats under construction

+ The 1st stage implementation is from 16 October 2014 to 31 December 2015 (both dates are inclusive).

++ The 2nd stage implementation is from 1 January 2016 (inclusive) onwards.

* 19,000 and 21,000 for Group NW2 contractors on the Premier League. The additional 4,000 flats are not calculated in the Global Capping Limit.

** 11,000 for Piling Contractors on either Large Diameter Bored Piling (LDBP) or the Percussive Piling (PP) category.

*** 13,000 for Piling Contractors on both LDBP and PP categories

Rules for application

- 1) Capping limits applicable to the following HA Lists of Contractors
 - Building Contractors in New Works Category
 - Electrical Installation Contractors
 - Fire Services and Water Pump Contractors
 - Lift and Escalator Contractors
 - Piling Contractors
 - (i) Whenever a contractor on these Lists attains a workload higher than such List Capping limit in the relevant list, it would be restricted from tendering until such time its workload has dropped below the List Capping Limit.
 - (ii) Whenever a contractor has a workload approaching the List Capping Limit in the relevant list, it would only be allowed to tender if the projected workload (including the tender under consideration) is kept within a 20% allowance in excess.
- 2) When calculating the 'flats under construction', the production of flats by main contractor and nominated sub-contractors are all taken into account.
- 3) When a company and its related companies perform the roles of a main contractor and/or nominated sub-contractors in a project, the production of the project is to be counted only once in calculating the flats under construction for the Global Capping Limit.
- 4) For the definition of Related Companies, please refer to Sub-section 3.3.5 of Part I (General Guidelines).

Tender Award Restriction for Building New Works

- 1) A company or a group of Related Companies on the List of Building Contractors (New Works Category) would be awarded a maximum number of three Building New Works contracts within any rolling six-month period (counted in calendar months).

CAPPING LIMITS OF FOR MAINTENANCE WORKS

The capping limits^{Note 10} for M1 and M2 Contractors and the criteria for QMC to undertake different combinations of building maintenance contracts and DTCs are as follows-

Group		Status	Maximum Combination of Various Types of Building Maintenance Contracts to be held Concurrently	Maximum No. of DTCs to be held Concurrently	Criteria for Undertaking Maximum No. of Contracts (including DTCs)
M1		Probationary	3	N/A	N/A
		Confirmed	4	N/A	N/A
M2	All	Probationary	3	1	N/A
	Non-QMC	Confirmed	4	1	N/A
	QMC	Confirmed	7	2	N/A
			8	3	Satisfactory completion of one DTC or local non-HA contract ^{Note 11}
			10	5	Satisfactory completion of two or more DTCs or local non-HA contracts ^{Note 11} with the QMC status awarded for at least 12 months

Note 10 Contracts of an estimated value not exceeding \$3M shall be excluded from the workload calculation for the capping limit.

Note 11 Contractor can submit a completed local non-HA contract as the substitute for a completed DTC, subject to fulfillment of the following requirements-

- The submitted contract must be a term general building maintenance and improvement main contract of latest contract sum not less than \$330M and average annual contract expenditure not less than \$110M, with other major clients such as DEVB, public organizations and private companies;
- The contract must be awarded after the contractor was included in the Group M2 List;
- The contract must be completed within the past three years from the date of invitation for submission of a substituting local non-HA contract;
- The contractor must act as the Main Contractor for the contract;
- The contractor must not have received any adverse reports in the contract with DEVB and any adverse comments and/or contractual disputes in the contract with public organization or private company, during the contract period; and
- The submission must achieve a threshold score in both Works Assessment and Contract Management Assessment of the Qualitative Assessment adopted in the QMC admission.

Note In addition to the above capping limits, the workload capping for both new works and maintenance works shall be governed by the prevailing tendering and workload capping.

13. “QUARANTINE” SYSTEM UNDER TENDER EVALUATION MECHANISM

HA will put those tenderers who have been involved in circumstances that are defined as serious incidents under “quarantine” if they are one of the top three scorers, regardless of whether or not they have marks deducted, for any serious incidents occurring within the six-month period preceding the tender closing date or within the tender assessment period preceding the tender award date.

For the purpose of putting tenderers under the “Quarantine” system, the meaning of serious incident(s) should refer to Sub-section 4.10.1 of Part I (General Guidelines).

of HD's notification. Should there be no submission received within the time allowed, the regulatory action shall be deemed confirmed and takes effect as specified in the relevant notice of intended regulatory action.

Should any such submission be received, CA/P will review the grounds of appeal. The appellant will be informed of HA's determination in writing within two months upon receipt of written submission, with supporting documents, from the appellant. Appeal/objection to CA/P's decision will be reviewed by the Chairman of PRLMB. The decision of the Chairman of PRLMB shall be final.

4.1.6 Re-admission

A contractor who has been removed from a List may apply for re-admission. Subsequent application by that contractor will be deemed a fresh application and will be subject to the provisions stipulated in the **Guide**. In the event of list removal due to serious incidents, conditions stipulated in sub-section 4.10 for re-admission will be applied.

4.1.7 Sharing of Information

In addition to the regulatory actions stipulated below, HA may make referral of a case to the relevant statutory and registration authority for consideration of appropriate regulatory action against a contractor including its registered personnel under the relevant Ordinance. HA may also share the performance ratings, conviction records as well as the status of contractors on the HA Lists with relevant Government Bureaus and Departments and other procuring entities as and when necessary.

4.1.8 Circumstances Warranting List Regulatory Actions

Circumstances which may lead to the taking of list regulatory actions as stipulated in **Annex 4** can be categorized as follows-

- (a) Failure to meet HA's contractual requirements or adverse performance (Sub-section 4.3)
- (b) Contravention of ordinances, violation of law, misconduct or other non-conformities (Sub-section 4.4)
- (c) Failure to meet the requirements and procedures in tendering (Sub-sections 4.5 and 4.6)
- (d) Failure to meet the requirements for being retained on the List (Sub-sections 4.7 and 4.8)

4.3 ADVERSE PERFORMANCE

4.3.1 List Management as a Tool in Performance Monitoring

The purpose of removal, suspension, restriction, downgrading or demotion of contractors from HA List following an adverse report is to ensure that-

- (a) Only suitable competent contractors are allowed to tender for HA contracts;
- (b) Pressure is put on the contractors to improve their performance; and
- (c) Contractors are all treated alike decisively with consistency and fairness.

4.3.2 Adverse Performance

The performance of contractors in carrying out services for HA will be appraised by respective HA's contractors review committees at its regular meeting which will normally be conducted on a quarterly basis. Contractors with the following deficiencies will normally be given "Adverse" rating in the performance assessment reports-

- (a) Slow progress or poor response;
- (b) Poor workmanship or unsatisfactory service standards;
- (c) Poor management of its sub-contractors;
- (d) Poor wage payment system (for its employees or sub-contractors). For example, there is no proven system and designated personnel in dealing with the employment and deployment of workers that are employed either directly or indirectly by its sub-contractors;
- (e) Poor wage payment record (of its employees or sub-contractors);
- (f) Non-compliance of requirements stipulated in the contracts (breach of contractual obligations);
- (g) Poor site safety performance;
- (h) Deficiency in other aspects as determined by respective HA's CRC.

- (m) One or more incidents of wage arrears which may arouse or has aroused the concern of the public or media.
- (n) Continual failure to submit an annual declaration and satisfy the requirements for being retained on appropriate HA List.
- (o) Failure in paying the annual renewal fee for list retention.

2. **Circumstances warranting suspension from tendering**

- (a) Suspected misconduct (until such time as the contractor is cleared of such suspicion, or misconduct is confirmed in which case consideration will be given for removal).
- (b) Signs of cash flow problems.
- (c) Poor performance, including but not limited to consecutive adverse reports for the same contract rated by the respective CRC, where it is desirable to ensure that the contractor completes its current commitments before undertaking further contracts.
- (d) Suspected serious poor performance or other serious causes in any public or private sector contract.
- (e) Poor environmental protection record.
- (f) Poor site safety record. For example, consecutive failures in site safety audits; Labour Department's Suspension notice in HA contracts.
- (g) The decision of Safety Panels for HA contracts.
- (h) Poor wage payment system (for its employees or sub-contractors). For example, failures in complying with the contractual obligations.
- (i) Poor wage payment record (of its employee or sub-contractors).
- (j) Poor management of its sub-contractors in paying their workers. For example, failure to demonstrate to HD an effective system in regulating its sub-contractors or failure to prove its determination to replace its sub-contractors even with knowledge of their mal-practices in non-payment or exploitation of their workers.
- (k) Withdrawal of tender(s) within the tender validity period.
- (l) Failure to meet the list-retention requirements.

4.10 SERIOUS INCIDENTS

4.10.1 Actions against Contractors/Tenderers due to Serious Incidents

In the event that a contractor has been involved in circumstances that are defined as serious incident(s), such as but not limited to the following -

- (a) Serious misconduct or criminal offences;
- (b) Serious incidents of wages in arrears, quality or safety problems which had brought disrepute to the HA;
- (c) Contractors' bankruptcy or inability to complete the contracts which had brought financial losses to the HA;
- (d) Other serious incident that has aroused grave concern of the Government and members of the public,

it will be removed from relevant or all HA Lists.

If there are tenders under assessment and the tenderers have been involved in the above serious incident(s) or serious site safety incidents occurring in any site in Hong Kong with construction works (of works nature similar to the scope of works of the tender under consideration), they will be put under the "Quarantine" system.

4.10.2 Period of List Removal (Debarment Period for List Re-admission)

The debarment period before application for list re-admission to be considered shall be ranging normally from three (3) to ten (10) years, commensurate with the seriousness of the case and the extent of damages, tangible and intangible, sustained by the HA.

If the incident is due to the act of the key person (i.e. director, major shareholder ^{Note8}, or senior managerial staff etc. having a controlling stake of the company), such person may be debarred from admission as key person of any contractor on HA Lists for a specified period. Contractors on HA Lists will be removed if persons subject to the debarment are found to have positions therein during the debarment period.

If the contractor, upon expiry of the debarment period, wishes to apply for re-admission onto the HA List, it has to compensate the losses to the satisfaction of HA, if any, and demonstrate it has instituted appropriate remedial measures and rectified its deficiencies before considerations can be given by HA.

Note8 For the purpose of this clause, major shareholder means a shareholder having a controlling stake of the company, i.e. holding of 20% or more of the voting power of an enterprise, in accordance with the Hong Kong Institute of Certified Public Accountants (HKICPA) Accounting Standard.

Removal from PLS

4. Should a Premier Contractor, after admission, be subject to regulatory actions imposed by HA in the form of suspension, downgrading and/or removal from the HA List of Building Contractors, it will be removed from the PLS immediately.

Re-admission to PLS

5. After a contractor is removed from the PLS, it may apply for re-admission and follow the same procedures as admission.

6. Should the contractor removed from the PLS be imposed with a sanitization period, request for re-admission by the removed contractor will not be considered during the sanitization period.

Incentives to Premier League Contractors

7. A Premier League Contractor will –

- (i) be given a leading position in the Partnering Charter and be issued with a certificate stating that the contractor is admitted to PLS;
- (ii) have the prevailing List Capping Limit for building works being extended by 25% to the nearest thousand; and
- (iii) be given an unqualified opportunity to participate in restrictive tendering for “special projects” of high financial and/or technical risks, along with other pre-qualified contractors.

(7) The Surveyor may from time to time delegate to the Surveyor's Representative any of the duties and powers vested in him. Any such delegation shall be in writing signed by the Surveyor and shall specify the duties and powers thereby delegated. No such delegation shall have effect until a copy thereof has been delivered to the Contractor. Provided that:—

if the Contractor or the Employer shall be dissatisfied by reason of any decision of the Surveyor's Representative they may refer the matter to the Surveyor who shall confirm, reverse or vary such decision.

(8) No act or omission by the Surveyor or the Surveyor's Representative in the performance of any of his duties or the exercise of any of his powers under the Contract shall in any way operate to relieve the Contractor of any of the duties, responsibilities, obligations or liabilities imposed upon him by any of the provisions of the Contract.

ASSIGNMENT AND SUB-LETTING

3. The Contractor shall not assign the Contract or any interest therein without the written consent of the Employer and any assignment shall be in a form approved by the Employer. Assignment

4. (1) The Contractor shall not sub-let the Works. The Contractor shall be permitted, unless expressly prohibited by the Contract, to sub-let a part of the Works either on the basis of the provision by the sub-contractor of labour and materials or by the provision of labour on a piece-work basis. Sub-letting

(2) The Contractor shall be permitted to sub-let a part of the Works on the basis of provision of Constructional Plant by the sub-contractor, provided that such sub-letting is not expressly prohibited by the Architect in writing within a period of 14 days from receipt by the Architect of a request in writing from the Contractor.

(3) Notwithstanding that the Contract has not prohibited sub-letting under sub-clause (1) of this Clause and the Architect has not prohibited sub-letting under sub-clause (2) of this Clause the Architect, if in his opinion he considers it necessary, shall have full power to order the removal of any sub-contractor from the Site and/or the Works, which power shall not be exercised unreasonably.

(4) The sub-letting of any part of the Works shall not relieve the Contractor from any liability or obligation under the Contract particularly in respect of the provision of superintendence in accordance with Clause 17 and he shall be responsible for the acts, defaults and neglects of any sub-contractor or the agents, employees or workmen of any sub-contractor as fully as if they were the acts, defaults or neglects of the Contractor; his agents, employees or workmen.

(5) It shall be the duty of the Contractor if so required by the Architect to furnish the Architect with full particulars of any sub-contractor employed or to be employed on the Works.

CONTRACT DOCUMENTS

5. (1) Save to the extent that any Special Condition of Contract provides to the contrary the provisions of these General Conditions of Contract shall prevail over those of any other document forming part of the Contract. Documents mutually explanatory

(2) Subject to the foregoing the several documents forming the Contract are to be taken as mutually explanatory of one another but in case of ambiguities or discrepancies the same shall be explained by the Architect who shall issue to the Contractor instructions clarifying such ambiguities or discrepancies. Where the Contractor makes a request in writing to the Architect for instructions under this sub-clause the Architect shall respond within 14 days of receipt of such request.

Provided that:—

- (a) errors in firm quantities or work shown on the Drawings or described in the Specification but not measured in the Bills of Quantities shall be dealt with in accordance with Clause 59;
- (b) if in the opinion of the Surveyor compliance with such instructions shall involve the Contractor in any expense which by reason of any ambiguity or discrepancy the Contractor did not and had no reason to anticipate, the Surveyor shall value such expense in accordance with Clause 61, and shall certify in accordance with Clause 79;
- (c) if in the opinion of the Surveyor compliance with such instructions shall involve the Contractor in any saving then the Surveyor shall value such saving and deduct the same from the Contract Sum accordingly.

6. (1) Four copies of the Drawings shall be furnished to the Contractor free of charge together with two copies of the Bills of Quantities and/or the particular specification. Provision of Drawings and Specification

such withdrawal, remove the agent from the Site forthwith and shall not thereafter employ him again on the Site in any capacity and shall replace him by another competent English-speaking agent approved by the Architect.

(4) Such authorized agent shall receive on behalf of the Contractor directions and instructions from the Architect and the Architect's Representative.

Contractor's
employees

18. (1) The Contractor, and any of his sub-contractors, shall provide and employ on the Site in connection with the execution of the Works:—

- (a) only such technical personnel as are skilled and experienced in their respective trades and callings and such sub-agents, foremen and leading hands as are competent to give proper supervision to the work they are required to supervise, and
- (b) such skilled, semi-skilled and unskilled labour as is necessary for the proper and timely execution of the Works.

(2) The Architect shall be at liberty to object to and require the Contractor to remove forthwith from the Works any person employed by the Contractor or by a sub-contractor in or about the execution of the Works who in the opinion of the Architect misconducts himself or is incompetent or negligent in the proper performance of his duties or whose employment is otherwise considered by the Architect to be undesirable and such person shall not be again employed upon the Works without the written permission of the Architect.

(3) Any person so removed from the Works shall be replaced as soon as possible by a competent substitute.

Setting-out

19. (1) The Contractor shall be responsible for the true and proper setting-out of the Works in relation to original points, lines and levels of reference shown on the Drawings or any schedule supplied by the Architect and for the correctness of the position, level, dimensions and alignment of all parts of the Works and for the provision of all necessary instruments, appliances and labour in connection therewith.

(2) If at any time during the progress of the Works any error shall appear or arise in the position, level, dimensions or alignment of any part of the Works, the Contractor on being instructed so to do by the Architect or the Architect's Representative shall, at his own expense, rectify such error unless such error is based on incorrect data shown on the Drawings or any document supplied to the Contractor by the Architect or the Architect's Representative in which case the rectification shall be treated as a variation ordered in accordance with Clause 60.

(3) The checking of any setting-out or of any line or level by the Architect or the Architect's Representative shall not in any way relieve the Contractor of his responsibility for the correctness thereof and the Contractor shall carefully protect and preserve all bench-marks, sight-rails, pegs and other things used in setting out the Works.

Safety and
security of the
Works

20. (1) The Contractor shall throughout the progress of the Works take full responsibility for the adequate stability and safety of all operations on the Site other than those of Specialist Contractors and utility undertakings and have full regard for the safety of all persons on the Site. The Contractor shall keep the Site and the Works in an orderly state appropriate to the avoidance of danger to all persons.

(2) The Contractor shall in connection with the Works provide and maintain all lights, guards, fences and warning signs and provide watchmen when and where necessary or required by the Architect or by any competent statutory or other authority for the protection of the Works or for the safety and convenience of the public or others.

(3) The Contractor shall ensure that all parts of the Site where work is being carried out are so lighted as to ensure the safety of all persons on or in the vicinity of the Site and of such work.

(4) The Contractor, after obtaining any necessary approval from any relevant authority, shall submit to the Architect proposals showing the layout of pedestrian routes, lighting, signing and guarding for any road opening or traffic diversion which may be required in connection with the execution of the Works. No such road opening or traffic diversion shall be brought into operation or use unless the proposals submitted have been previously approved by the Architect and properly provided and implemented on the Site.

Care of the
Works

21. (1) From and including the date for commencement of the Works notified by the Architect in accordance with Clause 47 until 28 days after the date of completion of the Works certified by the Architect in accordance with Clause 53 or until the date the Employer takes over the Works, if earlier, the Contractor shall take full responsibility for the care of the Works and subject to Clause 20(1) any

shall specify the duties and powers thereby delegated. No such delegation shall have effect until a copy thereof has been delivered to the Contractor.

- (4) No act or omission by the Surveyor or the Surveyor's Representative in the performance of any of his duties or the exercise of any of his powers under the Contract shall in any way operate to relieve the Contractor of any of his duties, responsibilities, obligations or liabilities under the Contract.
- (5) Where a person is appointed to be the Surveyor or the Surveyor's Representative, as the case may be, and is described as the holder for the time being of a public office, any person for the time being lawfully discharging the functions of that public office or any part of such functions and any person appointed to act in or perform the duties of such public office or any part of such duties for the time being may carry out the duties and may exercise the powers of the Surveyor or the Surveyor's Representative, as the case may be.
- (6) The Surveyor shall have the power to order the Contractor to provide any information which in the opinion of the Surveyor is relevant to the Surveyor's execution of his duties under the Contract. Such information may include costing and pricing documents and shall be presented and submitted by the Contractor in a form acceptable to the Surveyor within such time or times as may be required by the Surveyor.

3 ASSIGNMENT AND SUB-CONTRACTING

3.1 Assignment

- (1) The Contractor shall not assign the Contract or any interest therein without the written consent of the Employer and any assignment shall be in a form approved by the Employer.
- (2) The application of the Contractor for consent of assignment shall be supported by such submissions and details as the Employer may require. The Employer shall have the right not to consent to any such application and no consent of the Employer shall be implied from an acknowledgement or acceptance of delivery of such submissions or details.

3.2 Sub-contracting

- (1) The Contractor shall not sub-contract the Works. The Contractor shall, unless expressly prohibited by and subject to the limitation on the number of tiers of sub-contracting as specified in the Contract, be permitted to sub-contract a part of the Works either on the basis of the provision by the sub-contractor of labour and materials or by the provision of labour. The Contractor shall be under a continuous duty to ensure and be responsible for the compliance with the limitation on the number of tiers of sub-contracting and shall cause his sub-contractors to observe and comply with such limitation.
- (2) The Contractor shall also be permitted to sub-contract a part of the Works on the basis of provision of Constructional Plant by the sub-contractor, provided that such sub-contracting is not expressly prohibited by the Contract Manager in writing within a period of 14 days from receipt by the Contract Manager of a request in writing from the Contractor.
- (3) Notwithstanding that the Contractor may be permitted to sub-contract a part of the Works under Clause 3.2(1) and the Contract Manager has not prohibited sub-contracting under Clause 3.2(2), the Contract Manager shall, if in his opinion he considers it necessary, have power to order the removal of any sub-contractor from the Site and/or the Works, which power shall not be exercised unreasonably.
- (4) The sub-contracting of any part of the Works shall not relieve the Contractor from any of his liabilities or obligations under the Contract particularly in respect of the provision of the Contractor's management team in accordance with Clause 5.8 and he shall be responsible for the acts, defaults and neglects of any sub-contractor or the agents, employees or workers of any sub-contractor as fully as if they were the acts, defaults or neglects of the Contractor.
- (5) The Contractor shall ensure that each and every sub-contract (including Specialist Sub-contracts and Nominated Sub-contracts) irrespective of the tier of the relevant sub-contractor employed or to be employed for the Works shall contain provisions consistent with the Contract in particular for those provisions in relation to prompt payments of fair wages to workers, site safety and site security. It shall be the duty of the Contractor if so required by the Contract Manager to furnish

the Contract Manager with full particulars of any sub-contractor employed or to be employed for the Works.

- (6) Parts of the Works shall, where specified in the Contract, be executed by a sub-contractor selected by the Contractor from the relevant list given or referred to in the Specification or by a Specialist Sub-contractor.
- (7) The Contractor shall submit the Sub-contractors Management Plan and any subsequent revision or update to the Contract Manager in accordance with the requirements as specified in the Contract.
- (8) (a) Unless the Contract provides to the contrary, the Contractor shall ensure that each of his sub-contractors shall not sub-contract the whole of the works sub-contracted to him.
(b) The Contractor shall employ his own staff to manage and supervise his sub-contractors.

4 CONTRACT DOCUMENTS

4.1 Documents mutually explanatory

- (1) The several documents forming the Contract shall be taken as mutually explanatory of one another and shall be construed according to the order of precedence as may be provided in the Contract, provided always that the Special Conditions of Contract shall prevail over the General Conditions of Contract for the purpose of interpretation.
- (2) In case of ambiguities or discrepancies found in the documents forming the Contract, the same shall be explained by the Contract Manager who shall issue to the Contractor instructions clarifying such ambiguities or discrepancies. Where the Contractor makes a request in writing to the Contract Manager for instructions under this Clause 4.1(2), the Contract Manager shall respond within 14 days of receipt of such request.

Provided that:-

- (a) errors in quantities provided in the Bills of Quantities (other than provisional quantities) or work shown on the Drawings or described in the Specification but not measured in the Bills of Quantities shall be dealt with in accordance with Clause 11.1, and
- (b) if compliance with such instructions shall, in the opinion of the Surveyor, involve the Contractor in any expense which by reason of any ambiguity or discrepancy the Contractor did not and had no reason to anticipate, the Surveyor shall determine such expense in the same manner as a sum to be added to the Contract Sum in respect of a Variation in accordance with Clause 11.3 and shall take this into account in the calculation of the Final Contract Sum, and
- (c) if compliance with such instructions shall, in the opinion of the Surveyor, involve the Contractor in any saving then the Surveyor shall determine such saving in the same manner as a sum to be deducted from the Contract Sum in respect of a Variation in accordance with Clause 11.3 and shall take this into account in the calculation of the Final Contract Sum.

4.2 Provision of Drawings and Specification

- (1) The Contractor shall be furnished free of charge with four copies of the Drawings together with two copies of the Bills of Quantities and/or the schedule of rates and the Specification other than the standard specification library.
- (2) The Contract Manager shall within 14 days of receiving a request in writing from the Contractor provide the Contractor with any further copies of the Drawings requested by the Contractor upon payment at the standard rates laid down from time to time by the Employer.
- (3) The Contract Manager shall issue to the Contractor from time to time during the progress of the Works such other Drawings and Specification as in the opinion of the Contract Manager shall be necessary for the purpose of the execution of the Works and the Contractor shall be bound by the same.
- (4) The Contractor shall give adequate notice in writing to the Contract Manager of other Drawings or Specification that may be required for the execution of the Works.

- (2) Without prejudice to the Contractor's obligations under Clause 5.8(1), the Contractor shall provide and maintain a management team of sufficient number of members to manage and supervise the Contract during the currency of the Works. All members of the management team shall have the qualifications and experience as specified in the Contract and shall be under the direct employment of the Contractor.
- (3) No member of the management team shall take up or be awarded a sub-contract for any part of the Works or shall have a vested interest in any sub-contract or sub-contractor of any tier (including Specialist Sub-contractors and Nominated Sub-contractors) in connection with the Contract.
- (4) The Contractor shall name from the members of the management team a competent and authorized agent who shall be proficient in both Chinese and English and shall at all times represent the Contractor on the Site and receive on behalf of the Contractor instructions, orders or directions from the Contract Manager and the Contract Manager's Representative. Such agent shall be constantly on the Site on a full time basis dedicated to the superintendence of the Works.
- (5) The Contractor shall submit for approval of the Contract Manager the names, qualifications, experience and documentary proof of the employment status of any members of his management team as required under the Contract.
- (6) The Contract Manager shall have the power to revoke his approval of any member of the Contractor's management team at any time. Upon receipt of a notice in writing by the Contract Manager revoking his approval of a member of the management team, the Contractor shall remove such member from the Works forthwith and shall not thereafter employ him again on the Works. Such member shall be replaced as soon as possible by a competent substitute with the qualifications and experience as specified in the Contract subject to the approval of the Contract Manager in accordance with Clause 5.8(5).
- (7) The Contractor shall inform the Contract Manager forthwith of any changes made to the management team.

5.9 Contractor's employees

- (1) The Contractor shall provide and employ and shall ensure that any of his sub-contractors shall provide and employ on the Site in connection with the execution of the Works:-
 - (a) only such technical personnel as are skilled and experienced in their respective trades and callings and such sub-agents, foremen and leading hands as are competent to give proper supervision to the work which they are required to supervise, and
 - (b) such skilled, semi-skilled and general workers as is necessary for the proper and timely execution of the Works, and
 - (c) such number of qualified workers to fulfil the requirements provided in the Contract.
- (2) The Contract Manager shall have the power to object to and require the Contractor to remove forthwith from the Works any person employed by the Contractor or by a sub-contractor on the Works who in the opinion of the Contract Manager misconducts himself or is incompetent or negligent in the proper performance of his duties or whose employment is otherwise considered by the Contract Manager to be undesirable and such person shall not be again employed upon the Works without the written permission of the Contract Manager.
- (3) Any person so removed from the Works shall be replaced as soon as possible by a competent substitute.

5.10 Setting-out

- (1) The Contractor shall be responsible for the true and proper setting-out of the Works in relation to original points, lines and levels of reference shown on the Drawings or any document supplied by the Contract Manager and for the correctness of the position, level, dimensions and alignment of all parts of the Works and for the provision of all necessary instruments, appliances and labour in connection therewith.
- (2) If at any time during the progress of the Works any error shall appear or arise in the position, level, dimensions or alignment of any part of the Works, the Contractor on being instructed so to do by the Contract Manager or the Contract Manager's Representative shall, at his own expense,

4.10 SERIOUS INCIDENTS**4.10.1 Actions against Contractors/Tenderers due to Serious Incidents**

In the event that a contractor has been involved in circumstances that are defined as serious incident(s), such as but not limited to the following -

- (a) Serious misconduct or criminal offences;
- (b) Serious incidents of wages in arrears, quality or safety problems which had brought disrepute to the HA;
- (c) Contractors' bankruptcy or inability to complete the contracts which had brought financial losses to the HA;
- (d) Other serious incident that has aroused grave concern of the Government and members of the public,

it will be removed from relevant or all HA Lists.

If there are tenders under assessment and the tenderers have been involved in the above serious incident(s) or serious site safety incidents occurring in any site in Hong Kong with construction works (of works nature similar to the scope of works of the tender under consideration), they will be put under the "Quarantine" system.

4.10.2 Period of List Removal (Debarment Period for List Re-admission)

The debarment period before application for list re-admission to be considered shall be ranging normally from three (3) to ten (10) years, commensurate with the seriousness of the case and the extent of damages, tangible and intangible, sustained by the HA.

^{Note8} If the incident is due to the act of the key person (i.e. director, major shareholder, or senior managerial staff etc. having a controlling stake of the company), such person may be debarred from admission as key person of any contractor on HA Lists for a specified period. Contractors on HA Lists will be removed if persons subject to the debarment are found to have positions therein during the debarment period.

If the contractor, upon expiry of the debarment period, wishes to apply for re-admission onto the HA List, it has to compensate the losses to the satisfaction of HA, if any, and demonstrate it has instituted appropriate remedial measures and rectified its deficiencies before considerations can be given by HA.

Note8 For the purpose of this clause, major shareholder means a shareholder having a controlling stake of the company, i.e. holding of 20% or more of the voting power of an enterprise, in accordance with the Hong Kong Institute of Certified Public Accountants (HKICPA) Accounting Standard.

Note In addition to the above capping limits, the workload capping for both new works and maintenance works shall be governed by the prevailing tendering and workload capping.

13. “QUARANTINE” SYSTEM UNDER TENDER EVALUATION MECHANISM

HA will put those tenderers who have been involved in circumstances that are defined as serious incidents under “quarantine” **if they are one of the top three scorers, regardless of whether or not they have marks deducted**, for any serious incidents occurring **within the six-month period preceding the tender closing date or within the tender assessment period preceding the tender award date**.

For the purpose of putting tenderers under the “Quarantine” system, the meaning of serious incident(s) should refer to Sub-section 4.10.1 of Part I (General Guidelines).

HONG KONG HOUSING AUTHORITY



GENERAL

CONDITIONS OF CONTRACT

FOR

BUILDING WORKS

2013 EDITION

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GENERAL CONDITIONS OF CONTRACT

1 DEFINITIONS AND INTERPRETATION

1.1 Definitions

In the Contract the following words and expressions shall have the meaning hereby assigned to them except when the context otherwise requires:-

“Agreed Requested Variation” means the changes referred to in the Requested Variation Proposal (including any amendments thereto) agreed between the Contract Manager and the Contractor in accordance with Clause 11.8.

“Articles of Agreement” means the articles of agreement to be executed by the Employer and the Contractor.

“Bills of Quantities” means the bills of quantities of the Contract.

“Change in Law” means any Law or any amendment or addition to any Law which is

- (a) made on or after the date 10 days prior to the Tender Closing Date, or
- (b) made before the date 10 days prior to the Tender Closing Date and the commencement date of which is only ascertainable on or after the date 10 days prior to the Tender Closing Date and the Contract does not expressly provide for the Employer’s and the Contractor’s respective rights and obligations in relation to compliance with such Law or such amendment or addition upon its commencement

and which of itself directly affects the Contractor’s execution of the Contract.

“Conditions of Contract” means the General Conditions of Contract and the Special Conditions of Contract.

“Constructional Plant” means all appliances or things of whatsoever nature required for the execution of the Works but does not include materials or other things intended to form or forming part of the permanent work or vehicles engaged in transporting any personnel, constructional plant, materials or other things to or from the Site.

“Contingency Sum” means the sum provided for work or expenditure which cannot be foreseen at the time the tender documents are issued which sum may include provision for Nominated Sub-contract Works.

“Contract” means the Articles of Agreement, the Tender, the Letter of Acceptance, the Drawings, the General Conditions of Contract, the Special Conditions of Contract, the Specification and the Bills of Quantities and/or schedule of rates.

“Contract Manager” means the person, company or firm named in the Contract as the Contract Manager or such other person, company or firm as may be appointed from time to time by the Employer and notified in writing to the Contractor to act as the Contract Manager for the purposes of the Contract. The person named or appointed may be described by name or as the holder for the time being of a public office.

“Contract Manager’s Representative” means any person, company or firm appointed from time to time by the Contract Manager and notified in writing to the Contractor to perform the duties set out in Clause 2.1(2). The person or persons appointed may be described by name or as the holder for the time being of a public office.

“Contract Sum” means the sum accepted by the Employer for the execution of the Works as stated in the Letter of Acceptance.

“Contractor” means the person, firm or company whose Tender has been accepted by the Employer and includes the Contractor’s personal representatives, successors and permitted assigns.

“Cost” means expenditure reasonably incurred including overheads whether on or off the Site and depreciation in value of Constructional Plant owned by the Contractor but excluding profit.

“DARA” means the dispute avoidance and resolution advisor appointed under Clause 17.1.

“Director of Housing” means the Director of Housing of the Hong Kong Housing Authority.

- “Drawings” means the drawings referred to in the Specification, Bills of Quantities and/or schedule of rates and any modification of such drawings approved in writing by the Contract Manager and such other drawings as may from time to time be furnished or approved in writing by the Contract Manager.
- “Employer” means the Hong Kong Housing Authority.
- “Enhancement Works” means any work ordered by the Contract Manager under Clause 11.9.
- “Environmental Management Plan” means a plan setting out the Contractor’s policies, detailed procedures and requirements for the implementation and fulfilment of the Contractor’s obligations as to environmental management, waste management and site hygiene under the Contract.
- “Final Contract Sum” means the final sum determined or ascertained to be payable to the Contractor in accordance with the Contract and for the avoidance of doubt, the sum shall exclude any amount that may be deducted by the Employer under Clause 15.3.
- “Form of Tender” means the form of tender as completed and submitted by the Contractor with the Tender.
- “General Conditions of Contract” means the general conditions of contract set forth as such in the Contract.
- “General Holiday” means every Sunday and other day which is a general holiday by virtue of the General Holidays Ordinance (Cap. 149).
- “Government” means the Government of Hong Kong.
- “Hong Kong” means the Hong Kong Special Administrative Region.
- “Intellectual Property Rights” means patents, trade marks, service marks, trade names, design rights, copyright, domain names, database rights, rights in know-how, new inventions, designs, processes and other intellectual property rights whether now known or created in future (of whatever nature and wherever arising) and in each case whether registered or unregistered and including applications for the grant of any such rights.
- “Law” means any enactment of the laws of Hong Kong as defined in Chapter 1 of the laws of Hong Kong.
- “Letter of Acceptance” means the letter issued by or on behalf of the Employer for the acceptance of the Tender including such documents as may be attached to or expressly stated in the letter to form part of the Contract.
- “Maintenance Period” means the maintenance period for the Works or Section or part thereof as stated in the appendix to the Form of Tender which shall commence on the date as specified in Clause 8.7.
- “Maintenance Works” means any works which are required to be carried out by the Contractor within such time and in such manner as specified in the Contract for the fulfilment of the Contractor’s obligations as set out in Clause 10.1(2) which may include but without limitation any work of repair or rectification (whether such work is necessitated by any default or neglect of the Contractor under the Contract or otherwise) or any work of making good of any defect, imperfection, shrinkage, settlement or other fault as identified within the Maintenance Period.
- “Memorandum of Agreement” means the memorandum issued by the Contract Manager under Clause 11.8(4)(c) setting out the terms of agreement in respect of an Agreed Requested Variation.
- “Nominated Sub-contract” means the sub-contract between the Contractor and a Nominated Sub-contractor.
- “Nominated Sub-contract Works” means any work to be executed, any materials to be supplied or any services to be provided by a Nominated Sub-contractor.
- “Nominated Sub-contractor” means a sub-contractor nominated by the Employer and employed by the Contractor to carry out any part of the Nominated Sub-contract Works.
- “Notice of Dispute” means a notice of dispute served in writing under Clause 17.1.
- “Pass” means the pass, in a form as required under the Contract, for the admission of the bearer to the Site.

- “Period of Final Measurement” means the period of final measurement as stated in the appendix to Form of Tender which shall commence on the date as referred to in Clause 11.1(7)(a).
- “Portion” means a part of the Site separately identified in the Contract.
- “Preliminaries” means the bill or schedule for preliminaries included in the Bills of Quantities and/or schedule of rates as referred to in Clause 11.1.
- “Prime Cost Sum” means the sum provided for Nominated Sub-contract Works which sum shall be the estimated net price to be paid for such Nominated Sub-contract Works, after deducting any trade or other discount.
- “Provisional Sum” means a sum provided for work or expenditure which has not been quantified or detailed at the time the tender documents are issued and which sum may include provision for Nominated Sub-contract Works.
- “Requested Variation Proposal” shall be as defined in Clause 11.8(1).
- “Retention Money Held in respect of the Contractor” shall be as defined in Clause 14.2(1)(i).
- “Retention Money Held in respect of the Nominated Sub-contractor” shall be as defined in Clause 14.2(1)(ii).
- “Safety Plan” means a plan setting out the Contractor’s policies, detailed procedures and requirements for the implementation and fulfilment of the Contractor’s obligations as to safety and health under the Contract.
- “Section” means a part of the Works for which a separate date for commencement and/or a separate time for completion is/are specified in the Contract.
- “Self-employed Worker” means a worker who is not an employee of the Contractor or his sub-contractor of any tier including Specialist Sub-contractors and Nominated Sub-contractors but is engaged for the execution of the Works on the Site.
- “Site” means the lands and other places provided by the Employer for the purpose of the execution of the Works together with such other places as may be subsequently agreed in writing by the Contract Manager as forming part of the Site.
- “Site Personnel” means such workers or staff employed by the Contractor or any of his sub-contractors of all tiers including Specialist Sub-contractors and Nominated Sub-contractors engaged for the execution of the Works on the Site but excluding Self-employed Workers.
- “Special Conditions of Contract” means the conditions of contract which amend or revise any General Conditions of Contract by way of addition, deletion or substitution.
- “Specialist Contractor” means any contractor employed by the Employer to execute Specialist Works.
- “Specialist Works” means any work separately identified in the Contract and connected with or ancillary to the Works which may from time to time be carried out on and/or outside the Site by a Specialist Contractor or the supply of any materials specified in the Contract for incorporation into the Works which may from time to time be provided and delivered to the Site by a Specialist Contractor.
- “Specialist Sub-contract” means a sub-contract made between the Contractor and a Specialist Sub-Contractor.
- “Specialist Sub-contract Works” means any work to be executed, any design to be carried out, any materials to be supplied or any services to be provided by a Specialist Sub-contractor.
- “Specialist Sub-contractor” means such domestic sub-contractor of the Contractor executing that part of the Works and/or carrying out that part of the design of the Works or supplying those materials or providing those services for the Works specifically specified in the Contract and who shall have been or shall be selected in accordance with the provisions of the Contract and employed by the Contractor.
- “Specification” means the specifications referred to in the Contract and any modification thereof or addition thereto as may from time to time be furnished or approved in writing by the Contract Manager.

“Sub-contractors Management Plan” means a plan setting out the Contractor’s policies, detailed procedures and requirements for the implementation and fulfilment of the Contractor’s obligations as to sub-contracting arrangement and management of sub-contractors of all tiers under the Contract.

“Surveyor” means the person, company or firm named in the Contract as the Surveyor or such other person, company or firm as may be appointed from time to time by the Employer and notified in writing to the Contractor to act as the Surveyor for the purposes of the Contract. The person appointed may be described by name or as the holder for the time being of a public office.

“Surveyor’s Representative” means any person or persons appointed from time to time by the Surveyor and notified in writing to the Contractor to perform the duties set out in Clause 2.2(3). The person or persons appointed may be described by name or as the holder for the time being of a public office.

“Temporary Works” means all temporary work of every kind required for the construction, completion and/or maintenance of the Works.

“Tender” means the Contractor’s tender for the Contract.

“Tender Closing Date” means the date for the return of tenders for the Contract.

“Utility Undertaking” means any person, undertaking, company, organization or government department and includes any office, division, sub-division, section, sub-section, unit or group within a government department which engages in or is so engaged in supplying or providing utilities (including but not limited to electricity, lighting, traffic control, telecommunications, cable television, gas, water, drainage, sewerage and tramway) and any associated work and the supply or provision of which does not form part of the Works under the Contract, including the contractors and sub-contractors of any tier of such person, undertaking, company, organization or government department.

“Variation” means any change to the Works as defined in Clause 11.2(1).

“Works” means the work or services (including but not limited to Nominated Sub-contract Works, Specialist Sub-contract Works and Enhancement Works) to be constructed, completed, maintained and/or supplied in accordance with the Contract and includes Temporary Works.

“Works Subject to Excision” means any part of the Works specified in the Contract as works subject to excision.

1.2 Singular and plural

Words importing the singular only also include the plural and vice versa where the context requires.

1.3 Marginal notes

The index, marginal notes and headings in the General Conditions of Contract, Special Conditions of Contract and the Specification shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction thereof.

1.4 Payment

- (1) Unless otherwise provided, all payments under the Contract or in respect of the Works shall be made in Hong Kong dollars.
- (2) No adjustment shall be made to any payments under the Contract, including the Final Contract Sum, on account of any variation in the exchange rate between the Hong Kong dollar and any other currency.

1.5 Contract governed by Laws of Hong Kong

- (1) The Contract shall be governed by and construed according to the laws for the time being in force in Hong Kong.
- (2) Except where the context otherwise requires, any reference to any statute or statutory provision includes reference to:-
 - (a) that statute or statutory provision as amended, extended, re-enacted or consolidated from time to time, and
 - (b) any orders, regulations, instruments or other subordinate legislation made pursuant to it.

1.6 Gender

Except where the context otherwise requires, words importing one gender (whether masculine, feminine or neuter) shall be taken to include any other gender and words importing persons shall include firms, companies and corporations and vice versa.

1.7 Day

Whenever the word “day” is referred to in the Contract, it means a calendar day and includes General Holidays.

2 CONTRACT MANAGER AND CONTRACT MANAGER’S REPRESENTATIVE AND SURVEYOR AND SURVEYOR’S REPRESENTATIVE

2.1 Duties and powers of the Contract Manager and the Contract Manager’s Representative

- (1) The Contract Manager shall carry out the duties as are specified in or necessarily to be implied from the Contract with due expedition. The Contract Manager may exercise such powers as are specified in or necessarily to be implied from the Contract, but when such powers are exercised they shall be exercised with due expedition. Subject to the provisions of Clause 2.1(3) the Contractor shall take instructions, orders or directions only from the Contract Manager.
- (2) The Contract Manager’s Representative shall have the duties and powers to watch and inspect the Works, to test and examine any material to be used and workmanship employed by the Contractor in connection with the Works, and shall carry out such duties and may exercise such powers vested in the Contract Manager as may be delegated to him by the Contract Manager in accordance with the provisions of Clause 2.1(3).
- (3) The Contract Manager may from time to time delegate to the Contract Manager’s Representative any of the duties and powers vested in him. Any such delegation shall be in writing signed by the Contract Manager and shall specify the duties and powers thereby delegated. No such delegation shall have effect until a copy thereof has been delivered to the Contractor. Any written instruction or written approval given by the Contract Manager’s Representative to the Contractor within the terms of such delegation, but not otherwise, shall bind the Contractor and the Employer as though it had been given by the Contract Manager.

Provided that failure of the Contract Manager’s Representative to disapprove any work or material shall not prejudice the power of the Contract Manager thereafter to disapprove such work or material.

- (4) No act or omission by the Contract Manager or the Contract Manager’s Representative in the performance of any of his duties or the exercise of any of his powers under the Contract shall in any way operate to relieve the Contractor of any of his duties, responsibilities, obligations or liabilities under the Contract.
- (5) Where a person is appointed to be the Contract Manager or the Contract Manager’s Representative, as the case may be, and is described as the holder for the time being of a public office, any person for the time being lawfully discharging the functions of that public office or any part of such functions and any person appointed to act in or perform the duties of such public office or any part of such duties for the time being may carry out the duties and may exercise the powers of the Contract Manager or the Contract Manager’s Representative, as the case may be.

2.2 Duties and powers of the Surveyor and the Surveyor’s Representative

- (1) The Surveyor shall carry out the duties as are specified in the Contract with due expedition. The Surveyor may exercise such powers as are specified in or necessarily to be implied from the Contract, but when such powers are exercised they shall be exercised with due expedition.
- (2) The Surveyor’s Representative shall carry out such duties and may exercise such powers vested in the Surveyor as may be delegated to him by the Surveyor in accordance with the provisions of Clause 2.2(3).
- (3) The Surveyor may from time to time delegate to the Surveyor’s Representative any of the duties and powers vested in him. Any such delegation shall be in writing signed by the Surveyor and

shall specify the duties and powers thereby delegated. No such delegation shall have effect until a copy thereof has been delivered to the Contractor.

- (4) No act or omission by the Surveyor or the Surveyor's Representative in the performance of any of his duties or the exercise of any of his powers under the Contract shall in any way operate to relieve the Contractor of any of his duties, responsibilities, obligations or liabilities under the Contract.
- (5) Where a person is appointed to be the Surveyor or the Surveyor's Representative, as the case may be, and is described as the holder for the time being of a public office, any person for the time being lawfully discharging the functions of that public office or any part of such functions and any person appointed to act in or perform the duties of such public office or any part of such duties for the time being may carry out the duties and may exercise the powers of the Surveyor or the Surveyor's Representative, as the case may be.
- (6) The Surveyor shall have the power to order the Contractor to provide any information which in the opinion of the Surveyor is relevant to the Surveyor's execution of his duties under the Contract. Such information may include costing and pricing documents and shall be presented and submitted by the Contractor in a form acceptable to the Surveyor within such time or times as may be required by the Surveyor.

3 ASSIGNMENT AND SUB-CONTRACTING

3.1 Assignment

- (1) The Contractor shall not assign the Contract or any interest therein without the written consent of the Employer and any assignment shall be in a form approved by the Employer.
- (2) The application of the Contractor for consent of assignment shall be supported by such submissions and details as the Employer may require. The Employer shall have the right not to consent to any such application and no consent of the Employer shall be implied from an acknowledgement or acceptance of delivery of such submissions or details.

3.2 Sub-contracting

- (1) The Contractor shall not sub-contract the Works. The Contractor shall, unless expressly prohibited by and subject to the limitation on the number of tiers of sub-contracting as specified in the Contract, be permitted to sub-contract a part of the Works either on the basis of the provision by the sub-contractor of labour and materials or by the provision of labour. The Contractor shall be under a continuous duty to ensure and be responsible for the compliance with the limitation on the number of tiers of sub-contracting and shall cause his sub-contractors to observe and comply with such limitation.
- (2) The Contractor shall also be permitted to sub-contract a part of the Works on the basis of provision of Constructional Plant by the sub-contractor, provided that such sub-contracting is not expressly prohibited by the Contract Manager in writing within a period of 14 days from receipt by the Contract Manager of a request in writing from the Contractor.
- (3) Notwithstanding that the Contractor may be permitted to sub-contract a part of the Works under Clause 3.2(1) and the Contract Manager has not prohibited sub-contracting under Clause 3.2(2), the Contract Manager shall, if in his opinion he considers it necessary, have power to order the removal of any sub-contractor from the Site and/or the Works, which power shall not be exercised unreasonably.
- (4) The sub-contracting of any part of the Works shall not relieve the Contractor from any of his liabilities or obligations under the Contract particularly in respect of the provision of the Contractor's management team in accordance with Clause 5.8 and he shall be responsible for the acts, defaults and neglects of any sub-contractor or the agents, employees or workers of any sub-contractor as fully as if they were the acts, defaults or neglects of the Contractor.
- (5) The Contractor shall ensure that each and every sub-contract (including Specialist Sub-contracts and Nominated Sub-contracts) irrespective of the tier of the relevant sub-contractor employed or to be employed for the Works shall contain provisions consistent with the Contract in particular for those provisions in relation to prompt payments of fair wages to workers, site safety and site security. It shall be the duty of the Contractor if so required by the Contract Manager to furnish

the Contract Manager with full particulars of any sub-contractor employed or to be employed for the Works.

- (6) Parts of the Works shall, where specified in the Contract, be executed by a sub-contractor selected by the Contractor from the relevant list given or referred to in the Specification or by a Specialist Sub-contractor.
- (7) The Contractor shall submit the Sub-contractors Management Plan and any subsequent revision or update to the Contract Manager in accordance with the requirements as specified in the Contract.
- (8)
 - (a) Unless the Contract provides to the contrary, the Contractor shall ensure that each of his sub-contractors shall not sub-contract the whole of the works sub-contracted to him.
 - (b) The Contractor shall employ his own staff to manage and supervise his sub-contractors.

4 CONTRACT DOCUMENTS

4.1 Documents mutually explanatory

- (1) The several documents forming the Contract shall be taken as mutually explanatory of one another and shall be construed according to the order of precedence as may be provided in the Contract, provided always that the Special Conditions of Contract shall prevail over the General Conditions of Contract for the purpose of interpretation.
- (2) In case of ambiguities or discrepancies found in the documents forming the Contract, the same shall be explained by the Contract Manager who shall issue to the Contractor instructions clarifying such ambiguities or discrepancies. Where the Contractor makes a request in writing to the Contract Manager for instructions under this Clause 4.1(2), the Contract Manager shall respond within 14 days of receipt of such request.

Provided that:-

- (a) errors in quantities provided in the Bills of Quantities (other than provisional quantities) or work shown on the Drawings or described in the Specification but not measured in the Bills of Quantities shall be dealt with in accordance with Clause 11.1, and
- (b) if compliance with such instructions shall, in the opinion of the Surveyor, involve the Contractor in any expense which by reason of any ambiguity or discrepancy the Contractor did not and had no reason to anticipate, the Surveyor shall determine such expense in the same manner as a sum to be added to the Contract Sum in respect of a Variation in accordance with Clause 11.3 and shall take this into account in the calculation of the Final Contract Sum, and
- (c) if compliance with such instructions shall, in the opinion of the Surveyor, involve the Contractor in any saving then the Surveyor shall determine such saving in the same manner as a sum to be deducted from the Contract Sum in respect of a Variation in accordance with Clause 11.3 and shall take this into account in the calculation of the Final Contract Sum.

4.2 Provision of Drawings and Specification

- (1) The Contractor shall be furnished free of charge with four copies of the Drawings together with two copies of the Bills of Quantities and/or the schedule of rates and the Specification other than the standard specification library.
- (2) The Contract Manager shall within 14 days of receiving a request in writing from the Contractor provide the Contractor with any further copies of the Drawings requested by the Contractor upon payment at the standard rates laid down from time to time by the Employer.
- (3) The Contract Manager shall issue to the Contractor from time to time during the progress of the Works such other Drawings and Specification as in the opinion of the Contract Manager shall be necessary for the purpose of the execution of the Works and the Contractor shall be bound by the same.
- (4) The Contractor shall give adequate notice in writing to the Contract Manager of other Drawings or Specification that may be required for the execution of the Works.

- (5) One copy of the Drawings furnished to the Contractor as aforesaid shall be kept by the Contractor on the Site and the same shall at all reasonable times be available for inspection and use by the Contract Manager, the Contract Manager's Representative, the Surveyor, the Surveyor's Representative and any other persons authorized by the Contract Manager in writing.
- (6) The Contractor shall, if required by the Contract Manager or the Surveyor upon completion of the Works, return to the Contract Manager all Drawings and other documents provided under the Contract except the Contractor's signed copies of such Drawings and documents.

4.3 Drawings provided by the Contractor for the Works

- (1) When the Contractor is required to provide Drawings or other documents in connection with the Works, unless the Contract provides to the contrary, all such Drawings and documents shall be submitted in duplicate to the Contract Manager at a reasonable time before the work shown or described thereon is to be carried out so as to permit the Contract Manager sufficient time to examine the Contractor's proposals properly. Subject to Clause 4.3(2), the Contract Manager shall give or refuse his approval in writing to such proposals within a reasonable time.
- (2) If the Contract Manager has reasonable cause for being dissatisfied with the proposals set out in the Contractor's Drawings or documents the Contract Manager shall require the Contractor to make such amendments thereto as the Contract Manager may consider reasonably necessary. The Contractor shall make and be bound by such amendments at no additional expense to the Employer.
- (3) The Contractor shall provide the Contract Manager with the type and number of copies of such Drawings and documents as may be specified in the Contract within 14 days of the Contract Manager's approval.
- (4) Should it be found at any time after approval has been given by the Contract Manager that the details of such Drawings or documents do not comply with the terms and conditions of the Contract or that the details do not agree or comply with the Drawings or documents previously submitted and approved by the Contract Manager, the Contractor shall make such alterations or additions as in the opinion of the Contract Manager are necessary to remedy such non-compliance or non-agreement at the Contractor's own expense.
- (5) No examination by the Contract Manager of the Drawings or documents submitted by the Contractor under the provisions of this Clause 4.3 nor any approval given by the Contract Manager of the same, with or without amendment, shall absolve the Contractor from any of his liabilities or obligations under the Contract.

4.4 Information not to be divulged

- (1) The Contractor shall not use or divulge, except for the purposes of the Contract, any information provided by the Employer, the Contract Manager, the Contract Manager's Representative, the Surveyor or the Surveyor's Representative in the Contract or in any subsequent correspondence or documentation. Any disclosure to any sub-contractor or person for the purposes of the Contract shall be in strict confidence and shall only be on the basis that it is necessary for the purposes of the Contract for such sub-contractor or person to have such disclosure. The Contractor shall take all necessary measures (including by way of contractual provisions where appropriate) to ensure that information is not divulged for purposes other than that the purposes of the Contract by such sub-contractor or person. The Contractor shall indemnify and keep indemnified the Employer against all losses, liabilities, damages, costs, legal costs, professional fees and other expenses of any nature whatsoever the Employer may suffer, sustain or incur, whether direct or consequential, arising out of or in connection with any breach of the aforesaid non-disclosure provisions by the Contractor or his employees, agents or sub-contractors.
- (2) The Employer, the Contract Manager and the Surveyor may use any information provided by the Contractor in accordance with the Contract but shall not divulge such information except for the purposes of the Contract or for the purposes of carrying out any repair, amendment, extension or other work in connection with the Works.

Provided that the Employer may disclose the outline of any dispute and the terms of settlement for which a settlement agreement has been reached with the Contractor or the outcome of an arbitration or any other means of resolution of dispute to the Public Accounts Committee of the Legislative Council upon its request. Before disclosures are made to the said Committee, the

Employer shall inform the Contractor. Disclosures shall not be made to the said Committee before expiry of the first 6 months from the date of the settlement agreement, arbitration award or, as the case may be, outcome of other means of resolution of dispute without the written consent of the Contractor but such consent shall not be unreasonably withheld. The Contractor shall be deemed to have given his consent to disclosures on the expiry of the first 6 months from the date of the settlement agreement, arbitration award or, as the case may be, outcome of other means of resolution of dispute. The Contractor may, if he considers necessary to protect the sensitive nature of certain information relating to him, request the Employer to disclose such specified information to the said Committee strictly on a confidential basis. If the Employer considers that there are legitimate grounds to accede to the Contractor's request, the Employer shall convey the request to the said Committee for its consideration.

- (3) (a) Notwithstanding Clause 4.4(2) and subject to Clause 4.4(3)(b):-
- (i) any contract rates or related information provided by the Contractor in connection with the Contract may be used by the Employer for the sole purpose of cost estimation or cost analysis for the Employer's other works which may or may not be connected with the Contract, and
 - (ii) the Employer may also disclose such information to any third party engaged by the Employer for the sole purpose of cost estimation or cost analysis, provided that the Employer shall obtain from such third party an undertaking to maintain the confidentiality of the same and not to use it for any other purpose.
- (b) In connection with the use and/or disclosure of the contract rates and related information under Clause 4.4(3)(a), the Employer shall ensure that the Contract number, Contract title and the names of the Contractor and his sub-contractors of any tier shall not be disclosed.

4.5 Use of English language

The Contract, all correspondence in connection with the Contract and the Drawings or other documents provided by the Contractor in accordance with Clause 4.3 shall be in English.

5 GENERAL OBLIGATIONS

5.1 Extent of Contract

- (1) The Contractor shall, subject to the provisions of the Contract, execute the Works and provide all labour, materials, Constructional Plant, Temporary Works, transport to and from the Site or in and about the Works and everything whether of a temporary or permanent nature required in and for such execution so far as the necessity for providing the same is specified in or reasonably to be inferred from the Contract.
- (2) The Contractor shall liaise and co-ordinate with his sub-contractors including Specialist Sub-contractors and Nominated Sub-contractors in compliance with the Contract.

5.2 Contractor to execute Articles of Agreement

The Contractor shall, when called upon to do so, enter into and execute the Articles of Agreement which shall be prepared at the expense of the Employer in the form prescribed in the Contract with such modifications as may be necessary.

5.3 Sureties or security

- (1) The Contractor shall procure a bond in the form as provided in the appendix to the Conditions of Contract from an insurance company or bank, in either case to be approved in writing in advance by the Employer, in favour of the Employer in the sum stated in the Contract.
- (2) The Contractor shall submit the bond duly executed by the insurance company or bank to the Employer within 21 days of the date of the Letter of Acceptance.

5.4 Inspection of the Site

- (1) The Contractor shall be deemed to have examined and inspected the Site and its surroundings and to have satisfied himself, before submitting the Tender, as regards existing roads or other means of communication with and access to the Site, the nature of the ground and sub-soil, the

form and nature of the Site, the risk of death of or injury to any person or loss of or damage to any property, the nature of materials (whether natural or otherwise) to be excavated, the nature of the work and materials necessary for the execution of the Works, the accommodation he may require and generally to have obtained his own information on all matters affecting the Tender and the execution of the Works.

- (2) Save as expressly provided otherwise in the Contract, no demand or claim by the Contractor for additional payment shall be accepted or allowed on the ground of any misunderstanding in respect of the matters referred to in Clause 5.4(1) or otherwise or on the ground of any allegation or fact that incorrect or insufficient information was given to him by any person whether in the employ of the Employer or not or of the failure of the Contractor to obtain correct or sufficient information, nor shall the Contractor be relieved from any risk or obligation imposed on or undertaken by him under the Contract on any such ground or on the ground that he did not or could not foresee any matter which may in fact affect or have affected the execution of the Works.

5.5 Sufficiency of Tender

The Contractor shall be deemed to have satisfied himself before submitting the Tender as to the correctness and sufficiency of the Tender for the Works and of all the rates stated in the Bills of Quantities or the schedule of rates, if any, and all such rates shall, except in so far as it is otherwise provided in the Contract, cover all his risks, liabilities and obligations set out in or implied from the Contract and all matters and things necessary for the proper execution of the Works.

5.6 Works to be to the satisfaction of the Contract Manager

Save in so far as it is legally or physically impossible, the Contractor shall execute the Works in strict accordance with the Contract to the satisfaction of the Contract Manager and shall comply with and adhere strictly to the Contract Manager's instructions on any matter related to the Contract whether mentioned in the Contract or not.

5.7 Programme to be furnished

- (1) Save as otherwise specified in the Contract, the Contractor shall, within 14 days of the date of the Letter of Acceptance, submit to the Contract Manager a programme, in a form acceptable to the Contract Manager, showing the sequence, method and timing, including (in so far as such work is described in the Contract) due allowance for the carrying out of Specialist Works and work by Utility Undertakings, in which the Contractor proposes to carry out the Works and shall, whenever required by the Contract Manager, furnish the Contract Manager with particulars in writing of the Contractor's arrangements for carrying out the Works and of the Constructional Plant and Temporary Works which the Contractor intends to supply, use or construct as the case may be.
- (2) The Contractor shall regularly update the programme during the currency of the Works and shall submit the updated programme to the Contract Manager at the intervals stated in the Contract but in any event within 28 days of:-
 - (a) the date of granting of an extension of time for completion by the Contract Manager under Clause 8.4, or
 - (b) the receipt of the Contract Manager's notification in writing under Clause 8.5 informing the Contractor that the rate of progress of the Works or any Section is too slow to ensure completion by the time or extended time for completion as referred to in Clause 8.3(1), or
 - (c) the receipt of the Contract Manager's notification in writing requesting the Contractor to update the programme.
- (3) The submission to the Contract Manager of such programme or updated programme in accordance with the Contract, or the furnishing of such particulars shall not relieve the Contractor of any duty or responsibility under the Contract.

5.8 Contractor's superintendence

- (1) The Contractor shall give or provide all necessary superintendence during the currency of the Works and as long thereafter as the Contract Manager may consider necessary for the proper fulfilment of the Contractor's obligations under the Contract.

- (2) Without prejudice to the Contractor's obligations under Clause 5.8(1), the Contractor shall provide and maintain a management team of sufficient number of members to manage and supervise the Contract during the currency of the Works. All members of the management team shall have the qualifications and experience as specified in the Contract and shall be under the direct employment of the Contractor.
- (3) No member of the management team shall take up or be awarded a sub-contract for any part of the Works or shall have a vested interest in any sub-contract or sub-contractor of any tier (including Specialist Sub-contractors and Nominated Sub-contractors) in connection with the Contract.
- (4) The Contractor shall name from the members of the management team a competent and authorized agent who shall be proficient in both Chinese and English and shall at all times represent the Contractor on the Site and receive on behalf of the Contractor instructions, orders or directions from the Contract Manager and the Contract Manager's Representative. Such agent shall be constantly on the Site on a full time basis dedicated to the superintendence of the Works.
- (5) The Contractor shall submit for approval of the Contract Manager the names, qualifications, experience and documentary proof of the employment status of any members of his management team as required under the Contract.
- (6) The Contract Manager shall have the power to revoke his approval of any member of the Contractor's management team at any time. Upon receipt of a notice in writing by the Contract Manager revoking his approval of a member of the management team, the Contractor shall remove such member from the Works forthwith and shall not thereafter employ him again on the Works. Such member shall be replaced as soon as possible by a competent substitute with the qualifications and experience as specified in the Contract subject to the approval of the Contract Manager in accordance with Clause 5.8(5).
- (7) The Contractor shall inform the Contract Manager forthwith of any changes made to the management team.

5.9 Contractor's employees

- (1) The Contractor shall provide and employ and shall ensure that any of his sub-contractors shall provide and employ on the Site in connection with the execution of the Works:-
 - (a) only such technical personnel as are skilled and experienced in their respective trades and callings and such sub-agents, foremen and leading hands as are competent to give proper supervision to the work which they are required to supervise, and
 - (b) such skilled, semi-skilled and general workers as is necessary for the proper and timely execution of the Works, and
 - (c) such number of qualified workers to fulfil the requirements provided in the Contract.
- (2) The Contract Manager shall have the power to object to and require the Contractor to remove forthwith from the Works any person employed by the Contractor or by a sub-contractor on the Works who in the opinion of the Contract Manager misconducts himself or is incompetent or negligent in the proper performance of his duties or whose employment is otherwise considered by the Contract Manager to be undesirable and such person shall not be again employed upon the Works without the written permission of the Contract Manager.
- (3) Any person so removed from the Works shall be replaced as soon as possible by a competent substitute.

5.10 Setting-out

- (1) The Contractor shall be responsible for the true and proper setting-out of the Works in relation to original points, lines and levels of reference shown on the Drawings or any document supplied by the Contract Manager and for the correctness of the position, level, dimensions and alignment of all parts of the Works and for the provision of all necessary instruments, appliances and labour in connection therewith.
- (2) If at any time during the progress of the Works any error shall appear or arise in the position, level, dimensions or alignment of any part of the Works, the Contractor on being instructed so to do by the Contract Manager or the Contract Manager's Representative shall, at his own expense,

rectify such error unless such error is based on any incorrect data shown on the Drawings or any document supplied to the Contractor by the Contract Manager or the Contract Manager's Representative, in which case the rectification shall be treated as a Variation.

- (3) The checking of any setting-out, position, dimension or of any line or level by the Contract Manager or the Contract Manager's Representative shall not in any way relieve the Contractor of his responsibility for the correctness thereof and the Contractor shall carefully protect and preserve all bench-marks, sight-rails, pegs and other things used in setting out the Works.

5.11 Safety, security and environmental management of the Works

- (1) Without prejudice to the generality of the Contractor's responsibilities under the Contract or any statutory regulation with respect to safety, security and environmental management and without imposing any obligation or responsibility on the Employer or the Contract Manager beyond that set out in the Contract, the Contractor shall comply with the requirements of Clauses 5.11(2) to 5.11(6) in relation to safety, security and environmental management.
- (2) The Contractor shall throughout the progress of the Works take full responsibility for the adequate stability and safety of all operations on the Site other than those of Specialist Contractors and Utility Undertakings and have full regard for the safety of all persons on the Site. The Contractor shall keep the Site and the Works in an orderly state appropriate to avoid danger to all persons.
- (3) The Contractor shall in connection with the Works provide and maintain all lights, guards, fences and warning signs and shall provide watchmen when and where necessary or required by the Contract Manager or any competent statutory or other authority for the protection of the Works or for the safety and convenience of the public or others.
- (4) The Contractor shall provide adequate lighting with all necessary lighting facilities to or in all parts of the Site where any works are being carried out so as to ensure the safety of all persons on or in the vicinity of the Site or such works.
- (5) The Contractor shall submit the Safety Plan and the Environmental Management Plan and their subsequent revisions or updates to the Contract Manager in accordance with the requirements as specified in the Contract.
- (6) The Contractor shall, after obtaining any necessary approval from any relevant authority, submit to the Contract Manager proposals showing the layout of pedestrian routes, lighting, signing and guarding for any road opening or traffic diversion which may be required in connection with the execution of the Works. No such road opening or traffic diversion shall be brought into operation or use unless the proposals submitted have been previously approved by the Contract Manager and properly implemented to the satisfaction of the Contract Manager.

5.12 Care of the Works

- (1) The Contractor shall (from and including the date for commencement of the Works as notified by the Contract Manager under Clause 8.1 up to and including the day 28 days after the date of completion of the Works certified by the Contract Manager under Clause 8.7 but in the event of the Employer taking possession of the Works earlier, then up to and including the day 28 days after such date of possession) take full responsibility for the care of the Works and subject to Clause 5.11(2) any Specialist Works, and for the care of any Constructional Plant, temporary buildings and materials and things whatsoever on the Site or delivered to or placed on the Site in connection with or for the purpose of the Works or any Specialist Works.

Provided that when a Section or part of the Works is completed before completion of the Works, the Contractor shall be responsible for the care of such Section or part of the Works up to and including the day 28 days after the date of completion therefor as certified under Clause 8.7.

Provided further that the Contractor shall take full responsibility for the care of any outstanding work (which he shall have undertaken to finish during the Maintenance Period) and any Enhancement Works (which may be ordered under Clause 11.9) until such outstanding work and Enhancement Works are completed in accordance with the Contract, and shall continue to be responsible for all things or items which are required to be retained on the Site during the Maintenance Period including Constructional Plant, temporary buildings and materials and other facilities provided for the use of the Contract Manager, the Contract Manager's

Representative and any persons authorized by the Contract Manager, the Contract Manager's Representative or the Employer.

- (2) In the event that any damage, loss or injury from any cause whatsoever, except the "excepted risks" as defined in Clause 5.12(4), happens to the Works or Specialist Works or any part thereof, or to any Constructional Plant, temporary buildings, materials and things whatsoever on the Site, the Contractor shall at his own expense and with all possible speed make good or at the option of the Employer shall pay to the Employer the cost of making good any such damage, loss or injury to the satisfaction of the Contract Manager and shall, notwithstanding such damage, loss or injury, proceed with the Works in all respects in accordance with the Contract and the Contract Manager's instructions.
- (3) To the extent that any damage, loss or injury arises from any of the "excepted risks" defined in Clause 5.12(4), the Contractor shall, if instructed by the Contract Manager, repair and make good the same at the expense or proportionate expense of the Employer. Any sum payable under this Clause 5.12(3) by the Employer shall be determined by the Surveyor in the same manner as a sum payable in respect of a Variation in accordance with Clause 11.3.
- (4) The "excepted risks" are:-
 - (a) outbreak of war (whether war be declared or not) in which Hong Kong shall be actively engaged,
 - (b) invasion of Hong Kong,
 - (c) act of terrorists in Hong Kong,
 - (d) civil war, rebellion, revolution or military or usurped power in Hong Kong,
 - (e) riot, commotion or disorder in Hong Kong otherwise than amongst the employees of the Contractor, any sub-contractor or Specialist Contractor currently or formerly engaged on the Works or Specialist Works,
 - (f) a cause due to the occupation by the Employer or his agents, employees or contractors of any part of the Works for a purpose other than the carrying out of Specialist Works and such purpose is authorized and required by the Employer,
 - (g) damage, loss or injury which is the direct consequence of the Contract Manager's design of the Works,
 - (h) a cause due to any neglect or default by the Contract Manager or the Employer or the Employer's employees or agents in the course of their employment, and
 - (i) ionizing radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste or from the combustion of nuclear fuel, radioactive toxic explosive, or other hazardous properties of any explosive, nuclear assembly or nuclear component thereof provided always that the same are not caused in whole or in part by the Contractor or any sub-contractor.

5.13 Death of or injury to any person or loss of or damage to any property

- (1) The Contractor shall, except if and so far as the Contract otherwise provides, indemnify and keep indemnified the Employer against all losses and claims for death of or injury to any person or loss of or damage to any property whatsoever, other than surface or other damage to land or crops on the Site, which may arise out of or in consequence of the execution of the Works and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto.
- (2) The Contractor shall make good or at the option of the Employer, shall pay to the Employer the cost of making good any damage, loss or injury which may occur to any property of the Employer and shall recompense the Employer in respect of any damage, loss or injury which may occur to any employee of the Employer by or arising out of or in consequence of the execution of the Works or in the carrying out of the Contract.
- (3) The Contractor's liability to indemnify or recompense the Employer under Clauses 5.13(1) and 5.13(2) shall, subject to Clause 5.13(4), be reduced proportionately to the extent that the act or neglect of the Contract Manager, the Employer or the Employer's employees or agents has contributed to such damage, loss or injury, and nothing herein contained shall be deemed to

render the Contractor liable to the Employer for or in respect of any interference with or of the use or occupation of land provided by the Employer for the purpose of the execution of the Works or any right of way, light, air or water or other easement or quasi easement or the right of the Employer to construct the Works on, over, under, in or through any land which is an unavoidable result of the Contractor's proper and necessary execution of the Works in accordance with the Contract.

- (4) The indemnities given herein by the Contractor shall not be rendered ineffective or reduced by reason of any negligence or omission of the Employer or the Contract Manager or the Contract Manager's Representative in watching and inspecting the Works, or in testing and examining any material to be used and workmanship employed by the Contractor in connection with the Works, or in supervising or controlling the Contractor's site operations or methods of working or Temporary Works, or in detecting or preventing or remedying defective work or services, or in ensuring proper performance of any other obligation of the Contractor.

5.14 Third party insurance

- (1) Without limiting the Contractor's obligations and responsibilities under Clause 5.13, the Contractor shall procure before the date for commencement of the Works as notified by the Contract Manager under Clause 8.1, in the joint names of the Contractor, the Employer, the power supply company (if the design, supply and installation of grid-connected photovoltaic system has been specified as part of the Works) and the Contractor's sub-contractors of any tier an insurance policy covering the period from and including such notified date for commencement of the Works up to and including the certified date of completion of the maintenance obligations but if there is more than one certified date of completion of the maintenance obligations then the last date of such dates of completion of the maintenance obligations certified by the Contract Manager under Clause 14.3, against any damage, loss or injury which may occur to any property including that of the Employer (other than the Works), and/or to any person, by or arising out of or in consequence of the execution of the Works or in the carrying out of the Contract otherwise than due to the matters referred to in Clause 5.13(3).
- (2)
 - (a) Such insurance shall be effected with an insurer as specified in the Contract for at least the amount stated in the appendix to the Form of Tender and the insurance policy shall be consistent with the terms of the specimen policy as provided in the appendix to the Conditions of Contract and shall at least cover the risks stipulated therein.
 - (b) The Contractor shall lodge with the Employer through the Surveyor or the Surveyor's Representative the originals of the policy or policies of insurance, the originals of the receipts for payment of the current premiums and a confirmation letter consistent with the sample as provided in the appendix to the Conditions of Contract. Such insurance shall be in terms approved by the Employer which approval shall not be unreasonably withheld.

Provided that if through no fault of the Contractor, it becomes impracticable for the Contractor to procure an insurance policy consistent with the terms of the specimen policy, the Employer may accept an insurance policy with modified terms as may be proposed by the Contractor subject to adjustment to the Contract Sum under Clause 5.14(2)(c).

- (c) Any proposal submitted by the Contractor for modifications to the terms in the specimen policy shall be accompanied with a proposed adjustment to the Contract Sum. If the Employer agrees to such modifications and such proposed adjustment, the adjustment shall be taken into account in the calculation of the Final Contract Sum. Failing agreement on the adjustment to the Contract Sum, the Surveyor shall determine the amount of the adjustment in the same manner as a sum to be added to or deducted from the Contract Sum in respect of a Variation in accordance with Clause 11.3 and shall take such amount into account in the calculation of the Final Contract Sum.
- (d) The Contractor shall, if so required in writing by the Employer at any time during the currency of the Works, procure an insurance policy or, where the Contractor has already procured an insurance policy in accordance with Clause 5.14(1) or the proviso of Clause 5.14(2)(b), a replacement insurance policy, with modified terms. In such event, the Surveyor and the Contractor shall agree on an adjustment to the Contract Sum and failing agreement, the Surveyor shall determine the amount of the adjustment in the

same manner as a sum to be added to or deducted from the Contract Sum in respect of a Variation in accordance with Clause 11.3. The adjustment agreed between the Surveyor and the Contractor or, as the case may be, determined by the Surveyor shall be taken into account in the calculation of the Final Contract Sum.

5.15 Design responsibility

- (1) Unless otherwise provided for in the Contract, the Contractor shall not be responsible for the design of the permanent work or for the design of any Temporary Works designed by the Contract Manager.
- (2) The Contractor shall, in respect of any defect or insufficiency in any design:-
 - (a) as is required to be carried out by the Contractor under the Contract, or
 - (b) as is required to be carried out by a Nominated Sub-contractor under a Nominated Sub-contract or by a Specialist Sub-contractor under a Specialist Sub-contract, or
 - (c) which the Contractor has to carry out as a result of a Variation or an Agreed Requested Variation

(referred to in this Clause 5.15 as the “Contractor’s Design”), have the like liability to the Employer, whether under statute or otherwise, as would an appropriate professional designer holding himself out as competent to take on the Contractor’s Design.
- (3) Notwithstanding the provisions of Clause 5.15(2) and except as otherwise provided for in the Contract, the Contractor shall ensure that the equipment, plant, materials and goods are reasonably fit for the purpose intended by the Contract where the Employer has relied upon the Contractor to select such equipment, plant, materials and goods required to be incorporated into the Works.
- (4) In preparing the Contractor’s Design and complying with his obligations under Clause 5.15(2), the Contractor shall, where prescribed in the Contract, comply in all respects with the design checking procedures provided in the Contract.
- (5) No examination or lack of examination of whatsoever nature by the Employer, his agents or employees of the Contractor’s drawings, documents, calculations or details relating to the Contractor’s Design or otherwise nor any certification, comment, rejection or approval expressed by any of such persons in regard thereto, whether with or without modification, shall in any respect relieve or absolve the Contractor from any obligation or liability under or in connection with the Contract.

5.16 Use of Intellectual Property Rights

- (1) In so far as work which forms part of the Works shall be designed by the Contractor under the Contract or in accordance with an Agreed Requested Variation, all Intellectual Property Rights incorporated or utilized in such work which are owned or procured by the Contractor shall, save as otherwise expressed in the Contract, remain vested in him.
- (2) After the date of completion of the Works as certified under Clause 8.7 or upon termination of the Contractor’s employment under Clause 15.1 or in the event of frustration of this Contract or where the Employer has appointed other contractors to perform work pursuant to Clause 15.2, the Contractor shall be deemed to have granted to the Employer and the subsequent owners or occupiers of the Works free of all fee a non-exclusive irrevocable licence to utilize such Intellectual Property Rights which have been provided or procured by the Contractor, provided that the Employer shall make use of such Intellectual Property Rights solely in connection with the execution of the Works and/or the subsequent alteration, extension and maintenance thereof and for no other purpose whatsoever. No prior written agreement or consent from the Contractor shall be required for such use by the Employer. Where sectional or partial completion is provided for in the Contract, the expression “certificate of completion” shall, for the purpose of Clause 5.16(2), mean such certificate of the relevant Section or part of the Works.

5.17 Indemnity for Intellectual Property Rights

- (1)
 - (a) The Contractor shall, subject to Clause 5.17(3), indemnify the Employer from and against and keep the Employer fully and effectively indemnified from and against all actions, claims, demands, proceedings, costs, losses, charges, damages and expenses (including without limitation the fees and disbursements of lawyers, agents and expert witnesses) and all awards and cost which may be agreed to be paid in settlement of any proceedings and liabilities of whatsoever nature which the Employer may pay or incur for or on account of any allegation and/or claim of infringement of any Intellectual Property Rights in respect of any Constructional Plant, machine, work, method or material or anything whatsoever required or used for or in connection with the Works.
 - (b) Except when otherwise specified in the Contract, the Contractor shall pay all tonnage and other royalties, rent and other payments or compensation (if any) for getting stone, sand, gravel, clay or other materials required for the Works.
 - (c) The indemnity granted pursuant to Clause 5.17(1)(a) shall continue to apply where the actions, claims, demands and/or proceedings concerned are subsequently withdrawn or settled or in the event that the allegations or claims of infringement are subsequently found to be unsubstantiated and shall not terminate if the Contractor shall for any reason cease to be employed in connection with the Works.
- (2) The Contractor shall, at his own expense and in consultation with the Employer, conduct any proceedings arising from any allegation and/or claim for infringement referred to in Clause 5.17(1)(a) and all negotiations in connection therewith.
- (3)
 - (a) Where the Contractor shall, in compliance with the Contract or the Contract Manager's written instruction, incorporate into the permanent work any patented article, process or invention, the Contractor shall be reimbursed by the Employer for any expenses, costs or damages which the Contractor may have had to pay to the persons entitled to such patented article, process or invention in respect of any infringement of any Intellectual Property Rights in relation to such article, process or invention.
 - (b) The Contractor shall, as a condition precedent to any such reimbursement under Clause 5.17(3)(a), notify the Contract Manager in writing as soon as the Contractor is aware of or ought reasonably to be aware of any incorporation of any such patented article, process or invention into the permanent work.
- (4) The provisions of this Clause 5.17 shall survive and continue in full force and effect notwithstanding the completion of the Works as certified under Clause 8.7 or the completion of the maintenance obligations as certified under Clause 14.3 or the termination of the Contractor's employment under Clause 15.1.

5.18 Interference with traffic and adjoining properties

- (1) All operations necessary for the execution of the Works shall be carried on so as not to interfere unnecessarily or improperly with:-
 - (a) the convenience of the public, or
 - (b) the access to, use or occupation of any public or private roads or footpaths or any properties whether in the possession of the Employer or any other person.
- (2) The Contractor shall save harmless and indemnify the Employer in respect of all claims, demands, proceedings, damages, costs, charges and expenses whatsoever arising out of or in relation to any such matters in so far as the Contractor is responsible therefor.

5.19 Remedy on failure to insure

If the Contractor fails to effect and keep in force any insurance which he may be required to effect under the Contract, then the Employer may, in any such case, effect and keep in force any such insurance and pay such premiums as may be necessary for that purpose and such premiums, together with any other expenses incurred by the Employer, shall be recoverable by the Employer from the Contractor.

5.20 Accident or injury to workers

The Employer shall not be liable for or in respect of any damages or compensation payable at law in respect of or in consequence of any accident or injury to any worker or other person in the employ of the Contractor or any of his sub-contractors save and except an accident or injury resulting from any act or default of the Employer or his agents or employees and the Contractor shall indemnify and keep indemnified the Employer against all such damages and compensation, save and except as aforesaid and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto.

5.21 Contractor to give notice of injury

In the event of any worker or other person employed on the Works or in connection with the Contract whether in the employ of the Contractor or a sub-contractor suffering any personal injury and whether there is or will be a claim for compensation or not, the Contractor shall, without delay, notify the Commissioner for Labour in such form and manner as required under the Employees' Compensation Ordinance (Cap. 282) and report the matter to the Contract Manager in the form prescribed in the Contract.

5.22 Giving of notices and payment of fees

The Contractor shall give all notices and pay all licences, levies, premiums or other fees required to be given or paid by reason of any enactment or any regulation or bye-law of any local or other duly constituted authority in relation to the execution of the Works and by the rules and regulations of all public bodies and statutory authorities whose property or rights are affected or may be affected in any way by the Works.

5.23 Compliance with enactments and regulations

The Contractor shall conform in all respects with:-

- (a) the provisions of any enactment, and
- (b) the regulations or bye-laws of any local or duly constituted authority, and
- (c) the rules and regulations of such public bodies and statutory authorities as are referred to in Clause 5.22

and any additions or amendments thereto or any new enactments, regulations, bye-laws or rules made during the currency of the Works, which are applicable to the Works, and shall be responsible for the payment of all penalties and fines and the discharge of all obligations under such enactments, regulations, bye-laws or rules and shall keep the Employer indemnified against all penalties and fines and liabilities of every kind for breach of any such enactments, regulations, bye-laws or rules.

Provided that the Contractor shall, under no circumstances, be paid by the Employer for any penalties, fines and liabilities for breach of such enactments, regulations, bye-laws or rules nor shall the Final Contract Sum be adjusted for that purpose.

5.24 Notices to be written in English and Chinese

Any notice required to comply with any enactment or the rules and regulations of Government or other duly constituted authority and which the Contractor may have to exhibit either for the benefit of the public or for the benefit of his employees and any sub-contractors shall be written in English and Chinese.

5.25 Site diary and labour returns

- (1) The Contract Manager's Representative shall record daily in the Contract Manager's site diary information with regard to labour, plant, materials, utilities, work carried out and instructions issued to the Contractor and all other facts that may affect the progress or quality of the Works.
- (2) The authorized agent or representative of the Contractor shall sign the site diary daily indicating his agreement to the information and details recorded therein. Should the authorized agent or representative of the Contractor disagree with any of the recorded items or details, he shall indicate clearly in writing in the site diary such items or details with which he disagrees.
- (3) The Contractor shall, as and when called upon to do so by the Contract Manager, make available to the Contract Manager or such other person as the Contract Manager may direct, such information as the Contract Manager considers necessary to enable him to keep and

maintain his site records properly, but in any event and without prejudice to the generality of the foregoing, the Contractor shall deliver to the office of the Contract Manager's Representative by not later than 1.00 p.m. on each working day a return in such form as the Contract Manager may prescribe showing in detail the numbers of the several classes of labour on the Site that day together with the numbers of the several classes of labour so employed during the preceding twenty-four hours who were not included in the return for the previous day together with such information concerning materials, Constructional Plant and other such matters as the Contract Manager's Representative may require.

5.26 Fossils

All fossils, coins, articles of value or antiquities and structures and other remains or things of geological or archaeological interest discovered on the Site shall, as between the Employer and the Contractor, be the absolute property of the Employer. The Contractor shall take reasonable precautions to prevent his workers, sub-contractors or any other persons from removing or damaging any such items, remains or things and shall upon discovery but before removal thereof notify the Contract Manager or the Contract Manager's Representative in writing of such discovery and carry out at the expense of the Employer the instructions of the Contract Manager as to the disposal of the same. The Surveyor shall determine such expense in the same manner as a sum to be added to the Contract Sum in respect of a Variation in accordance with Clause 11.3.

5.27 Facilities for other persons

- (1) The Contractor shall in accordance with the requirements of the Contract Manager afford all reasonable facilities to any person who may be carrying out, on or adjacent to the Site, any work not included in the Contract but required by the Employer or any Specialist Contractor, Utility Undertaking or other duly constituted authority.
- (2) In the event that the Contractor shall on written request of the Contract Manager:-
 - (a) make available any road or way the maintenance of which the Contractor is responsible, or
 - (b) afford the use of any Constructional Plant, or
 - (c) provide any other service of whatsoever natureto any person who may be carrying out, on or adjacent to the Site, any work not included in the Contract but required by the Employer or any Specialist Contractor, Utility Undertaking or other duly constituted authority, the Employer shall pay to the Contractor in respect of such use or service such sum as determined to be reasonable by the Surveyor. Provided that if the Contractor is responsible for affording such use or service in accordance with the Contract, the cost of such use or service shall be deemed to have been included in the Contract Sum.

5.28 Clearance of the Site on completion

As soon as practicable after the date of completion of the Works as certified under Clause 8.7, the Contractor shall clear away and remove all surplus materials and rubbish of any kind whatsoever from the Site but in the event of the completion relating to a Section or part of the Works, then from such Section or part of the Works (as the case may be) and leave the same in a clean and tidy condition.

5.29 Publication of photographs of the Site or the Works

- (1) The Contractor shall not disclose, publish or circulate photographs of the Site or of the Works or any part thereof or anything therein except with the permission in writing of the Employer.
- (2) No such permission shall exempt the Contractor from complying with any statutory provision in regard to the taking and publication of photographs.

5.30 Prohibition of offering gratuities

- (1) If the Contractor or any of his employees, representatives or agents shall be found to have offered or given any advantage, gratuity, bonus, discount, bribe or loan of any kind to any employee, representative or agent of the Employer, to the Contract Manager or to any member of the Contract Manager's staff or to the Surveyor or any member of the Surveyor's staff, the Employer may terminate the employment of the Contractor under Clause 15.1 and hold the Contractor liable for any loss or damage which the Employer may thereby sustain.

- (2) The Contractor shall prohibit his employees, representatives, agents, and sub-contractors who are involved in the Contract from offering, soliciting or accepting any advantage as defined in the Prevention of Bribery Ordinance (Cap. 201) when conducting business in connection with the Contract.
- (3) The Contractor shall require his employees, representatives, agents and sub-contractors who are involved in the Contract to declare in writing to the Contractor any conflict or potential conflict between their personal/financial interests and their duties in connection with the Contract. In the event that such conflict or potential conflict is disclosed in a declaration, the Contractor shall forthwith take such reasonable measures as are necessary to mitigate as far as possible or remove the conflict or potential conflict so disclosed.
- (4) The Contractor shall prohibit his employees who are involved in the Contract from engaging in any work or employment other than in the performance of the Contract, with or without remuneration, which may create or potentially give rise to a conflict between their personal/financial interests and their duties in connection with the Contract. The Contractor shall also require his sub-contractors and agents to impose similar restriction on their employees by way of a contractual provision.
- (5) The Contractor shall take all necessary measures (including by way of contractual provisions and/or providing training workshops where appropriate) to ensure that his employees, representatives, agents and sub-contractors are aware of the prohibitions and requirements in this Clause 5.30.
- (6) The Contractor acknowledges his full awareness that dishonesty, theft or corruption on his part or on any part of his employees, representatives, agents or sub-contractors who are involved in the Contract may lead to prosecution under, without limitation, the Prevention of Bribery Ordinance (Cap. 201), the Theft Ordinance (Cap. 210) and the Crimes Ordinance (Cap. 200). These offences commonly carry terms of imprisonment upon conviction.

5.31 Site cleanliness

The Contractor shall provide and maintain efficient and hygienic toilet facilities for the use of all persons on the Site and shall keep the Site in a clean and hygienic condition.

5.32 Disposal ground

- (1) The Contractor shall not dispose of construction and demolition materials generated from the Works or in connection with the Site at any place other than the disposal ground designated in the Contract or directed by the Contract Manager or such alternative disposal grounds as proposed by the Contractor and approved by the Contract Manager in accordance with the Specification.
- (2) Notwithstanding any other provisions in the Contract, the Contract Manager's approval or disapproval of any alternative disposal ground proposed by the Contractor shall not in any way relieve the Contractor of any duty or responsibility under the Contract nor entitle the Contractor to any additional payment or extension of time.

5.33 Care of the Works insurance

- (1) Without limiting the Contractor's obligations and responsibilities under Clause 5.12, the Contractor shall procure before the date for commencement of the Works as notified by the Contract Manager under Clause 8.1, in the joint names of the Contractor, the Employer and the Contractor's sub-contractors of any tier an insurance policy for care of the Works and any Specialist Works covering the period from and including such notified date for commencement of the Works up to and including the day 28 days from the date of completion of the Works as certified by the Contract Manager under Clause 8.7, provided that should the Works be completed in Sections, the period of insurance for a Section shall cover the period from and including the date for commencement of such Section up to and including the day 28 days from the date of completion of such Section as certified by the Contract Manager under Clause 8.7.
- (2) (a) Such insurance shall be effected with an insurer as specified in the Contract and the insurance policy shall be consistent with the terms of the specimen policy as provided in the appendix to the Conditions of Contract. Such insurance policy shall at least cover the risks stipulated therein and in respect of Specialist Works within the coverage of the insurance policy, the Contractor shall also assess the value of the Specialist Works.

- (b) The Contractor shall lodge with the Employer through the Surveyor or the Surveyor's Representative the originals of the policy or policies of insurance, the originals of the receipts for payment of the current premiums and a confirmation letter consistent with the sample as provided in the appendix to the Conditions of Contract. Such insurance shall be in terms approved by the Employer which approval shall not be unreasonably withheld.
 - (c) In the event that through no fault of the Contractor, it becomes impracticable for the Contractor to procure an insurance policy consistent with the terms of the specimen policy, the Employer may accept an insurance policy with modified terms as may be proposed by the Contractor subject to the adjustment as may be agreed between the Employer and the Contractor or determined by the Surveyor in accordance with Clause 5.33(2)(d).
 - (d) Any proposal submitted by the Contractor for modifications to the terms in the specimen policy shall be accompanied with a proposed adjustment to the Contract Sum. If the Employer agrees to such modifications and such proposed adjustment, the adjustment shall be taken into account in the calculation of the Final Contract Sum. Failing agreement on the adjustment to the Contract Sum, the Surveyor shall determine the amount of the adjustment in the same manner as a sum to be added to or deducted from the Contract Sum in respect of a Variation in accordance with Clause 11.3 and shall take such amount in the calculation of the Final Contract Sum.
 - (e) The Contractor shall, if so required in writing by the Employer at any time during the currency of the Works, procure an insurance policy or, where the Contractor has already procured an insurance policy in accordance with Clause 5.33(1) or 5.33(2)(c), a replacement insurance policy, with modified terms. In such an event, the Surveyor and the Contractor shall agree on an adjustment to the Contract Sum and failing such agreement the Surveyor shall determine the amount of the adjustment in the same manner as a sum to be added to or deducted from the Contract Sum in respect of a Variation in accordance with Clause 11.3. The adjustment agreed between the Surveyor and the Contractor or, as the case may be, determined by the Surveyor shall be taken into account in the calculation of the Final Contract Sum.
- (3) The extent of the insurance cover to be provided shall be:-
- (a) the Works and Specialist Works to the full reinstatement value, and
 - (b) the materials, Constructional Plant and all other things brought onto the Site by anyone so authorized to do so to the full replacement value of such materials, Constructional Plant and other things.

6 LABOUR

6.1 Engagement of labour

- (1) The Contractor shall make his own arrangements in regard to the provision of such labour, skilled and unskilled, as may be required for the execution of the Works and shall use all diligence in arranging for a sufficient and suitable supply of such labour but all such arrangements shall be in accordance with general local usage and subject to such enactments and regulations as Government may from time to time require to be observed.
- (2) As far as practicable all labour both skilled and unskilled shall be engaged in Hong Kong.

6.2 Fair wages

- (1) The Contractor shall pay rates of wages and observe hours and conditions of labour which are not less favourable than the general level of wages, hours and conditions observed by other employers whose general circumstances in the trade or industry in which the Contractor is engaged are similar.
- (2) The Contractor shall in respect of all persons employed by him, whether in carrying out the Contract or otherwise, in every workshop or other place occupied or used by him for carrying out the Works comply with the general conditions required in this Clause 6.2.

- (3) The Contractor shall be responsible for the observance of this Clause 6.2 by sub-contractors employed in the carrying out of the Works.
- (4) The Employer may make payment, in whole or in part, on behalf of the Contractor of claims of any employee of wages in arrears by the Contractor or as the case may be, the Contractor's superior sub-contractors under and as defined in the Employment Ordinance (Cap. 57), out of any money due or becoming due to the Contractor (whether under the Contract or any other contract between the Employer and the Contractor), which money shall exclude the Retention Money held in respect of the Contractor before it is due, in the event:-
 - (a) that default is being made by the Contractor in the payment of any money in respect of wages of any person employed by the Contractor in and for carrying out the Contract, or
 - (b) that the Contractor is liable to an employee of his sub-contractor of any tier including Specialist Sub-contractors but excluding Nominated Sub-contractors for the first two months of the wages in arrears under section 43C of the Employment Ordinance (Cap. 57)

and if the claim therefor is filed by the employee in the office of the Labour Department and proof thereof (including, where the claim is disputed by the Contractor or as the case may be, the sub-contractor (as the employer of the employee) or it is found necessary by the Commissioner for Labour, proof of final determination of the claim by an award or order of the Labour Tribunal or as the case may be the Minor Employment Claims Adjudication Board or a judgment of the District Court or, where the matter is subsequently further disputed by way of appeal, by a judgment of the appellate court) is furnished to the satisfaction of the Commissioner for Labour. Without prejudice to Clause 15.3, any money due or becoming due to the Contractor under the Contract or any other contract between the Employer and the Contractor shall be reduced correspondingly by the amount so paid by the Employer to the employee as aforesaid provided that the aggregate reductions shall not exceed the amount paid by the Employer under this Clause 6.2(4).

- (5) The Employer may make payment, in whole or in part, on behalf of the Nominated Sub-contractor for or of claims of the employee of wages in arrears by the Nominated Sub-contractor or as the case may be, the superior nominated sub-contractors under the Employment Ordinance (Cap. 57), out of any money due or becoming due to the Nominated Sub-contractor under the nominated sub-contract, which money shall exclude the Retention Money held in respect of the Nominated Sub-contractor before it is due, in the event:-
 - (a) that default is being made in the payment of any money in respect of wages of any person employed by the Nominated Sub-contractor in and for carrying out the Nominated Sub-contract Works, or
 - (b) that the Nominated Sub-contractor is liable to an employee of his nominated sub-contractor of any tier for the first two months of the wages in arrears under section 43G of the Employment Ordinance (Cap. 57)

and if the claim therefor is filed by the employee in the office of the Labour Department and proof thereof (including, where the claim is disputed by the Nominated Sub-contractor or as the case may be, the nominated sub-contractor (as the employer of the employee) or it is found necessary by the Commissioner for Labour, proof of final determination of the claim by an award or order of the Labour Tribunal or as the case may be the Minor Employment Claims Adjudication Board or a judgment of the District Court or, where the matter is subsequently further disputed by way of appeal, by a judgment of the appellate court) is furnished to the satisfaction of the Commissioner for Labour. Without prejudice to Clause 15.3, any money due or becoming due to the Contractor under the Contract shall be reduced correspondingly by the amount so paid by the Employer to the employee as aforesaid provided that the aggregate reductions shall not exceed the amount paid by the Employer under this Clause 6.2(5). For the purpose of this Clause 6.2(5), the respective meaning of the "superior nominated sub-contractor" and "nominated sub-contractor" shall be as defined in the Employment Ordinance (Cap. 57).

- (6) Where any person claiming or alleged to be a Self-employed Worker is found by the Labour Tribunal or as the case may be the Minor Employment Claims Adjudication Board or a judgment of the District Court or, where the matter is subsequently further disputed by way of appeal, by a judgment of the appellate court to be an employee instead of a Self-employed Worker, Clauses 6.2(4) and 6.2(5) shall apply to such person.

6.3 Passes

- (1) The Contractor shall set up and maintain a system for controlling and regulating the admission of workers, Site Personnel and visitors to the Site as required under the Contract.
- (2) The Contractor shall, at his own expense, issue a Pass to each of such persons who are authorized to enter the Site for the carrying out of the Works or any other purposes in connection with the Works and thereafter keep full and proper records thereof and conduct regular checking of such Passes being carried at all times on the Site and ensure such Passes are returned to the Contractor after use by the bearers. The Contractor shall be responsible for any delay or disruption to the progress or execution of the Works due to any matter in connection with such Passes including but not limited to the issue or late issue of any Passes.
- (3) The Contractor shall keep and maintain at all times and update on a weekly basis a list of such Passes that were reported lost or not returned to the Contractor. Such list shall be kept at or in the guard post or house at the entrance of the Site for the checking of the Employer or his representatives and a copy thereof shall be provided by the Contractor to the Contract Manager.

7 MATERIALS AND WORKMANSHIP

7.1 Quality of materials, workmanship and tests

- (1) All materials and workmanship shall be of the respective character, quality or kind required under the Contract and in accordance with the Contract Manager's instructions and shall be subjected to such examinations, measurements or tests as required under the Contract or as ordered by the Contract Manager or the Contract Manager's Representative at the place of manufacture, or on the Site, or at such other place or places as the Contract Manager may think appropriate.
- (2) The Contractor shall provide such assistance, instruments, machines, labour and other facilities as may be necessary for examining, measuring or testing any work or the quality, weight or quantity of any material used and shall, before incorporation into the Works, supply for examining, measuring or testing samples of such materials as may be selected or required by the Contract Manager or the Contract Manager's Representative.
- (3) The Contractor shall bear the expense and costs of any examination, measurement or test and of complying with the requirements of Clause 7.1(2), including without limitation any transportation costs and shall reimburse the Employer in respect of the costs of the Contract Manager and the Contract Manager's Representative in attending such examination, measurement or test, if such examination, measurement or test and all repetitions thereof are clearly intended or provided for in the Contract.
- (4) If any examination, measurement or test not so intended or provided for in the Contract is ordered by the Contract Manager or the Contract Manager's Representative, then the expense and costs of such examination, measurement or test including those of the attendance by the Contract Manager and/or the Contract Manager's Representative shall be borne by the Contractor if the examination, measurement or test shows the materials or workmanship to be not in accordance with the Contract or the Contract Manager's instructions but otherwise such expense and costs shall be determined by the Surveyor in the same manner as a sum to be added to the Contract Sum in respect of a Variation in accordance with Clause 11.3 and be borne by the Employer.
- (5) In the event that any test shows that the Contractor has failed to comply with the requirements of the Contract or with the Contract Manager's instructions in respect of materials or workmanship, the Contractor shall propose and carry out at his own expense further or any other test as the Contract Manager may approve.

- (6) Clauses 7.1(4) and 7.1(5) shall apply to any series of tests carried out on any part of the Works the results of which indicate that in the opinion of the Contract Manager the Contractor has failed to comply with the requirements of the Contract or with the Contract Manager's instructions in respect of materials or workmanship notwithstanding there being satisfactory individual tests included in any such series of tests.
- (7) Notwithstanding the other provisions of this Clause 7.1, any test carried out in the Employer's laboratories in connection with the Works shall be free of charge.

7.2 Access to the Site and places of manufacture

The Contract Manager and any person authorized by him shall at all times have access to the Works and to the Site and to all workshops and places where materials or manufactured articles are being stored or prepared or from where materials or manufactured articles are being supplied by the Contractor or any sub-contractor, and the Contractor shall render every assistance to the Contract Manager and any person so authorized by him to obtain access when required to such workshops and places from where materials or manufactured articles are being obtained for incorporation into the Works.

7.3 Examination of work before covering up

- (1) No work shall be covered up or put out of view without the approval of the Contract Manager or the Contract Manager's Representative and the Contractor shall afford full opportunity for the Contract Manager or the Contract Manager's Representative to examine and measure any work which is about to be covered up or put out of view and to examine any foundation before permanent work is placed thereon.
- (2) The Contractor shall give reasonable notice to the Contract Manager's Representative whenever any such work or foundation is ready for examination and the Contract Manager or the Contract Manager's Representative shall, without unreasonable delay and unless he considers it unnecessary and advises the Contractor accordingly, attend for the purpose of examining and measuring such work or examining any such foundation.

7.4 Uncovering and making openings

- (1) The Contractor shall uncover or make such openings in or through any part of the Works as the Contract Manager may from time to time direct and shall reinstate and make good any such part in accordance with the Contract.
- (2) If any such part has been covered up or put out of view after compliance with the requirements of Clause 7.3 and is found to be executed in accordance with the Contract, the expense of uncovering, making openings in or through, reinstating and making good the same shall be determined by the Surveyor in the same manner as a sum to be added to the Contract Sum in respect of a Variation in accordance with Clause 11.3 and shall be taken into account in the calculation of the Final Contract Sum. In any other case the expense shall be borne by the Contractor.

7.5 Removal of unsatisfactory material and work

- (1) The Contract Manager shall during the progress of the Works have the power to order in writing:-
 - (a) the removal from the Site within such time as may be specified in the order of any material which in the opinion of the Contract Manager is not in accordance with the Contract, and
 - (b) the substitution with proper and suitable material, and
 - (c) the removal and proper re-execution, notwithstanding any previous examination, measurement or test thereof or any interim payment therefor, of any work which, in respect of materials or workmanship, is not in accordance with the Contract.
- (2) The Contractor shall bear the expense of uncovering, breaking up and removal from the Site of any material or work not in accordance with the Contract and the Contractor shall also bear the expense of reinstating and making good all consequential damage to the Works resulting from such uncovering, breaking up or removal.

- (3) Where the rectification of any work or replacement of any material by the Contractor which does not comply with the Contract would involve the removal and re-execution of the original permanent work the Contract Manager may but shall not be obliged to give directions for a Variation in lieu of such removal and re-execution at no additional expense to the Employer.

Provided that if in the opinion of the Surveyor such Variation has involved the Contractor in expense in excess of that which would have been involved in the removal and re-execution of the original permanent work then the Surveyor shall determine such excess in the same manner as a sum to be added to the Contract Sum in respect of a Variation in accordance with Clause 11.3 and shall take this into account in the calculation of the Final Contract Sum.

- (4) In the event that the Contract Manager exercises any of his powers under Clause 7.5(1) concerning materials supplied by the Employer, and if the Contractor could not, in the opinion of the Contract Manager, have reasonably ascertained that the material was not in accordance with the Contract then the Surveyor shall ascertain such Cost incurred and shall take this into account in the calculation of the Final Contract Sum.

7.6 Warranty

- (1) Without prejudice to any right of the Employer under the Contract or at law, the Contractor shall, in respect of such material, equipment or installation work specifically required in the Contract, unconditionally warrant to the Employer the satisfactory performance of such specified material, equipment or installation work for such period of time as specified in the Contract and that such specified material, equipment and installation work are in conformity to the specified requirements.
- (2) Where a deed of warranty from a manufacturer, supplier, agent, sub-contractor or such other person is required in the Contract, the Contractor shall, at no cost to the Employer and without prejudice to Clause 7.6(1) procure from such person and submit to the Employer within the time as stipulated in the Contract such deed of warranty on such terms and conditions as specified in the Contract.

Provided that the provision of such deed of warranty shall not relieve the Contractor of any of his other obligations or liabilities under the Contract.

8 COMMENCEMENT, COMPLETION AND DELAYS

8.1 Commencement of the Works

The Contractor shall commence the Works on the date for commencement of the Works as notified in writing by the Contract Manager. If the Works are phased for completion in Sections and where it is specified in the Contract that the date for commencement of any of the Sections is not the same as the notified date for commencement of the Works, the Contractor shall commence the Section on the date for commencement as notified in writing by the Contract Manager for such Section. The Contractor shall not commence the Works or Section before the notified date for commencement thereof. The Contractor shall proceed with the Works and/or Sections with due diligence after commencement thereof. The date for commencement of the Works so notified by the Contract Manager shall fall within the period of time after the date of the Letter of Acceptance as stated in the appendix to the Form of Tender.

8.2 Possession of the Site

- (1) Save in so far as the Contract may prescribe the extent of Portions of which the Contractor is to be given possession from time to time and the order in which such Portions shall be made available to him and, subject to any requirement in the Contract as to the order in which the Works shall be executed, the Employer shall give to the Contractor on the date for commencement as notified by the Contract Manager under Clause 8.1 possession of so much of the Site as may be required to enable the Contractor to commence and proceed with the Works in accordance with the programme referred to in Clause 5.7 and otherwise in accordance with such reasonable proposals in writing as the Contractor shall make to the Contract Manager. The Employer will from time to time, as the Works proceed, give to the Contractor possession of such further parts of the Site as may be required to enable the Contractor to proceed with the Works with due despatch in accordance with the said programme or proposals, as the case may be.

- (2) The Contractor shall bear all expenses and charges for special or temporary wayleaves required by him in connection with access to the Site.

8.3 Time for completion

- (1) The Works and any Section shall be completed within the time or times stated in the Contract calculated from and including the date for commencement as notified by the Contract Manager in accordance with Clause 8.1 but in the event that an extension of time is granted for the Works or Section, as the case may be, under Clause 8.4, then the Works or Section shall be completed within such extended time.
- (2) None of the Works shall be carried out on General Holidays save and except:-
 - (a) such part of the Works carried out in pursuance of the Contractor's obligations under Clause 5.11, or
 - (b) any work that is unavoidable or absolutely necessary for:-
 - (i) preventing injury to any person or saving the life of any person;
 - (ii) preventing damage to property;
 - (iii) curing of concrete which has been poured on the previous day, loosening of wallform bolts and the like and any similar works which the Contract Manager accepts as being necessary for the working cycle;
 - (iv) essential maintenance of Constructional Plant;
 - (v) providing any attendance required for turfing and planting or any other Specialist Works carried out on General Holidays; or
 - (vi) administrative office work on the Site related to the Works or as required under the Contract, or
 - (c) any part of the Works which may be carried out on General Holidays as expressly specified in the Contract.

Provided that as soon as is practicable the Contractor shall advise the Contract Manager of the need for such work referred to in Clauses 8.3(2)(a) and 8.3(2)(b) to be carried out on General Holidays and provided further that the Contract Manager has not expressly prohibited such work to be carried out on General Holidays.

- (3) The Contractor may also give notice in writing to the Contract Manager, accompanied with detailed reasons and justifications, requesting the Contract Manager to permit any work, other than those works covered by Clause 8.3(2), to be executed on General Holidays, and the Contract Manager shall respond within 14 days of the receipt of such notice. The Contract Manager may at his sole discretion grant or refuse to grant such permission so requested by the Contractor, and the Contract Manager shall not be obliged to give any reason to the Contractor in the case of the request being refused.
- (4) The Contractor shall not be entitled to any payment nor extension of time as a result of compliance with the provisions of this Clause 8.3 or as a result of any permission or refusal of the Contract Manager given under Clause 8.3(3).
- (5) Neither any of the provisions of Clause 8.3(2) nor the permission of the Contract Manager given under Clause 8.3(3) shall in any way relieve the Contractor of his obligations under Clause 5.23 or any of the Contractor's responsibilities or liabilities under the Contract. In particular, the Contractor shall not be relieved of his obligations to obtain any relevant and necessary permit required by law including but not limited to a Construction Noise Permit under the Noise Control Ordinance (Cap. 400).
- (6) Notwithstanding Clause 8.3(2), General Holidays shall be included in the time for completion unless otherwise stated in the Contract.

8.4 Extension of time for completion

Extension of time for inclement weather conditions

- (1) Within 42 days after the receipt by the Contract Manager of the Contractor's written request, the Contract Manager shall grant and notify in writing to the Contractor an extension of time for the completion of the Works or the relevant Section by one day for any single occurrence of the following prescribed events on any day falling within the time or extended time for completion (as the case may be) referred to in Clause 8.3(1):-
- (a) rainfall recorded at the Hong Kong Observatory, Nathan Road, Tsim Sha Tsui, Kowloon as exceeding twenty millimetres between midnight and midnight, or
 - (b) a Tropical Cyclone Warning Signal No. 8 or above issued by the Hong Kong Observatory, or
 - (c) a Black Rainstorm Warning issued by the Hong Kong Observatory.

Provided that consecutive occurrence and/or concurrent occurrence of any two or more of the circumstances described in this Clause 8.4(1) in any single day shall be deemed to be a single occurrence for the purposes of this Clause 8.4(1).

For the avoidance of doubt, the term "one day", "any day" and "single day" as stated in this Clause 8.4(1) shall include any day which is a General Holiday.

Contractor's notice for delay

- (2) (a) The Contractor shall, as soon as practicable but in any event within 28 days of the cause of any delay to the progress of the Works or any Section becoming apparent, serve a notice of claim for extension of time in writing on the Contract Manager, accompanied with particulars of the cause of the delay and the probable effect and extent of such delay.

Grounds for extension of time for delay

- (b) If in the opinion of the Contract Manager the cause of the delay is:-
- (i) the effects of an event caused by inclement weather conditions in respect of which a Tropical Cyclone Warning Signal No. 8 or above being issued and in force on any day falling within the time or extended time for completion (as the case may be) referred to in Clause 8.3(1) in so far as such effects have adversely affected the progress of the Works or Section (as the case may be) subsequent to the day of the lowering of the Tropical Cyclone Warning Signal No. 8, or
 - (ii) the effects of an event caused by inclement weather conditions in respect of which a Black Rainstorm Warning Signal being issued and in force on any day falling within the time or extended time for completion (as the case may be) referred to in Clause 8.3(1) in so far as such effects have adversely affected the progress of the Works or Section (as the case may be) subsequent to the day of the cancellation of the Black Rainstorm Warning Signal, or
 - (iii) an instruction issued by the Contract Manager under Clause 4.1, or
 - (iv) a Variation, or
 - (v) a substantial increase in the quantity of any item of work included in the Contract not resulting from any error in firm quantities or from a Variation, or
 - (vi) the Contractor not being given possession of the Site or any Portion or part thereof in accordance with the Contract, or
 - (vii) a disturbance to the progress of the Works for which the Employer, the Contract Manager or a Specialist Contractor is responsible including but not restricted to any matter referred to in Clause 11.5(1)(a), or
 - (viii) the Contract Manager suspending the Works in accordance with Clause 9.2 in so far as the suspension is not occasioned by the circumstances described in Clauses 9.2(3)(a)(i) to 9.2(3)(a)(iv), or
 - (ix) any Utility Undertaking or other duly constituted authority failing to commence or to carry out in due time any work directly affecting the execution of the Works, provided that the Contractor has taken all practical steps to cause the Utility Undertakings or duly constituted authority to commence or to proceed with such work, or

- (x) any utility work not forming part of the Works which in the opinion of the Contract Manager could not have been foreseen by a competent contractor based on the information available as at the Tender Closing Date, or
- (xi) a Change in Law, or
- (xii) delay on the part of any Nominated Sub-contractor for any reason specified in Clauses 8.4(2)(b)(i) to 8.4(2)(b)(xi) and which the Contractor has taken all reasonable steps to avoid or mitigate, or
- (xiii) any special circumstances of any kind whatsoever,

then the Contract Manager shall, taking into account of any extension of time granted pursuant to Clause 8.4(1), decide whether the Contractor is fairly entitled to an extension of time for the completion of the Works or the relevant Section.

- (c) Notwithstanding the powers of the Contract Manager under the provisions of this Clause 8.4 to decide whether the Contractor is fairly entitled to an extension of time, the Contractor shall not be entitled to an extension of time for the completion of the Works or any Section if the cause of the delay is:-
 - (i) a suspension occasioned by any of the circumstances described in Clauses 9.2(3)(a)(i) to 9.2(3)(a)(iv), or
 - (ii) a shortage of Constructional Plant or labour not occasioned by a Change in Law, or
 - (iii) a delay on the part of any Specialist Sub-contractor, or
 - (iv) inclement weather conditions and/or their consequential effects except as expressly provided in Clause 8.4(1), 8.4(2)(b)(i) or 8.4(2)(b)(ii).

- (d) If in accordance with Clause 8.4(2)(b) the Contract Manager decides that the Contractor is fairly entitled to an extension of time for the completion of the Works or a Section, the Contract Manager shall within 60 days after the receipt of the Contractor's notice of claim served pursuant to Clause 8.4(2)(a) notify in writing to the Contractor such extension. If the Contract Manager decides that the Contractor is not entitled to an extension, the Contract Manager shall notify the Contractor in writing accordingly.

Decision on extension of time

Provided that the Contract Manager and the Contractor may by mutual written agreement extend the said 60 day period by not more than 60 days. Any extension of the said 60 day period by more than 60 days shall be made by mutual written agreement between the Employer and the Contractor.

- (e) If in the opinion of the Contract Manager the cause of the delay envisaged by the Contractor's notice of claim served pursuant to Clause 8.4(2)(a) has a continuing effect, the Contract Manager may, but is not obliged to, grant an interim extension of time as he thinks fit for the completion of the Works or Section (as the case may be) at any time before his decision on the extension of time for the Works or such Section pursuant to Clause 8.4(2)(d).
- (f) The Contract Manager shall take into account all the circumstances known to him when making his decision on an extension of time for completion, including the effect of any omission of work or substantial decrease in the quantity of any item of work.
- (g) For the purposes of deciding whether or to what extent the Contractor may be entitled to an extension of time under Clause 8.4(2)(b) the Contract Manager may, within 14 days after the receipt of the Contractor's notice of claim served pursuant to Clause 8.4(2)(a), require the Contractor to submit further particulars of the cause and extent of the delay to the progress of the Works. Where such further particulars are required by the Contract Manager, they shall be submitted in writing by the Contractor to the Contract Manager within 14 days after the receipt of the Contract Manager's request.
- (h) (i) If the Contractor fails to comply with the notice requirements of Clause 8.4(2)(a) in respect of a claim for extension of time, such claim shall not be considered and shall be deemed to have been waived by the Contractor under the Contract and at common law.

- (ii) If the Contractor fails to comply with the provisions of Clause 8.4(2)(g) but nevertheless has served a notice of claim pursuant to Clause 8.4(2)(a), the Contract Manager shall consider granting such extension only to the extent that the Contract Manager is able to on the information available.

Programme to be revised

- (3) Whenever the Contract Manager grants an extension of time for completion in accordance with Clause 8.4, the Contractor shall revise the programme referred to in Clause 5.7 accordingly.
- (4) Provided that if the Contract Manager grants an extension of time in respect of a prescribed event under Clause 8.4(1) or a cause of delay under Clause 8.4(2)(b) occurring after the Employer is entitled to recover liquidated damages in respect of the Works or a Section (as the case may be) the period of extension of time granted shall be added to the time or extended time for the completion of the Works or the relevant Section in accordance with Clause 8.3(1).
- (5) Any extension of time granted by the Contract Manager to the Contractor shall, except as provided elsewhere in the Contract, be deemed to be in full compensation and satisfaction for any loss, damage or injury sustained or sustainable by the Contractor in respect of any matter or thing in connection with which such extension shall have been granted and every extension shall exonerate the Contractor from any claim or demand on the part of the Employer for the delay during the period of such extension but not for any delay continued beyond such period.

8.5 Rate of progress

- (1) If the rate of progress of the Works or any Section is at any time in the opinion of the Contract Manager too slow to ensure completion by the time or extended time for completion referred to in Clause 8.3(1), the Contract Manager may so inform the Contractor in writing and the Contractor shall take such steps as are necessary to expedite the completion of the Works or such Section. The Contractor shall inform the Contract Manager of such proposed steps and revise the programme referred to in Clause 5.7 accordingly.
- (2) Notwithstanding the provisions of Clause 8.5(1) and subject to compliance with any enactment, regulation or bye-law, the Contract Manager shall be empowered to instruct the Contractor in writing to carry out the Works or any part thereof during any hours of the day where the Contract Manager considers it necessary owing to the default, negligence, omission or slow progress of the Contractor.
- (3) The Contractor shall not be entitled to any additional payment for complying with any instruction given in accordance with this Clause 8.5.

8.6 Liquidated damages for delay

- (1) If the Contractor fails to complete the Works or where the Works are divided into Sections any Section within the time or extended time for completion referred to in Clause 8.3(1), then the Employer shall be entitled to recover from the Contractor liquidated damages, and may but shall not be bound to deduct such damages either in whole or in part, in accordance with Clause 15.3. Payment of such liquidated damages shall not relieve the Contractor from his obligation to complete the Works or from any of his other obligations under the Contract.
- (2) The liquidated damages shall be calculated using the rate of liquidated damages prescribed in the Contract, either for the Works or for the relevant Section, whichever is applicable.

Provided that, if the Contract Manager certifies completion under Clause 8.7 of any part of the Works before completion of the Works or any part of any Section before the completion of the whole thereof, then the rate of liquidated damages for the Works or such Section shall from and including the day following such date of completion certified under Clause 8.7 be reduced in the proportion which the value of the part so certified bears to the value of the Works or such Section, as applicable, both values as of the date of such certification shall be determined by the Surveyor.

- (3) The period for which liquidated damages shall be calculated shall be the number of days from and including the day following the date for completion or any extension thereof of the Works or the relevant Section until and including the day of the date of completion certified under Clause 8.7.

Provided that, if the Contract Manager subsequently grants an extension of time which affects the period described above, then the Employer shall reimburse the Contractor the liquidated damages for the number of days so affected at the rate described in Clause 8.6(2) together with

interest for the period commencing from the date on which the said liquidated damages were deducted from or paid by the Contractor until the day of actual payment of the reimbursement to the Contractor at the rate provided for in Clause 14.2(6) within 28 days of the granting of such extension of time.

- (4) (a) Where the Contract Manager has issued an instruction pursuant to Clause 9.1 omitting a part of any Section, the rate of liquidated damages in respect of such Section shall be reduced by the same proportion as the omission as a result of the instruction valued in accordance with the Contract bears to the amount contained in the Contract Sum for such Section.
- (b) Where the Contract Manager has issued an instruction pursuant to Clause 9.1 omitting a part of the Works, the rate of liquidated damages in respect of the Works shall be reduced by the same proportion as the omission as a result of the instruction valued in accordance with the Contract bears to the amount contained in the Contract Sum for the Works.
- (5) All monies payable by the Contractor to the Employer pursuant to this Clause 8.6 shall be paid as liquidated damages for delay and not as a penalty.

8.7 Completion of the Works

- (1) When the Works have been substantially completed and have satisfactorily passed any final test that may be prescribed by the Contract, the Contractor may serve notice in writing to that effect to the Contract Manager, accompanied by an undertaking to carry out any outstanding work during the Maintenance Period, requesting the Contract Manager to issue a certificate of completion in respect of the Works. The Contract Manager shall, within 21 days of the receipt of such notice either:-
 - (a) issue a certificate of completion stating the date on which, in the Contract Manager's opinion, the Works were substantially completed in accordance with the Contract and the Maintenance Period shall commence on the day following the date of completion stated in such certificate, or
 - (b) give instructions in writing to the Contractor specifying all the work which, in the Contract Manager's opinion, is required to be done by the Contractor before such certificate can be issued, in which case the Contractor shall not be permitted to make any further request for a certificate of completion.
- (2) Notwithstanding other provisions in the Contract, as soon as in the opinion of the Contract Manager the Works have been substantially completed and satisfactorily passed any final test which may be prescribed by the Contract, the Contract Manager may issue a certificate of completion in respect of the Works and the Maintenance Period shall commence on the day following the date of completion stated in such certificate.
- (3) The Contractor shall carry out any outstanding work as soon as practicable after the issue of the certificate of completion or as reasonably directed by the Contract Manager and in any event before the expiry of the Maintenance Period. The Contractor's obligation to provide, service and maintain site offices, toilet facilities and the like, shall continue for as long as may reasonably be required by the Contract Manager.
- (4) The provisions of Clauses 8.7(1), 8.7(2) and 8.7(3) shall apply equally to any Section.
- (5) (a) The Contract Manager shall issue a certificate of completion in respect of any part of the Works which has been completed to the satisfaction of the Contract Manager and is required by the Employer for permanent occupation or use before the completion of the Works or any Section.
- (b) The Contract Manager may, following a written request from the Contractor, issue a certificate of completion in respect of any substantial part of the Works which has been completed to the satisfaction of the Contract Manager before the completion of the Works or any Section and is capable of permanent occupation and/or permanent use by the Employer.
- (c) When a certificate of completion is issued in respect of a part of the Works, such part shall be considered as completed and the Maintenance Period for such part shall commence on the day following the date of completion stated in such certificate.

- (6) Any certificate of completion issued under this Clause 8.7 in respect of any Section or part of the Works shall not be deemed to certify completion of any ground or surface requiring reinstatement unless the certificate shall expressly so state.
- (7) For the purposes of this Clause 8.7 the term “Works” shall exclude any Maintenance Works and any Enhancement Works.

9 EXCISION AND SUSPENSION OF THE WORKS

9.1 Works Subject to Excision

Where any part of the Works is specified in the Contract to be Works Subject to Excision, the Contractor shall have no right to carry out any such part of the Works unless and until a written instruction to proceed is issued by the Contract Manager. The Contract Manager’s instruction to proceed shall be issued pursuant to this Clause 9.1 within the time period specified in the Contract. In the event that the Contract Manager has not issued any instruction pertaining to the Works Subject to Excision within the time period specified in the Contract, the Contractor shall, within 7 days from the expiry of such time period, write to the Contract Manager seeking the Contract Manager’s direction. If the Contractor has not written to the Contract Manager within the said 7 day period or unless the Contract Manager directs to proceed within 14 days from the Contractor’s written request for a direction, such Works Subject to Excision shall be deemed to be excised from the Works and the amount of which shall be determined by the Surveyor in the same manner as a sum to be deducted from the Contract Sum in respect of a Variation in accordance with Clause 11.3.

9.2 Suspension of the Works

- (1) The Contract Manager shall have power to suspend the progress of the Works or any part thereof. The Contractor shall upon the written order of the Contract Manager suspend the progress of the Works or any part thereof for such time or times and in such manner as the Contract Manager may consider necessary and shall during such suspension properly protect and secure the Works so far as is necessary in the opinion of the Contract Manager.
- (2) If the Contractor intends to claim any expenditure that he has incurred or is likely to incur by reason of the suspension of the Works or any part thereof ordered by the Contract Manager pursuant to Clause 9.2(1), he shall, within 28 days from the date of the suspension order, serve a notice of intention to claim on the Contract Manager with a copy to the Surveyor.
- (3)
 - (a) The Contract Manager shall ascertain the circumstances and effects of the suspension order issued under Clause 9.2(1) and if he decides that the Contractor has incurred or is likely to incur expenditure by reason of the suspension order issued by him under Clause 9.2(1), then he shall, within 21 days from the date of serving of such notice of intention to claim, instruct the Surveyor to ascertain the Cost unless he is of the opinion that the suspension order is:-
 - (i) otherwise provided for in the Contract, or
 - (ii) necessary or occasioned by reason of weather conditions affecting the safety or quality of the Works or any part thereof, or
 - (iii) necessary or occasioned by reason of some default on the part of the Contractor or any person carrying out the Works, or
 - (iv) necessary or occasioned for the proper execution of the Works or for the safety of the Works or any part thereof or for the safety and health of any person or the safety of any property on or adjacent to the Site in as much as such necessity does not arise from any act or default of the Contract Manager or the Employer or from any of the excepted risks defined in Clause 5.12(4).
 - (b) If the Contract Manager decides that the issue of the suspension order under Clause 9.2(1) falls within the circumstances of Clauses 9.2(3)(a)(i) to 9.2(3)(a)(iv) or the Contractor has not incurred or is unlikely to incur expenditure for which the Contractor has submitted the notice of intention to claim under Clause 9.2(2), the Contract Manager shall notify the Contractor of his decision in writing with a copy to the Surveyor within 21 days from the date of serving of such notice of intention to claim.

- (c) Notwithstanding the notice requirements in Clauses 9.2(2) and 11.6(2)(d), if the Contractor has served a notice of claim for extension of time to the Contract Manager under Clause 8.4(2)(a) for which an extension of time has subsequently been granted by the Contract Manager for cause of delay under Clause 8.4(2)(b)(viii), then:-
- (i) such notice of claim for extension of time shall be taken to the effect that a notice of intention to claim expenditure has also been served by the Contractor under Clause 9.2(2), and
 - (ii) such notice of claim for extension of time shall also be taken to the effect that the Contractor has notified the Surveyor pursuant to Clause 11.6(2)(d) of the submission of such notice of claim for extension of time, and
 - (iii) the Contract Manager shall be deemed to have instructed the Surveyor under Clause 9.2(3)(a) to ascertain the expenditure incurred or likely to be incurred by the Contractor,
- unless the Contractor has otherwise complied with Clauses 9.2(2) and 11.6(2)(d) by serving the required notices.
- (4) It shall be a condition precedent to the Contractor's entitlement to the Cost that the Contractor shall comply with the notice requirements of Clause 9.2(2). If the Contractor fails to comply with the said notice requirements in respect of any claim, such claim shall not be considered and shall be deemed to have been waived by the Contractor under the Contract and at common law.

9.3 Suspension lasting more than 90 days

If the progress of the Works or any part thereof is suspended on the written order of the Contract Manager and if written permission to resume work is not given by the Contract Manager within a period of 90 days after the date of suspension then the Contractor may, unless such suspension is occasioned by the circumstances described in Clauses 9.2(3)(a)(i) to 9.2(3)(a)(iv), serve a notice in writing on the Contract Manager requiring permission within 28 days after the receipt of such notice to proceed with the Works or that part thereof in regard to which progress is suspended. If the Contract Manager does not, within the said 28 days, grant such permission, the Contractor may but is not bound to, by a further notice in writing served on the Contract Manager, elect to treat the suspension where it affects only part of the Works as an omission of such part under Clause 11.2 or where it affects the whole of the Works as an abandonment of the Contract by the Employer.

10 MAINTENANCE AND DEFECTS

10.1 Execution of Maintenance Works

- (1) The Works or Section or part thereof (as the case may be) shall upon or as soon as practicable after the expiry of the respective Maintenance Period be delivered to the Employer in the condition required under the Contract, with fair wear and tear excepted.
- (2) During the Maintenance Period or within 14 days after its expiry, the Contract Manager may from time to time instruct the Contractor in writing to carry out any Maintenance Works. The Maintenance Works shall be carried out within the following times and in the following manner:-
 - (a) If the necessity for the Maintenance Works is, in the opinion of the Contract Manager, due to the use of material or workmanship not in accordance with the Contract, or due to neglect or failure on the part of the Contractor to comply with any obligation expressed or implied on the Contractor's part under the Contract, the Contract Manager shall state so in his instruction, in which case the Contractor shall carry out and complete such Maintenance Works within their respective times for completion as specified in the Contract.

Provided that, as soon as it becomes apparent that the progress of the execution of the Maintenance Works instructed by the Contract Manager is likely to be delayed, then:-

- (i) the Contractor shall forthwith give notice in writing to the Contract Manager of the cause and probable effect and extent of such delay, and
- (ii) if the delay is, in the opinion of the Contract Manager, due to the occurrence of a

***Execution of
Maintenance
Works***

special circumstance beyond the control of the Contractor, he shall within a reasonable time consider whether the Contractor is fairly entitled to an extension of the time for the completion of any such Maintenance Works and shall notify the Contractor of such extended time accordingly.

Provided further that where there is no specific time for completion of the Maintenance Works specified in the Contract, such Maintenance Works shall be carried out by the Contractor within the Maintenance Period or as soon as practicable thereafter.

- (b) If such necessity is, in the opinion of the Contract Manager, due to any cause other than those stated in Clause 10.1(2)(a), the Contract Manager shall state so in his instructions, in which case the Contractor shall carry out the Maintenance Works within the Maintenance Period or as soon as practicable thereafter.
- (c) Notwithstanding the requirements of Clauses 10.1(2)(a) and 10.1(2)(b), if the Maintenance Works shall, in the opinion of the Contract Manager, be required to be carried out urgently, the Contract Manager may give the Contractor such instructions as he considers necessary to carry out such Maintenance Works and the Contractor shall comply with such instructions forthwith.

***Notice for
completion of
Maintenance
Works***

- (3) When the Maintenance Works required in each of such Contract Manager's written instructions under Clause 10.1(2) have been completed, the Contractor shall serve notice in writing to that effect to the Contract Manager requesting the Contract Manager to issue a written confirmation of completion in respect of such Maintenance Works. The Contract Manager shall within a reasonable time of receipt of such notice issue a confirmation to the Contractor in writing:-
 - (a) stating the date on which the Maintenance Works were completed and in respect of those Maintenance Works with specific time for completion under Clause 10.1(2)(a), stating the date before which such Maintenance Works shall be completed in accordance with the Contract, or
 - (b) stating that such Maintenance Works were not so completed.
- (4) All Maintenance Works shall be carried out by the Contractor at his own expense if the necessity for such Maintenance Works is, in the Contract Manager's opinion, due to the use of materials or workmanship not in accordance with the Contract or due to neglect or failure on the part of the Contractor to comply with any obligation expressed or implied on the Contractor's part under the Contract. If in the opinion of the Contract Manager such necessity is due to any other cause, the Surveyor shall determine the value of the Maintenance Works in the same manner as a sum to be added to the Contract Sum in respect of a Variation in accordance with Clause 11.3 and shall take this into account in the calculation of the Final Contract Sum.

***Contractor's
failure to
perform***

- (5) If the Contractor fails to:-
 - (a) carry out any Maintenance Works in such terms as required by the Contract Manager in accordance with Clauses 10.1(2)(a) and 10.1(2)(b), or
 - (b) comply with any instruction requiring Maintenance Works to be carried out urgently in accordance with Clause 10.1(2)(c),

the Employer shall be entitled, after giving reasonable notice in writing to the Contractor, except that no notice is required for Maintenance Works ordered under Clause 10.1(2)(c), to have such Maintenance Works carried out by his own workers or other contractors. If such Maintenance Works are works which the Contractor should have carried out at his own expense, the Employer shall be entitled to recover from the Contractor any expenditure incurred in connection therewith.

***Maintenance
Works Stages***

- (6) The Maintenance Works in each of such Contract Manager's instructions under Clause 10.1(2) shall be phased into one of the following Maintenance Works stages based upon the date of such instruction. Where there is more than one certificate of completion issued under the Contract, the expression "certificate of completion" shall for the purposes of this Clause 10.1(6) mean the last of the certificates of completion issued under Clause 8.7:-
 - (a) the first stage of the Maintenance Works shall include all Maintenance Works in each of such Contract Manager's instructions under Clause 10.1(2) where the date of the instruction falls within the period ending on the date six months from the day following the date of completion stated in the certificate of completion, and

- (b) the second stage of the Maintenance Works shall include all Maintenance Works in each of such Contract Manager's instructions under Clause 10.1(2) where the date of the instruction falls within the six month period commencing from the day following the end of the first stage of the Maintenance Works, and
 - (c) the third stage of the Maintenance Works shall include all Maintenance Works in each of such Contract Manager's instructions under Clause 10.1(2) where the date of the instruction falls within the period commencing from the day following the end of the second stage of the Maintenance Works up to the expiry of the 14 days period after the end of the Maintenance Period.
- (7) Further to Clause 10.1(3)(a), the Contract Manager shall issue a confirmation in writing to the Contractor with a copy to the Surveyor when any of the following occurs:-
- (a) all Maintenance Works pertaining to the Nominated Sub-contract Works of a Nominated Sub-contractor with respect to any one of the Maintenance Works stages described in Clause 10.1(6) have been completed in accordance with the manner required under the Contract, and
 - (b) all Maintenance Works pertaining to the Works, other than Nominated Sub-contract Works, with respect to any one of the Maintenance Works stages described in Clause 10.1(6) have been completed in accordance with the manner required under the Contract.

10.2 Temporary reinstatement

If in the course or for the purpose of the execution of the Works or any part thereof any highway or other road or way has been broken into then notwithstanding any other provision of the Contract:-

- (a) if the permanent reinstatement of such highway, road or way is to be carried out by the appropriate authority or any person other than the Contractor, the Contractor shall at his own expense and independently of any requirement of or notice from the Contract Manager be responsible for the making good of any subsidence or shrinkage or other defect, imperfection, settlement or fault in the temporary reinstatement of such highway, road or way and for the execution of any necessary repair or amendment thereof from whatever cause the necessity arises until the expiry of the Maintenance Period in respect of the relevant part of the Works beneath such highway, road or way or until the authority or person as aforesaid shall have taken possession of the relevant part of the Site for the purpose of carrying out permanent reinstatement, whichever is the earlier. The Contractor shall indemnify the Employer against and from any damage or injury to the Employer or to third parties arising out of or in consequence of any neglect or failure of the Contractor to comply with the foregoing obligations or any of them and against and from all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto;
- (b) as from the expiry of such Maintenance Period or the taking of possession as aforesaid, whichever is the earlier, the Employer shall indemnify the Contractor against and from any damage or injury as aforesaid arising out of or in consequence of or in connection with the said permanent reinstatement or any defect, imperfection or failure of or in such work of permanent reinstatement and against and from all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto;
- (c) where the authority or person as aforesaid shall take possession of the Site as aforesaid in Portions or parts the responsibility of the Contractor under Clause 10.2(a) shall cease in regard to any such Portion or part at the time possession thereof is so taken but shall during the currency of the said Maintenance Period continue in regard to any Portion or part of which possession has not been so taken and the indemnities given by the Contractor and the Employer respectively under Clauses 10.2(a) and 10.2(b) shall be construed and have effect accordingly.

10.3 Investigating defects

- (1) At any time prior to the issue of the various maintenance certificates under Clause 14.3, the Contractor shall, if instructed by the Contract Manager in writing, investigate the cause of any defect, imperfection or fault under the directions of the Contract Manager.

Provided that if the Contract Manager at his discretion so decides, the Employer shall be entitled, after giving reasonable notice in writing to the Contractor, to have such investigation carried out by his own workers or by other contractors.

- (2) If such defect, imperfection or fault shall be one for which the Contractor is liable under the Contract, the expense incurred in investigating as aforesaid shall be borne by the Contractor and he shall in such case repair, rectify and make good such defect, imperfection or fault together with any consequential damage at his own expense.
- (3) If such defect, imperfection or fault shall be one for which the Contractor is not so liable, then the Surveyor shall determine the value of any investigation and remedial work carried out by the Contractor as aforesaid in the same manner as a sum to be added to the Contract Sum in respect of a Variation in accordance with Clause 11.3 and shall take this into account in the calculation of the Final Contract Sum.

11 MEASUREMENT, VARIATIONS, VALUATIONS AND CLAIMS

11.1 Bills of Quantities and measurement or schedule of rates

Bills of Quantities

- (1) When Bills of Quantities are included in the Contract, the quality and quantity of the work the value of which is included in the Contract Sum shall be deemed to be those which are set out in the Bills of Quantities, and the Bills of Quantities including measurements thereto shall, except where any statement in the Bills of Quantities expressly specifies to the contrary, be deemed to have been prepared according to the procedures set forth in the method of measurement stated in the Preliminaries.
- (2) Any error in description in or omission from the Bills of Quantities shall not vitiate the Contract nor release the Contractor from the execution of the whole or any part of the Works according to the Drawings and Specification or from any of his obligations or liabilities under the Contract.
- (3) The quantities in the Bills of Quantities are firm except where described or stated as provisional. Only provisional quantities, Variations, work required by the Contract Manager to be carried out which is shown on the Drawings or described in the Specification but not measured in the Bills of Quantities and errors discovered in firm quantities shall be measured.

Provided that there shall be no rectification of any error, omission or wrong estimate in any description, quantity or rate inserted by the Contractor in the Bills of Quantities.

- (4)
 - (a) Work shown on the Drawings or described in the Specification but not measured in the Bills of Quantities, Variations and the rectification of any error in firm quantities shall be determined in accordance with Clause 11.3. Provisional quantities shall, subject to Clause 11.1(4)(b), be valued at the rates stated in the Bills of Quantities.
 - (b) If the execution of work in respect of any item for which a provisional quantity is stated in the Bills of Quantities results in the actual quantity of work executed being substantially greater or less than that stated in the Bills of Quantities and if in the opinion of the Surveyor such increase or decrease of itself shall render the rate for the item unreasonable or inapplicable and subject to any provisions in the Contract which provide otherwise, the Surveyor shall determine an appropriate increase or decrease of the rate for the item using the Bills of Quantities rate as the basis for such determination and shall notify the Contractor accordingly.

Schedule of rates

- (5) When Bills of Quantities are not included in the Contract, the quality and quantity of the work the value of which is included in the Contract Sum shall be deemed to be those which are shown on the Drawings and/or described in the Specification. The Contractor shall submit a fully priced and detailed schedule of rates with approximate quantities showing the build-up of the Tender. When any provisional quantity is included in the Contract by the Employer the item shall be valued at the rate in the schedule of rates. Variations shall be valued based on the rates included in the schedule of rates in accordance with Clause 11.3.

Measurement and valuation

- (6) When any part of the Works is required to be measured, the Surveyor shall inform the Contractor who shall forthwith attend or send a representative to assist the Surveyor in making such measurement on the Site and shall furnish all particulars required. Should the Contractor not attend or neglect or omit to send such representative then the measurement made or approved by the Surveyor shall be taken to be the correct measurement of such part of the

Works.

- (7) (a) When the Surveyor is required to furnish the Contractor with his measurement and valuation under the Contract, such measurement and valuation shall be provided progressively to the Contractor. Effect shall be given to such measurement and valuation in the calculation of the Final Contract Sum. The Surveyor shall provide the Contractor a copy of the statement of final account which is a summary of all adjustments to be made to the Contract Sum within the Period of Final Measurement stated in the appendix to the Form of Tender which period, unless otherwise stated in the Contract, shall commence on the day following the date of completion stated in the certificate of completion issued under Clause 8.7. Where there is more than one certificate of completion issued under the Contract, the expression “certificate of completion” shall, for the purpose of this Clause 11.1(7)(a), mean the last of the certificates of completion issued under Clause 8.7.
- (b) With respect to any measurement and valuation under Clause 11.1(7)(a) for provisional quantities, the Surveyor shall provide the Contractor his determination for provisional quantities within the period as specified in the Contract after the commencement of the Period of Final Measurement.

11.2 Variation

- (1) The Contract Manager shall order any change to the Works or any Section or any part thereof that is necessary for the completion of the Works and shall have the power to order any change that for any other reason shall in his opinion be desirable for or to achieve the satisfactory completion and functioning of the Works. Any such change (referred to in the Contract as “Variation”) may include:-
 - (a) addition, omission, substitution, alteration, change in quality, form, character, kind, position, dimension, level or line, and
 - (b) change to any sequence, method or timing of construction specified in the Contract, and
 - (c) change to the Site or entrance to and/or exit from the Site.

Provided that the Contract Manager shall not be under any obligation to order a Variation that is necessary for the completion of the Works or any Section or any part thereof the design of which is the Contractor’s responsibility.

- (2) The Contract Manager may order any Variation to any part of the outstanding work referred to in Clause 8.7 during the Maintenance Period if such Variation shall in the opinion of the Contract Manager be desirable for or to achieve the satisfactory completion and functioning of the Works.
- (3) No change to the Works shall be made by the Contractor without an order in writing by the Contract Manager. No Variation shall in any way vitiate or invalidate the Contract but the value of such Variation shall be taken into account in calculating the Final Contract Sum.

11.3 Valuing Variation

The Surveyor shall determine the sum which in his opinion shall be added to or deducted from the Contract Sum as a result of a Variation in accordance with the following principles:-

- (a) Any item of work omitted from the Works shall be valued at the rate set out in the Contract for such work.
- (b) Any work carried out which is the same as or similar in character to and executed under the same or similar conditions and circumstances to any item of work priced in the Contract shall be valued at the rate set out in the Contract for such item of work.
- (c) Any work carried out which is not the same as or similar in character to or is not executed under the same or similar conditions or circumstances to any item of work priced in the Contract shall be valued at a rate based on the rates in the Contract so far as may be reasonable, failing which, at a rate determined by the Surveyor.

Provided that if the nature or extent of any Variation relative to the nature or extent of the Works or any part thereof shall be such that in the opinion of the Surveyor any rate contained in the Contract for any item of work is by reason of such Variation rendered unreasonable or inapplicable, then a new rate shall be determined by the Surveyor for that item, using the Contract rates as the basis for determination.

This proviso shall not apply to the valuation of any omission resulting from instructions issued under Clause 9.1.

Provided always that any Cost which has been or is likely to be incurred by reason of the progress of the Works or any Section or any part thereof having been materially affected by any Variation shall be notified by the Contractor and ascertained by the Surveyor within such time and in such manner as provided in Clauses 11.5 and 11.6. Such Cost shall be ascertained exclusively pursuant to Clause 11.6 and not as part of the Surveyor's determination made pursuant to this Clause 11.3.

11.4 Daywork

- (1) The Contract Manager may, if in his opinion it is necessary or desirable, order in writing that any work to be carried out as a result of a Variation shall be executed on a daywork basis.
- (2) The Contractor shall then be paid for such work under the conditions and at the rates set out in the Contract or if no such conditions and rates have been included, at such rates as the Surveyor shall determine as being reasonable.
- (3) The Contractor shall furnish to the Surveyor such receipts or other vouchers as may be necessary to prove the sums paid and before ordering materials shall, if so required by the Surveyor, submit to the Surveyor quotations for the same for his approval.
- (4) In respect of all work executed on a daywork basis the Contractor shall during the currency of such work deliver on each working day to the Contract Manager's Representative a list, in duplicate, of the names and occupations of and time worked by all workers employed on such work on the previous working day and a statement, also in duplicate, showing the descriptions and quantity of all materials and Constructional Plant used thereon or therefor. One copy of such lists and statements shall be agreed as correct or be rejected with stated reasons, and which shall be signed by the Contract Manager's Representative and returned to the Contractor within 2 days exclusive of General Holidays.
- (5) At the end of each month the Contractor shall deliver to the Contract Manager's Representative a priced statement of the labour, materials and Constructional Plant used on a daywork basis.

Provided that if the Surveyor shall consider that for any reason the delivery of such statement by the Contractor in accordance with the foregoing provision was impracticable, the Surveyor shall nevertheless be entitled to authorize payment for such work either as daywork, on being satisfied as to the time employed and the Constructional Plant and materials used thereon, or at such value as shall in the Surveyor's opinion be reasonable.

- (6) The Contractor shall inform the Contract Manager's Representative in advance whenever the Contractor proposes to carry out daywork ordered by the Contract Manager and shall afford every facility for the Contract Manager's Representative to check all time and materials for which the Contractor proposes to charge therefor.

11.5 Notice of claims

- (1) (a) If the Contractor has incurred or is likely to incur expenditure for which the Contractor would not be reimbursed by a payment made under any other provision in the Contract by reason of the progress of the Works or any part thereof having been materially affected by:-
 - (i) the Contractor not having received in due time necessary instructions, orders, directions, decisions, Drawings, Specifications, details or levels from the Contract Manager for which the Contractor specifically applied in writing on a date which, having regard to the time or extended time for completion of the Works referred to in Clause 8.3(1), was neither unreasonably distant from nor unreasonably close to the date on which it was necessary for the Contractor to receive the same, or
 - (ii) any Variation, or
 - (iii) the opening up for inspection in accordance with Clause 7.4 of any work covered up or put out of view after compliance with the requirements of Clause 7.3 or the testing of materials or workmanship not required under the Contract but directed by the Contract Manager or the Contract Manager's Representative in accordance with Clause 7.1(1) unless the inspection or test showed that the work, materials or

workmanship were not in accordance with the Contract, or

- (iv) delay caused by any person or any company, not being a Utility Undertaking, engaged by the Employer in supplying materials or in executing work directly connected with but not forming part of the Works, or
- (v) late delivery of material, plant or equipment by the Employer, or
- (vi) failure of the Employer to give possession of the Site or any Portion or part thereof in accordance with the Contract,

and if the Contractor intends to claim such expenditure, he shall, within 28 days of the event set out in Clauses 11.5(1)(a)(i) to 11.5(1)(a)(vi) upon which the claim is based becoming apparent, serve a notice of intention to claim in writing on the Contract Manager with a copy to the Surveyor.

- (b) Upon receipt of the notice of intention to claim under Clause 11.5(1)(a), the Contract Manager shall decide:-
 - (i) that the Contractor has incurred or is likely to incur expenditure by reason of the progress of the Works or any part thereof having been materially affected and the Contract Manager shall, within 21 days from the date of serving of such notice of intention to claim, instruct the Surveyor to ascertain the expenditure incurred or likely to be incurred by the Contractor for which the Contractor would not be reimbursed by a payment made under any other provision in the Contract, or
 - (ii) that the Contractor has not incurred or is unlikely to incur expenditure for which the Contractor has submitted a notice of intention to claim under Clause 11.5(1)(a) and the Contract Manager shall notify the Contractor of his decision in writing with a copy to the Surveyor within 21 days from the date of serving of such notice of intention to claim.
- (c) Notwithstanding the notice requirements in Clauses 11.5(1)(a) and 11.6(2)(d), if the Contractor has served a notice of claim for extension of time to the Contract Manager under Clause 8.4(2)(a) for which an extension of time has subsequently been granted by the Contract Manager for cause of delay under Clauses 8.4(2)(b)(iv), 8.4(2)(b)(vi) or 8.4(2)(b)(vii), then:-
 - (i) such notice of claim for extension of time shall be taken to the effect that a notice of intention to claim expenditure has also been served by the Contractor under Clause 11.5(1)(a), and
 - (ii) such notice of claim for extension of time shall also be taken to the effect that the Contractor has notified the Surveyor pursuant to Clause 11.6(2)(d) of the submission of such notice of claim for extension of time, and
 - (iii) the Contract Manager shall be deemed to have instructed the Surveyor under Clause 11.5(1)(b)(i) to ascertain the expenditure incurred or likely to be incurred by the Contractor,

unless the Contractor has otherwise complied with Clauses 11.5(1)(a) and 11.6(2)(d) by serving the required notices.

- (2) If the Contractor intends to claim additional payment under any provision of the Conditions of Contract other than Clauses 7.5(4), 9.2(2), 11.5(1) and 12.3(1)(b), the Contractor shall within 28 days of an event which may give rise to a claim becoming apparent serve a notice of intention to claim in writing on the Surveyor with a copy to the Contract Manager and state the contractual provision upon which the claim is based.
- (3) It shall be a condition precedent to the Contractor's entitlement to any expenditure or additional payment referred to in this Clause 11.5 that the Contractor shall comply with the notice requirements of Clause 11.5(1)(a) or 11.5(2). If the Contractor fails to comply with the said notice requirements in respect of any claim, such claim shall not be considered and shall be deemed to have been waived by the Contractor under the Contract and at common law.

11.6 Ascertainment of claims

- (1) Upon serving of a notice of intention to claim under Clause 9.2(2), 11.5(1)(a) or 11.5(2), the Contractor shall keep such contemporary records as may reasonably be necessary to support any claim and shall submit to the Surveyor details of the records being kept in respect thereof. Without necessarily admitting the Employer's liability, the Surveyor may require the Contractor to keep and agree with the Contract Manager's Representative any additional contemporary records as are reasonable and may in the opinion of the Surveyor be material to the claim. The Contractor shall permit the Surveyor and the Contract Manager's Representative to inspect all records kept pursuant to this Clause 11.6 and shall supply copies thereof as and when the Surveyor or Contract Manager's Representative may so require.
- (2) The Contractor shall, after the submission of a notice of intention to claim expenditure or additional payment under Clause 9.2(2), 11.5(1)(a) or 11.5(2), submit to the Surveyor the claim including an account giving particulars of the circumstances giving rise to the claim, the sum claimed and the methodology and calculation of such sum within the following time:-
 - (a) within 60 days from the date of serving of the notice of intention to claim under Clause 9.2(2), 11.5(1)(a) or 11.5(2) unless Clause 11.6(2)(b), 11.6(2)(c) or 11.6(2)(d) shall apply;
 - (b) (where the effect of the event giving rise to the claim commences later than 60 days after the Contractor has served the notice of intention to claim and the Contractor has notified the Surveyor of the said late commencement of the effect in writing within 60 days from the date of serving such notice of intention to claim) within 60 days from a date which shall be agreed between the Surveyor and the Contractor in writing, but failing agreement, then within 60 days from such date fixed and notified to the Contractor by the Surveyor which in his opinion reasonably represents the date on which the effect of the event giving rise to the claim commences, or
 - (c) (where the event giving rise to the claim has a continuing effect and the Contractor has notified the Surveyor of the said continuing effect in writing within 60 days from the date of serving the notice of intention to claim) within 28 days from a date which shall be agreed between the Surveyor and the Contractor in writing, but failing agreement, then within 28 days from such date fixed and notified to the Contractor by the Surveyor which in his opinion reasonably represents the date after which the ascertainment of the entirety of the claim becomes possible, or
 - (d) (where the event giving rise to the claim is the same as the event for which the Contractor has submitted a notice of claim for extension of time pursuant to Clause 8.4(2) and the Contractor has notified the Surveyor of the said submission in writing within 60 days from the date of serving the notice of intention to claim) within 28 days after the receipt of the Contract Manager's grant of such extension of time.
- (3) The Surveyor may within 14 days after the receipt of the submission from the Contractor under Clause 11.6(2), require the Contractor to submit any further information which the Surveyor may reasonably require for the purpose of his ascertainment of the Cost or additional payment. The Contractor shall submit the requisite information to the Surveyor within 28 days from the receipt of the Surveyor's requirement.
- (4) Upon the Contract Manager's instruction under Clause 9.2(3)(a) or 11.5(1)(b)(i) or if the Surveyor is of the opinion that the Contractor is entitled to additional payment for the notice of intention to claim submitted under Clause 11.5(2), the Surveyor shall ascertain the Cost or additional payment (if any) according to the respective provisions of the Contract within 60 days after the receipt of the information submitted by the Contractor pursuant to Clause 11.6(2) or 11.6(3) as the case may be.
- (5) It shall be a condition precedent to the Contractor's entitlement to any Cost or additional payment to be ascertained under Clause 11.6(4) that the Contractor shall comply with the claim submission requirements of Clause 11.6(2). If the Contractor fails to comply with the said claim submission requirements in respect of any claim, such claim shall not be considered and shall be deemed to have been waived by the Contractor under the Contract and at common law. If the Contractor fails to comply with the provisions of Clause 11.6(3) in respect of any claim, the Surveyor shall consider such claim only to the extent that the Surveyor is able to on the information available.

Provided that the Surveyor shall not be obliged to take into account any particulars of the claim received by him after the expiry of a period of 180 days calculated from the date of completion stated in the certificate of completion with respect to the Works. In the event of different certificates of completion having been issued for different Sections or parts of the Works under Clause 8.7, the expression “certificate of completion” shall, for the purpose of this Clause 11.6(5), mean the last of such certificates.

11.7 Surveyor’s determination and ascertainment

- (1) Where the Surveyor is required to issue a determination or an ascertainment under the Contract, the Surveyor shall make such determination or ascertainment within such time and in such manner as provided in the Contract.

Provided that:-

- (a) the Surveyor shall be allowed to make corrections of arithmetical errors in his determination or ascertainment issued in accordance with any of the provisions of the Contract, and
 - (b) no deviation from the time provided in the Contract for issuing Surveyor’s determinations and ascertainment shall be allowed without the written agreement between the Surveyor and the Contractor.
- (2) (a) Prior to issuing a Surveyor’s determination under the Contract, the Surveyor shall, within such time stipulated in the Contract or within such time as may be agreed in writing between the Surveyor and the Contractor, issue an assessment in connection with the Surveyor’s determination to the Contractor.
- (b) Within 42 days from the receipt of the Surveyor’s assessment in connection with the Surveyor’s determination under Clause 11.7(2)(a), the Contractor shall either notify the Surveyor in writing of his agreement to the assessment or make a request in writing with reasons to the Surveyor for a review of the assessment.
- (c) If the Contractor does not respond to the Surveyor’s assessment in connection with the determination within the time stipulated in Clause 11.7(2)(b), such assessment shall be deemed to have been agreed by the Contractor.
- (d) The Surveyor shall:-
- (i) issue his determination based on the agreement or deemed agreement of the Contractor to the Surveyor’s assessment in connection with the Surveyor’s determination within 14 days upon being notified by the Contractor of his agreement in writing pursuant to Clause 11.7(2)(b) or within 14 days after the Contractor’s failure to respond as stated in Clause 11.7(2)(c) as the case may be, or
 - (ii) make a review of his assessment in connection with the Surveyor’s determination if the Contractor shall so request in writing in accordance with Clause 11.7(2)(b) taking into account any supplementary information made available to him by the Contractor and issue his reviewed assessment within 28 days from the receipt of the Contractor’s written request.
- (e) If the Surveyor has issued a reviewed assessment in accordance with Clause 11.7(2)(d)(ii), the Contractor shall within 14 days from the receipt of the Surveyor’s reviewed assessment either notify the Surveyor in writing of his agreement to the reviewed assessment or make a request in writing with reasons to the Surveyor for a final review of the assessment.
- (f) If the Contractor does not respond to the Surveyor’s reviewed assessment within the time stipulated in Clause 11.7(2)(e), such Surveyor’s reviewed assessment shall be deemed to have been agreed by the Contractor.
- (g) The Surveyor shall:-
- (i) issue his determination based on the agreement or deemed agreement of the Contractor to the Surveyor’s reviewed assessment within 14 days of being notified by the Contractor of his agreement in writing pursuant to Clause 11.7(2)(e) or within 14 days after the Contractor’s failure to respond as stated in Clause 11.7(2)(f) as the case may be, or

- (ii) make a final review of his reviewed assessment if the Contractor shall so request in writing in accordance with Clause 11.7(2)(e) taking into account any supplementary information where appropriate and issue his determination within 14 days from the receipt of the Contractor's written request.

11.8 Requested Variation

- (1) The Contractor may, before the date of completion of the Works or any Section as certified under Clause 8.7, submit in writing a proposal (referred to in the Contract as "Requested Variation Proposal") which shall relate to any of the following changes to the Contract Manager for his consideration and agreement:-

- (a) addition, omission, substitution, alteration and change in quality, form, character, kind, position, dimension, level or line,
- (b) change to any sequence, method or timing of construction specified in the Contract.

Provided always that the Contract Manager shall not agree to any Requested Variation Proposal which:-

- (i) proposes change to any part of the Works or Section the design of which shall be the responsibility of the Contractor under the Contract, or
- (ii) may result in an increase in the Contract Sum, or
- (iii) may cause delay or require an extension of time for completion of the Works or any Section, or
- (iv) may render the quality or standard of any work or material inferior in any aspect to that specified in the Contract.

- (2) The Contractor shall include the following information and documents in a Requested Variation Proposal:-

- (a) a detailed written description or narrative of and drawings and sketches for the proposed change(s) to the Works or any Section,
- (b) the estimated amount of saving in the Contract Sum with a detailed breakdown thereof in connection with or arising from the Requested Variation Proposal,
- (c) the principles of design adopted in the Requested Variation Proposal,
- (d) a programme showing the time and sequence of the requisite submissions, approvals and consents for the carrying out of the change(s) set out in the Requested Variation Proposal,
- (e) an outline of the benefit (if any) arising from the change(s) set out in the Requested Variation Proposal in terms of the environmental, health, safety and/or technical aspects in relation to the Works or any Section as the case may be,
- (f) the date before which the Contract Manager's agreement (if any) shall be given for the timely completion of the Works or any Section to which the Requested Variation Proposal relates, and
- (g) any other information or documents that may be useful to the Contract Manager for his consideration or to the Surveyor for his assessment of the value of the change(s) set out in the Requested Variation Proposal.

- (3) The Contractor shall not be reimbursed for any cost or expense incurred by him and any Nominated Sub-contractor (if applicable) for the preparation and submission of any Requested Variation Proposal unless and until a Memorandum of Agreement in respect of such Requested Variation Proposal is issued under Clause 11.8(4)(c). In any event, the Contractor shall pay to the Employer reasonable charges for technical checking of any Requested Variation Proposal and subsequent amendments thereof, whether or not such Requested Variation Proposal and subsequent amendments are agreed by the Contract Manager.

- (4) (a) The Contract Manager may request the Contractor in writing to amend the Requested Variation Proposal submitted to him under this Clause 11.8, and the Contractor may then make such amendments.

- (b) The Contract Manager may instruct the Surveyor to value the change(s) set out in any Requested Variation Proposal (including any amendments thereto) and the Surveyor shall, upon such instruction, assess and agree with the Contractor the value of saving to the Contract Sum arising from the change(s) set out in the Requested Variation Proposal in accordance with the principles set out in Clause 11.3 and shall take into account any expenditure already incurred or to be incurred or likely to be incurred by the Contractor in connection with the Requested Variation Proposal if the Surveyor is satisfied that:-
 - (i) the expenditure is reasonably incidental to the change(s) set out in the Requested Variation Proposal, and
 - (ii) the Contractor has not been and will not be reimbursed by a payment under any other provisions in the Contract.
 - (c) If the Contract Manager is satisfied with the change(s) set out in the Requested Variation Proposal (including any amendments thereto) in terms of both the technical aspect and value of saving (agreed between the Surveyor and the Contractor), the Contract Manager may, as soon as practicable but before such specified date, where applicable, in the Requested Variation Proposal as referred to in Clause 11.8(2)(f) or such date or extended date as may be agreed between the Contract Manager and the Contractor, issue a Memorandum of Agreement to the Contractor and such change(s) set out in the Requested Variation Proposal (including such amendments thereto (if any)) shall become an Agreed Requested Variation. Upon receipt of the Memorandum of Agreement, the Contractor shall carry out the Agreed Requested Variation in accordance with the terms of the Memorandum of Agreement and the provisions of the Contract.
 - (d) If the Contractor fails to make any amendment to the Requested Variation Proposal upon the written request of the Contract Manager referred to in Clause 11.8(4)(a) or the Contract Manager fails to issue a Memorandum of Agreement before such specified date, where applicable, in the Requested Variation Proposal as referred to in Clause 11.8(2)(f) or such date or extended date as may be agreed between the Contract Manager and the Contractor, the Requested Variation Proposal shall be deemed to have been disagreed.
 - (e) The Contract Manager shall have the absolute discretion to agree or not to agree to a Requested Variation Proposal and shall not be bound to disclose to the Contractor the reasons therefor.
- (5) A Memorandum of Agreement shall contain the following information:-
- (a) details of the Agreed Requested Variation,
 - (b) references of such documents that are relevant or applicable to the Agreed Requested Variation,
 - (c) the value of saving to the Contract Sum of the Agreed Requested Variation agreed between the Surveyor and the Contractor in accordance with Clause 11.8(4)(b),
 - (d) adjustment to the Contract Sum after taking into account the value of the Agreed Requested Variation, and
 - (e) any other documents or information as may be required which include but are not limited to the following undertakings from the Contractor:-
 - (i) types of warranties to be submitted by the Contractor, his sub-contractors and/or suppliers,
 - (ii) types and limits of indemnity of professional indemnity insurance, and
 - (iii) technical checking/audit by an independent qualified checker/auditor.
- (6) An Agreed Requested Variation shall form part of the Works. Unless otherwise expressly stated in the Memorandum of Agreement, no agreement given by the Contract Manager shall relieve or absolve the Contractor from any of his obligations or liabilities under the Contract and all terms, conditions and requirements of the Contract shall apply to the Agreed Requested Variation. The Contractor shall indemnify and keep indemnified the Employer against all costs, expenses, claims, liabilities and losses in respect of or arising from any Agreed Requested Variation.

- (7) (a) Unless otherwise specified in the Memorandum of Agreement, the value of saving to the Contract Sum of the Agreed Requested Variation as stated in the Memorandum of Agreement shall be considered as a fixed sum and shall not be adjusted in any event.
- (b) The adjustment to the Contract Sum in respect of an Agreed Requested Variation in the calculation of the Final Contract Sum shall be made in accordance with the following principles:-
 - (i) For a Requested Variation Proposal submitted by the Contractor at the request of a Nominated Sub-contractor pursuant to the conditions of the Nominated Sub-contract, 57.5% of the value of saving of the Agreed Requested Variation shall be deducted from the concerned nominated sub-contract sum and 7.5% of the value of saving of the Agreed Requested Variation shall be added to the Contract Sum for the Contractor's share of the saving in connection with the Agreed Requested Variation.
 - (ii) For a Requested Variation Proposal other than one as referred to in Clause 11.8(7)(b)(i), half of the value of saving of the Agreed Requested Variation shall be deducted from the Contract Sum.

11.9 Enhancement Works

- (1) The Contract Manager may order any Enhancement Works to any part of the Works or Section that has been certified complete by the Contract Manager under Clause 8.7 that are desirable for or to achieve the better functioning of the Works, during the period of 180 days following the date of completion of the Works or the relevant Section or the relevant part thereof, as the case may be, stated in the certificate of completion issued under Clause 8.7. The Contract Manager shall state the time for completion of the Enhancement Works in his written instruction.

Provided that no Enhancement Works with a date for completion beyond the Maintenance Period shall be ordered by the Contract Manager. The Enhancement Works may include addition, substitution and alteration of the Works or any Section or any part thereof.
- (2) The Contractor shall comply with the Contract Manager's instruction issued under Clause 11.9(1) and shall carry out and complete the Enhancement Works with due diligence and to the satisfaction of the Contract Manager.
- (3) The Surveyor shall determine by way of fair valuation the sum which in his opinion shall be added to the Contract Sum as a result of an order for Enhancement Works issued by the Contract Manager under Clause 11.9(1).
- (4) No Enhancement Works shall in any way vitiate or invalidate the Contract but the value of all Enhancement Works shall be taken into account in calculating the Final Contract Sum.

12 PRIME COST, PROVISIONAL AND CONTINGENCY SUMS

12.1 Use of Prime Cost, Provisional and Contingency Sums

- (1) All sums set out in the Contract which are stated to be Prime Cost Sums, Provisional Sums or the Contingency Sum shall only be used upon the written instruction of the Contract Manager.
- (2) Where any Prime Cost Sum is included in the Contract, the Contractor shall, when instructed by the Contract Manager, enter into a sub-contract with the Nominated Sub-contractor in the form of sub-contract provided by the Employer. Subject to Clause 12.3(1), the Contractor shall not enter into any other form of sub-contract with a Nominated Sub-contractor.
- (3) If in connection with any Prime Cost Sum or Provisional Sum, the services to be provided include any matter of design or specification of any part of the Works (other than Temporary Works) or of any equipment or plant to be incorporated therein, such design or specification requirement shall be stated in the Contract and shall be included in any such Nominated Sub-contract and the obligations of the Contractor in respect thereof shall only be such obligations which have been stated in accordance with this Clause 12.1(3).
- (4) The Contractor shall not terminate the employment of a Nominated Sub-contractor on the ground of the Nominated Sub-contractor's failure to submit a bond as required under the Nominated Sub-contract without the prior written consent of the Employer which consent shall

not be unreasonably withheld.

12.2 Accounting of Provisional and Contingency Sums

For the purpose of calculating the Final Contract Sum, the Provisional Sums and the Contingency Sum shall be deducted from the Contract Sum and in lieu thereof shall be added the value of the work ordered by the Contract Manager as determined in accordance with Clause 11.3 or, where the Provisional Sum or Contingency Sum relates to Nominated Sub-contract Works, determined in accordance with the Nominated Sub-contract. Any part of any Provisional Sum or the Contingency Sum which is to be used for Nominated Sub-contract Works shall be deemed to be a Prime Cost Sum.

12.3 Varied form of sub-contract and objections to nomination

- (1) The Contract Manager may instruct the Contractor to enter into a sub-contract with a Nominated Sub-contractor containing different terms to those specified in the form of sub-contract referred to in Clause 12.1(2). If the Contract Manager so instructs, then:-
 - (a) the Contractor shall not be bound to discharge his obligations under the Contract to the extent that the terms of such sub-contract are inconsistent with the discharge of the same, and
 - (b) in the event of the Contractor incurring additional expenditure due to the terms of such sub-contract being different from the terms in the form of sub-contract referred to in Clause 12.1(2), so much of such expenditure as the Contractor could not reasonably avoid shall be ascertained by the Surveyor and shall be taken into account in the calculation of the Final Contract Sum.
- (2)
 - (a) The Contract Manager shall, prior to calling for tenders for Nominated Sub-contracts, notify the Contractor in writing of the names of the proposed tenderers and the Contractor may, within 14 days of such notification, raise objection with reason in writing to entering into a sub-contract with any proposed tenderer so named. If the Contract Manager considers any such objection to be reasonable the proposed tenderer so objected to shall not be invited to tender.
 - (b) Unless such objection shall be notified in writing within 14 days of the Contract Manager's notification of the names of the proposed tenderers and such objection is accepted by the Contract Manager, the Contractor shall be obliged to enter into a sub-contract with any one of the proposed tenderers in accordance with the Contract Manager's subsequent instruction to do so.
 - (c) In the event that the Contractor raises objections under Clause 12.3(2)(a) to all of the tenderers referred to therein and in the opinion of the Contract Manager, all such objections are reasonable, then the Contract Manager may, by an order of Variation, vary any part of the Works or the work, materials or services provided for in the Prime Cost Sum, Provisional Sum or Contingency Sum as the case may be, including if necessary the omission of any such work, materials or services so that the same may be taken up and provided by workers or contractors employed by the Employer either concurrently with the Works, in which case the provisions of Clause 5.27 shall apply, or at some other dates or time.

12.4 Accounting of Prime Cost Sums

- (1) For the purpose of calculating the Final Contract Sum, Prime Cost Sums shall be deducted from the Contract Sum and in lieu thereof shall be added the total sums to be paid by the Contractor to Nominated Sub-contractors on the final payment certificate to be issued by the Surveyor.
- (2) The sum included by the Contractor in the Contract for attendance on the Nominated Sub-contract Works in respect of a Nominated Sub-contractor shall be fixed regardless of whether the actual sum expended is greater or less than the Prime Cost Sum. In respect of profit on the Nominated Sub-contract Works, the final sum to be paid shall be the product of the percentage quoted by the Contractor in the Contract and the actual sum expended in relation to the Prime Cost Sum.

12.5 Payments to Nominated Sub-contractors

- (1) The Contractor shall, when required by the Surveyor, produce all quotations, invoices, vouchers and receipts in connection with any Prime Cost Sum, Provisional Sum or the Contingency Sum.
- (2) The Contractor shall, within 28 days of the Surveyor's certification in accordance with Clause 14.2, notify and pay to every Nominated Sub-contractor the sum certified in such certificate as due to such Nominated Sub-contractor.
- (3)
 - (a) Before issuing any certificate under Clause 14.2, the Surveyor shall be entitled to demand from the Contractor reasonable proof that all sums included in previous certificates in respect of the Nominated Sub-contract Works have been paid to all relevant Nominated Sub-contractors accordingly. If the Contractor has not made such payments or any part thereof, the Contractor shall:-
 - (i) give details to the Surveyor in writing of the reason why the Contractor is withholding or refusing to make such payments, and
 - (ii) produce to the Surveyor reasonable proof that the Contractor has so informed the relevant Nominated Sub-contractors in writing.
 - (b) If the Contractor fails to satisfy the Surveyor that he has reasonable cause for withholding or refusing to make any payment to any Nominated Sub-contractor as aforesaid, the Employer shall, after serving notice in writing on the Contractor, be entitled:-
 - (i) to pay any Nominated Sub-contractor direct, upon the certificate of the Surveyor, all payments, less retention provided for in the Nominated Sub-contract, which the Contractor has failed to make to any Nominated Sub-contractor and all such sums paid direct shall be recoverable by the Employer from the Contractor, and/or
 - (ii) if satisfied that it is expedient to do so, to pay any Nominated Sub-contractor direct all payments that become due, less retention provided for in the Nominated Sub-contract, for any work carried out, or materials supplied or services provided in connection with the Works in so far as the price or cost thereof has not already been paid by the Contractor.
 - (c) Where on the certification to the Contractor of a portion of the Retention Money Held in respect of the Nominated Sub-contractor in accordance with Clause 14.2(5)(a), the Contractor fails to make payment to any Nominated Sub-contractor of the sum so due to such Nominated Sub-contractor and the Surveyor considers that the Contractor does not have reasonable cause for such failure, the Employer shall, after serving notice in writing on the Contractor, be entitled to pay such Nominated Sub-contractor direct and any sum so paid shall be recoverable by the Employer from the Contractor.
 - (d) Neither the existence nor the exercise of any of the aforesaid powers by the Employer or the Surveyor shall render the Employer liable to pay any Nominated Sub-contractor directly.

12.6 Assignment of Nominated Sub-contractor's obligations

In the event of a Nominated Sub-contractor having undertaken towards the Contractor in respect of his Nominated Sub-contract Works any continuing obligations extending for a period exceeding that of the Maintenance Period under the Contract, the Contractor shall immediately after the expiry of the Maintenance Period assign to the Employer the benefit of such obligations for the unexpired duration thereof.

13 CONSTRUCTIONAL PLANT, TEMPORARY BUILDINGS AND MATERIALS

13.1 Vesting of Constructional Plant and temporary buildings

All Constructional Plant and temporary buildings owned by the Contractor shall when brought onto the Site be and become the property of the Employer but may be removed from the Site by the Contractor at any time unless removal is expressly prohibited by the Contract Manager in writing. Upon removal as aforesaid or under the provisions of Clause 19.1(2), such Constructional Plant and temporary buildings shall re-vest in the Contractor. Upon completion of the Works the remainder of such Constructional Plant and temporary buildings shall, subject to Clause 15.1, re-vest in the Contractor.

13.2 Vesting of materials

All materials owned by the Contractor for incorporation into the Works shall be and become the property of the Employer upon delivery to the Site, and shall not be removed without an instruction or the prior written consent of the Contract Manager. Materials shall, subject to Clause 15.1, only re-vest in the Contractor to the extent that they may be found to be surplus to requirements upon or prior to completion of the Works. The operation of this Clause 13.2 shall not be deemed to imply any approval by the Contract Manager of such materials or prevent the rejection by the Contract Manager of any material at any time.

13.3 Removal of Constructional Plant, temporary buildings and materials

- (1) Upon issue of the certificate of completion of the Works, or the last of such certificates where there is more than one certificate of completion issued under the Contract for the completion of the Works, the Contractor shall remove all Constructional Plant, temporary buildings and surplus materials from the Site, except those required to complete any outstanding work and/or Enhancement Works (if any) under Clauses 8.7 and 11.9 or to discharge the Contractor's other obligations under the Contract.
- (2) If the Contractor fails to remove from the Site any Constructional Plant, temporary buildings or surplus materials as aforesaid within such reasonable time after completion of the Works as may be allowed by the Contract Manager, then the Employer may:-
 - (a) sell any such Constructional Plant, temporary buildings or surplus materials owned by the Contractor and after deducting from any proceeds of sale the charges and expenses of and in connection with such sale shall pay the balance, if any, to the Contractor but to the extent that the proceeds of sale are insufficient to meet all such charges and expenses the excess shall be recoverable by the Employer from the Contractor, or
 - (b) return such Constructional Plant hired or being the subject of a hire-purchase agreement to the firm or company from whom it was so hired by the Contractor, and recover the charges and expenses of and in connection with such return from the Contractor.

13.4 Hired and hire-purchase Constructional Plant

- (1) In respect of any item of Constructional Plant brought onto the Site, the Contractor shall upon written request by the Contract Manager (which may be issued by the Contract Manager from time to time or at any time during the currency of the Works) produce to the Contract Manager proof of ownership of such item or items of Constructional Plant to the satisfaction of the Contract Manager or, where any item of Constructional Plant is not solely owned by the Contractor, a written undertaking, in a form approved by the Employer, from the owner of the relevant item of Constructional Plant to the Employer that:-
 - (a) the owner of the Constructional Plant will consent to the assignment by the Contractor to the Employer of the benefit of any hiring or hire-purchase or other agreement made with the Contractor in respect of the relevant Constructional Plant in the event of either the termination of the Contractor's employment or termination of the Contract by the Employer in accordance with the provisions of the Contract or the abandonment of the Contract by the Contractor before completion of the Works, and
 - (b) subject to any assignment under Clause 13.4(1)(a), the owner of the Constructional Plant will permit the Employer, or any other contractor employed by the Employer, to use the relevant Constructional Plant for the purpose of completion of the Works.

The Contract Manager may make as many separate written requests as he thinks fit during the currency of the Works.

- (2) In the event that the Contract Manager shall certify in writing to the Employer that the Contractor has failed to comply with any written request referred to in Clause 13.4(1) within 28 days of the date of the written request and without prejudice to any other rights or remedies available to the Employer, the Employer may withhold a sum equal to 5 percent of the total certified sum referred to in the second proviso to Clause 14.2(1) from each interim payment otherwise due to the Contractor in accordance with the Contract until such time as such failure to comply with the relevant written request is rectified to the satisfaction of the Contract Manager or until the item or, as the case may be, all the items of Constructional Plant specified in the relevant written request shall be removed from the Site by the Contractor in accordance with the provisions of the Contract, whichever is the earlier and upon such time the total sum withheld by the Employer shall be returned to the Contractor without interest in the next interim payment.

Provided that the total sum withheld by the Employer on the ground of failure to comply with any written request referred to in Clause 13.4(1) shall not exceed an amount equal to the market value or as the case may be the total market value of the relevant item of Constructional Plant as decided and notified in writing by the Contract Manager to the Employer and the Contractor.

- (3) The application of Clauses 13.4(1) and 13.4(2) is limited to items of Constructional Plant which, in the Contract Manager's opinion, are essential to the completion of the Works and are difficult to replace in the event of termination of the Contractor's employment under Clause 15.1.

13.5 Employer's expense in entering into hire or hire-purchase agreement

In the event of the Employer entering into any agreement for hiring or hire-purchase under Clause 13.4 all sums paid by the Employer under the provisions of any such agreement and all expenses incurred by the Employer in entering into such agreement shall be deemed to be part of the cost of completing the Works, and shall be recoverable by the Employer from the Contractor.

13.6 Liability for loss or damage to Constructional Plant

Save as stated in Clause 5.12, the Employer shall not at any time be liable for any loss of or damage to the Constructional Plant, temporary buildings or materials which has become the property of the Employer under Clause 13.1 or 13.2 or for any loss of or damage to any hired or hire-purchase Constructional Plant brought onto the Site in accordance with Clause 13.4.

13.7 Incorporation of certain Clauses in sub-contracts

The Contractor shall when entering into any sub-contract for the execution of any part of the Works incorporate in such sub-contract the provisions of Clauses 13.1 to 13.6 and shall use his best endeavours to ensure that they are observed.

14 CERTIFICATES AND PAYMENTS

14.1 Contractor's interim statements

- (1) The Contractor shall deliver to the Surveyor at the end of each period of interim certificates stated in the appendix to the Form of Tender a statement showing:-
- (a) the estimated contract value of the work done in accordance with the Contract up to the end of such period with sums payable in respect of daywork, Nominated Sub-contractors and adjustments for Variations listed separately, and
 - (b) a list of the materials specified for interim payment purpose in the Contract that have been delivered to the Site for use in the permanent work and their estimated contract value, and
 - (c) all other estimated sums which the Contractor considers to be due to him under the Contract.
- (2) The Contractor shall deliver to the Contract Manager no later than 3 days after the end of each period of interim certificates stated in the appendix to the Form of Tender a statement showing:-
- (a) the estimated contract value of work done in accordance with the Contract up to the end of such period for each item in the Bills of Quantities or schedule of rates for site safety, environmental management and other sundry requirements, and

- (b) the information to be submitted by the Contractor for each item in the Bills of Quantities or schedule of rates for site safety, environmental management and other sundry requirements.
- (3) The statement to be submitted in accordance with Clauses 14.1(1) and 14.1(2) shall be prepared in a form supplied by and at the expense of the Contractor and in the format and by the number of copies as required by the Surveyor and the Contract Manager respectively.
- (4) The Contractor shall also submit a signed declaration in a form as provided in the appendix to the Conditions of Contract to confirm compliance with the provisions on confidentiality and ethical commitment as stated in Clauses 4.4 and 5.30 as part of the Contractor's interim statement. If the Contractor fails to submit the declaration as required, the Employer shall be entitled to withhold payment until such declaration is submitted and the Contractor shall not be entitled to interest as provided for under Clause 14.2(6)(a) in that period.

14.2 Interim payments, retention money and interest

- (1) The Surveyor shall value and certify within 21 days (unless otherwise stated in the Contract) of the date of delivery to the Surveyor of the Contractor's statement in accordance with Clause 14.1(1) based on the rates in the Contract where appropriate, in respect of the following:-
 - (a) the estimated value of the permanent work executed, and
 - (b) the estimated value of any Temporary Works or item in the Preliminaries for which a separate sum is provided in the Bills of Quantities or schedule of rates, and
 - (c) the estimated value of the materials as referred under Clause 14.1(1)(b) for inclusion in the permanent work and not being prematurely delivered to and being properly stored on the Site, and
 - (d) the estimated sums payable in respect of Nominated Sub-contractors, and
 - (e) any other estimated sums to which, in the opinion of the Surveyor, the Contractor is entitled in accordance with the Contract.

Provided that any item in the Bills of Quantities or schedule of rates for site safety, environmental management and other sundry requirements shall only be valued and certified by the Surveyor if the Contract Manager has instructed the valuation and certification of the item.

Provided further that the total estimated sum in respect of Clauses 14.2(1)(a) to 14.2(1)(e) shall be adjusted by the Surveyor to take into account:-

- (i) the retention of the percentage as specified in the Contract of all estimated sums payable (before any adjustment made in accordance with Clause 14.2(1)(iii)) excepting any estimated sums payable in respect of Nominated Sub-contractors (the sum so retained shall be referred to in the Contract as "Retention Money Held in respect of the Contractor") until the sum retained hereunder reaches the limit as specified in the Contract, and
 - (ii) the retention of the percentage of five percent of any estimated sum payable in respect of any Nominated Sub-contractor (before any adjustment made in accordance with Clause 14.2(1)(iv)) (the sum so retained shall be referred to in the Contract as "Retention Money Held in respect of the Nominated Sub-contractor") until the total of any such retention reaches the limit as stated in the respective Nominated Sub-contract, and
 - (iii) any adjustment to be made for contract price fluctuations in accordance with Clause 20.2, if applicable, and
 - (iv) any adjustment to be made to the sum payable to any Nominated Sub-contractor for price fluctuations as may be provided for in the Contract, if applicable.
- (2) Within 21 days of the day following the Surveyor's certification of interim payment, the Employer shall pay to the Contractor the total sum certified which in the opinion of the Surveyor is due under the Contract, subject to deduction of previous payments on account, if any, and any other sum deductible by the Employer under the Contract.

- (3) For the purpose of Clause 14.2(1)(c), the estimated value of materials for use in connection with any item of permanent work priced in the Contract shall be valued on the basis of the rate set out in the Contract for such work.
- Provided that the value of materials required for work being valued under the Contract on the basis of rates other than rates in the Contract or rates based thereon, shall be based on actual cost or current prices.
- (4) The Surveyor may refuse to issue a certificate for an interim payment for a sum less than the minimum payment stated in the Contract, but nothing in this Clause 14.2 shall prevent the Surveyor from issuing a certificate at any time for any sum if in the opinion of the Surveyor it is desirable to do so.
- (5) The Retention Money Held in respect of the Contractor and the Retention Money Held in respect of the Nominated Sub-contractor shall be released in the proportions specified in the Contract and in accordance with the following:-
- (a) Within 14 days of the date of written confirmation by the Contract Manager for all of the Maintenance Works included in the Maintenance Works stage in respect of the part of the Nominated Sub-contract Works of the respective Nominated Sub-contractor in accordance with Clause 10.1(7)(a), the Surveyor shall certify for payment of the specified portion of the respective Retention Money Held in respect of the Nominated Sub-contractor and the certificate shall state the money so due to the respective Nominated Sub-contractor and, subject to Clause 15.3, the Employer shall pay such money to the Contractor within 21 days of the day following the Surveyor's certification of interim payment.
- (b) Within 14 days of the date of written confirmation by the Contract Manager for all Maintenance Works included in the Maintenance Works stage in respect of the part of the Works executed, materials or services supplied for the Works excepting Nominated Sub-contract Works in accordance with Clause 10.1(7)(b), the Surveyor shall certify for payment of the specified portion of the Retention Money Held in respect of the Contractor and the certificate shall state the money so due and, subject to Clause 15.3, the Employer shall pay such money to the Contractor within 21 days of the day following the Surveyor's certification of interim payment.
- (6) (a) In the event of failure by the Employer to pay the Contractor in compliance with the provisions of this Clause 14.2, the Employer shall pay to the Contractor interest in simple interest on a daily basis and at a rate equivalent to 1% per annum above the average of the best lending rates of the three Hong Kong note-issuing banks prescribed from time to time upon any overdue payment from the day following the date on which the same should have been made.
- (b) The Employer shall not under any circumstances be liable to pay to the Contractor interest on any sum payable to the Contractor under or arising out of the Contract, whether upon the certificate of the Surveyor or otherwise, at a rate in excess of 1% above the said average of the best lending rates.
- (7) (a) The Surveyor shall have the power to omit from any certificate the value of any work done, materials supplied or services rendered with which the Contract Manager may for the time being be dissatisfied and for that purpose, or for any other reason which to the Surveyor may consider proper, may by any certificate delete, correct or modify any sum previously certified by him.
- (b) The Contract Manager shall have the power to refuse to instruct the Surveyor to value and certify any of the items in the Bills of Quantities or schedule of rates for site safety, environmental management and other sundry requirements for which the Contractor has failed to submit the requisite information in accordance with Clause 14.1(2).

14.3 Maintenance certificate

- (1) Upon the expiry of the Maintenance Period, or where there is more than one such Maintenance Period, upon the expiry of the last Maintenance Period, the Contract Manager shall issue:-
 - (a) a separate partial maintenance certificate in respect of the Nominated Sub-contract Works of each of the Nominated Sub-contractors, and
 - (b) a separate maintenance certificate in respect of the Works excepting any part of the Nominated Sub-contract Works,

when, in relation to that part of the Works in respect of which partial maintenance certificate(s) and/or the maintenance certificate is to be issued, all outstanding work referred to in Clause 8.7, all Enhancement Works referred to in Clause 11.9 and all Maintenance Works referred to in Clause 10.1 shall have been completed in accordance with the Contract, and the Contract Manager shall, in such partial maintenance certificate(s) and/or maintenance certificate as may be issued, state the date on which the Contractor has completed his obligation to execute that part of the Works in respect of which it is issued.

Provided that where the Contract Manager considers that the Contractor has fulfilled the conditions for the issue of the maintenance certificate under Clause 14.3(1)(b) at a time when the conditions for the issue of any of the partial maintenance certificates under Clause 14.3(1)(a) remain unfulfilled, the Contract Manager shall issue the maintenance certificate on condition that the Contractor shall remain to be bound by, and shall not be relieved from, his obligation to execute that part or parts of the Works which remain outstanding, until such time when the partial maintenance certificates in respect thereof have been issued.

- (2) No certificate, other than the partial maintenance certificates or the maintenance certificate, shall be deemed to constitute approval of any work or other matter in respect of which it is issued or shall be taken as an admission of the due performance of the Contract or any part thereof.

Provided that the partial maintenance certificates or the maintenance certificate shall not be deemed to constitute approval of any work or other matter in respect of which it is issued which has not been carried out in accordance with the Contract and which the Contract Manager could not with reasonable diligence have discovered before the issue of the partial maintenance certificates or the maintenance certificate.

- (3) The issue of any certificate including a partial maintenance certificate or the maintenance certificate shall not be taken as relieving either the Contractor or the Employer from any liability the one towards the other arising out of or in any way connected with the performance of their respective obligations under the Contract. Provided that the Employer shall not be liable to the Contractor for any matter or thing arising out of or in connection with the Contract or the execution of the Works unless the Contractor shall have made a claim in relation thereto in accordance with the time limits specified in Clause 8.4(2), 11.5 or 11.6(2).

15 REMEDIES AND POWERS

15.1 Termination of the Contractor's employment

- (1) If the Contractor shall become bankrupt or have a receiving order made against him or shall present his petition in bankruptcy or shall make an arrangement with or assignment in favour of his creditors or shall agree to carry out the Contract under a committee of inspection of his creditors or (being a corporation) shall go into liquidation (other than a voluntary liquidation for the purposes of amalgamation or reconstruction) or if the Contractor shall assign the Contract without the consent in writing of the Employer first obtained or shall have an execution levied on his goods or if the Contractor or any of his employees, representatives or agents is found to have offered or given any advantage, gratuity, bonus, discount, bribe or loan of any kind to any employee, representative or agent of the Employer or to the Contract Manager or any member of the Contract Manager's staff or to the Surveyor or any member of the Surveyor's staff or if the Contract Manager shall certify in writing to the Employer that in his opinion the Contractor:-
 - (a) has abandoned the Contract, or

- (b) without reasonable excuse has failed to commence the Works in accordance with Clause 8.1, or
- (c) has suspended the progress of the Works for 14 days after receiving from the Contract Manager a notice in writing to proceed, or
- (d) has failed to comply with an order from the Contract Manager given in accordance with Clause 7.5, or
- (e) despite previous warning by the Contract Manager in writing is failing to proceed with the Works with due diligence or is persistently in breach of any of his obligations under the Contract, or
- (f) has sub-contracted the Works, or
- (g) has to the detriment of good workmanship or in defiance of the Contract Manager's instruction to the contrary sub-contracted any part of the Works, or
- (h) has failed to submit a bond as required under Clause 5.3,

then the Employer may after giving at least 7 days' notice in writing to the Contractor enter upon the Site and the Works and expel the Contractor therefrom without thereby avoiding the Contract or releasing the Contractor from any of his obligations or liabilities under the Contract or affecting the rights and powers conferred on the Employer or the Contract Manager by the Contract and the Employer may complete the Works or may employ any other contractor to complete the Works and the Employer or such other contractor may use for such completion so much of the Constructional Plant, temporary buildings and materials which become the property of the Employer under Clauses 13.1 and 13.2 as the Employer may think proper and the Employer may at any time sell any of the said Constructional Plant, temporary buildings and unused materials and apply the proceeds of sale in or towards the satisfaction of any sum due or which may become due to the Employer from the Contractor under the Contract.

- (2) As soon as may be practicable after such entry and expulsion by the Employer, the Surveyor shall ascertain and record:-
 - (a) the quantity of work completed up to the time of such entry and expulsion, and
 - (b) the quantity of unused or partially used materials and list any Constructional Plant and temporary buildings which have become the property of the Employer under the Contract as at the time of such entry and expulsion.

The provisions of Clause 11.1(6) shall apply for the purposes of attendance by the Contractor for measurement and agreement of records and drawings.

- (3) By the notice referred to in Clause 15.1(1) or by further notice in writing within 28 days of the date thereof the Employer may require the Contractor to assign to the Employer and if so required the Contractor shall forthwith assign to the Employer the benefit of any agreement for the supply of any materials and/or for the execution of any work for the purposes of the Contract which the Contractor may have entered into.
- (4)
 - (a) If the Employer enters upon the Site and the Works and expels the Contractor in accordance with this Clause 15.1, the Employer shall not be liable to pay to the Contractor any money under the Contract (whether in respect of amounts certified by the Surveyor or otherwise) unless and until the Surveyor certifies that an amount is due to the Contractor under Clause 15.1(4)(b).
 - (b) The Surveyor shall certify the difference between:-
 - (i) such sum as would have been due to the Contractor if he had duly completed the Works together with any proceeds of sale under Clause 15.1(1), and
 - (ii) the sum of the costs of completing the Works (whether or not the Works are completed under a separate contract), damages for delay (if any) to the completion of the Works and all other expenses reasonably incurred by the Employer in connection with or arising out of the termination under Clause 15.1(1).
 - (c) Such difference as certified by the Surveyor under Clause 15.1(4)(b), subject to adjustment by the Surveyor to take into account of the amount (if any) certified by the

Surveyor under Clause 15.1(5), shall be a debt due to the Employer or the Contractor as the case may be and shall be paid by or to the Contractor as the case may be within 21 days of the day following the Surveyor's certification of interim payment.

- (5) If the Surveyor is satisfied at any time prior to the completion of the Works that the whole or part of the costs, damages and other expenses referred to in Clause 15.1(4)(b)(ii) exceeds such sum as calculated under Clause 15.1(4)(b)(i), he may issue a certificate for interim payment to that effect and the amount of such excess as certified by the Surveyor in such certificate shall be considered as a debt due from the Contractor to the Employer and shall be paid by the Contractor within 21 days of the day following the Surveyor's certification of interim payment.

15.2 Work by person other than the Contractor

- (1) If the Contractor shall fail to carry out any work required under the Contract or refuse to comply with any instruction or order given by the Contract Manager in accordance with the Contract within a reasonable time, the Contract Manager may give the Contractor 14 days' notice in writing to carry out such work or comply with such instruction. If the Contractor fails to comply with such notice, the Employer shall be entitled to carry out such work or instruction by his own workers or by other contractors. Without prejudice to any other remedy, all additional expenditure properly incurred by the Employer in having such work or instruction carried out shall be recoverable by the Employer from the Contractor.
- (2) If by reason of any accident or failure or other event occurring to, in, or in connection with the Works any remedial or other work shall in the opinion of the Contract Manager be urgently necessary and the Contractor is unable or unwilling at once to carry out such remedial or other work, the Contract Manager may authorize the carrying out of such remedial or other work by a person other than the Contractor. If the remedial or other work so authorized by the Contract Manager is work which in the Contract Manager's opinion the Contractor was liable to carry out under the Contract, all expenses properly incurred in carrying out the same shall be recoverable by the Employer from the Contractor. Provided that the Contract Manager shall as soon after the occurrence of any such emergency as may be reasonably practicable notify the Contractor thereof in writing.

15.3 Recovery of money due to the Employer

- (1) All damages (including liquidated damages), costs, charges, expenses, debts or sums for which the Contractor is liable to the Employer under any provision of the Contract may be deducted by the Employer from monies due to the Contractor under the Contract and any sum retained as retention money in accordance with the Contract and the Employer shall have the power to recover any balance not so deducted from monies due to the Contractor under any other contract between the Employer and the Contractor.
- (2) All damages (including liquidated damages), costs, charges, expenses, debts or sums for which the Contractor is liable to the Employer under any provision of any other contract between the Contractor and the Employer may be deducted by the Employer from monies due to the Contractor under the Contract and any sum retained as retention money in accordance with the Contract.

16 SPECIAL RISKS AND FRUSTRATION

16.1 Special risks

- (1) If during the currency of the Works, there shall be:-
 - (a) an outbreak of war (whether war be declared or not) in any part of the world which, whether financially or otherwise, materially affects the execution of the Works, or
 - (b) an invasion of Hong Kong, or
 - (c) civil war, rebellion, revolution or military or usurped power in Hong Kong, or
 - (d) riot, commotion or disorder in Hong Kong otherwise than amongst the employees of the Contractor, any sub-contractor of any tier including Specialist Sub-contractors and Nominated Sub-contractors or any Specialist Contractor currently or formerly engaged on the Works or Specialist Works, or

- (e) act of terrorists in Hong Kong,

hereinafter referred to as the “special risks”, the Contractor shall, unless and until the Contract is terminated under the provisions of this Clause 16.1, use his best endeavours to complete the execution of the Works.

Provided that the Employer shall be entitled at any time after the occurrence of any of the special risks to terminate the Contract (with the exception of the provisions of this Clause 16.1 and Clause 17.1) by giving written notice to the Contractor, and upon such notice being given the Contract shall terminate but without prejudice to the claims of either the Employer or the Contractor in respect of any antecedent breach thereof.

- (2) In the event of termination in accordance with the proviso to Clause 16.1(1), the Contractor shall with all reasonable despatch remove from the Site all Constructional Plant and temporary buildings and surplus materials and shall similarly allow his sub-contractors to do so.
- (3) In the event of termination in accordance with the proviso to Clause 16.1(1), the Contractor shall be paid by the Employer, in so far as such items have not already been covered by payment on account made to the Contractor, for all work executed prior to the date of termination at the rates provided in the Contract and in addition:-
- (a) the sums payable in respect of items in the Preliminaries in so far as the work or service comprised therein has been carried out or performed and a proper proportion as certified by the Surveyor of all such items the work or service comprised in which has been partially carried out or performed;
 - (b) the Cost of materials reasonably ordered for the Works which shall have been delivered to the Contractor or of which the Contractor is legally liable to accept delivery, such materials becoming the property of the Employer upon such payment being made by the Employer;
 - (c) a sum to be certified by the Surveyor being any Cost reasonably incurred by the Contractor in the expectation of completing the Works in so far as such Cost shall not have been paid in accordance with any provisions of this Clause 16.1.
- (4) Whether the Contract shall be terminated in accordance with the proviso to Clause 16.1(1) or not, the following provisions shall apply or be deemed to have applied as from the occurrence of any of the special risks notwithstanding anything expressed in or implied by the other terms of the Contract:-
- (a) The Contractor shall be under no liability whatsoever whether by way of indemnity or otherwise for or in respect of damage to the Works (other than work condemned under Clause 7.5) or to property (other than property of the Contractor including property vested in the Employer under Clauses 13.1 and 13.2 or property hired by the Contractor for the purposes of executing the Works) whether of the Employer or of third parties or for or in respect of injury or loss of life which is wholly the consequence of the occurrence of any of the special risks and the Employer shall indemnify the Contractor against all such liabilities and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto.
 - (b) If the Works or any material on the Site shall be destroyed or damaged by reason of any of the special risks, the Contractor shall nevertheless be entitled to payment for the Works and for any materials so destroyed or damaged and the Contractor shall be entitled to recover from the Employer the expense incurred in making good any such destruction or damage to the Works and of replacing or making good such materials so far as may be required by the Contract Manager or as may be necessary for the completion of the Works, the Surveyor shall determine the expense incurred by the Contractor as in his opinion reasonable and notify the Contractor accordingly.
 - (c) Destruction, damage, injury or loss of life caused by the explosion or impact, whenever and wherever occurring, of any mine, bomb, shell, grenade, missile, munition or explosive of war shall be deemed to be a consequence of the special risks.

16.2 Frustration

In the event of the Contract being frustrated whether by war or otherwise howsoever, the sum payable by the Employer to the Contractor shall be the same as that which would have been payable under Clause 16.1 as if the Contract had been terminated in accordance with Clause 16.1.

17 AVOIDANCE AND RESOLUTION OF DISPUTES

17.1 Avoidance and resolution of disputes

- (1) In order to foster co-operation among the Employer, the Contractor and the Nominated Sub-contractors and Specialist Sub-contractors who may be engaged for the execution of any part of the Works, to minimize the volume of claims, disputes and disruptions to the Works, and to ensure the cost-effective and expeditious resolution of disputes that do arise, the dispute avoidance and resolution procedures as set forth in this Clause 17.1 shall be implemented.
- (2) All Nominated Sub-contracts and Specialist Sub-contracts for the execution of any part of the Works shall have a clause requiring the Nominated Sub-contractor or Specialist Sub-contractor to participate fully in the dispute avoidance and resolution procedures set forth herein and to resolve any claims which arise out of a difference or dispute between the Contractor and the Employer over the Nominated Sub-contract Works or Specialist Sub-contract Works by the process required in this Clause 17.1 and to be bound by the results of such process.
- (3)
 - (a) As soon as practicable after the issue of the Letter of Acceptance, the Employer and the Contractor shall jointly select and appoint a DARA in accordance with the procedures specified in the Contract.
 - (b) The tenure of the DARA shall, unless the Employer and the Contractor otherwise agree in writing, end upon the expiry of the Period of Final Measurement or upon termination or abandonment of the Contract, whichever is the earlier, but in the event that any dispute stated in any Notice of Dispute issued in accordance with Clause 17.1(7) or 17.1(8) having been referred to the DARA remains unresolved after the expiry of the tenure of the DARA, such tenure shall, unless the Contract has been terminated or abandoned, automatically be extended until the dispute is resolved through the dispute avoidance and resolution procedures or is referred to short form arbitration in accordance with Clause 17.1(14) or as the case may be to arbitration in accordance with Clause 17.1(15).
- (4)
 - (a) The DARA's fees and expenses for his services shall be shared equally between the Employer and the Contractor. In the event that the DARA's services are required in respect of a difference or dispute raised by the Contractor to the Employer at the request of a Nominated Sub-contractor or Specialist Sub-contractor or as a result of the resolution of dispute raised by a Nominated Sub-contractor or Specialist Sub-contractor pursuant to the Nominated Sub-contract or Specialist Sub-contract, then the DARA's fees and expenses in respect of such difference or dispute shall be shared equally by the Employer, the Contractor and such Nominated Sub-contractor or Specialist Sub-contractor.
 - (b) If the Contractor or such Nominated Sub-contractor or Specialist Sub-contractor fails to pay his share of the DARA's fees and expenses as required under Clause 17.1(4)(a) within 7 days after the due date for payment as reasonably demanded by the DARA, the Employer may pay such amount and recover the same as a debt from the Contractor.
- (5)
 - (a) The Employer, the Contractor, the Contract Manager and the Surveyor shall perform their obligations or duties under the Contract with due expedition. The Employer, the Contractor, the DARA and the Nominated Sub-contractors and Specialist Sub-contractors shall adopt a proactive and cooperative working attitude with an aim to reduce conflicts and disputes and to resolve any difference or dispute that may arise from or in relation to the Contract.

Objectives

Appointment of DARA

Cost of DARA service

General Obligations for dispute avoidance

- (b) The DARA shall meet the Employer and the Contractor either jointly or separately on a monthly basis to facilitate the avoidance and resolution of disputes that may arise during the currency of the Works. The DARA shall as soon as practicable meet the Employer and the Contractor if either of the Employer or the Contractor requests such a meeting in writing.

***Difference
and Dispute***

- (6) If a difference of any kind whatsoever arises between the Employer and the Contractor in connection with or arising out of the Contract or the carrying out of the Works whether during the progress of the Works or after completion and whether before or after termination, abandonment or breach of the Contract, the Employer and the Contractor shall follow the dispute avoidance and resolution procedures stipulated herein. The Contractor shall proceed with the Works with due diligence unless the Contract has been abandoned or terminated.

Provided that the Employer and the Contractor shall not raise a difference over or in connection with any decision, certificate, determination or ascertainment of the Contract Manager or the Surveyor as the case may be unless and until the same has been issued or notified in writing to the Employer and/or the Contractor in accordance with the Contract.

- (7) (a) If a difference between the Employer and the Contractor arises over the following:-
 - (i) a decision of an extension of time for completion issued by the Contract Manager under Clause 8.4, or
 - (ii) a certificate of completion issued by the Contract Manager under Clause 8.7, or
 - (iii) a decision of the Contract Manager issued under Clause 9.2(3) or 11.5(1)(b), or
 - (iv) a determination or ascertainment issued by the Surveyor under the Contract,

the site level representatives of the Employer and the Contractor shall attempt in good faith to resolve the difference within 28 days from the date of such Contract Manager's decision referred to in Clauses 17.1(7)(a)(i) and 17.1(7)(a)(iii), such certificate of completion referred to in Clause 17.1(7)(a)(ii) or such Surveyor's determination or ascertainment referred to in Clause 17.1(7)(a)(iv) as the case may be.

- (b) In the event that the site level representatives of the Employer and the Contractor have failed to resolve the difference and if either the Employer or the Contractor wishes to pursue the resolution of the difference, he shall before the expiry of the said 28 day period stated in Clause 17.1(7)(a) serve on the other a Notice of Dispute and copy the same to the DARA.

Provided that if no Notice of Dispute is served by either the Employer or the Contractor within the said 28 day period, the difference shall be deemed to have been resolved and settled.

Provided further that any notice of dispute in respect of such difference (whether named or purported to be a Notice of Dispute) served by the Employer or the Contractor on the other after the said 28 day period shall be invalid and of no effect.

- (c) Notwithstanding any other provisions in the Contract, any:-
 - (i) decision of extension of time for completion issued by the Contract Manager under Clause 8.4, or
 - (ii) certificate of completion issued by the Contract Manager under Clause 8.7, or
 - (iii) decision of the Contract Manager issued under Clause 9.2(3) or 11.5(1)(b), or
 - (iv) determination or ascertainment issued by the Surveyor under the Contract,

for which neither the Employer nor the Contractor serves a Notice of Dispute within 28 days from the date of issue of the same shall become final and binding between and upon the Employer and the Contractor subject to any correction of arithmetical errors made pursuant to Clause 11.7(1)(a) in Surveyor's determination and ascertainment. The Employer and the Contractor shall not raise any matter, difference or dispute in relation to the finality or other issues concerning such Contract Manager's decision or certificate of completion, or Surveyor's determination or ascertainment (as the case may be) in any subsequent dispute avoidance and resolution procedures provided hereinbelow.

- (8) (a) If a difference between the Employer and the Contractor arises over any matter other than those matters referred to in Clauses 17.1(7)(a)(i) to 17.1(7)(a)(iv), either the Employer or the Contractor shall notify the other in writing stating the difference between them over the matter. Within 28 days from the date of such notice, either the Employer or the Contractor may write to the Contract Manager and copy the same to the other, requesting the Contract Manager to make a decision on the difference.

Provided that if no such written request is made to the Contract Manager within 28 days after the date of such notice, the difference shall be deemed to have been resolved and settled.

- (b) If the Employer or the Contractor has made a written request in accordance with Clause 17.1(8)(a), the Contract Manager shall, within 14 days after the receipt of such written request, issue to the Employer and the Contractor in writing either his decision or a statement of his inability to make a decision.
- (c) Within 28 days after the issue of the Contract Manager's decision or statement of his inability to make a decision, as the case may be, the site level representatives of the Employer and the Contractor shall attempt in good faith to resolve the difference. If the site level representatives have failed to resolve the difference, and if either the Employer or the Contractor wishes to pursue the resolution of the difference, he shall before the expiry of the said 28 day period stated in this Clause 17.1(8)(c) serve on the other a Notice of Dispute and copy the same to the DARA.

Provided that if no Notice of Dispute is served by either the Employer or the Contractor within the said 28 day period, the difference shall be deemed to have been resolved and settled. Provided further that any notice of dispute in respect of such difference (whether named or purported to be a Notice of Dispute) served by the Employer or the Contractor on the other after the said 28 day period shall be invalid and of no effect.

- (9) For the purposes of this Clause 17.1, a Notice of Dispute shall be a notice in writing and served on the Employer by the Contractor or, as the case may be, served on the Contractor by the Employer stating the matter in dispute. A dispute shall be deemed to arise when such Notice of Dispute has been served.

- (10) Upon receipt of a copy of a Notice of Dispute, the DARA shall forthwith meet the site level representatives of the Employer and the Contractor to help resolve the dispute stated in the Notice of Dispute. If the dispute is not resolved within 14 days of the date of service of the Notice of Dispute, the DARA shall provide his views on the dispute by submitting a DARA report in writing to the senior management of the Employer and the Contractor within 7 days after the date that the efforts of resolution by the site level representatives have been terminated or within 21 days of the date of the service of the Notice of Dispute, whichever is the earlier. The DARA shall be allowed access to records or documents that are relevant to the dispute.

*Reference to
DARA*

- (11) (a) The DARA shall set out the key issues of the dispute and identify the obstacles to settlement in the DARA report. Upon request in writing by both the Employer and the Contractor, the DARA shall provide in the DARA report a non-binding recommendation for settlement or as the case may be a non-binding evaluation of the merits of the subject matter of the dispute.

*DARA
report*

- (b) The DARA report and any views given by the DARA (whether in the DARA report or otherwise) shall not be admissible in any subsequent dispute resolution process or legal proceedings in connection with the Contract.
- (c) Any statement or settlement offer made by either the Employer or the Contractor in any meeting convened for the purposes of dispute resolution facilitated by the DARA or otherwise made in confidence to the DARA shall not be admissible in any subsequent dispute resolution process or legal proceedings in connection with the Contract.
- (d) The DARA shall not be called upon as a witness in any subsequent dispute resolution process or legal proceedings in connection with the Contract.

- (12) Upon receipt of the DARA report, the senior management of the Employer and the Contractor shall meet and attempt to settle the dispute. The DARA shall only attend such meetings if requested by both the Employer and the Contractor. If the dispute is not settled within 14 days of the date of issue of the DARA report, the DARA may, within 7 days after the date that senior

*Alternative
form of
dispute
resolution*

management settlement efforts have been terminated or within 21 days of the date of issue of the DARA report, whichever is the earlier, propose to the Employer and the Contractor a form of dispute resolution alternative to any form of arbitration, but the Employer and the Contractor shall not be obliged to accept such proposal.

- (13) (a) If either the Employer or the Contractor refuses to accept the DARA's proposal as referred to in Clause 17.1(12), then the dispute resolution procedures set out in Clause 17.1(14) shall be followed, but in the event that the Employer and the Contractor agree to accept the DARA's proposal, the Employer and the Contractor shall, with the assistance of the DARA (if required by the Employer and the Contractor), agree on the conduct of such alternative dispute resolution process (which may include but not limited to the time for appointment of the expert or other person, for exchange of submissions or documents and for commencement of the dispute resolution process) within 21 days after the date of the senior management settlement efforts have been terminated or within 35 days of the date of issue of the DARA report, whichever is the earlier.
- (b) If the Employer and the Contractor fail to agree on the time for appointment of the expert or other person, for exchange of submissions or documents or for commencement of the alternative dispute resolution process within the time as provided in Clause 17.1(13)(a), then either the Employer or the Contractor may notify the DARA in writing of the disagreement and copy to the other, and the DARA shall decide such time for the alternative dispute resolution process.
- (c) If the Employer and the Contractor fail to agree on the appointment of the expert or other person for conducting the alternative dispute resolution process under this Clause 17.1(13), the alternative dispute resolution process under this Clause 17.1(13) shall be deemed to have been abandoned by both of them.

***Reference to
short form
arbitration***

- (14) When any of the following events occurs:-
- (a) in the absence of a DARA's proposal referred to in Clause 17.1(12) and the Employer and the Contractor fail to reach agreement to adopt any alternative dispute resolution process, or
- (b) either the Employer or the Contractor refuses to accept the DARA's proposal referred to in Clause 17.1(12), or
- (c) the Employer and the Contractor fail to reach an agreement on the conduct of such alternative dispute resolution process within the time stated in Clause 17.1(13), or
- (d) such alternative dispute resolution process adopted in accordance with Clause 17.1(13) is abandoned or terminated by either the Employer or the Contractor, or
- (e) no settlement of the dispute is reached in such alternative dispute resolution process adopted in accordance with Clause 17.1(13),

then the Employer and the Contractor shall resolve the dispute by way of short form arbitration in accordance with the "Short Form Arbitration Rules" as provided in the appendix to the Conditions of Contract unless either the Employer or the Contractor refuses to do so in writing within 14 days after the date that any of the events referred to in Clauses 17.1(14)(a) to 17.1(14)(e) occurs, in which case, the dispute resolution procedures stated in Clause 17.1(15) shall be followed.

- (15) If either the Employer or the Contractor refuses in writing to resolve the dispute by short form arbitration, he may refer the dispute to arbitration in accordance with and subject to the provisions of the Arbitration Ordinance (Cap. 609) or any statutory modification thereof for the time being in force and any such reference shall be deemed to be a submission to arbitration within the meaning of such Ordinance. Any reference to such arbitration shall be made within 28 days of the written refusal to resolve the dispute by way of short form arbitration by either the Employer or the Contractor.

***Reference to
arbitration***

- (16) If a dispute of any kind whatsoever arises between the Employer and the Contractor in connection with or arising out of the Contract or the carrying out of the Works of which a Notice of Dispute is given pursuant to the provisions of the Contract after the expiry of the Period of Final Measurement or after the termination or abandonment of the Contract, the dispute shall be resolved by way of mediation or arbitration as hereinafter provided. Either the

Employer or the Contractor may within 28 days of the service of the Notice of Dispute refer the dispute to mediation in accordance with and subject to the “Government of Hong Kong Special Administrative Region Construction Mediation Rules” or any modification thereof being in force at the date of such request. If the Employer and the Contractor fail to resolve the dispute by mediation or if either the Employer or the Contractor has no intention to refer the dispute to mediation, then he may refer the dispute to arbitration in accordance with and subject to the provisions of the Arbitration Ordinance (Cap. 609) or any statutory modification thereof for the time being in force and any reference shall be deemed to be a submission to arbitration within the meaning of such Ordinance. Any such reference to arbitration shall be made within 90 days of:-

- (a) the refusal to mediate, or
 - (b) the abandonment or termination of the mediation, or
 - (c) the failure of the Employer and the Contractor to reach a settlement in the mediation.
- (17) The reference to arbitration under Clause 17.1(15) or 17.1(16) shall be in accordance with and subject to the following:-
- (a) All the provisions in Schedule 2 to the Arbitration Ordinance (Cap. 609) shall apply to any arbitration instituted in accordance with Clause 17.1(15) or 17.1(16).
 - (b) Subject to Clauses 17.1(17)(c) and 17.1(17)(d), the Domestic Arbitration Rules (2012) of the Hong Kong International Arbitration Centre (the “Arbitration Rules”) or any modification thereof for the time being in force shall apply to any arbitration instituted in accordance with Clause 17.1(15) or 17.1(16).
 - (c) Notwithstanding any provision of the Arbitration Rules, the place of meetings and hearings in the arbitration shall be Hong Kong unless the parties otherwise agree.
 - (d) Article 26 of the Arbitration Rules shall be deleted and replaced by the following:-
 - “26.1 The arbitration proceedings are private and confidential between the parties and the arbitrator. Subject to the provisions of section 18 of the Ordinance and these Rules, no information relating to the arbitration shall be disclosed by any person without the written consent of each and every party to the arbitration. Disclosures are permissible where disclosures:-
 - (a) are necessary for implementation or enforcement, or
 - (b) are required by the parties’ auditors or for some other legitimate business reasons, or
 - (c) are required by any order of the courts of Hong Kong or other judicial tribunal, or
 - (d) which are necessary for the making of claims against any third party or to defend a claim brought by any third party.
 - 26.2 Notwithstanding Article 26.1 and subject to the following provisions, the Hong Kong Housing Authority of the Hong Kong Special Administrative Region (the “Housing Authority”) may disclose the outline of any dispute with the other party and the outcome of the arbitration to the Public Accounts Committee of the Legislative Council upon its request. Before disclosures are made to the said Committee, the Housing Authority shall inform the other party. Disclosures shall not be made to the said Committee before expiry of the first 6 months from the date of the outcome of the arbitration without the written consent of the other party but such consent shall not be unreasonably withheld. The other party shall be deemed to have given his consent to disclosures on the expiry of the first 6 months from the date of the outcome of the arbitration. The other party may, if he considers it necessary to protect the sensitive nature of certain information relating to him, request the Housing Authority to disclose such specified information to the said Committee strictly on a confidential basis. If the Housing Authority considers that there are legitimate grounds to accede to the other party’s request, the Housing Authority shall convey the request to the said Committee for its consideration.”

***Arbitrator's
powers***

- (18) The arbitrator appointed in a short form arbitration instituted under Clause 17.1(14) or an arbitration instituted under Clause 17.1(15) or 17.1(16) shall have full power to open up, review and revise any decision (other than a decision under Clause 7.5(3) not to vary the Works), opinion, instruction, order, direction or certificate of the Contract Manager or any measurement, valuation, determination, ascertainment or certificate of the Surveyor.

Provided that:-

- (a) any Contract Manager's decision or certificate of completion, or Surveyor's determination or ascertainment which has become final and binding between and upon the Employer and the Contractor by virtue of Clause 17.1(7)(c), and
- (b) any settlement, deemed settlement or resolution of difference or dispute pursuant to the provisions of this Clause 17.1

shall not be opened up, reviewed or revised by the arbitrator in the arbitration.

18 NOTICES

18.1 Service of notices

- (1) Any notice to be given to the Contractor under the provisions of the Contract shall be in writing and may be served:-
- (a) personally, or
 - (b) by post addressed to the Contractor's last known place of business or, in the event of the Contractor being
 - (i) a firm, to the last known place of residence of the owner or any of the partners thereof, or
 - (ii) a company, to the registered office in Hong Kong of such company, or
 - (c) by leaving a copy at the Contractor's last known place of business or, in the event of the Contractor being
 - (i) a firm, at the last known place of residence of the owner or any of the partners thereof, or
 - (ii) a company, at the registered office in Hong Kong of such company, or
 - (d) by posting a copy in a conspicuous position upon the Site.
- (2) Subject to Clause 18.1(4), any notice to be given to the Contract Manager or to the Surveyor under the provisions of the Contract shall be served by post or leaving such notice at the office of the Contract Manager.
- (3) Any notice to be given to the Employer, as distinct from the Contract Manager, under the provisions of the Contract shall be served by post or leaving such notice at the office of the Director of Housing. At the same time such notice shall be copied to the Contract Manager and the Surveyor and served on them in like manner to any other notice to be given to the Contract Manager or to the Surveyor.
- (4) Notices may be served by facsimile only if the recipient has previously notified the other party and the Contract Manager in writing that it is prepared to accept service of notices in that manner. It shall in any event be a condition of valid service by facsimile that the hard copy is subsequently sent forthwith to the recipient in accordance with Clause 18.1(1), 18.1(2) or 18.1(3).

19 DEFAULT OF THE EMPLOYER

19.1 Default of the Employer

- (1) In the event of the Employer failing to pay to the Contractor any sum certified in accordance with Clause 14.2 within 28 days after the same shall have become due under the provisions of the Contract the Contractor may give a 14 days' notice in writing to the Employer to make payment of the sum due. Such notice shall make express reference to this Clause 19.1. In the event of failure by the Employer to make such payment within such 14 day notice period, the Contractor shall be entitled to terminate the Contract.
- (2) So long as no notice pursuant to Clause 15.1(1) is given to the Contractor either before or during the 14 day notice period provided in Clause 19.1(1), on expiration of the said 14 day notice period, the property in all Constructional Plant and temporary buildings brought upon the Site by the Contractor shall thereupon re-vest in him and he shall with all reasonable despatch remove the same from the Site.
- (3) Nothing in this Clause 19.1 shall prejudice the right of the Contractor to exercise, either in lieu of or in addition to the rights and remedies available to him under this Clause 19.1, any other rights or remedies to which the Contractor may be entitled.

20 CHANGE IN LAW AND FLUCTUATIONS

20.1 Adjustment of Contract Sum due to Change in Law

- (1) Subject to the Contractor's compliance with the provisions under Clauses 11.5(2) and 11.6, if the Surveyor is of the opinion that the Contractor has incurred additional expenditure due to a Change in Law for which the Contractor would not be reimbursed by a payment made under any other provisions in the Contract, the Surveyor shall in compliance with Clauses 11.6(3), 11.6(4) and 11.6(5) ascertain the increase in Cost and shall take this into account in the calculation of the Final Contract Sum.
- (2) If the Surveyor is of the opinion that the Contractor has been or is likely to be involved in decrease in expenditure to the Contractor in execution of the Contract due to a Change in Law, the Surveyor shall determine such decrease which shall be deducted from the Contract Sum and be taken into account in the calculation of the Final Contract Sum.
- (3) For the avoidance of doubt, if the Change in Law results in additional expenditure incurred by the Contractor in execution of the Contract, any such additional expenditure incurred by reason other than additional deployment and procurement of labour, Constructional Plant and materials resources shall be deemed to have been fully reimbursed by the operation of Clause 20.2 and no further reimbursement of such expenditure shall be made under this Clause 20.1.

20.2 Contract price fluctuations

- (1) The sum certified by the Surveyor in any interim or final payment certificate as being due (other than sums due under this Clause 20.2) shall be increased or decreased in accordance with the provisions of this Clause 20.2 if there shall be any changes in the Index Figures listed in the "Index Numbers of the Costs of Labour and Materials used in Public Sector Construction Projects (April 2003 = 100)" compiled by the Census and Statistics Department of the Government and applicable to those items included in the "Schedule of Proportions".
- (2) The net total of such increases or decreases shall be given effect to in determining the Final Contract Sum.
- (3) For the purpose of this Clause 20.2:-
 - (a) "Index Figure" shall mean any Index Figure appropriate to Clause 20.2(1).
 - (b) "Base Index Figure" shall mean the appropriate Index Figure applicable to the date 42 days prior to the Tender Closing Date.
 - (c) "Current Index Figure" shall mean the appropriate Index Figure to be applied in respect of the Works or any Section in any interim or final payment certificate by the Surveyor and shall be the appropriate Index Figure applicable to the date 42 days prior to:-
 - (i) in the event that the Works are not phased for completion in Sections in the

Contract

- (a) the due date, but in the event of the time for completion having been extended, then the extended date, for completion of the Works, or
- (b) the date of completion of the Works certified pursuant to Clause 8.7, or
- (c) the last day of the period to which the Surveyor's certificate relates, whichever is the earliest.

Provided that in the event that any work forming part of the Works is certified complete pursuant to Clause 8.7 before the remainder of the Works is certified complete pursuant to Clause 8.7 and the value of such work is included in such payment certificate, the Current Index Figure to be applied in respect of such work shall be the Index Figure applicable to the date 42 days prior to:-

- (A) the due date, but in the event of the time for completion having been extended, then the extended date, for completion of the Works, or
- (B) the date of completion of such work certified pursuant to Clause 8.7, or
- (C) the last day of the period to which the Surveyor's certificate relates, whichever is the earliest, and the Current Index Figure to be applied in respect of the remainder of the Works shall be determined in the same way as that applicable to the Works specified in Clause 20.2(3)(c)(i) save and except that the words "the Works" in Clause 20.2(3)(c)(i)(b) shall be "the remainder of the Works" and the proviso to Clause 20.2(3)(c)(i) shall not apply.

- (ii) in the event that the Works are phased for completion in Sections in the Contract
 - (a) the due date, but in the event of the time for completion having been extended, then the extended date, for completion of the Section, or
 - (b) the date of completion of the Section certified pursuant to Clause 8.7, or
 - (c) the last day of the period to which the Surveyor's certificate relates, whichever is the earliest.

Provided that in the event that any work forming part of the Section is certified complete pursuant to Clause 8.7 before the remainder of the Section is certified complete pursuant to Clause 8.7 and the value of such work is included in such payment certificate, the Current Index Figure to be applied in respect of such work shall be the Index Figure applicable to the date 42 days prior to:-

- (A) the due date, but in the event of the time for completion having been extended, then the extended date, for completion of the Section, or
- (B) the date of completion of such work certified pursuant to Clause 8.7, or
- (C) the last day of the period to which the Surveyor's certificate relates, whichever is the earliest, and the Current Index Figure to be applied in respect of the remainder of the Section shall be determined in the same way as that applicable to the Section specified in Clause 20.2(3)(c)(ii) save and except that the words "the Section" in Clause 20.2(3)(c)(ii)(b) shall be "the remainder of the Section" and the proviso to Clause 20.2(3)(c)(ii) shall not apply.

- (d) The "Effective Value" in respect of the Works or any Section or any part thereof shall be the difference between:-
 - (i) the sum, exclusive of any increases or decreases made in accordance with this Clause 20.2, which in the opinion of the Surveyor is due to the Contractor under Clause 14.2, before deducting retention and before deducting previous payments on account, less all sums in respect of Nominated Sub-contractors including profit thereon and items and portions of items based on actual cost or current prices; and
 - (ii) the sum calculated in accordance with Clause 20.2(3)(d)(i) and included in the last preceding interim payment certificate issued by the Surveyor.

Provided that in the case of the first Surveyor's certificate the Effective Value shall be the sum calculated in accordance with Clause 20.2(3)(d)(i).

- (4) The increase or decrease in the sums otherwise payable in an interim or final payment certificate pursuant to Clause 20.2(1) shall be calculated by multiplying the Effective Value by a Price Fluctuation Factor which shall be the net sum of the products obtained by multiplying each of the calculated proportions given in column 4 of the "Schedule of Proportions" by a fraction the numerator of which is the relevant Current Index Figure minus the relevant Base Index Figure and the denominator of which is the relevant Base Index Figure.

Provided that if any appropriate Current Index Figure has not been published at the time of issue of any Surveyor's certificate, the increase or decrease in the sum payable in respect of that certificate will be provisionally calculated and added to or deducted from the sum payable in the certificate by the Surveyor using the latest published Current Index Figure and shall be corrected in the next Surveyor's certificate following the publishing of the relevant Current Index Figure.

- (5) The "Schedule of Proportions" shall (irrespective of the actual constituents of the work) be "the Schedule of Proportions to be used in calculating the Price Fluctuation Factor" submitted with the Tender and with the calculations duly completed.

21 HEIGHT RESTRICTIONS

21.1 Airport height restrictions

The Contractor shall comply with all height restrictions contained in the Hong Kong Airport (Control of Obstructions) Ordinance (Cap. 301) as if the same applied to all plant, machinery and other structures used or erected by the Contractor.

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PLU1 WATER SUPPLY

GENERAL

GENERAL

PLU1.G010.7

SCOPE OF THE WORK

1. The works to be carried out under this Worksection shall include the complete plumbing installation for fresh, flush, rainwater harvesting and fire services pipework all as shown on the Drawings and detailed in this Worksection including:
 - a. Fresh and flush water pipework installations commencing from the government mains at the entry of site boundary to individual sanitary fixtures, gas water heaters and taps. Part of the plumbing installation inside pump room, including the pumpsets, ball float valves etc., connection point inside the pump room will be carried out by the Nominated Sub-contractor for fire services and water pump installation where shown on the Drawings. The installation of gas water heater, if applicable, will be carried out by a separate gas water heater contractor;
 - b. Rainwater harvesting pipework installation commencing from outlets of the rainwater storage tank to individual irrigation water points. Part of the rainwater harvesting installation inside pump room, including the pumpsets, ball float valves, filter, chlorination system, pipework etc., will be carried out by the Nominated Sub-contractor for fire services and water pump installation where shown on the Drawings;
 - c. Fire services water pipework installation commencing from the government mains at the entry of the site boundary including the up-feed pipes to the fire services roof/transfer tank and, if applicable, down-feed pipes to the street fire hydrants. Part of the plumbing installation inside pump room, including the pumpsets, ball float valves etc., connection point inside the pump room will be carried out by the Nominated Sub-contractor for fire services and water pump installation where shown on the Drawings; and
 - d. Extend and connect the fresh, flush and fire services water pipes to the government mains outside the Site boundary, if applicable. Where shown in the Drawings, connection shall be made to existing in-service supply mains of adjacent Housing Authority estate instead of government mains.
2. The complete installation shall mean, not only the major items of equipment and apparatus conveyed in this Worksection, but all the incidental sundry components necessary for the complete execution of the works and for the proper operation of the installation with their labour charges, whether or not these supply components are mentioned in detail in the tender document;
3. Refer to Worksection PLU2 for the requirements on sanitary fixtures/appliances installation.

PLU1.G020.7

REGULATIONS AND STANDARDS

1. Comply with all statutory regulations together with any revisions or amendments made thereto. The following regulations and standards are particularly relevant:
 - a. The Waterworks Ordinance and its Regulations;
 - b. The Fire Services Ordinance and its Regulations;
 - c. The Noise Control Ordinance;

-
- d. Hong Kong Waterworks Standard Requirements for Plumbing Installations in Buildings and Circular Letters issued by the Water Authority;
 - e. Codes of Practice for Minimum Fire Services Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment and Circular Letters issued by the Fire Services Department;
 - f. Factories and Industrial Undertakings (Confined Spaces) Regulation;
 - g. Where applicable, relevant sections of appropriate international standards on materials and workmanship as listed in **PLU1.APPEND1**.

PLU1.G030.7**PRECEDENCE**

In case of conflict between the requirements among the publications referred to **PLU1.G020**, interpretation shall be in accordance with the following order of precedence unless otherwise directed by the Contract Manager:

1. Ordinances and Regulations, Laws of Hong Kong;
2. This Specification and/or the Drawings;
3. International standards.

MATERIALS

PIPES, FITTINGS AND JOINTS

PLU1.M110.7

GENERAL

All pipes and fittings shall:

1. Conform to this Specification. Alternative materials may be used if approved by the Contract Manager;
2. Be constructed of materials suitable for the required working and test pressures and temperatures of the fluid carried;
3. Be capable of withstanding system working pressure and maximum static pressure that may arise upon failure of the associated pressure reducing devices;
4. Be of standard products. Do not use on-site fabricated and locally manufactured pipes and fittings except specified elsewhere or where shown on the Drawings or approved by the Contract Manager;
5. Be approved by the Water Authority for the intended application. Submit type test reports/certificates for pipes, elbows and equal tees issued by laboratories that comply with **PRE.B9.570** for verification of compliance with this Specification. Submit type test reports/ certificates of fittings other than elbows and equal tees upon Contract Manager's request;
6. Be taken with all necessary precautions to avoid surface damage or contamination during shipping, handling, storage and fabrication;
7. Be provided with protective wrapping, including the pipe ends.

PLU1.M120.7

COPPER PIPES

1. Be of seamless drawn copper tubes manufactured to BS EN 1057 with nominal wall thickness as below:

Nominal Pipe Outside Diameter (mm)	Nominal Minimum Pipe Wall Thickness (mm)		Hardness / Temper
	(Aboveground)	(Underground)	
15	0.7	1.0	HH
22	0.9	1.2	HH
28	0.9	1.2	HH
35	1.2	1.5	HD
42	1.2	1.5	HD
54	1.2	2.0	HD
66.7	1.2	2.0	HD
76.1	1.5	2.0	HD
Note: HH - Half Hard R250 HD - Hard Drawn R290			

2. Take into account temper conditions after solder/brazed jointing or heat bending in determining their pressure withstanding capability;
3. Provide pipe markings in accordance with tube manufacturing standard BS EN 1057;

4. Copper pipes for cold water supply inside domestic flats shall be completed with factory applied plain polyethylene sheath to BS 3412. Copper pipes for cold water supply at external areas and common areas, including corridors, lobbies and plant rooms, shall be bare and without paint finishes;
5. Copper pipes for hot water supply inside and outside domestic flats shall be completed with factory applied castellated polyethylene sheath comply with BS 3412 and suitable for use up to 80°C.

PLU1.M130.7**COPPER PIPE FITTINGS**

1. Copper and copper alloy fittings such as end feed capillary, integral solder capillary and compression type bushes, reducers, bends and tees: comply with BS EN 1254 -1, 2, 4 & 5 or equivalent standard;
2. For compression type fittings used for hot water pipework, submit type test reports issued by laboratories that comply with **PRE.B9.570** for proving their suitability for use at a pressure (working and/or maximum static pressure that may arise upon failure of the associated pressure reducing devices) above that allowed at 80°C in BS EN 1254-2 or equivalent standard by the following tests:
 - a. Temperature cycling test of a pipe/fitting assembly of the compression type fittings to be carried out by alternately circulating water of 80°C and 15°C through it and pressurizing the assembly to the working or maximum static pressure, whichever is higher, for 2 minutes after it reaches 80°C and 15°C respectively in each cycle. A total of 400 cycles of test shall be performed;
 - b. Pressure test of the pipe/fitting assembly to be carried out after the temperature cycling test at 1.5 times the working or maximum static pressure, whichever is higher, for 24 hours with its temperature maintained at 80°C throughout the 24-hour period;
 - c. The compression type fittings are to be regarded as capable of withstanding the working and maximum static pressure that may arise upon failure of the associated pressure reducing devices at 80°C if no sign of deformation of the fittings and water leakage from the pipe/fitting assembly are observed/detected throughout the tests as mentioned in sub-clauses (2)(a) and (2)(b) above.
3. Provide written confirmation from the manufacturer on suitability of the compression type fittings for use with hot water pipework for application at 80°C under the working and maximum pressure;
4. Use compression type fittings for pipe sizes less than or equal to 54 mm or use solder (end feed or integral) or brazed capillary fittings for pipe sizes less than or equal to 76.1 mm;
5. Bolted flange joints: brazed type and comply with BS EN 1092-3 or equivalent standard;
6. Unless otherwise specified or shown on the Drawings, use the following types of joints and fittings:

Application	Copper Pipe Size	Joint / Fitting
a. Up-feed to storage tank, storage tank downfeed and mains pressure direct up-feed	Up to and including 76.1 mm	Brazed, end feed or integral solder capillary joints; Flanged joints where future disconnection is required.
b. Meter assembly branch and pipework	Up to and including 76.1 mm	Brazed, end feed or integral solder capillary joints;

c. Meter outlet and consumer pipework	Up to and including 32 mm	Brazed, end feed or integral solder capillary joints; Compression or screw joint fittings for connection to valves etc or if capillary jointing is not practical.
d. Consumer hot water pipework	15 mm / 22 mm	Brazed, end feed or integral solder capillary joints; Compression fittings for connection to valves, etc. or if capillary jointing is not practical.

7. Use dielectric fittings or epoxy coated flange with gasket for connecting copper pipe to pipes and fittings made of other metals in order to prevent direct contact with different metals.

PLU1.M140.7**PREFORMED POLYETHYLENE SHEATHS FOR CAPILLARY TYPE JOINTS AND FITTINGS OF SHEATHED COPPER PIPES**

Be of "clip-on" type preformed polyethylene sheaths to BS 3412 or of equivalent quality in accordance with manufacturer's recommendation. Thickness of sheaths shall not be less than that in straight pipes and suitable for use up to 80°C.

PLU1.M150.7**BRAZING ALLOYS FOR COPPER AND COPPER ALLOY CAPILLARY FITTINGS**

1. Comply with Table 6 Section VI of BS EN 1254-1 with 2% nominal silver content;
2. Use cadmium-free category brazing alloy;
3. Do not use flux when brazing copper-to-copper joints;
4. Brazing filler material to BS EN ISO 17672 shall be used;
5. For joints other than copper to copper, use only a flux that is recommended by the brazing alloy manufacturer; or use a suitable type adaptor subject to the Contract Manager's approval.

PLU1.M160.7**SOLDERING ALLOYS FOR COPPER AND COPPER ALLOY CAPILLARY FITTINGS**

1. Comply with BS EN 1254-1, Table 6 Sections II & III;
2. Use of integral solder fittings is permitted provided they comply with BS EN 1254-1;
3. Use only lead-free category solders;
4. Use only a non-corrosive type of flux that is recommended by the solder alloy manufacturer.

PLU1.M170.7**DUCTILE IRON PIPES AND FITTINGS**

1. Ductile iron pipes: comply with BS EN 545;
2. Ductile iron pipe fittings: comply with BS EN 545;
3. Be coated with metallic zinc and bitumen finishing externally to BS EN 545 and lined with cement mortar internally, or be coated with metallic zinc and epoxy externally and lined with cement mortar and epoxy internally. Epoxy coating shall be complied with BS EN 14901. Adoption of epoxy coating shall be subject to the Contract Manager approval;

4. The minimum wall thickness of pipes and fittings shall comply with the following table:

Nominal size DN	Flexible push-on type connection (mm)	Screwed flange and integral flange connection (mm)
80	6.0	7.0
100	6.1	7.2
150	6.3	7.8
200	6.4	8.4
250	6.8	9.0
300	7.2	9.6

5. Slip on flange adaptors:
- Be provided at check meters positions;
 - Be designed and manufactured to suit the pipework installation. The flanges shall comply with BS EN 1092-2 PN 16 or PN 25 as appropriate;
 - Be made of ductile iron to BS EN 545 and shall be coated with epoxy externally and internally comply with BS EN 14901;
 - Stud bolts and nuts of the flange adaptors shall be made of stainless steel to BS EN 10088-3 Grade 1.4401;
 - Gaskets shall be made of Ethylene Propylene Diene Monomer (EPDM) If used for fresh water and fire services water, it shall comply with BS 6920;
 - Be equipped with guide rod assembly to prevent damage from excessive movement. The assembly shall consist of guide rod plates, at least three guide rods each of minimum 16mm diameter and washers all made of stainless steel at least to BS EN 10088-3 Grade 1.4401 on both sides, and shall be fitted with resilient neoprene sleeves, resilient neoprene washers on at least one side of the assembly for isolating vibration transmission;

PLU1.M180.7**GALVANIZED STEEL PIPES AND FITTINGS**

- Galvanised steel pipes: comply with BS EN 10255 with screwing to BS EN 10226-1 and of medium grade for above ground installation and of heavy grade for below ground installation unless otherwise specified or shown on the drawings;
- Pipe fittings: galvanised malleable cast iron to BS 143 and 1256 or BS EN 10242; Or galvanised wrought steel pipe fittings (screwed BS 21 R series thread) to BS EN 10241;
- Mechanical couplings and fitting shall be as follows:
 - As an alternative to flanged and screwed joints, grooved end mechanical couplings may be employed subject to the approvals of the Contract Manager,

- b. Mechanical couplings shall be hot dip galvanized, self-centering, engaged and locked in place onto the grooved or shouldered pipe and pipe fitting ends. The result shall be in a positive watertight couple providing some allowance for angular pipe deflection, contraction and expansion. Coupling housing clamps shall consist of two or more malleable iron castings or rolled steel or ductile iron segment holdings with a composition water sealing gasket so designed that the internal water pressure increases in the water tightness of the seal. Sealing gasket shall be selected for the service and working temperature according to the manufacturer's recommendations. The coupling assembly shall be securely held together by two or more zinc plated track head square or oval-neck heat-treated carbon steel bolts and nuts. All pipe fittings connected to mechanical pipe couplings shall have groove and shouldered ends. Flanged or threaded end valves may be used with grooved adapters;
- c. Coupling housing material of mechanical couplings shall be as follows:
 - i. Ductile iron shall be to ASTM A536 or to BS EN 545 or BS EN 1563;
 - ii. Rolled steel shall be to BS EN 10162.
- d. Rubber gaskets shall be complied to the following standards:
 - i. Hardness: ASTM D2240;
 - ii. Tensile testing: ASTM D412;
 - iii. Compression: ASTM D395;
 - iv. Heat aging: ASTM D573.

PLU1.M190.7**STAINLESS STEEL PIPES**

1. All stainless steel pipes and fittings shall be approved by Water Regulations Advisory Scheme (WRAS) UK and the Water Authority as suitable for use locally in conformity with the Waterworks Ordinance and Regulations for the intended application and shall be of standard products supplied by ISO 9001 accredited manufacturers;
2. All pipes, including fasteners, shall be of stainless steel to BS EN 10088-1 Grade 1.4301;
3. Stainless steel pipes with nominal outside diameter up to and including 54mm shall be suitable for use with stainless steel non-welding type fittings, pickled and supplied in solution annealed condition to BS EN 10312, Series 2;
4. Stainless steel pipes with nominal outside diameter above 54mm to BS EN 10217-7 or BS EN 10312 Series 2, suitable for use with stainless steel non-welding type fittings supplied in the solution-annealed condition or pickled. For stainless steel pipes to BS EN 10217-7, the dimensions, wall thickness, tolerances and conventional masses per unit length of pipes shall be to BS EN ISO 1127 with minimum wall thickness as below:

Nominal size (mm)	Outside diameter (mm)	Minimum wall thickness (mm)
65	76.1	2.6
80	88.9	2.6
100	114.3	2.6
150	168.3	3.0

5. Submit sample of the pipes for the Contract Manager's approval prior to placing orders. Samples submitted for approval shall be accompanied by test reports of those test methods required in the relevant standards.

6. Provide test specimens from the materials delivered to site and carry out testing on dimension and chemical composition in accordance with the relevant BS by an Approved Accredited Laboratory as required by PRE.B9.570. Rate of sampling to be one pipe per batch (regardless of size) delivered to site unless otherwise specified; one batch being the material quantity covered under each delivery note.
 - a. In the event that the sample fails to meet the testing requirements, follow either one of the following actions:
 - i. Remove the batch off Site; or
 - ii. Carry out re-test for the batch in accordance with the testing methods as specified on three separate samples (regardless of size) selected by the Contract Manager from the batch. In case of any one sample fails the re-test, remove the batch off Site
 - b. When the batch is removed off Site, replace with another new batch and carry out test for one sample (regardless of size) selected by the Contract Manager from the replacing batch. In case of such test fails, follow action stated in sub-clause (6)(a);
 - c. Bear all associated costs for the test and re-test required.
7. Submit the supplier's original delivery note/invoice and mill certificates for all pipes before installation on site and shall include the following information on the items delivered:
 - a. Manufacturer's name, the date and place of manufacture;
 - b. Type, description and dimensions;
 - c. Heat number of pipes;
 - d. Quantities of items delivered;
 - e. The grade and compositions of stainless steel pipes and international standard complied with;
 - f. Results of tests;
 - g. Pickling and surface treatment processed.

PLU1.M191.7**STAINLESS STEEL PIPE FITTINGS**

1. All stainless steel pipe fittings, including fasteners, shall be of stainless steel to BS EN 10088-1 Grade 1.4301;
2. Stainless steel pipe fittings shall be tested in compliance with the pull out test requirement specified in BS EN 1254-2, (Clause 5.5 Resistance to pull out) or equivalent standard. Test report issued by laboratories that comply with PRE.B9.570 shall be submitted;
3. For all stainless steel non-welding type fittings, it shall be manufactured by loss wax investment casting or by stamping mould and welding, pickled and 100% inspected by hydrostatic testing. The minimum system working pressure and temperature of the fittings and pipe system shall be 20 bar and 80°C respectively;
4. All sealing gaskets shall be silicone rubber to BS 6920 and O-rings shall be of nitrile rubber (NBR) or Ethylene Propylene Diene Monomer (EPDM);
5. All stainless steel fasteners, including bolts, screws, studs and nuts, shall be to BS EN ISO 3506-1 & 2 unless otherwise specified and shall be assembled to manufacturer's recommendations;
6. Use dielectric fittings or epoxy coated flange with gasket for connecting stainless steel pipe to pipes and fittings made of other metals in order to prevent direct contact with different metals;

7. Submit sample of the pipe fittings for the Contract Manager's approval prior to placing orders. Samples submitted for approval shall be accompanied by test reports of those test methods required in the relevant standards;
8. Provide test specimens from the materials delivered to site and carry out testing on dimension and chemical composition in accordance with the relevant BS by an Approved Accredited Laboratory as required by **PRE.B9.570**. Rate of sampling to be one pipe fitting per batch (regardless of size and type) delivered to site unless otherwise specified; one batch being the material quantity covered under each delivery note.
 - a. In the event that the sample fails to meet the testing requirements, follow either one of the following actions:
 - i. Remove the batch off Site; or
 - ii. Carry out re-test for the batch in accordance with the testing methods as specified on three separate samples (regardless of size and type) selected by the Contract Manager from the batch. In case of any one sample fails the re-test, remove the batch off Site
 - b. When the batch is removed off Site, replace with another new batch and carry out test for one sample (regardless of size and type) selected by the Contract Manager from the replacing batch. In case of such test fails, follow action stated in sub-clause (9)(a);
 - c. Bear all associated costs for the test and re-test required.
9. Submit the supplier's original delivery note/invoice and mill certificates for all pipe fittings before installation on site and shall include the following information on the items delivered:
 - a. Manufacturer's name, the date and place of manufacture;
 - b. Type, description and dimensions;
 - c. Heat number of pipe fittings;
 - d. Quantities of items delivered;
 - e. The grade and compositions of stainless steel pipe fittings and international standard complied with;
 - f. Results of tests;
 - g. Pickling and surface treatment processed.

PLU1.M200.7**UNPLASTICIZED PVC (UPVC) PIPES AND FITTINGS**

1. Pipes: comply with BS 3505, Class D or Class E or BS EN ISO1452-2 series S8 or higher to suit system working pressure and as shown on the Drawings;
2. Fittings: comply with BS 4346-1 in conjunction with BS EN ISO 1452-3 or BS 4346-2 in conjunction with BS EN ISO 1452-3;
3. Colour: white unless approved by the Contract Manager;
4. Jointing compound: be of a type recommended by the manufacturer of the pipes and fittings.

PLU1.M210.7**STAINLESS STEEL TYPE EXPANSION JOINTS**

Use for fresh and fire services water pipeworks passing through building expansion joints where shown on the Drawings and comply with the following requirements:

1. Be of axial pattern bellows type and able to withstand designed / allowable horizontal and vertical movement;
2. Be screwed ends to BS 21 in conjunction with BS EN 10226-1 or flanged ends to BS EN 1092-1 as appropriate to facilitate replacement;

3. Be manufactured from stainless steel of BS EN 10088-1 Grade 1.4301 or equivalent standard, or other Approved material appropriate to the system;
4. Be designed to withstand the test pressure of the system and maximum static pressure that may arise upon failure of the associated pressure reducing devices. Testing pressure of the expansion joints shall be not less than 1.5 times of the system working pressure involved.
5. Be equipped with guide rod assembly to prevent damage from excessive movement. The assembly shall consist of guide rod plates, guide rods and steel washers on both sides, and shall be fitted with resilient neoprene sleeves, resilient neoprene washers on at least one side of the assembly for isolating vibration transmission;
6. Be the type accepted by the Water Authority and FSD. For sprinkler system, the expansion joints shall be installed and provided to comply the design requirement of LPC Sprinkler Rules.
7. Submissions:
 - a. Submit type hydraulic test certificates/reports issued by laboratories that comply with **PRE.B9.570**;
 - b. Submit for Approval the installation length, material, rated movement (axial extension, axial compression, lateral deflection, angular rotation, or any combination thereof) and pressure ratings upon the Contract Manager's request.
 - c. Submit details of anchors and guides installation in accordance with the recommendations of the expansion joint manufacturer for approval before manufacturing commences.

PLU1.M220.7**STAINLESS STEEL FLEXIBLE CONNECTORS**

1. Use for fresh water pipeworks at pump room and other locations for pipeline vibration elimination where shown on the Drawings:
 - a. Be of omega-shape, close pitch annular corrugation, and fabricated from stainless steel plates/sheets/strips;
 - b. Be able to sustain a system working pressure compatible with the pipework with which the connectors are connected. Unless otherwise specified, the system working pressure shall not be less than 16 bar, a minimum test pressure of 1.5 times of the system working pressure and a minimum burst pressure of 40 bar;
 - c. Include a bellow which shall be non-toxic, corrosion and abrasion resistant and complete with braiding. Should the convolution of the bellow not be gradually formed by continuous rolling in shape, appropriate heat treatment should be conducted to release the internal stress imposed on the bellow during the forming process;
 - d. Be of sufficient length for absorption of offset motion and effective isolation of vibration. The total stress on bellow due to internal pressure, offset motion and vibration shall not exceed the design endurance limit. Unless otherwise specified, the minimum rated lateral movement shall be as tabulated below:

Nominal bore of braided bellow	Minimum rated lateral movement
Up to 100 mm diameter	4 mm offset motion plus ±1 mm vibration
Above 100 mm diameter	6 mm offset motion plus ±1 mm vibration

- e. Be comprised of the following component materials unless otherwise specified, and inert gas arc welding shall be used for the termination of bellow and braiding at the tube ends:

- i. Bellow: austenitic chromium nickel or austenitic chromium nickel molybdenum stainless steel sheet to BS 1449-2 or BS EN 10029 or BS EN ISO 9445-2 or BS EN 10048 or BS EN 10051 or BS EN 10095;
 - ii. Braiding: stainless steel wires or plates;
 - iii. Flange: corrosion resistant carbon steel.
 - f. Have any part which is in contact with the water of the same material as the bellow;
 - g. Unless otherwise specified, be of flanged end connection. Flanges shall comply with BS EN 1092-1;
 - h. Have identification markings for the brand name, model number, bellow material, braiding material, system working pressure and bellow nominal diameter;
 - i. Be equipped with guide rod assembly to prevent damage from excessive movement. The assembly shall consist of guide rod plates, guide rods and steel washers, and shall be fitted with resilient neoprene sleeves and resilient neoprene washers on at least one side of the assembly for isolating vibration transmission.
2. Submissions:
- a. Submit type hydraulic test certificates/reports issued by laboratories that comply with PRE.B9.570 to the Contract Manager;
 - b. Submit for Approval the installation length, material, rated movement (axial extension, axial compression, lateral deflection, angular rotation, or any combination thereof) and pressure ratings upon the Contract Manager's request.

PLU1.M230.7**RUBBER FLEXIBLE CONNECTORS/EXPANSION JOINTS**

1. Use rubber flexible connectors for flush water and fire services water pipeworks at pump rooms and other locations for pipeline vibration elimination and use rubber expansion joints for flush water pipeworks passing through building expansion joints where shown on the Drawings and comply with the following requirements:
 - a. Be of double or multiple arch/sphere type;
 - b. Be able to sustain a system working pressure compatible with the pipework with which the connectors are connected. Unless otherwise specified, the system working pressure shall not be less than 16 bar, with a minimum test pressure of 1.5 times of the system working pressure and a minimum burst pressure of 55 bar;
 - c. Be non-toxic, corrosion and abrasion resistant and of sufficient length for effective isolation of vibration;
 - d. Be fitted with corrosion resistant steel or ductile iron floating flanges to BS EN 1092-1 or 2;
 - e. Include a flexible tube made of multiple layers of high tensile fabric reinforcement with EPDM, neoprene or synthetic rubber cover and liner. Tube end shall be of locked bead construction with steel wire bead ring and raised face;
 - f. Be equipped with guide rod assembly to prevent damage from excessive movement. The assembly shall consist of guide rod plates, guide rods and steel washers, and shall be fitted with resilient neoprene sleeves and resilient neoprene washers on at least one side of the assembly for isolating vibration transmission.
2. Submissions:

- a. Submit type hydraulic test certificates/reports issued by laboratories that comply with **PRE.B9.570**;
- b. Submit for Approval the installation length, material, rated movement (axial extension, axial compression, lateral deflection, angular rotation, or any combination thereof) and pressure ratings upon the Contract Manager's request.

PLU1.M240.7**CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPES AND FITTINGS**

1. Pipes: comply with ASTM F441/F441M (Schedules 40 or 80);
2. Fittings: comply with ASTM F438 (Schedule 40 socket) and ASTM F437 (Schedule 80 threaded) or ASTM F439 (Schedule 80 socket) for pipe fittings;
3. System: comply with ASTM D2846;
4. Colour: white unless approved by the Contract Manager;
5. Jointing compound: all socket type joints shall be made up employing appropriate primers and solvent cement that comply with ASTM F656 and ASTM F493 respectively;
6. Provide pipe markings for Schedule 40 or 80 pipe in accordance with ASTM F441/F441M including the manufacturer name (or trade mark), the nominal pipe size, the material designation, the pipe schedule and the pressure rating;
7. Outdoor CPVC pipe and fittings shall be protected from ultraviolet attack by ultraviolet resistant paint or other effective means as recommended by the manufacturer;
8. Bending to CPVC pipe of diameter exceeding 25 mm is not allowed. Where there is site restriction and subject to the Contract Manager's approval, bending to CPVC pipe of diameter equal to or less than 25mm may be carried out only in strict accordance with manufacturer's instructions;
9. Mock-up or demonstration of CPVC pipe installation shall be carried out on the Site for the Contract Manager's inspection and approval prior to the commencement of installation works.

FLANGES**PLU1.M310.7****FLANGES**

Conform to BS EN 1092-1, 2 and 3 PN16 or PN25 to suit the pressure rating of the system.

PLU1.M320.7**PUDDLE FLANGES**

1. Unless otherwise specified or Approved, the following pipe connections and all accessories for setting into the tanks shall be provided:

Pipe Connection	Connection Fittings		
	Fresh water tank, Fire Services water tank, Rainwater collection tank and Rainwater mixing tank		Flush water tank
	Pipe dia. less than 65 mm	Pipe dia. from 80 mm and above	
a. Tank inlet	Puddle Flange made of Brass or Gunmetal or Stainless Steel to BS EN 10088-1 Grade 1.4301 and flange end connection to BS EN 1092-3 and BS EN	Puddle Flange made of Spheroidal graphite cast iron (ductile iron) to BS EN 545 or Gunmetal or Stainless Steel to BS EN 10088-1 Grade 1.4301 and flange end connection to BS	Puddle Flange made of Spheroidal graphite cast iron (ductile iron) to BS EN 545 or Gunmetal or Stainless Steel to BS EN 10088-1 Grade 1.4401 and flange end
b. Tank outlet			

c. Drain	1092-1 respectively	EN 1092-2 and BS EN 1092-1 respectively.	connection to BS EN 1092-2 and BS EN 1092-1 respectively.
d. Overflow	UPVC pipes to BS 3505 Class D or Class E or BS EN ISO 1452-2 Series 8		UPVC pipes to BS 3505 Class D or Class E or BS EN ISO 1452-2 Series 8
e. Sleeves for level controllers			
f. Air vent			
g. Bell mouth perforated dropper	Stainless Steel Pipes to BS EN 10088-1 Grade 1.4301		

PIPE BRACKETS AND SLEEVES

PLU1.M410.7

PIPE BRACKETS

1. Be of sufficient strength to take the load with no noticeable deflection with clips detachable without disturbing the fixing;
2. Be of stainless steel at least to BS EN 10088-3 Grade 1.4301 unless otherwise specified;
3. Be welded to stainless steel rods/ angles and lined with plastic which fitted between the pipe and the bracket;
4. Bolts, nuts and washers of the pipe brackets: stainless steel at least to BS EN 10088-3 Grade 1.4301;
5. Pattern, type and fixing ends/anchors of the pipe brackets: suitable for mounting onto the surface to which they are fixed;
6. Submit sample of the pipe brackets and anchors for the Contract Manager's approval prior to installation.

PLU1.M420.7

PIPE BRACKET WITH VIBRATION ISOLATOR

1. Vibration isolator:
 - a. Unless otherwise specified or approved by the Contract Manager, vibration isolator shall contain a steel spring with minimum 8mm pad of neoprene in series and enclosed in hanger box. The neoprene element shall be moulded with a rod isolation bushing that passes through the isolator hanger box. Spring diameter and isolator hanger box hole sizes shall be large enough to permit the hanger rod to swing through a 30 degrees arc before contacting the edge of the hole and short-circuiting the spring. The minimum static deflection of the spring shall be 20 mm;
 - b. Select vibration isolator in accordance with manufacturer's recommendations and taking into account the weight distribution of the pipework, pipe anchor points, guide etc. so as to produce uniform deflections and to ensure that the vibration and noise generated from associated pipework would be isolated and would not be transmitted to other parts of the building, in particular, to avoid causing nuisance to the tenants of the domestic flats;
 - c. Be responsible for and submit calculation to verify the correctness of selection and overall suitability of every vibration isolator as shown in the Drawings or specified in clause **PLU1.W310** (3).
2. Pipe bracket:

Details of the pipe bracket to be in accordance with **PLU1.M410** wherever applicable;
3. Connection between vibration isolator and pipe bracket:

Secure the pipe bracket firmly to the vibration isolator in accordance with manufacturer's recommendations.

PLU1.M430.7**PIPE SLEEVES**

1. Diameter of pipe sleeves: as shown on the Drawings, otherwise at least one size larger than the pipe that passes through;
2. Except for pipes as given in sub-clause (3) below:
 - a. For pipes passing through walls, slabs etc. which separate different fire compartments, use sleeves of galvanized steel to BS EN 10255 medium grade for pipe diameter below 150mm and carbon steel to BS EN 10217-1 for pipe diameter up to and above 150 mm . Pre-fabricated sleeves of hot dipped galvanized steel to BS EN 10346 can be used for pipe diameter up to and above 150mm subject to the Contract Manager's approval;
 - b. For pipes passing through walls, slabs etc. within the same fire compartment, use sleeves of UPVC pipe to BS 3505 or BS EN ISO 1452-2;
 - c. Where UPVC pipe passes through fire rated walls and floor slabs, provide an Approved type fire collar to BS 476-20 with equal or higher fire resistant rating than that of the walls and slabs;
3. For pipes passing through external basement walls where there is ground water pressure, use gunmetal or stainless steel to BS EN 10088-1 Grade 1.4301 or spheroidal graphite cast iron (ductile iron) to BS EN 545 puddle sleeves cast in basement wall for pipe connection.

STRAINERS**PLU1.M510.7****STRAINERS**

1. Be of Y-type or U-type (Bucket/Basket type) as shown on the Drawings with minimum free flow area ratio of 2 and the maximum aperture size to be of diameter 1.5mm for strainers of nominal size 100mm or below and of diameter 3.0mm for strainers of nominal size 150mm or above, unless otherwise specified;
2. Have the same nominal sizes as the pipes in which they are connected and shall be suitable for both working and test pressures of the pipework in which they are installed;
3. Be constructed of materials suitable for the required working and test pressures and temperature of the fluid carried with the minimum standards as indicated below:
 - a. For nominal sizes up to and including 65mm (fresh water and fire services water application):
 - i. Body & cover: bronze to BS EN 1982 CuSn5Zn5Pb5 or CB491K or CC491K;
 - ii. Screen: stainless steel to BS EN 10088-1 Grade 1.4401.
 - b. For nominal sizes up to and including 65mm (flush water application):
 - i. Body & cover: stainless steel to BS EN 10088-1 Grade 1.4401;
 - ii. Screen: Stainless steel to BS EN 10088-1 Grade 1.4401.
 - c. For nominal sizes above 65 mm (fresh water, fire services and flush water application):
 - i. Body & cover: grey cast iron to BS EN 1561 EN-GJL-250, or spheroidal graphite cast iron (ductile iron) to BS EN 1563 EN-GJS-400-15;
 - ii. Screen: stainless steel to BS EN 10088-1 Grade 1.4401;
 - iii. Drain plug: malleable iron;

- iv. Stud and Nut: stainless steel to BS EN 10088-1 Grade 1.4401;
 - v. Grey cast iron components shall be coated with an epoxy based material as specified in **PLU1.M610**.
4. All bronze type strainers shall be of screwed female end connection to BS 21 in conjunction with BS EN 10226-1 and all grey cast iron type strainers shall be of flanged end connection to BS EN 1092-2;
 5. U-type strainer shall be equipped with quick release cover composed of clamper and hand nuts which shall be so designed that the basket can be taken out for cleaning without using tools. Appropriate safety mechanism shall be incorporated in the quick release cover;
 6. Submit test certificates/reports issued by laboratories that comply with **PRE.B9.570** confirming that the strainers have been tested in conformity with this Specification.

VALVES

PLU1.M610.7

GENERAL

1. Be designed and constructed of materials suitable for both the working and test pressure of the pipework in which they are installed and the temperature of the fluid carried. Be capable of withstanding system working pressure and maximum static pressure that may arise upon failure of the associated pressure reducing devices. Unless otherwise specified, all valves shall have a system working pressure of not less than 16 bar;
2. Comply with the following standards:

Size Valve	For nominal sizes up to and including 65mm	For nominal sizes above 65 mm	
		Standard of valve	Grading
Gate valves	Copper alloy to BS EN 12288	Cast iron to BS 5163-1 in conjunction with BS EN 1074-1 and 2	Grey cast iron to BS EN 1561 EN-GJL-250 Spheroidal graphite cast iron (ductile iron) to BS EN 1563 EN-GJS-400-15
Non-return valves	Copper alloy to BS 5154	Cast iron to BS EN 12334	Grey cast iron to BS EN 1561 EN-GJL-250 Spheroidal graphite cast iron (ductile iron) to BS EN 1563 EN-GJS-400-15
Globe valves	Copper alloy to BS 5154	Cast iron to BS EN 13789	Grey cast iron to BS EN 1561 EN-GJL-250 Spheroidal graphite cast iron (ductile iron) to BS EN 1563 EN-GJS-400-15
Ball valves	UPVC	Comply with PLU1.M660	N/A

3. Be pressure tested in accordance with the relevant British Standards/European Standards or international/national standards by the valve manufacturer before leaving the factory. Valves of the same type shall be from the same manufacturer;
4. Be of the type approved by the Water Authority. Submit type test certificates/reports issued by laboratories that comply with **PRE.B9.570** confirming that the valves have been tested in conformity with this Specification. Provide the following type test certificates/reports upon the Contract Manager's request, wherever appropriate:
 - a. Test certificates for valves in compliance with the standards quoted in sub-clause (2) above;
 - b. Test certificates on composition analysis, chemical, physical and mechanical properties of the metallic materials for valves;

- c. Test certificates for resilient seating material and epoxy coating showing compliance with the physical property and thickness requirements of this Specification;
 - d. In case of valves in fresh and fire services water application, test certificates issued by Water Research Centre of UK or an equivalent organization for non-metallic materials of resilient seating and epoxy coating, showing compliance with the full tests of effect on water quality to BS 6920 and suitable for fresh and fire services water usage.
5. Be of the same nominal size as the pipe in which they are installed except those for flow or pressure control such as modulating float valves or pressure reducing valves as shown on the Drawings;
 6. Manually operated valves shall be closed by turning the handwheel in a clockwise direction when facing the handwheel. The handwheel shall be made of malleable iron or of composition having metal insert for securing positively to the stem;
 7. Be located, as far as practicable, at convenient positions of operation from the floor unless otherwise specified or approved by the Contract Manager;
 8. All valves shall be provided with an indicator to show the open and shut position;
 9. Valves and cocks for installation in screwed joined pipework shall have taper screwed ends. Flanges of flanged valves shall be BS EN 1092-2 for PN16 rating or otherwise specified.;
 10. All copper alloy valves shall be of screw female end connection to BS 21 in conjunction with BS EN 10226-1 and all grey cast iron and spheroidal graphite cast iron (ductile iron) valves shall be of the flanged end connections to BS EN 1092-2 and their bolts and nuts shall be to BS EN 1515-1;
 11. Grey cast iron and spheroidal graphite cast iron (ductile iron) parts of all valves shall be coated with an epoxy based material both on internal and external surfaces. The following minimum thickness of epoxy coating shall apply:

	Electrostatically Fusion Powder Coated (µm)	Airless Sprayed Application (µm)
i. Flat and pressurised parts	250	400
ii. Convex outer edges	150	300
 12. Be robust and capable of withstanding hard water.

PLU1.M620.7**VALVES FOR FRESH AND FIRE SERVICES APPLICATION**

Be constructed to the following minimum standards, wherever applicable:

1. For nominal sizes up to and including 65mm:
 - a. Body, bonnet and disc: bronze to BS EN 1982 CuSn5Zn5Pb5 or CB491K or CC491K;
 - b. Stem: brass to high tensile brass to BS EN 12163.
2. For nominal sizes above 65mm:
 - a. Body and bonnet: grey cast iron to BS EN 1561 EN-GJL-250, or spheroidal graphite cast iron (ductile iron) to BS EN 1563 EN-GJS-400-15;
 - b. Disc or seat:
 - i. Solid or trimmed with bronze to BS EN 1982 CuSn5Zn5Pb5 or CB491K or CC491K;

- ii. Resilient material to BS EN 681-1, Type WA, Hardness Category "70" with nominal thickness of minimum 1.5mm on the non-seating areas and 4.0mm on the seating areas, and in case for fresh and fire services water application, showing compliance with full tests of effect on water quality to BS 6920.
- c. Stem:
 - i. For underground application or gate valve installed in fresh water or street fire hydrant system, stainless steel to BS EN 10088-3 Grade 1.4057;
 - ii. For applications other than that mentioned in sub-clause (2)(c)(i) above, brass to high tensile brass to BS EN 12163 or stainless steel to BS EN 10088-3 Grade 1.4301, 1.4401, 1.4006, 1.4005, 1.4021 or 1.4057.

PLU1.M630.7**VALVES FOR FLUSH WATER APPLICATIONS**

Be constructed to the following minimum standards, wherever applicable:

1. For nominal sizes up to and including 65 mm: use UPVC ball valves
2. For nominal sizes 65 mm and above:
 - a. Body and bonnet: grey cast iron to BS EN 1561 EN-GJL-250, or spheroidal graphite cast iron (ductile iron) to BS EN 1563 EN-GJS-400-15;
 - b. Disc or seat:
 - i. Solid or trimmed with zinc free bronze to BS EN 1982 CuSn10 or trimmed with austenitic chromium nickel stainless steel or austenitic chromium nickel molybdenum stainless steel to BS EN 10283 Grade 1.4308 or 1.4408;
 - ii. Resilient material to BS EN 681-1, Type WA, Hardness Category "70" with nominal thickness of minimum 1.5 mm on the non-seating areas and 4.0mm on the seating areas.
 - c. Stem: stainless steel to BS EN 10088-3 Grade 1.4301 or 1.4401 or 1.4057.

PLU1.M640.7**NON-RETURN VALVES**

1. Be of hinged swing or recoil type suitable for horizontal installations and spring type shall be of globe or wafer type, suitable for both vertical and horizontal installations unless otherwise specified or indicated on Drawings. Hinge pins and springs shall be of stainless steel;
2. Be of spring type or recoil type, unless otherwise approved by the Contract Manager, if the non-return valve is installed at pump discharge or with a water head exceeding 15 m to ensure silent shut-off operation;
3. Bronze swing non-return valves shall have screwed type cap and cast iron swing non-return valves shall have the cap and body bolted together to ensure a strong, tight closure;
4. Be designed to close before reversal of flow starts;
5. Recoil or spring type non-return valves shall have a flow area not less than the cross-sectional area of the connected pipework and shall be non-slam in operations;
6. Wafer type spring non-return valves will be acceptable, provided the body ends are capable of matching connecting flanges complying with the requirements of BS EN 1092-1, -2 and -3.

PLU1.M650.7**GATE AND GLOBE VALVES**

1. Types:

- a. Gate valves: full way solid or split wedge disc type with rising or non-rising stem;
 - b. Globe valves: straight globe type with rising stem;
2. Provided with an indicator to show the open and shut position at critical locations for cast iron valves as shown on Drawings;
3. For copper alloy type valves, the bonnet shall be of the screwed type with ample threads to ensure positive sealing to the body;
4. For grey cast iron and spheroidal graphite cast iron (ductile iron) type valve, the body and bonnet shall be bolted together and the disc shall be guided;
5. The gland shall be fitted with non-asbestos packing and shall be bolted for grey cast iron and spheroidal graphite cast iron (ductile iron) valves;

PLU1.M660.7**BALL VALVES**

Use UPVC type ball valves which comply with the following:

1. Valve components:
 - a. UPVC;
 - b. Ball center-pivoted, smooth and spherical with a circular orifice, and seated on resilient seating suitable for tight shut off;
 - c. Stem one-piece with O-ring made of Ethylene Propylene Diene Monomer (EPDM) for positive sealing of the body.
2. Valve operation:
 - a. By wrench turned in a clockwise direction to close when facing the wrench;
 - b. At fully open position of valve, wrench to be mounted parallel to the flow of passage through the ball;
 - c. Wrench to fully close valve at a quarter turn;
 - d. Provide suitable stops for both fully open and fully closed positions of valve.
3. Valve end connections and pressure standards:
 - a. Socket or union suitable for directly connecting the pipe to which it is installed;
 - b. Suitable for both the working and test pressure of the pipework in which it is installed with system working pressure of at least 10 bar at 35°C unless otherwise specified. Be capable of withstanding system working pressure and maximum static pressure that may arise upon failure of the associated pressure reducing devices;
 - c. Testing Method to BS 1010-2.
4. Test certificate/report
 - a. Submit type test certificates/reports issued by laboratories that comply with **PRE.B9.570** confirming that the valves have been tested in conformity with sub-clause 3(c).

PLU1.M680.7**DRAW OFF TAPS AND STOP VALVES**

Comply with BS 1010-2, unless otherwise specified or approved by the Contract Manager. Be of screw down type, easy-clean pattern body surface, stop valves shall be with chromium plated unless otherwise approved by the Contract Manager. Submit sample for Approval prior to installation;

PLU1.M690.7**BALL FLOAT VALVES FOR FLUSHING TANKS**

Be of diaphragm type, plastic body to BS 1212-3 with rubber or plastic diaphragm, unless otherwise approved by the Contract Manager and be suitable for high, medium or low pressure as required. Be suitably coated to prevent corrosion on metal parts. Submit valve sample for Approval prior to installation.

FIXED RATIO TYPE PRESSURE REDUCING VALVE**PLU1.M910.7****PERFORMANCE REQUIREMENTS**

1. Comply with the following requirements:
 - a. Able to maintain the outlet pressure as a fixed ratio of the inlet pressure, independent of the magnitude of the inlet pressure and the water flow across the valve;
 - b. Of a size and pressure ratio as specified on the Drawings;
 - c. With an operating pressure range suitable for the particular application and a rated system working pressure not less than 16 bar;
2. Submit details of the pressure reduction against flow rate and inlet pressure performance curve and submit test certificates/reports issued by laboratories that comply with **PRE.B9.570** confirming that the valve has been tested in accordance with the requirements of this Specification.

PLU1.M920.7**VALVE CONSTRUCTION**

Be of gunmetal body to BS EN 1982 CuSn5Zn5Pb5 (CC491K) for fresh and flush water or stainless steel body to BS EN 10283 Grade 1.4308 for fresh water and to BS EN 10283 Grade 1.4408 for flush water:

1. Have a piston of straight through design, constructed of stainless steel at least to BS EN 10088-3 Grade 1.4301 for fresh water and BS EN 10088-3 Grade 1.4401 for flush water unless otherwise approved by the Contract Manager;
2. With seats and O-ring seals of high grade synthetic rubber;
3. Be provided with an arrow on the exterior to indicate the direction of flow;
4. Valves of nominal sizes up to and including 50mm shall be of the screwed female end connection to BS 21 in conjunction with BS EN 10226-1. Valves of nominal sizes above 50mm shall be of the flanged end connection to BS EN 1092-1 and -2 and their bolts and nuts shall be to BS EN 1515-1.

CISTERNS AND TANKS**PLU1.M1110.7****GENERAL**

1. For fresh water system, be made of non-toxic materials and approved by the Water Authority;
2. The cisterns and tanks shall be provided with safety access to the roof of the tank and railings on the roof of the tank as shown on the Drawings for maintenance and cleansing.

PLU1.M1120.7 STAINLESS STEEL CISTERNS, FIBRE GLASS WATER TANKS, COVERS, TANKS AND CYLINDERS

1. For capacity equal to 1000 litres and below, be made of stainless steel to BS EN 10088-3 Grade 1.4301 for fresh water, fire services water and rainwater harvesting systems or to BS EN 10088-3 Grade 1.4401 for flush water system or be made of fibreglass reinforced plastic with minimum 3 mm thickness for fresh water, fire services water, flush water and rainwater harvesting systems;
2. For capacity above 1000 litres, be made of fibreglass reinforced plastic, manufactured to BS EN 13923;
- 3 Flat bottom and a top cover with suitable reinforcing and bracing;
- 4 Be non-insulated with no external bracings, ribs, hoops or supporting wires required;
5. Structure calculation shall be submitted if the capacity of fibre glass water tank exceeds 5000 litres.

PLU1.M1130.7 CISTERN / TANK COVERS

1. For stainless steel water tanks, be fitted with stainless steel access covers and frames, the grading and thickness of stainless steel shall be the same as stainless steel water tanks.;
2. For concrete fresh water, fire services water and rainwater harvesting water tanks, be fitted with stainless steel double sealed access covers and frames, the grading of stainless steel shall be BS EN 10088-3 Grade 1.4301 and with minimum thickness of 3 mm;
3. For concrete flush water tanks, be fitted with stainless steel access covers and frames, the grading of stainless steel shall be to BS EN 10088-3 Grade 1.4401 and with minimum thickness of 3 mm;
4. For fibre glass water tanks, be fitted with fibre glass access covers, the thickness of fibre glass shall be the same as fibre glass water tanks.

STREET FIRE HYDRANTS**PLU1.M1210.7 PERFORMANCE REQUIREMENTS**

1. Be of pedestal type complying with the requirements of FSD;
2. Be of an accepted standard pattern with two 65 mm outlets and one 100 mm outlet;
3. Be capable of delivering not less than 2000 litres per minute (33.3 l/s) with a minimum running pressure of 170 kPa at the outlet when tested in accordance with the provision of BS 1042 with one 65 mm outlet working;
4. The minimum output as stated in sub-clause (3) above shall be made available from two 65 mm outlets of a system delivering at same time, i.e. a total output of not less than 4000 litres per minute (66.7 l/s) at 170 kPa;
5. The maximum pressure drop through the street fire hydrant shall not be greater than 380 kPa at a flow of 66.7 l/s with two 65 mm outlets delivering at the same time;
6. Be capable of withstanding a hydraulic pressure of 25 bar;
7. Should either flow or pressure performance as specified in sub-clause (3) or (4) above is found unsatisfactory in flow test resulting from the pressure drop across the street fire hydrant, the hydrant shall be replaced at no additional cost to the Contract.

PLU1.M1220.7 HYDRANT CONSTRUCTION

Be constructed of materials with the following minimum standards:

1. Hydrant body: ferrous casting to BS EN 1561 - Grey Cast-iron Castings, Grade EN-GJL-250 (5.1301) or BS EN 1563 spheroidal graphite cast iron (ductile iron) with a density of not less than 7200 kg/m³;
2. Caps: spheroidal graphite cast iron (ductile iron) casting to BS EN 1563 of Grade EN-GJS-450-10;
3. Inlet: 150mm PN16 flange to BS EN 1092-2;
4. Outlet pieces: bronze casting to BS EN 1982 for CuSn10Pb10-C (CC480K) with zinc content not exceeding 2 %; two 65 mm and one 100 mm male thread outlets to BS 336;
5. Screw for fixing outlet pieces: M20 stainless steel countersunk square head type to BS EN 10088-3 Grade 1.4301 with the square head being cut off after the tightening of the screws;
6. Rubber gaskets to BS EN 681-1:
 - a. 2 mm thick rubber insertion between the body and the outlet pieces; and
 - b. 6 mm thick rubber insertion between the outlet pieces and the caps.
7. Chains: stainless steel chains attaching the caps to the hydrant body to BS EN 10088-3 Grade 1.4301;
8. Internal protection: coating to BS EN 10300 Category 1, grade c or BS 3416 type 1;
9. Painting:
 - a. One coat primer of epoxy resin with aluminium mastic paint (of colour different from the undercoat);
 - b. One undercoat of epoxy resin paint of grey colour with a minimum total dry film thickness of 280 µm (including the coating thickness of item (a));
 - c. One finishing coat of epoxy resin paint of colour to suit FSD requirements.

PLU1.M1230.7 TEST CERTIFICATE

Submit test certificate / report for hydraulic pressure test, ferrous and non-ferrous castings, coatings and dimensions from laboratories that comply with **PRE.B9.570** confirming that the street fire hydrant has been tested conforming to this Specification.

WORKMANSHIP

GENERAL

PLU1.W010.7 SITE STORAGE

1. Prior to installation, store all materials properly in accordance with the manufacturer's instructions to afford maximum protection against weather, corrosion, mechanical damage and other causes;
2. Store all pipes with closed ends;
3. Store pipes and fittings under cover and clear of a levelled, well-drained and maintained hard-standing ground;
4. Remove all damaged materials from site immediately.

PLU1.W020.7 SITE CLEANLINESS

1. Clean all pipes and fittings before erection to remove all scale, burrs, furs, sand, slag etc.;
2. Maintain cleanliness throughout erection by covering the exposed ends of the pipework.

PLU1.W030.7 PIPEWORK INSTALLATION

Unless otherwise specified, carry out pipe joint installation in accordance with Section 6 of BS 6700.

PLU1.W040.7 PIPEWORK ROUTING

1. Co-ordinate the pipework installation with the work of other trades, services and structural beams and to allow for diversion of pipework to ascertain that the overall pipework is installed in a neat and tidy manner;
2. Cross-over of pipe to be kept minimum;
3. Avoid pipe runs above electrical installation as far as practicable;
4. Drawings supplied are diagrammatic and indicate only the approximate location and manner in which the pipework is to be installed.
5. Labeling system shall be provided on pipes inside pump rooms and at the lowest and highest locations of typical floors. Legibly marked with the black or white letters and arrows to indicate the type of service and direction of flow.

PLU1.W050.7 VENTING

1. Automatic air vents shall be provided as specified and at all high points of the system as shown on the Drawings;
2. Connections to the service pipes shall be made at the highest point to ensure complete venting. Automatic air vents shall be mounted so that the inlet connection is in an exact vertical plane. A lock shield valve shall be located between the service pipe and the automatic air vent;
3. Automatic air vents for water systems shall have bodies of brass, gunmetal or malleable iron, non-ferrous or stainless steel floats and guides, and noncorrodible valves and rubber seats. Connections to the pipework shall be via a screwed BSP (British Standard Parallel) or NPT (National Pipe Thread Tapered Thread) connection.

PLU1.W060.7**EASE OF DISMANTLING**

Unless otherwise Approved, do not embed pipes in concrete or grout in or install in such a way as to make alterations difficult at a later date.

PLU1.W070.7**BENDS AND OFFSETS OF COPPER PIPEWORK**

1. Bends and offsets of up to 90° can be formed in pipe sizes 15mm to 28mm provided they:
 - a. Have a minimum centre line radius of more than or equal to 3.5 times the pipe diameter;
 - b. Are only formed using tools specifically designed for that purpose, i.e. spring benders and formers;
 - c. Are free of deformation that may restrict water flow.
2. Bends and offsets of up to 30° and have a minimum centre line radius of more than or equal to 3.5 times the pipe diameter can be formed in pipe sizes less than or equal to 28mm by heat bending / annealing techniques without the need for bending tools;
3. Where building design permits, offsets shall be achieved using 45° in preference to 90° bends.
4. The installations location of bends and offsets for the above mentioned shall be subjected to the Contract Manager approval.

PLU1.W080.7**COPPER PIPEWORK REQUIRING POLYETHYLENE SHEATH**

1. Do not remove or damage the polyethylene sheath where bends are formed in copper pipes with factory applied polyethylene sheath;
2. Terminate factory applied polyethylene sheath at a consistent/uniform distance not more than twice the diameter of the pipe from the connecting copper fitting body.

PLU1.W090.7**UNDERGROUND PIPES**

Follow procedures and requirements specified in Worksection DRA2 for excavation of underground pipes directly in trench.

PLU1.W100.7**PIPES ON FLAT ROOFS AND CANOPIES**

Support pipes on flat roofs and canopies at least 150 mm above roof and canopy finish on concrete blocks with pipe clamps.

PLU1.W110.7**INSTALLATION CONTRACTOR AND ATTENDANCE FOR INSPECTION BY THE WATER AUTHORITY**

Carry out all plumbing installation works mentioned in this Specification and shown on the Drawings, including, if applicable, connection work to the water town mains by a contractor or licensed plumber as approved by the Water Authority. Submit all necessary applications and forms to the Water Authority and attend upon their representative for the purpose of tests and inspections for the plumbing installation.

PLU1.W120.7**REGISTERED FIRE SERVICES CONTRACTOR**

Employ a registered Fire Services Contractor to carry out the installation work, subsequent testing and commissioning and make necessary submissions to FSD for the fire services installation carried out by Main Contractor such as street fire hydrant system and up-feed riser pipe to storage/transfer tank.

PIPE JOINT

PLU1.W210.7 GENERAL

1. Unless otherwise specified, store, handle and joint pipes and fittings in accordance with manufacturer's recommendations;
2. Do not make pipe joints in the thickness of any wall, floor, ceiling or beam;
3. Provide expansion joint for all pipework passing through any building expansion joint.

PLU1.W220.7 JOINTING GALVANIZED STEEL PIPES

1. Unless otherwise Approved, joint galvanized steel pipes of sizes up to and including 100mm with screwed fittings. Use screwed flanges only for connection to flanged end valves or equipment;
2. Unless otherwise Approved, joint galvanized steel pipes of size of 150mm and above with screwed fittings, screwed flanges or flanged fittings;
3. Do not joint galvanized steel pipes by welding unless approved by the Contract Manager;
4. Screwed fittings shall have pipe threads complying with BS 21 in conjunction with BS EN 10226-1. Screwed joints shall have tapered threads and shall be made with Approved jointing material.
5. As an alternative to flanged and screwed joints, grooved end mechanical couplings may be employed subject to the approval of the Contract Manager,
 - a. Before couplings are assembled, pipe ends and outsides of gaskets shall be lightly coated with suitable lubricant or graphite paste to facilitate installation;
 - b. Pipe grooving shall be carried out by using proprietary grooving machine and in accordance with the pipe coupling manufacturer's latest specifications. The grooving shall be roll-grooved without the removal of any metal. Zinc coating damaged during the grooving operation of galvanized steel pipe shall be rectified by scrubbing clean the affected area and coated with a zinc rich galvanizing paint as recommended by the pipe manufacturer's subject to the approval by the Contract Manager;
 - c. Unless otherwise specified, all mechanical couplings and fittings shall have a minimum system working pressure of not less than 1600kPa and the testing pressure shall not be less than 1.5 times the system working pressure;
 - d. The electrical continuity of the mechanical couplings shall be effective and shall be verified by site measurement;
 - e. The mechanical couplings and fittings shall comply with standards acceptable to Fire Services Department (FSD);
 - f. The entire coupling installation shall be in accordance with the latest published selected manufacturer's recommendations.

PLU1.W230.7 JOINTING DUCTILE IRON PIPES

Unless otherwise specified, joint all ductile iron pipes as follows:

1. For above ground installation: with screwed flanges or flanged fittings;
2. For below ground installation: with flexible push-on type connection joints;
3. At master water meter and check meter positions: with slip-on flange adaptor in accordance with the requirements of Water Authority and as shown on Drawings;

4. Equip slip-on flange adaptor with guide rod assembly between flanges consisting of guide rod plates, at least three guide rods each of minimum 16mm diameter and washers all as shown on the Drawings. The guide rod assembly shall be made of stainless steel at least to BS EN 10088-3 Grade 1.4401. After installation of slip-on flange adaptor, fix and leave the guide rod assembly in position to prevent damage to the adaptor from excessive movement;
5. Provide durable marking on the pipe body to indicate the installed position of the slip-on flange adaptor for future checking of any dislocation of the adaptor;
6. After installation of all slip-on flange adaptors in a master water meter room or a check water meter cupboard/chamber, the Contract Manager shall select one installed slip-on type flange adaptor to be disconnected for checking the lap length of the adaptor on the pipe against the manufacturer's recommendation. Upon the Contract Manager's satisfaction on the lap length, connect the ductile iron pipes of the master water meter room or check water meter cupboard/chamber to the water supply.

PLU1.W250.7 JOINTING COPPER PIPEWORK WITH COPPER ALLOY CAPILLARY FITTINGS BY BRAZING

Follow the following procedures:

1. Apply flux to the tube spigot and fitting socket when brazing;
2. Remove residual flux after brazing.

PLU1.W260.7 JOINTING COPPER PIPEWORK BY SOLDERING

Follow the following procedures:

1. Remove copper oxide and dirt from pipe spigot and fitting socket prior to the application of soldering flux;
2. Apply flux sparsely and remove excess flux prior to heating;
3. Clean pipe joints with a damp cloth on completion to remove flux residues.

PLU1.W270.7 CAPILLARY TYPE JOINTS AND FITTINGS OF SHEATHED COPPER PIPEWORK

Fit "clip-on" type preformed polyethylene sheaths to cover the capillary type joints and fittings after jointing of the pipework.

PLU1.W290.7 JOINTING STAINLESS STEEL PIPES

1. Unless otherwise Approved, joint stainless steel pipes with nominal outside diameter up to and including 54mm with compatible stainless steel non-welding type fittings with stainless steel O-rings or nitrile rubber (NBR) O-rings and silicone gaskets.
2. Unless otherwise Approved, joint stainless steel pipes with nominal outside diameter above 54mm with compatible stainless steel non-welding type fittings with couplings and silicone gaskets.
3. Joint stainless steel pipes to ductile iron pipes with purpose made stainless steel flange adaptor in accordance with the manufacturer's recommendations.
4. All pipe installation to be carried out in strict accordance with the manufacturer's instructions. In addition to the requirements on Trade Tested Workers as specified in **PRE.B6.065**, all workers carrying out stainless steel pipes installation shall have received relevant training and be certified by recognised local institution, trade union or the pipe supplier.

5. All pipes shall be cut to square ends, free from harmful burrs and be prepared in accordance with the manufacturer's recommendations. Purpose made equipment recommended by the manufacturer shall be used for cutting the pipes and shall be submitted for the Contract Manager's approval.
6. All grooves on the pipes shall be roll-formed in accordance with the manufacturer's standards and recommendations. Purpose made equipment recommended by the manufacturer shall be used for forming the grooves and shall be submitted for the Contract Manager's approval.

PLU1.W291.7**JOINTING UNPLASTICIZED PVC (UPVC) PIPES**

1. All pipes shall be cut to square ends, free from harmful burrs and be prepared in accordance with the manufacturer's recommendations. Purpose made equipment recommended by the manufacturer shall be used for cutting the pipes and shall be submitted for the Contract Manager's approval.
2. All UPVC pipes shall joint with sockets and fittings and as recommended by the UPVC manufacturer.
3. Solvent cement joints shall be used for all pipeworks. All the surfaces shall be cleaned with abrasive paper and spirit cleaner. When applying solvent, heat shall be avoided as the cement may dry before chemical bonding between the two surfaces is completed. Mating surfaces shall be turned for even spread of the solvent. Excessive cement shall be wiped off quickly.
4. Flanged joints on water services shall be used where solvent welding is not practicable and at locations to facilitate dismantling. Neoprene ring gaskets provided or approved by the manufacturer shall be used between flanges. The jointing compound must be in accordance with manufacturer's recommendation.

PLU1.W292.7**JOINTING CHLORINATED PVC (CPVC) PIPES**

1. Use jointing compound as recommended by the manufacturer of the pipes and fittings. For pipe size above 50mm, primer is needed to prepare the bonding area for the additional of the cement. Refer to ASTM D2855 and to ASTM F402 for safety handling;
2. For solvent cement joints, the solvent cement set and cure time shall be strictly conformed to the manufacturer's instructions; whereas, the required prolonged set and cure time shall be consulted and acquired from the manufacturer when the relative humidity is higher than 85% and/or the ambient temperature is below 10°C;
3. After the pipework is installed and all solvent cement is fully cured, the system shall be pressure tested and checked for leaks using water. The method to test the water leakage of the system shall be carried out in accordance with the manufacturer's recommendations.

PLU1.W293.7**JOINTING CHLORINATED PVC (CPVC) PIPES TO DUCTILE IRON PIPES**

1. Use CPVC flange joint as recommended by the manufacturer of the pipes and fittings for jointing CPVC pipes to ductile iron pipes of compatible size;
2. Flange joints shall incorporate an electrometric gasket between the mating faces to provide for seal. The gasket selected must be full-faced and have the hardness and thickness recommended by the manufacturer;
3. Flange joints shall be carefully aligned and the bolts inserted through matching holes. A flat washer shall be used beneath each nut and bolt head. The required bolt torque shall be carried out in strict accordance with the manufacturer's instructions.

PLU1.W294.7**JOINTING CHLORINATED PVC (CPVC) PIPES TO UNPLASTICIZED PVC (UPVC) PIPES**

1. Use jointing compound as recommended by the manufacturer of the pipes and fittings for jointing CPVC pipes to UPVC pipes of compatible size. For pipe size above 50 mm, primer is needed to prepare the bonding area for the additional of the cement. Refer to ASTM D2855 and to ASTM F402 for safety handling;
2. Joint CPVC pipes to UPVC pipes of incompatible size with purpose made CPVC adaptor in accordance with the manufacturer's recommendations;
3. For solvent cement joints, the solvent cement set and cure time shall be strictly conformed to the manufacturer's instructions; whereas, the required prolonged set and cure time shall be consulted and acquired from the manufacturer when the relative humidity is higher than 85% and/or the ambient temperature is below 10°C;
5. For threaded pipe fittings, all taper pipe threads shall be gauged in accordance with ASTM F1498;
5. After the pipework is installed and all solvent cement is fully cured, the system shall be pressure tested and checked for leaks using water. The method to test the water leakage of the system shall be carried out in accordance with the manufacturer's recommendations.

PIPEWORK SUPPORTS**PLU1.W310.7****GENERAL**

1. Support pipework in such a manner as to allow adequate movement for expansion and contraction;
2. Add neoprene or rubber to BS ISO 2028 vibration isolation pad of 6 mm thick between the pipe and bracket for the section of up-feed riser pipe running through the floor from outside the pump room to where the flexible connector is installed;
3. Do not mount pipe bracket inside pump room on wall and ceiling as far as practicable. If unavoidable, add neoprene or rubber to BS ISO 2028 vibration isolation pad of 6mm thick between the pipe and bracket for brackets mounted on wall; and add vibration isolator as **PLU1.M420** for brackets mounted to ceiling or steel support frames;
4. Do not fix pipe bracket to copper pipe by means of brazing or soldering;
5. Provide pipe brackets at both sides of a metal valve installed in uPVC pipes of any size and other types of pipes with nominal size of 80mm or above;
6. Provide pipe brackets at both sides of a turning point of uPVC flush water pipe riser and down pipe at communal area;
7. Provide pipe brackets at both sides of a turning point before and after the check water meter position with slip-on flange adaptors installed.
8. Provide duct foot bend fittings and support at the lowest end of water risers of 80mm diameter and above. Fittings shall be constructed of materials suitable for use in the system and shall be capable of withstanding the system working pressure. Fittings shall be connected to the riser pipes with flange joints.

PLU1.W320.7**PIPE BRACKET INTERVALS**

Install pipe bracket at intervals not exceeding those shown in the following table for straight runs, and with not less than one bracket per length of pipe. Short length of pipe can be without pipe bracket if approved by the Contract Manager. Support all pipework to ensure that it is free from excessive stress due to the weight of its contents, its own dead weight, and dynamic forces due to liquid movement and take particular care to ensure that the branch is not supporting the riser.

Pipes	Nominal Size (mm)	Maximum Spacing (mm)	
		Vertical Pipes	Horizontal Pipes
Ductile Iron	80 and 100 150	2700 3600	2700 3600
Steel	15	2400	1800
	20 and 25	3000	2400
	32	3000	2700
	40 and 50	3600	3000
	80	4500	3600
	100	4500	3900
	150	5400	4500
Copper	15	1800	1200
	22 and 28	2400	1800
	35 and 42	3000	2400
	54	3000	2700
	67 to 133	3600	3000
	159	4200	3600
UPVC	up to 25	1500	750
	32	1800	900
	40 and 50	2000	1000
	65 to 150	2500	1200
CPVC	With reference to manufacturer's recommendation		

PLU1.W330.7**ADDITIONAL REQUIREMENTS INSIDE MASTER WATER METER ROOM AND IN OPEN TRENCH FOR WATER SUPPLY PIPES**

1. Support pipes and valves at required levels by Grade 20 precast concrete wedges, blocks or cradles, or by other methods approved by the Contract Manager. Provide at least one support for each section of pipe and for each valve. The spacing between supports shall not exceed 3 m. Provide mounting brackets to support, and to constraint and limit movement of pipes;
2. Support bends and tees at required levels by Grade 20 concrete thrust blocks; and embed bends and tees in Grade 20 concrete surround for the full length of each thrust block. For vertical bends and tees where thrust blocks cannot be used, provide pipe brackets at both ends, if applicable, of each bend and tee to restrain and limit the movement of pipes;
3. All supports and brackets shall not obstruct the fixing and unfixing of bolts and nuts in the disconnection and reassembly of flange joints;
4. All concrete supports shall be anchored onto the floor by dowel bars except removable concrete supports at check meter positions as required by the Water Authority;
5. Design and submit layout and structural details of all concrete supports and sizes of mounting brackets to the Contract Manager for approval prior to any pipework installation.

PIPE SLEEVE

PLU1.W410.7

FIXING PIPE SLEEVES

1. Where pipes pass through walls, beams and floor/ceiling slabs, provide and fix sleeves with uniform annular clearance to allow for expansion and movement of pipe;
2. For pipes passing through walls and beams, fix sleeves that flush with the finished surfaces;
3. For pipe passing through floor slabs, fix sleeves in position with 100 mm projection above finished floor level and flush with the underside of the floor.

PLU1.W420.7

CAULKING PIPE SLEEVES AND PUDDLE SLEEVES

1. For metal sleeves used in walls and slabs within the same fire compartment, fill the full length of annular space between the sleeve and the pipe with mineral wool or Approved equivalent materials. Caulk both ends with mastic sealant;
2. For metal sleeves used in fire-rated walls and slabs within the same fire compartment, fill the full length of annular space between the sleeve and the pipe with non-flammable mineral wool or Approved equivalent materials. Caulk both ends with fire-rated mastic sealant which is durable and effective in sound insulation to maintain the required FRP of the walls/floor slabs;
3. For metal sleeves used in walls and slabs between fire compartments, fill the full length of annular space between the sleeve and the pipe with non-flammable mineral wool or Approved equivalent materials. Caulk both ends with fire-rated mastic sealant which is durable and effective in sound insulation to maintain the required FRP of the walls/floor slabs;
4. For puddle sleeves passing through external basement walls, gap between the sleeve and pipework shall be filled with mastic sealant approved by the Contract Manager.

PAINTING

PLU1.W510.7

GENERAL

Paint all pipes where specified in accordance with Worksection FIN7.

INSTALLATION OF VALVES

PLU1.W610.7

GENERAL

Unless otherwise specified, install the valve in accordance with manufacturer's recommendations.

PLU1.W620.7

NON-RETURN VALVE

When valve is installed vertically, ensure water flow is in an upward direction.

STREET FIRE HYDRANTS

PLU1.W720.7

FIXING

Install the street fire hydrant and associated valves as shown on the drawings given in the Water Authority Standard Drawings [Section 1 – Mainlaying] and FSD requirements.

PLU1.W730.7 ANNUAL INSPECTION, FINAL ACCEPTANCE TEST AND CERTIFICATE OF FIRE SERVICE INSTALLATIONS AND EQUIPMENT

1. Carry out annual inspection in accordance with Fire Services Department (FSD)'s requirements;
2. Comply with the followings at the end of the Maintenance Period:
 - a. Maintain the street fire hydrants in good condition;
 - b. Carry out the final acceptance test for the street fire hydrants;
 - c. Submit the Certificate of Fire Service Installations and Equipment (F.S. 251) to FSD.
3. Submit a copy of the Certificate (F.S. 251) to the Contract Manager within 14 days after the annual inspection and the final acceptance test respectively;
4. Copy, frame and display the Certificate (F.S. 251) together with a list of the fire services installation and equipment in a prominent area in accordance with the Contract Manager's instruction.

TANKS**PLU1.W810.7 CONNECTION TO CONCRETE TANKS**

Unless otherwise specified or Approved, use puddle flange in accordance to **PLU1.M320** for connection to tank.

CLEANING THE INSTALLATION**PLU1.W910.7 GENERAL**

1. Clean out all the water mains of inside service before they are put into operation as follows:
 - a. For fresh water mains of inside service, clean and sterilize the systems to the satisfaction of the Water Authority before they are put into operation. The Water Authority - Circular Letter no. 6/2002 or the latest prevailing recommendation from the Water Authority on the cleaning and sterilization process shall be followed. Arrange with the Waterworks Chemists of the Water Authority to collect bacteriological and chemical samples for analysis.
2. Clean out all the completed water tanks and supply pipework after completion of the cleaning of the water mains of inside service in sub-clause (1) above and before phased completion of the Works or completion of the Works as follows:
 - a. Clean the completed water tanks, supply pipework and cisterns according to **PLU1.W920 - PLU1.W950**;
 - b. The sequence of cleaning starts with the sump tank at the G/F, then the roof tanks, the pipework and finally the water tanks at the individual flats and rooms with installed water supply pipework and cisterns;
3. The requirement on cleaning during Maintenance Period shall be in accordance with **PLU1.W960**.
4. Witness and endorse the cleaning and sterilization process by the Contract Manager's representative and the Contractor's representative.

PLU1.W920.7**PROCEDURE FOR CLEANING FRESH WATER AND FLUSH WATER SUMP, TRANSFER, ROOF, RAINWATER COLLECTION AND RAINWATER MIXING TANKS**

1. For the cleaning required under sub-clause **PLU1.W910** (2)(a), clean all fresh water and flush water sump, transfer and roof tanks as follows:
 - a. Stop the pumps;
 - b. Turn off the inlet and outlet valves of the water tank;
 - c. Turn on the washout valve and drain the water tank completely. The Contractor shall carefully monitor the draining process and the flow condition so that the drainage system and the buffer tank will not overflow;
 - d. Thoroughly clean the inside walls, ceiling and the bottom of the water tank and the inlet/outlet pipes with fresh water;
 - e. Spray with water to ensure that all dirt and debris are removed and drained away;
 - f. Take 2 sets of record photographs of the tank after cleaning;
 - g. Turn off the washout valve;
 - h. Fill the tank with water by turning on the inlet valve;
 - i. Turn on all the outlet valves;
 - j. Start the pump.
2. For the cleaning required under sub-clause **PLU1.W960** (2)(b), clean all fresh water sump, transfer and roof tanks as follows:
 - a. Stop the pumps;
 - b. Turn off the inlet and outlet valves of the water tank;
 - c. Turn on the washout valve and drain the water tank completely. The Contractor shall carefully monitor the draining process and the flow condition so that the drainage system and the buffer tank will not overflow;
 - d. Thoroughly clean the inside walls, ceiling and the bottom of the water tank and the inlet/outlet pipes with fresh water;
 - e. Spray with water to ensure that all dirt and debris are removed and drained away;
 - f. Turn off the washout valve;
 - g. Scrub the water tank thoroughly with a solution of chloride of lime or bleaching powder containing 50mg/l of chlorine solution;
 - h. Rinse the water tank thoroughly with fresh water;
 - i. Take 2 sets of record photographs of the tank after cleaning;
 - j. Drain away the water through the washout pipe;
 - k. Fill the tank with water by turning on the inlet valve;
 - l. Turn on all the outlet valves;
 - m. Start the pump.
3. For the cleaning required under sub-clause **PLU1.W910** (2)(a), clean all rainwater collection and rainwater mixing tanks in accordance with sub-clause **PLU1.W920** (1). Before the cleaning, shut-off the vortex filter to stop rainwater flowing into rainwater collection tank. Open the vortex filter after completion of the cleaning process.

PLU1.W930.7**PROCEDURE FOR CLEANING INDIRECT FRESH WATER SUPPLY PIPEWORK**

1. For the cleaning required under sub-clause **PLU1.W910** (2)(a), clean the indirect fresh water supply pipework as follows:
 - a. Check that the roof tank is cleaned and filled with water;
 - b. Turn on all the main gate valves of the down-feed system at the roof level or the floor below roof and the provided booster pump if any;
 - c. Check, if applicable, that the break tank is cleaned and filled with water;
 - d. Turn on the gate valves in front of water meters;
 - e. Turn on the water taps of the individual flats/non-domestic units at the lowest supply point of each down-feed pipe and the floor above Pressure Reducing Valve (PRV) system or break tank, if applicable, for at least 5 minutes and then turn off;
 - f. Turn on all taps at each of the remaining flats/non-domestic units for at least 2 minutes. Check for satisfactory flow at taps and submit the satisfactory record;
 - g. If flow is unsatisfactory, clean the strainer/aerator of the taps or carry out necessary repair at the taps and re-test until flow is satisfactory.
2. For the cleaning required under sub-clause **PLU1.W960** (2)(b), clean the indirect fresh water supply pipework as follows:
 - a. Check that the roof tank (and the sump tank if the volume of the pipework to be cleaned exceeds the volume of the roof tank) is cleaned and filled with a homogeneous solution of chloride of lime for sterilization. The concentration of the solution has to meet the requirement that when the indirect fresh water supply pipework is filled up with water, the chlorine in the water will be 50 mg/l;
 - b. Turn on all the main gate valves of the down-feed system at the roof level or the floor below roof and the provided booster pump if any;
 - c. Check, if applicable, that the break tank is cleaned and filled with water;
 - d. Turn on the gate valves in front of water meters;
 - e. Turn on all taps at all locations until the presence of chlorine is confirmed via test kit approved by the Contract Manager, then shut off the taps;
 - f. Keep the indirect fresh water supply pipework under sterilization for 2 hours;
 - g. Thoroughly flush the indirect fresh water supply pipework with fresh water. All taps at all locations shall be turned on to ensure the entire pipework is thoroughly flushed with fresh water. Ensure all taps are closed after flushing;
 - h. Test at the supply point nearest to the roof tank and the lowest supply point to confirm the residual chlorine level is below 5mg/l after flushing. The test shall be carried out by a laboratory that complies with **PRE.B9.570**. Then resume the system to normal operation condition.

PLU1.W940.7**PROCEDURE FOR CLEANING DIRECT FRESH WATER SUPPLY SYSTEM**

Clean direct fresh water supply system as follows:

1. Turn on all the main gate valves of supply feed pipe at the G/F or 1/F level;
2. Turn on the gate valves in front of water meters;
3. Turn on all taps at individual flats/non-domestic for at least 2 minutes;
4. Check for satisfactory flow at taps;

5. If flow is unsatisfactory, clean the strainer/aerator of the taps or carry out necessary repair at the taps and re-test until flow is satisfactory.

PLU1.W950.7**PROCEDURE FOR CLEANING FLUSH WATER SYSTEM**

Clean flush water system as follows:

1. Check that the roof tank is cleaned and filled with water;
2. Turn on all the main gate valves of the down-feed system at the roof level and, if applicable, to the break tank;
3. Check, if applicable, that the break tank is cleaned and filled with water;
4. Turn on all inlet valves of flushing cistern in each flat/non-domestic;
5. Start flushing to water cisterns with the top most floor and then downwards;
6. Flush the water cisterns at the lowest floor of the down feed system and the floor above Pressure Reducing Valve (PRV) system or transfer tank, if applicable twice, and at the remaining floors twice;
7. Check for satisfactory flow at the water inlet, water discharge and any leaks at cisterns;
8. If the flow is unsatisfactory, carry out repair at the cistern and re-test until flow is satisfactory.

PLU1.W960.7**CLEANING DURING MAINTENANCE PERIOD**

1. Pursuant to and without affecting the generality of GCC Clause 10.1,
 - a. Execute all Maintenance Works as are instructed by the Contract Manager during the Maintenance Period to the water supply system;
 - b. Include further cleaning out of water tanks and Maintenance Works to the supply pipework, as may be necessitated by:
 - i. Incomplete cleaning out prior to phased completion of the Works or completion of the Works;
 - ii. Works and/or materials not in conformity with the Contract; and
2. Clean out all the completed fresh water tanks and indirect fresh water supply pipework at a date to be instructed by the Contract Manager before occupation of a New Building or a part of a New Building:
 - a. Submit a detailed cleaning action plan demonstrated with vertical plumbing line diagram showing the scope of cleaning and sterilization, the locations where the residual chlorine level will be tested, the test kit to be used for verifying the residual chlorine level and the calculation of amount of dosage of chlorine or other approved chemicals for the Contract Manager's approval prior to commence the cleaning;
 - b. Clean the completed fresh water tanks and indirect fresh water supply pipework according to **PLU1.W920 - PLU1.W930**;
 - c. The sequence of cleaning starts with the sump tank at the G/F, then the roof tanks, the pipework and finally the water tanks at the individual flats and rooms with installed water supply pipework.

PROTECTION**PLU1.W1010.7****SEALING THE SYSTEM**

Seal off ends of pipes and openings during construction to prevent entry of foreign matter into the system.

PLU1.W1020.7 VALVES AND TAPS

House valves and taps installed in public areas or those not intended for public use in vandal-resistant and corrosion-resistant enclosures.

PLU1.W1030.7 PROTECTION OF UNDERGROUND PIPES

1. Protect underground pipes against corrosion and against mechanical damage;
2. Clean pipework after joining it and treat it with two coats of good quality bituminous paint to BS 3416 and wrap it with petrolatum tape for protection against corrosion due to water, salts, soil organics and rest it on concrete bed, sand or sieved soil or in concrete haunch or concrete surround before the trench is backfilled;
3. Pressure test all underground pipework before the application of bituminous paint and petrolatum tape.

PLU1.W1040.7 PIPES PASSING UNDER ROADS

Where top of the pipe is less than 900 mm from finish level, surround the pipe by concrete in accordance to the Water Authority's requirement.

WORKS OUTSIDE SITE BOUNDARY**PLU1.W1110.7 CONNECTION BY THE WATER AUTHORITY**

Cap the ends of main pipes to prepare for connection to street mains by the Water Authority if the project is not under Helping Business Programme.

PLU1.W1120.7 NOTIFY THE WATER AUTHORITY FOR INSPECTION

Notify the Water Authority to inspect completed pipework and valve pit prior to back filling.

**CONNECTION OF UNDERGROUND WATER
SUPPLY MAINS TO EXISTING IN-SERVICE MAINS****PLU1.W1210.7 PROCEDURE**

Connect to the supply mains as follows:

1. Submit proposed re-arrangement or tee-off (if any) to the Contract Manager for approval at least 24 hours prior to execution;
2. Identify existing live fresh, flush, and fire service supply mains by:
 - a. Inspect as-built record drawings;
 - b. Verify by valve operation. Close all the valves of the pipes and turn on valve of each pipe one by one to identify the type of each water pipes;
 - c. Paint underground pipeworks of fresh, flush and fire service supply mains at both sides of isolating gate valves in colours as stated in **FIN7.W2510**.
3. Test turbidity to confirm salt water mains in accordance with **PLU1.T110**;
4. Provide temporary cover and lockable device for isolating valve pits;
5. Submit findings of the identification for inspection and confirmation by Estate Management Division;
6. Submit to Estate Management Division Form DCMP-F741 together with the Water Authority's Form 46 Part IV for making connections to existing in service supply mains within Housing Department estates;

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7. Upon receipt of Part B of Form DCMP-F741, proceed with connection works;
 8. Upon connection to supply mains, complete Part C of Form DCMP-F741 and submit to Estate Management Division together with a copy of Certificate Regarding Water Supply Connection issued by the Water Authority for record;
 9. Remove temporary cover of the isolating valve pits after completion of the connection of supply mains.

PLU1.W1220.7**INSPECTION OF CONNECTION**

Check all connected pipework to supply mains by valve operation. Close all the valves of the pipes and turn on valve of each pipe one by one to identify the type of each water pipe.

TESTING

GENERAL

PLU1.T010.7 PRE-TEST CLEANING

Before installations are subjected to inspection, testing and subsequent handover, clean thoroughly the entire installation internally and externally. Flush out all water installations with clean water. During the flushing operation, make provision to exclude filters, pumps, meters and any other item of plant which could be damaged during the cleaning operation.

PLU1.T020.7 PERFORMANCE TESTS, ADJUSTMENTS AND COMMISSIONING

1. Carry out complete performance tests for all equipment and systems installed, make all necessary adjustments including the setting of adjustable type pressure reducing valve and commission the installations in accordance with the manufacturers' instructions and to the satisfaction of the Contract Manager;
2. Prior to any tests, submit detailed procedures and a programme for testing and commissioning for the Contract Manager's approval;
3. Submit test reports to the Contract Manager for approval.

PLU1.T030.7 TEST INSTRUMENTS

1. Supply all instruments required for inspection and testing of the installation;
2. Include, but not limited to, the following instruments required for inspection and testing purpose:
 - a. Measuring tape;
 - b. Hand pump;
 - c. Pressure gauge;
 - d. Water flow gauge.

PLU1.T040.7 TESTING OF CONCEALED AND UNDERGROUND PIPEWORK

Before cover up of the pipework, invite the Contract Manager representative to check the pipework and witness for water pressure test in accordance with **PLU1.T050**. Result of water pressure test shall be satisfactory before cover up of the pipework. Submit test report for record within a week of the satisfactory test.

PLU1.T050.7 WATER PRESSURE TEST

1. Test water systems and circuits hydraulically to a minimum pressure of 1.5 times the system working pressure or a minimum of 10 bar whichever is the higher for a period of not less than one hour without leaks appearing;
2. Provide whatever hoses or drainage channels that are required to safely discharge the test water while carrying out these tests in order to ensure that no damage to the building and property will be caused by the test water;
3. Following the above, carry out a normal working test during which adjustments and regulation of valves shall be effected and each tap and shower shall be visually check for satisfactory rate of flow.

PLU1.T060.7**FSD INSPECTION AND WITNESS OF TESTS**

Make necessary applications including submission of Form 501 to Fire Services Department and attend upon their representative for the purpose of tests and inspections for the fire services installation carried out by Main Contractor such as street fire hydrant system, up-feed riser pipe to storage/transfer tank.

PLU1.T070.7**WATER QUALITY TEST**

Test on the quality of potable water for human consumption shall be carried out on each potable water system to the satisfaction of the Contract Manager and comply with the following:

1. Carry out the test after completion of the cleaning of the plumbing installation as specified in **PLU1.W910** (2) to the satisfaction of the Contract Manager of the respective potable water supply system;
2. Take samples from a selection of the water outlets used to supply potable water for human consumption in accordance with ISO 5667, but shall include samples taken at all the farthest point(s) of use in the distribution system from the storage tank, and at each potable water supply tank for human consumption in the building;
3. Analysis of the samples shall be carried out by a laboratory that complies with **PRE.B9.570** according to the water quality requirements specified in the Water Authority's Quality Water Recognition Scheme for Buildings;
4. In case the samples failed to comply with the water quality requirements as referred to in sub-clause (3), carry out investigation on the cause(s) and submit investigation results and details of all necessary rectification works to the Contract Manager for approval before carrying out of the approved rectification works. Arrange re-test(s) to ensure compliance of water quality requirements after completion of the rectification works. Bear all cost and expense in connection with the aforesaid investigation, rectification works and re-test(s) to ensure compliance of the required water quality requirements except if such investigation, rectification works and re-test(s) are the direct consequence of a conclusion from any test result(s) of the sample(s) taken at the user end of the first valve from the site boundary that water from the Water Authority failed to comply with the water quality requirements as referred to in sub-clause (3);
5. Submit the detailed report on the selection of sampling points, sampling techniques, handling of water samples, water quality test results with original or certified true copy (issued or certified by the laboratory that complies with **PRE.B9.570**) of the test reports showing full compliance with the requirements as referred to in sub-clause (3) and the investigation results and approved rectification works as referred to in sub-clause (4) for the Contract Manager's approval within 2 months from the date of the completion to the satisfaction of the Contract Manager of the cleaning of the plumbing installation as specified in **PLU1.W910** (2) of the respective potable water supply system.

TESTING TURBIDITY FOR CONNECTION OF UNDERGROUND WATER MAINS TO EXISTING IN-SERVICE MAINS

PLU1.T110.7**TESTING PRIOR TO CONNECTION OF SUPPLY MAINS**

Test fresh, flush and fire service supply mains prior to connection works as required by **PLU1.W1210**.

PLU1.T120.7**PROCEDURE**

Test for development of white turbidity to identify salt water mains to satisfaction of the Contract Manager, as follows:

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1. Collect two 10 ml samples in clean McCartney bottles from the supply mains under investigation;
 2. Add two drops of barium chloride solution to one sample;
 3. Shake to mix contents and wait for approximately 3 minutes for turbidity to develop;
 4. Compare with the other sample for increase in white turbidity (which would indicate the presence of salt water);
 5. In doubtful cases, seek record drawings as well as laboratory services for confirmation.

PLU2 SANITARY APPLIANCES

MATERIALS

GENERAL

PLU2.M010.7

SAMPLES

Comply with the requirements of **PRE.B9.410** by submitting samples of the specified sanitary fittings for Approval.

PLU2.M020.7

STANDARDS

Ensure sanitary appliances submitted for Approval comply with the following standards as applicable:

1. Vitreous china:
 - a. To BS 3402:1969;
 - b. Colour: white unless otherwise specified;
 - c. Ensuite, complete with all necessary fittings.
2. Waste and bath overflow chains and stays:
 - a. To BS 3380:1982;
 - b. Material: chromium plated brass.
3. Taps and combination tap assemblies:
 - a. To BS 5412:1996;
 - b. Material: chromium plated brass.

PLU2.M030.7

SANITARY APPLIANCES FOR STANDARD SCHOOLS

As scheduled on Drawings or Approved equivalent.

WCS AND CISTERNS

PLU2.M110.7

SINGLE FLUSH CLOSE-COUPLED WC SUITES

1. Submission Requirements:
 - a. At sample submission and approval stage, submit a sample of the proposed WC suites including their component float operated valves and flushing valves as a whole assembly for CM's approval together with all the following substantiation for CM's information:
 - i. Catalogue, brand name/model name, type of trap and job reference of the product;
 - ii. Name, address and contact person of the local supplier;
 - iii. Name, address and contact person of the manufacturer;
 - iv. When the WC suites are supplied for domestic blocks, except for the ancillary facilities at lower floors, also include the followings in the submission:

- Original or a certified true copy of the ISO 9001 certificate for the manufacturing plant. If a copy of the ISO certificate is submitted, it shall be certified true by a certification body or by the QCM. The certification body shall either be accredited by the Hong Kong Accreditation Service (HKAS) or an accreditation body which has entered into a multilateral recognition arrangement with HKAS.
 - v. Installation instruction of WC suites including the fixing of the flushing apparatus, the tools and method for tightening and connecting of pipes and components.
 - b. For single flush close-coupled WC suites used in domestic blocks, except for the ancillary facilities at lower floors, submit original or a certified true copy of the product conformity certificate to the "Product Conformity Certification Scheme for Close-coupled Water Closet Suites with 6 Litre Flushing Capacity" (PCCS-WC) published by the Hong Kong Institution of Plumbing and Drainage Limited. The product conformity certificate shall be issued by a certification body accredited by the Hong Kong Accreditation Service (HKAS) or an accreditation body which has entered into a multilateral recognition arrangement with HKAS. If a photocopy of the product conformity certificate is submitted, it shall be certified true by the certification body or by the QCM:
 - i. The product conformity certificate shall either be submitted at the sample submission and approval stage as mentioned in sub-clause (1)(a) above or at a time not later than 12 months from the date of commencement of the Works;
 - ii. In the event that the product conformity certificate has not been submitted for CM's information, CM may order the removal of materials or delivered products off Site. The Contractor shall bear all associated costs and no extension of time will be allowed.
 - c. Submit a summary of the test results under the audit testing of the PCCS-WC. The summary shall be prepared by the accredited laboratory carried out the testing or the certified manufacturer. If so directed by CM, submit a full set of the audit test reports to CM for record;
 - d. Submit original or certified true copy (issued or certified by the laboratory that complies with **PRE.B9.570**) of the test reports showing full compliance with the requirements of sub-clause (2)(b) for CM's information unless the test requirements are covered by the scope of the PCCS-WC:
 - i. The date of the test shall be generally within three years prior to the notified date for commencement of the Works or at an earlier date for domestic blocks subject to CM's consideration on the track records as maintained by the Housing Department;
 - ii. The test reports shall either be submitted at the sample submission and approval stage as mentioned in sub-clause (1)(a), or at a time not later than the delivery of the material as mentioned in sub-clause (3)(a);
 - iii. In the event that no test report has been submitted for CM's information when the materials are delivered to Site, the Contractor shall remove all delivered materials off Site and bear all associated costs and no extension of time will be allowed.
2. Quality Requirements:
- a. Close-coupled WC suite to Class 2 of BS EN 997:2003 suitable for salt water with quality of vitreous china to BS 3402:1969 comprising:
 - i. Vitreous china washdown WC pan:
 - Horizontal outlet to BS EN 33:2011;
 - Colour: as shown on Drawings or to Approval;
 - Fixing to be in accordance with **PLU2.M610**;

- Length and size to fit design layout.
- ii. Vitreous china flushing cistern:
 - Close-coupled type as part of WC suite with maximum flushing capacity of 6 litres;
 - Clearly marked internally with an indelible line to show the intended volume of flush, together with an indication of that volume;
 - All necessary fixings with stainless steel grade 304 screws/bolts.
- iii. Flushing apparatus:
 - Valve type flushing apparatus;
 - Overflow pipe and discharge to external;
 - Flushing mechanism (push button) with protective coating;
 - Without lid attachment to allow free lifting of the cover without damaging the flushing apparatus;
 - The design of the components and fixing details shall prevent bursting and flooding when the connecting component fails;
 - Properties of plastic materials shall be functional and durable in sustaining mechanical, dimensional and chemical stability, and suitable for use with salt water.
- iv. Seat and cover:
 - Plastic single ring to BS 1254:1981 (except the requirements on dimensions);
 - Colour: as shown on Drawings to match WC pan;
 - Complete with necessary fixings.
- b. The quality and performance requirements are as follows:
 - i. WC pan:

Items	Test Method	Acceptance Standards
Functional Dimensions	Measure the following dimensions <ul style="list-style-type: none"> - Connecting dimensions shown in BS EN 33: 2011 Cl.2 Table 3 & 4 - Fixing dimension for the seat shown in BS EN 33: 2011 Cl.4 Table 8 Figure 2 & 3a - Height from base to top surface measured at front of rim 	<ul style="list-style-type: none"> - Connecting dimension: BS EN 33: 2011 Cl.2 Table 3 & 4 - Fixing dimensions for the seat: BS EN 33: 2011 Cl.4 Table 8 Figure 2 & 3a. The seat provided or recommended shall comply with the fixing dimensions. - Height from base to top surface measured at front of rim: 390 ± 15 mm. For WC pan installed at accessible toilet, height from base to top of the toilet seat shall be 380 mm to 450 mm.
Visual Examination	BS 3402:1969:Cl. 5.1 & 5.4.	BS 3402:1969:Cl. 5.1 & Table 1.
Water Absorption	BS EN 997:2003:Cl. 5.8.3.	BS EN 997:2003:Cl. 6.15.
Crazing	BS 3402:1969:Cl. 7 & App. B.	BS 3402:1969:Cl. 7.
Chemical Resistance	BS 3402:1969:Cl. 8 & App. C.	BS 3402:1969:Cl. 8.

Resistance to Staining and Burning	BS 3402:1969:Cl. 9 & App. D.	BS 3402:1969:Cl. 9.
Static Load Test	BS EN 997:2003:Cl. 5.8.4.	BS EN 997:2003:Cl. 6.14.

ii. Cistern:

Items	Test Method	Acceptance Standards
Dimensional Test on:		
- Shell Thickness	BS 7357:1990:Cl. 5.1.3.	BS 7357:1990:Cl. 5.1.3.
- Spill-over Level	BS 7357:1990:Cl. 12 & Fig. 1.	BS 7357:1990:Cl. 12
- Warning Pipe and Overflow Provision	BS EN 997:2003:Cl. 6.17.2.	BS EN 997:2003:Cl. 6.4
Visual Examination	BS 3402:1969:Cl. 5.2 & 5.4.	BS 3402:1969:Cl. 5.2 & Table 2. (requirements on discolouration and polishing marks do not apply to the back of the cistern.)
Operating Mechanism Test	BS 7357:1990:Cl. 17.4 & App. H.3 for push button operating mechanism	BS 7357:1990:Cl. 17.4 for push button operating mechanism
Float Operated Valve:		
- Distortion and Deflection Tests		
i. Backnuts and Inlet Shank	BS 1212: Part 3:1990:Cl. 13.1 & App. A.	BS 1212: Part 3:1990:Cl. 13.1.
ii. Valve Assembly (for diaphragm type float operated valve only)	BS 1212: Part 3:1990:Cl. 13.2 & App. B.	BS 1212: Part 3:1990:Cl. 13.2.
iii. Float Attachment (for diaphragm type float operated valve only)	BS 1212: Part 3:1990:Cl. 13.3 & App. C.	BS 1212: Part 3:1990:Cl. 13.3.
- Hydraulic Pressure Tests : (salt water shall be used for the test)		
i. Static Pressure	BS 1212:Part 3:1990:Cl. 14.1.	BS 1212:Part 3:1990:Cl. 14.1.
ii. Shut-off Pressure	BS 1212:Part 3:1990: Cl. 14.2 & App. D. No restriction on volume of float immersed in water for compact type float operated valve.	BS 1212:Part 3: 1990:Cl. 14.2.
iii. Dynamic Pressure on Discharge Arrangement	BS 1212:Part 3:1990:Cl. 14.3 & App. E.	BS 1212:Part 3:1990:Cl. 14.3.
- Backflow Prevention	BS 1212:Part 3:1990:Cl. 15 & App. F.	BS EN 997:2003:Cl. 6.2.

- Endurance Test (salt water shall be used for the test and the supply pressure shall be 0.15±0.01 MPa)	BS 1212:Part 3:1990:Cl.17 & App. H. For the subsequent shut-off pressure test, no restriction on volume of float immersed in water for compact type float operated valve.	BS 1212:Part 3:1990:Cl.17
Flushing Device:		
- Physical Endurance and Leakage Test of Flushing Device (salt water shall be used for the test)	BS EN 997:2003:Cl. 6.17.5.	BS EN 997:2003:Cl. 6.7.
- Chemical Endurance of Flushing Device	BS EN 997:2003:Cl. 6.17.6.	BS EN 997:2003:Cl. 6.8.

iii. Completed assembly:

Items	Test Method	Acceptance Standards
Solid Discharge and After-flush Volume for Maximum Flush	BS EN 997:2003:Cl. 6.17.7.	BS EN 997:2003:Cl. 6.9.
Liquid Contaminant Dye Retention	BS EN 997:2003:Cl. 6.17.9.	BS EN 997:2003:Cl. 6.11.
Wash of Bowl	BS EN 997:2003:Cl. 6.17.10.	BS EN 997:2003:Cl. 6.12.
Flush Volume - Full Flush	BS EN 997:2003:Cl. 6.17.3.	BS EN 997:2003:Cl. 6.5.1.
Depth of Water Seal	BS EN 997:2003:Cl. 6.17.3.	BS EN 997:2003:Cl. 6.13.
Flush Rate	BS EN 997:2003:Cl. 6.17.4.	BS EN 997:2003:Cl. 6.6.

3. On Site Delivery Verification:

a. At delivery stage, submit the following documents:

- i. Written confirmation that the material delivered to Site conforms with the Approved sample submitted under sub-clause (1)(a);
- ii. Original or certified true copy of the Certificate of Origin for every batch of delivery. One batch being the material quantity covered under each delivery note;
- iii. Delivery notes for all material delivered to Site.

b. Carry out and submit report on the following verifications for WC suites upon delivery on Site. Prior to carrying out the verifications, inform CM's representatives who may present to witness the verifications:

i. Method:

Verification Items	Method	Acceptance Standards
Dimension check for WC pan	By measurement	Same as CM's Approved sample
Shell thickness of cistern	By measurement	Same as CM's Approved sample
Surface quality check for WC pan and cistern	Visual	No discolouration, no damage, no staining, no blemish, acceptable colour consistency

Surface quality check on the underside of WC pan	By measurement	<ul style="list-style-type: none"> • Less than or equal to 4 nos. fine, shallow, unrepaired, non-through cracks; and each crack is less than or equal to 50 mm long. • Cracks repaired other than by firing clayey material infill in furnace in the factories are not acceptable.
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ii. Frequency:

Verification Items	Sampling Frequency	Representative Batch
Dimension check for WC pan	1 sample from each batch	Material delivered to Site under one Delivery Note
Shell thickness of cistern	1 sample from each batch	Material delivered to Site under one Delivery Note
Surface quality check for WC pan and cistern	1 sample from each batch	Material delivered to Site under one Delivery Note
Surface quality check on the underside of WC pan	1 sample from every 200 nos. of WC pans from each batch	Material delivered to Site under one Delivery Note

c. Where any of the verifications fail to meet the acceptance standards, either:

- i. Remove the representative batch off Site; or
- ii. When agreed by the CM, repeat all verification items on three separate samples selected by the CM. In case of failure of any verification to any one sample, remove the representative batch off Site, bear all associated costs, and no extension of time will be allowed.

PLU2.M115.7**DUAL FLUSH CLOSE-COUPLED WC SUITES**

1. Submission Requirements:

- a. At sample submission and approval stage, submit a sample of the proposed WC suites including their component float operated valves and flushing valves as a whole assembly for CM's approval together with all the following substantiation for CM's information:
 - i. Catalogue, brand name/model name, type of trap and job reference of the product;
 - ii. Name, address and contact person of the local supplier;
 - iii. Name, address and contact person of the manufacturer;
 - iv. When the WC suites are supplied for domestic blocks, except for the ancillary facilities at lower floors, also include the followings in the submission:

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- Original or a certified true copy of the ISO 9001 certificate for the manufacturing plant. If a copy of the ISO certificate is submitted, it shall be certified true by a certification body or by the QCM. The certification body shall either be accredited by the Hong Kong Accreditation Service (HKAS) or an accreditation body which has entered into a multilateral recognition arrangement with HKAS.
 - v. Installation instruction of WC suites including the fixing of the flushing apparatus, the tools and method for tightening and connecting of pipes and components.
 - b. For dual flush close-coupled WC suites used in domestic blocks, except for the ancillary facilities at lower floors, submit original or a certified true copy of the product conformity certificate to the "Product Conformity Certification Scheme for Close-coupled Water Closet Suites with 6 Litre Flushing Capacity" (PCCS-WC) published by the Hong Kong Institution of Plumbing and Drainage Limited. The product conformity certificate shall be issued by a certification body accredited by the Hong Kong Accreditation Service (HKAS) or an accreditation body which has entered into a multilateral recognition arrangement with HKAS. If a photocopy of the product conformity certificate is submitted, it shall be certified true by the certification body or by the QCM:
 - i. The product conformity certificate shall either be submitted at the sample submission and approval stage as mentioned in sub-clause (1)(a) above or at a time not later than 12 months from the date of commencement of the Works;
 - ii. In the event that the product conformity certificate has not been submitted for CM's information, CM may order the removal of materials or delivered products off Site. The Contractor shall bear all associated costs and no extension of time will be allowed.
 - c. Submit a summary of the test results under the audit testing of the PCCS-WC. The summary shall be prepared by the accredited laboratory carried out the testing or the certified manufacturer. If so directed by CM, submit a full set of the audit test reports to CM for record;
 - d. Submit original or certified true copy (issued or certified by the laboratory that complies with **PRE.B9.570**) of the test reports showing full compliance with the requirements of sub-clause (2)(b) for CM's information unless the test requirements are covered by the scope of the PCCS-WC:
 - i. The date of the test shall be generally within three years prior to the notified date for commencement of the Works or at an earlier date for domestic blocks subject to CM's consideration on the track records as maintained by the Housing Department;
 - ii. The test reports shall either be submitted at the sample submission and approval stage as mentioned in sub-clause (1)(a), or at a time not later than the delivery of the material as mentioned in sub-clause (3)(a);
 - iii. In the event that no test report has been submitted for CM's information when the materials are delivered to Site, the Contractor shall remove all delivered materials off Site and bear all associated costs and no extension of time will be allowed.
2. Quality Requirements:
- a. Close-coupled WC suite to Class 2 of BS EN 997:2003 suitable for salt water with quality of vitreous china to BS 3402:1969 comprising:
 - i. Vitreous china washdown WC pan:
 - Horizontal outlet to BS EN 33:2011;
 - Colour: as shown on Drawings or to Approval;
 - Fixing to be in accordance with **PLU2.M610**;

- Length and size to fit design layout.
- ii. Vitreous china flushing cistern:
 - Close-coupled type as part of WC suite with dual flush combining a maximum flush of 6 litres and a reduced flush no greater than two-thirds of the maximum flush volume;
 - Clearly marked internally with an indelible line to show the intended volume of flush, together with an indication of that volume;
 - All necessary fixings with stainless steel grade 304 screws/bolts.
- iii. Flushing apparatus:
 - Valve type flushing apparatus;
 - Overflow pipe and discharge to external;
 - Flushing mechanism (push button) with protective coating;
 - Without lid attachment to allow free lifting of the cover without damaging the flushing apparatus;
 - The design of the components and fixing details shall prevent bursting and flooding when the connecting component fails;
 - Properties of plastic materials shall be functional and durable in sustaining mechanical, dimensional and chemical stability, and suitable for use with salt water.
- iv. Seat and cover:
 - Plastic single ring to BS 1254:1981 (except the requirements on dimensions);
 - Colour: as shown on Drawings to match WC pan;
 - Complete with necessary fixings.
- b. The quality and performance requirements are as follows:
 - i. WC pan:

Items	Test Method	Acceptance Standards
Functional Dimensions	Measure the following dimensions <ul style="list-style-type: none"> - Connecting dimensions shown in BS EN 33: 2011 Cl.2 Table 3 & 4 - Fixing dimension for the seat shown in BS EN 33: 2011 Cl.4 Table 8 Figure 2 & 3a - Height from base to top surface measured at front of rim 	<ul style="list-style-type: none"> - Connecting dimension: BS EN 33: 2011 Cl.2 Table 3 & 4 - Fixing dimensions for the seat: BS EN 33: 2011 Cl.4 Table 8 Figure 2 & 3a. The seat provided or recommended shall comply with the fixing dimensions. - Height from base to top surface measured at front of rim: 390 ± 15 mm. For WC pan installed at accessible toilet, height from base to top of the toilet seat shall be 380 mm to 450 mm.
Visual Examination	BS 3402:1969:Cl. 5.1 & 5.4.	BS 3402:1969:Cl. 5.1 & Table 1.
Water Absorption	BS EN 997:2003:Cl. 5.8.3.	BS EN 997:2003:Cl. 6.15.
Crazing	BS 3402:1969:Cl. 7 & App. B.	BS 3402:1969:Cl. 7.

Chemical Resistance	BS 3402:1969:Cl. 8 & App. C.	BS 3402:1969:Cl. 8.
Resistance to Staining and Burning	BS 3402:1969:Cl. 9 & App. D.	BS 3402:1969:Cl. 9.
Static Load Test	BS EN 997:2003:Cl. 5.8.4.	BS EN 997:2003:Cl. 6.14.

ii. Cistern:

Items	Test Method	Acceptance Standards
Dimensional Test on:		
- Shell Thickness	BS 7357:1990:Cl. 5.1.3.	BS 7357:1990:Cl. 5.1.3.
- Spill-over Level	BS 7357:1990:Cl. 12 & Fig. 1.	BS 7357:1990:Cl. 12
- Warning Pipe and Overflow Provision	BS EN 997:2003:Cl. 6.17.2.	BS EN 997:2003:Cl. 6.4
Visual Examination	BS 3402:1969:Cl. 5.2 & 5.4.	BS 3402:1969:Cl. 5.2 & Table 2. (requirements on discolouration and polishing marks do not apply to the back of the cistern.)
Operating Mechanism Test	BS 7357:1990:Cl. 17.4 & App. H.3 for push button operating mechanism	BS 7357:1990:Cl. 17.4 for push button operating mechanism
Float Operated Valve:		
- Distortion and Deflection Tests		
i. Backnuts and Inlet Shank	BS 1212: Part 3:1990:Cl. 13.1 & App. A.	BS 1212: Part 3:1990:Cl. 13.1.
ii. Valve Assembly (for diaphragm type float operated valve only)	BS 1212: Part 3:1990:Cl. 13.2 & App. B.	BS 1212: Part 3:1990:Cl. 13.2.
iii. Float Attachment (for diaphragm type float operated valve only)	BS 1212: Part 3:1990:Cl. 13.3 & App. C.	BS 1212: Part 3:1990:Cl. 13.3.
- Hydraulic Pressure Tests : (salt water shall be used for the test)		
i. Static Pressure	BS 1212:Part 3:1990:Cl. 14.1.	BS 1212:Part 3:1990:Cl. 14.1.
ii. Shut-off Pressure	BS 1212:Part 3:1990: Cl. 14.2 & App. D. No restriction on volume of float immersed in water for compact type float operated valve.	BS 1212:Part 3: 1990:Cl. 14.2.
iii. Dynamic Pressure on Discharge Arrangement	BS 1212:Part 3:1990:Cl. 14.3 & App. E.	BS 1212:Part 3:1990:Cl. 14.3.
- Backflow Prevention	BS 1212:Part 3:1990:Cl. 15 & App. F.	BS EN 997:2003:Cl. 6.2.

- Endurance Test (salt water shall be used for the test and the supply pressure shall be 0.15±0.01 MPa)	BS 1212:Part 3:1990:Cl.17 & App. H. For the subsequent shut-off pressure test, no restriction on volume of float immersed in water for compact type float operated valve.	BS 1212:Part 3:1990:Cl.17
Flushing Device:		
- Physical Endurance and Leakage Test of Flushing Device (salt water shall be used for the test)	BS EN 997:2003:Cl. 6.17.5.	BS EN 997:2003:Cl. 6.7.
- Chemical Endurance of Flushing Device	BS EN 997:2003:Cl. 6.17.6.	BS EN 997:2003:Cl. 6.8.

iii. Completed assembly:

Items	Test Method	Acceptance Standards
Solid Discharge and After-flush Volume for Maximum Flush	BS EN 997:2003:Cl. 6.17.7.	BS EN 997:2003:Cl. 6.9.
Paper discharge for reduced flush volume	BS EN 997:2003:Cl. 6.17.8.	BS EN 997:2003:Cl. 6.10.
Liquid Contaminant Dye Retention	BS EN 997:2003:Cl. 6.17.9.	BS EN 997:2003:Cl. 6.11.
Wash of Bowl	BS EN 997:2003:Cl. 6.17.10.	BS EN 997:2003:Cl. 6.12.
Flush Volume		
- Full Flush	BS EN 997:2003:Cl. 6.17.3.	BS EN 997:2003:Cl. 6.5.1.
- Reduced Flush	BS EN 997:2003:Cl. 6.17.3.	BS EN 997:2003:Cl. 6.5.2.
Depth of Water Seal	BS EN 997:2003:Cl. 6.17.3.	BS EN 997:2003:Cl. 6.13.
Flush Rate	BS EN 997:2003:Cl. 6.17.4.	BS EN 997:2003:Cl. 6.6.

3. On Site Delivery Verification:

a. At delivery stage, submit the following documents:

- i. Written confirmation that the material delivered to Site conforms with the Approved sample submitted under sub-clause (1)(a);
- ii. Original or certified true copy of the Certificate of Origin for every batch of delivery. One batch being the material quantity covered under each delivery note;
- iii. Delivery notes for all material delivered to Site.

b. Carry out and submit report on the following verifications for WC suites upon delivery on Site. Prior to carrying out the verifications, inform CM's representatives who may present to witness the verifications:

i. Method:

Verification Items	Method	Acceptance Standards
Dimension check for WC pan	By measurement	Same as CM's Approved sample

Shell thickness of cistern	By measurement	Same as CM's Approved sample
Surface quality check for WC pan and cistern	Visual	No discolouration, no damage, no staining, no blemish, acceptable colour consistency
Surface quality check on the underside of WC pan	By measurement	<ul style="list-style-type: none"> • Less than or equal to 4 nos. fine, shallow, unrepared, non-through cracks; and each crack is less than or equal to 50 mm long. • Cracks repaired other than by firing clayey material infill in furnace in the factories are not acceptable.

ii. Frequency:

Verification Items	Sampling Frequency	Representative Batch
Dimension check for WC pan	1 sample from each batch	Material delivered to Site under one Delivery Note
Shell thickness of cistern	1 sample from each batch	Material delivered to Site under one Delivery Note
Surface quality check for WC pan and cistern	1 sample from each batch	Material delivered to Site under one Delivery Note
Surface quality check on the underside of WC pan	1 sample from every 200 nos. of WC pans from each batch	Material delivered to Site under one Delivery Note

c. Where any of the verifications fail to meet the acceptance standards, either:

- i. Remove the representative batch off Site; or
- ii. When agreed by the CM, repeat all verification items on three separate samples selected by the CM. In case of failure of any verification to any one sample, remove the representative batch off Site, bear all associated costs, and no extension of time will be allowed.

PLU2.M120.7 WC PAN

Comprising:

1. Vitreous china washdown pan with horizontal outlet to BS 5503:Part 3:1990;
2. Seat and cover to BS 1254:1981: plastic single ring type.

PLU2.M130.7 SQUATTING WC

Vitreous china washdown WC pan with integral treads and loose trap for fitting at floor level.

PLU2.M140.7**CISTERNS**

To BS 1125:1987, comprising:

1. Flushing apparatus: valveless syphonic;
2. uPVC discharge pipe to BS 3505:1986 or BSEN 1452 Parts 1-5:2000;
3. Ball valve and overflow;
4. Type and material: low level plastic, high level plastic or low level vitreous china as shown on Drawings.

URINALS AND CISTERNS**PLU2.M210.7****BOWL URINAL SUITE**

Comprising:

1. Vitreous china bowl to BS 5520:1977:
 - a. Inlet supply: top for surface fixed pipework or back for concealed pipeworks;
 - b. Non-corroding, concealed, screw fixed brackets;
 - c. Colour: as shown on Drawings or to Approval.
2. Plastics waste outlet, 40 mm nominal size with backnut and plastics or stainless steel domed outlet grating.

PLU2.M220.7**FIRE CLAY SLAB URINALS**

Fire clay slab type with graded single channel, outlet and grating and fluted non-slip treads:

1. Arrangement and dimensions as shown on the Drawings;
2. Water supply, waste disposal fittings as shown on the Drawings.

PLU2.M230.7**STAINLESS STEEL SLAB URINAL**

To BS 4880:Part 1:1973 and:

1. Stainless steel spreaders, flush pipes and brackets;
2. Copper alloy outlet, 65 mm nominal size with backnut and hinged domed outlet grating;
3. Automatic plastics flushing cistern: to BS 1876:1990 non-corroding screw to the wall metal fixings;
4. Water supply fittings: as shown on Drawings;

PLU2.M240.7**CISTERNS**

Comprising:

1. Vitreous china automatic flushing cistern to BS 1876:1990;
2. Chromium plated flush pipe and fixing clips;
3. Surface fixed or concealed chromium plated spreader;
4. Colour: as shown on Drawings and to match urinal.

WASH BASINS AND SINKS

PLU2.M310.7

WALL HUNG OR COUNTER TOP OR SEMI-RECESSED WASH BASINS

1. Submission Requirements:

- a. At sample submission and approval stage, submit a sample of the proposed material for CM's approval together with all the following substantiation for CM's information:
 - i. Catalogue, brand name/model name and job reference of the product;
 - ii. Name, address and contact person of the local supplier;
 - iii. Name, address and contact person of the manufacturer;
 - iv. When the wash basins are supplied for domestic blocks, except for the ancillary facilities at lower floors, also include the followings in the submission:
 - Original or a certified true copy of the ISO 9001 certificate for the manufacturing plant. If a copy of the ISO certificate is submitted, it shall be certified true by a certification body or by the QCM. The certification body shall either be accredited by the Hong Kong Accreditation Service (HKAS) or an accreditation body which has entered into a mutual recognition agreement with HKAS.
- b. Submit original or certified true copy (issued or certified by the laboratory that complies with **PRE.B9.570**) of the test reports showing full compliance with the requirements of sub-clause (2)(b) for CM's information:
 - i. The date of the test shall be generally within three years prior to the notified date for commencement of the Works;
 - ii. The test reports shall either be submitted at the sample submission and approval stage as mentioned in sub-clause (1)(a), or at a time not later than the delivery of the material as mentioned in sub-clause (3)(a);
 - iii. In the event that no test report has been submitted for CM's information when the materials are delivered to Site, remove all delivered materials off Site, bear all associated costs and no extension of time will be allowed.
- c. Submit catalogue and test report (original or certified true copy issued or certified by the laboratory that complies with **PRE.B9.570**) showing compliance with sub-clause (2)(b)(v) for the proprietary screw anchors or threaded rods as specified in sub-clause (2)(a)(iii) for CM's agreement not later than the delivery of the material as mentioned in sub-clause (3)(a).

2. Quality Requirements:

- a. Vitreous china wall hung or counter top or semi-recessed wash basin comprising:
 - i. Vitreous china wash basin to BS 1188:1974, with single faucet hole to CM's approval for monoblock basin mixer with aerator, pop up waste and flexible supply pipes:
 - Type: wall hung or counter top or semi-recessed as shown on Drawings;
 - Colour: as shown on Drawings or to Approval;
 - Size to fit design layout and with sufficient space between the wall surface and the basin mixer for the operation of the pop up waste.
 - ii. Fixing for counter top or semi-recessed wash basins: in accordance with manufacturer's recommendations approved by CM;

iii. Fixing for wall-hung wash basins: proprietary screw anchors or threaded rods with flexible washers, plastic plugs (other types to be Approved) and all necessary fixing accessories to suit the site conditions.

b. The quality and performance requirements are as follows:

Items	Test Method	Acceptance Standards
i. Water Absorption	BS 3402:1969 0.76% MAX.	BS 3402:1969
ii. Crazeing	BS 3402:1969 No defects	BS 3402:1969
iii. Chemical Resistance	BS 3402:1969 No visual defects	BS 3402:1969
- Acetic acid		
- Citric acid		
- Detergent		
- HCL acid		
- NaOH		
- Sodium stearate		
- Sulphuric acid hole		
iv. Resistance to Staining and Burning	BS 3402:1969 No stain	BS 3402:1969
- Aqueous solution of ethylene blue		
- Aqueous solution of sodium hypochloride		
- Aqueous solution of hydrogen peroxide		
- AMYL acetate		
- Carbon tetrachloride		
- Iodine in alcohol		
- Lighted cigarette		
v. Load Resistance (for wall hung and semi-recessed wash basin only)	BS EN 14688:2006	<ul style="list-style-type: none"> - No cracking, breaking or permanent distortion of wash basins - No observable movement or loosening of screw anchors, threaded rods or plastic plugs

3. On Site Delivery Verification:

a. At delivery stage, submit the following documents:

- Written confirmation that the material delivered to Site conforms with the Approved sample submitted under sub-clause (1)(a);
- Original or certified true copy of the Certificate of Origin for every batch of delivery. One batch being the material quantity covered under each delivery note;
- Delivery notes for all material delivered to Site.

b. Carry out and submit report on the following verifications for vitreous china wash basins upon delivery on Site. Prior to carrying out the verifications, inform CM's representatives who may present to witness the verifications:

i. Method:

Verification Items	Method	Acceptance Standards
Dimension Check	By measurement	Same as CM's approved sample
Surface Quality	Visual	No discolouration, no damage, no staining, no blemish, acceptable colour consistency
On-site Load Resistance Test	BS EN 14688:2006	Same as sub-clause (2)(b)(v)

ii. Frequency:

Verification Items	Sampling Frequency	Representative Batch
Dimension Check	1 sample from each batch	Material delivered to Site under one Delivery Note
Surface Quality	1 sample from each batch	Material delivered to Site under one Delivery Note
On-site Load Resistance Test	2 samples in the sample flats for wash basins on both concrete and panel walls. Where the wash basins are only attached to one type of wall, 1 sample is taken.	Material delivered to Site for sample flat installation

c. Where any of the verifications fail to meet the acceptance standards, either:

- i. Remove the representative batch off Site; or
- ii. When agreed by the CM, repeat all verification items on three separate samples selected by the CM. In case of failure of any verification to any one sample, remove the representative batch off Site, bear all associated costs, and no extension of time will be allowed.

PLU2.M320.7**STAINLESS STEEL SINK**

Stainless steel non-magnetic and corrosive resistant and to BS 1244:Part 2:1988, comprising:

1. Bowl and drainer of steel grade 304S15 to BS 1449:Part 2:1983 with mill surface finish No.2A or with AISI 304 18/8, complete with 90 mm waste fittings, insert clips; rubber underlining, 0.8 mm thickness, polished finish;
2. Type: sit-on or inset type with number of bowls and drains as shown on Drawings;
3. Chromium plated brass chain and stay with rubber plug;
4. Pierced waste outlet to accommodate waste fitting;
5. Stainless steel drain outlets consisting of stainless steel strainer and fixing screws with PVC couplings for connection to 40 mm diameter PVC bottle traps and pipes;
6. Sound deadening pads fitted underneath sink and drainer;
7. 25 mm x 1.6 mm thick stainless steel earthing lug for equipotential bonding connection, or otherwise as indicated on Drawings.

BATHS AND SHOWERS

PLU2.M410.7

PORCELAIN ENAMELLED CAST IRON BATHS

1. Submission Requirements:

- a. At sample submission and approval stage, submit a sample of the proposed material for CM's approval together with all the following substantiation for CM's information:
 - i. Catalogue, brand name/model name and job reference of the product;
 - ii. Name, address and contact person of the local supplier;
 - iii. Name, address and contact person of the manufacturer;
 - iv. When the cast iron baths are supplied for domestic blocks, except for the ancillary facilities at lower floors, also include the followings in the submission:
 - Original or a certified true copy of the ISO 9001 certificate for the manufacturing plant. If a copy of the ISO certificate is submitted, it shall be certified true by a certification body or by the QCM. The certification body shall either be accredited by the Hong Kong Accreditation Service (HKAS) or an accreditation body which has entered into a mutual recognition agreement with HKAS.
- b. Submit original or certified true copy (issued or certified by the laboratory that complies with **PRE.B9.570**) of the test reports showing full compliance with the requirements of sub-clause (2)(b) for CM's information:
 - i. The date of the test shall be generally within three years prior to the notified date for commencement of the Works;
 - ii. The test reports shall either be submitted at the sample submission and approval stage as mentioned in sub-clause (1)(a), or at a time not later than the delivery of the material as mentioned in sub-clause (3)(a);
 - iii. In the event that no test report has been submitted for CM's information when the materials are delivered to Site, remove all delivered materials off Site, bear all associated costs and no extension of time will be allowed.

2. Quality Requirements:

- a. Porcelain enamelled cast iron bath to BS 1189:1986 comprising:
 - i. Porcelain enamelled cast iron non-apron type bath with non-slip surface:
 - Colour: as shown on Drawings or to Approval.
 - ii. Adjustable cast iron feet capable of raising top of bath to the height as shown on Drawings;
 - iii. Chromium plated brass bath pop up drain and flexible overflow assembly;
 - iv. 1.5 mm removable enamelled pressed steel apron with skirting and fixing devices:
 - Colour: as shown on Drawings to match the bath.
- b. The quality and performance requirements are as follows:
 - i. Cast iron bath tub and waste bodies:

Items	Test Method	Acceptance Standards	Remark
Visual Inspection	Cl. 3.3, 3.4 and 3.5 of BS 1189:1986.	Cl. 3.3, 3.4 and 3.5 of BS 1189:1986.	• All items are applicable to the bath.
Dimensional Check			• Visual inspection,

- Overall Dimensions	Cl. 6 of BS 1189:1986.	Length = $L \pm 5$ mm, - 10 mm. Width = $W \pm 5$ mm. where L, W are dimensions shown on Drawings.	dimensional check, functional characteristics and finish are applicable to apron • For visual inspection, adjust the cast iron feet so that the top of the bath is set at a height of 525 mm above test floor level.
- Connecting Dimensions	Cl. 4.1 of BS 1189:1986 on dimensions H, D ₁ , D ₂ , D ₄ & a.	Table 1 of BS 1189:1986.	
- Dimensional Deviations	Cl. 8.1 to 8.6 and App. B5 of BS 1189:1986	Cl. 8.2 to 8.6 of BS 1189:1986.	
Functional Characteristics	Cl. 7 of BS 1189:1986.	Cl. 7 of BS 1189:1986.	
Finish	Cl. 3.2.1 to 3.2.6 of BS 1189:1986.	Cl. 3.2.1. to 3.2.6. of BS 1189:1986.	
Pop Up Waste Assembly			
- Waste Plugs	See Test Method No. 1 as given in (b)(ii) below	Minimum 95% volume of water shall be left in the bath.	
- Coating Appearance	Cl. 6.1.1 of BS 4641:1986	Cl. 6.1.1 of BS 4641:1986	
- Overflow Body - Coating Appearance	Cl. 6.1.1 of BS 4641:1986	Cl. 6.1.1 of BS 4641:1986	
Rigidity	Test 1 to 5 of Cl. B.6 of BS 1390:1990	Same as the requirements stipulated in columns 'Type 1, Grade 22' of Table 4 of BS 1390:1990.	
Impact Resistance	Cl. B.7 of BS 1390:1990. (drop height to be 1.4 m)	Cl. B.7.2. of BS 1390:1990	

ii. Test Method No. 1:

- Operate the pop up drain five times;
- Close the waste plug. Check if it is watertight fit in the waste body by filling 50 mm depth of water at $25 \pm 1^\circ\text{C}$ into the bath and observe for sign of water leakage 5 min. later. There shall be no sign of leakage. Drain the water and repeat the test if leakage is found. The specimen fails the test if watertightness cannot be achieved after three attempts;
- Fill the bath with known volume of water at $32 \pm 1^\circ\text{C}$ up to 400 mm depth, measured at mid-length of the bath. This procedure shall be completed in less than 5 minutes;
- Maintain the temperature at $32 \pm 1^\circ\text{C}$ during the test;
- Measure volume of the water left in the bath after 1 hour.

3. On Site Delivery Verification:

a. At delivery stage, submit the following documents:

- i. Written confirmation that the material delivered to Site conforms with the Approved sample submitted under sub-clause (1)(a);
- ii. Original or certified true copy of the Certificate of Origin for every batch of delivery. One batch being the material quantity covered under each delivery note;
- iii. Delivery notes for all material delivered to Site.

b. Carry out and submit report on the following verifications for baths upon delivery on Site. Prior to carrying out the verifications, inform CM's representatives who may present to witness the verifications:

i. Method:

Verification Items	Test Method	Acceptance Standards
Dimension Check	By measurement	Same as CM's Approved sample
Surface Quality	Visual	No discolouration, no damage, no staining, no blemish, acceptable colour consistency

ii. Frequency:

Verification Items	Sampling Frequency	Representative Batch
Dimension Check	1 sample from each batch	Material delivered to Site under one Delivery Note
Surface Quality	1 sample from each batch	Material delivered to Site under one Delivery Note

c. Where any of the verifications fail to meet the acceptance standards, either:

- i. Remove the representative batch off Site; or
- ii. When agreed by the CM, repeat all verification items on three separate samples selected by the CM. In case of failure of any verification to any one sample, remove the representative batch off Site, bear all associated costs, and no extension of time will be allowed.

PLU2.M420.7**VITREOUS CHINA SHOWER TRAYS**

Vitreous china, to BS 6340:Part 8:1985:

1. Length and size to fit design layout;
2. Colour: as shown on Drawings or to Approval.

PLU2.M430.7**ACRYLIC SHOWER CUBICLE, SHOWER TRAY AND SLIDING SHOWER DOOR**

1. Submission Requirements:

- a. At sample submission and approval stage, submit a sample of the proposed material for CM's approval together with all the following substantiation for CM's information:
 - i. Catalogue, brand name/model name and job reference of the product;
 - ii. Name, address and contact person of the local supplier;
 - iii. Name, address and contact person of the manufacturer;
 - iv. When the shower cubicle and shower trays are supplied for domestic blocks, except for the ancillary facilities at lower floors, also include the followings in the submission:
 - Original or a certified true copy of the ISO 9001 certificate for the manufacturing plant. If a copy of the ISO certificate is submitted, it shall be certified true by a certification body or by the QCM. The certification body shall either be accredited by the Hong Kong Accreditation Service (HKAS) or an accreditation body which has entered into a mutual recognition agreement with HKAS.
- b. Submit original or certified true copy (issued or certified by the laboratory that complies with **PRE.B9.570**) of the test reports showing full compliance with the requirements of sub-clause (2)(b) for CM's information:

- i. The date of the test shall be generally within three years prior to the notified date for commencement of the Works;
 - ii. The test reports shall either be submitted at the sample submission and approval stage as mentioned in sub-clause (1)(a), or at a time not later than the delivery of the material as mentioned in sub-clause (3)(a);
 - iii. In the event that no test report has been submitted for CM's information when the materials are delivered to Site, remove all delivered materials off Site, bear all associated costs and no extension of time will be allowed.
2. Quality Requirements:
- a. Acrylic shower cubicle, shower tray and sliding shower door to BS 3193:1989, BS 5286:1978, BS 6206:1981 and BS 6340:Part 5:1983 or equivalent:
 - i. Acrylic shower cubicle or shower tray:
 - Length and size to fit design layout;
 - Colour: as shown on Drawings or to Approval;
 - Flat shower tray with adjustable feet and removable front panel. The shower trays shall be premounted and can be adjusted easily in height. The front panel shall be fixed at the frame by concealed clip system.
 - ii. Sliding shower door:
 - Number and size of doors as shown on Drawings;
 - Fully framed shower enclosure constructed of PVC coated or powder coated epoxy finished aluminium framing with 5 mm thick (minimum) clear tempered safety glass and magnetic closure device;
 - Adjustability of the panel by two mounting profiles;
 - Ball-bearing wheels for the panels to enable easy sliding of the doors;
 - Door panels should be demountable for easy cleaning.
 - b. The quality and performance requirements are as follows:
 - i. Shower cubicle or shower tray:

Shower tray:

Test Method BS 6340:Part 5:1983, AMD 4980, AMD 5913			Acceptance Standard	Remarks
Clause 4	Dimensions	Length (mm)	± 5 mm	The dimensions shall not deviate from the work size quoted by the manufacturer by more than the acceptance standards
		Width (mm)		
		Height (mm)		
		Radius (mm)		
Clause 6 and Appendix B.2	Dimensional Deviations	Squaring	± 5 mm	
		Straightness of the sides		
		Straightness of the rim edge		
		Flatness of the top surface of rim		
			1. To meet the requirements of Clause 5.	

Clause 7 and Appendix B.3 & B.5	Resistance to Temperature Changes	2. The maximum deflection at the gauge position is not greater than 4 mm 3. No evidence of distortion or other defects at the impact sites.		
Clause 8 and Appendix B.4	Resistance to Domestic Chemicals and Stains	No permanent staining or deterioration.		
Clause 9 and Appendix B.5	Resistance to Impact	No evidence of distortion or other defects.		
Clause 10 and Appendix B.6	Determination of rigidity after simulated installation of the shower tray	Test No	Maximum Permissible Deflection	
			Under load	Residual
		m	mm	mm
		1	2	0.3
		2	3	0.3

Shower cubicle:

Test Method			Acceptance Standards		Remarks
Dimensions	Assembly	Length (mm)	± 5 mm		The dimensions shall not deviate from the work size quoted by the manufacturer by more than the acceptance standards
		Width (mm)			
		Height (mm)			
		Radius (mm)			
	Thickness of Door (Outer Frame) (mm)		± 2 mm		
	Thickness of Enclosure Wall (Outer Frame) (mm)		± 2 mm		
	Thickness of Tempered Glass (mm)		Minimum 5 mm		
BS 6340:Part 3:1985	Test on Rigid Enclosure Walls	Maximum Permissible Deflection			
Appendix A		Under load	Residual		
		55 mm	5 mm		
BS 6340:Part 3:1985 Appendix A	Leakage Test		Inspect at the other side of the cubicle to check no water leakage/seepage.		

Tempered glass:

Test Method		Acceptance Standard	Remarks
BS 6206:1981 & AMD 8693	Test for Toughening Quality	BS 6206:1981 Clause 5.14 Have a minimum particle count of 40 particles in any 50 x 50 mm square.	If the test result of this test does not comply to the acceptance standard, the impact test shall not be carried out. The material shall not be classified.
	Test for Behavior on Impact	BS 6340:Part 3:1985 The safety glass to be Class C or higher class.	
BS 3193:1989 Appendix C	Resistance to Thermal Shock	BS 3193:1989 The glass panel shall not fracture	

Sliding shower doors:

Test Method		Acceptance Standard	Remarks
Dimensions (Assembly)	Height (mm)	± 5 mm	The dimensions shall not deviate from the work size quoted by the manufacturer by more than the acceptance standards
	Width (mm)	± 5 mm	
	Thickness of Door (mm) (Outer Frame)	± 2 mm	
Dimensions (Each sliding door panel)	Height (mm)	± 5 mm	The dimensions shall not deviate from the work size quoted by the manufacturer by more than the acceptance standards
	Width (mm)	± 5 mm	
	Thickness of Panel (mm)	± 2 mm	
	Thickness of Tempered Glass (mm)	Minimum 4 mm	Each sliding door panel shall be tested separately.
BS 5286:1978 & AMD 4641	Ease of Sliding	Force not less than 10 N and not exceeding 60 N applied at the hand-grip position to set the panel in motion.	Each sliding door panel shall be tested separately.
	Resistance to Excessive Operation Force	The force 150 N shall not cause a deflection of the stile greater than 3 mm and there shall be no permanent deflection on release of load.	
	Resistance to Accidental Loading	With the force 300 N applied, the stile shall not twist off the glazing and there shall not subsequently be any permanent deformation	
See methods given in (b)(ii) & (b)(iii) below	Test on Endurance Performance	No damage after 100,000 cycling test, back and forth movement. Force not less than 10 N and not exceeding 60 N applied at the hand-grip position to set the panel in motion after cycling test.	
BS 6340:Part 3: 1985 Appendix B	Leakage Test	Inspect at the other side of the door to check no water leakage/seepage.	The sliding door assembly shall be tested.

ii. Test on endurance performance of sliding door:

- Install the specimen unit according to the manufacturer's specification;
- Connect the test door at the hand-grip position to mechanical system (see cycling test mechanism below) capable of producing a uniform back and forth movement to the test door;
- Move the test door back and forth over a full travel distance for 100,000 cycles;
- Set the speed of operation of the test door between successive open/close cycles to a minimum of 5 seconds and a maximum of 10 seconds.

iii. Cycling test mechanism:

- The mechanism shall provide smooth opening of the test door and return of the test door to the closed position;
- The mechanism shall be capable of providing 100,000 continuous cycles of open / close;
- Means shall be provided for recording the number of operating cycles;
- Check for damages, examine and record the wear and tear conditions and carry out "Ease of Sliding Test" after 5,000, 10,000, 20,000 cycles and therefore after every 20,000 cycles.

3. On Site Delivery Verification:

- a. At delivery stage, submit the following documents:
 - i. Written confirmation that the material delivered to Site conforms with the Approved sample submitted under sub-clause (1)(a);
 - ii. Original or certified true copy of the Certificate of Origin for every batch of delivery. One batch being the material quantity covered under each delivery note;
 - iii. Delivery notes for all material delivered to Site.
- b. Carry out and submit report on the following verifications for shower cubicle and tray upon delivery on Site. Prior to carrying out the verifications, inform CM's representatives who may present to witness the verifications:
 - i. Method:

Verification Items	Method	Acceptance Standards
Dimension Check	By measurement	Same as CM's Approved sample
Surface Quality	Visual	No discolouration, no damage, no staining, no blemish, acceptable colour consistency

- ii. Frequency:

Verification Items	Sampling Frequency	Representative Batch
Dimension Check	1 sample from each batch	Material delivered to Site under one Delivery Note
Surface Quality	1 sample from each batch	Material delivered to Site under one Delivery Note

- c. Where any of the verifications fail to meet the acceptance standards, either:
 - i. Remove the representative batch off Site; or
 - ii. When agreed by the CM, repeat all verification items on three separate samples selected by the CM. In case of failure of any verification to any one sample, remove the representative batch off Site, bear all associated costs, and no extension of time will be allowed.

ANCILLARY MATERIALS

PLU2.M510.7

MIXERS (BATH/SHOWER, BASIN AND KITCHEN SINK) AND SHOWER HANDSETS

1. Submission Requirements:
 - a. At sample submission and approval stage, submit a sample of the proposed mixers and shower handsets for CM's approval together with all the following substantiation for CM's information:
 - i. Catalogue, brand name/model name and job reference;
 - ii. Name, address and contact person of the local supplier;
 - iii. Name, address and contact person of the manufacturer;
 - iv. Approval by the Water Supplies Department for the mixers;

- v. Where applicable, either the document from the manufacturer showing his authorization for the supplier as the agent/distributor in Hong Kong or document from the supplier showing the appointment of the manufacturer and manufacturer's agreement for the production of the proposed product;
- vi. Nominal flow rates of mixers and shower head;
- vii. Calculation in accordance to the method described in BEAM Plus to demonstrate that the use of the proposed mixers and shower head in the project will lead to an annual saving of consumption of potable water of not less than 20%;
- viii. When the mixers and shower handsets are supplied for domestic blocks, except for the ancillary facilities at lower floors, also include the followings in the submission:
 - Two identical panels with accessories mounted on boards similar to the one maintained by the Housing Department showing the quality and components for the mixers and shower handsets;
 - Original or certified true copies of certification to ISO 9001 and ISO 14001 for the manufacturing plant. If the mixers and shower handsets are not manufactured in the same plant, the certification is required for all manufacturing plants. If a copy of the ISO certificate is submitted, it shall be certified true by the certification bodies or by the QCM. The certification bodies shall be as follows:

ISO	Certification Body
ISO 9001	The certification body shall either be accredited by the Hong Kong Accreditation Service (HKAS) or an accreditation body which has entered into a mutual recognition agreement with HKAS.
ISO 14001	The certification body shall be accredited by the Hong Kong Accreditation Service (HKAS), or the China National Accreditation Service (CNAS), or an accreditation body which has entered into a mutual recognition agreement with HKAS.

- b. Submit original or certified true copy (issued or certified by the laboratory that complies with **PRE.B9.570**) of the test reports showing full compliance with the performance requirements of sub-clauses (2)(a)(iii), (2)(b)(iv), (2)(c)(v) and (2)(d)(iv) for CM's information:
 - i. The date of the test shall be generally within three years prior to the notified date for commencement of the Works or at an earlier date for domestic blocks subject to CM's consideration on the track records as maintained by the Housing Department;
 - ii. The test reports shall either be submitted at the sample submission and approval stage as mentioned in sub-clause (1)(a), or at a time not later than the delivery of the material as mentioned in sub-clause (3)(a);
 - iii. In the event that no test report has been submitted for CM's information when the materials are delivered to Site, remove all delivered materials off Site, bear all associated costs and no extension of time will be allowed.
2. Quality Requirements:
- a. Mixer (Bath/Shower):
 - i. Design and construction requirements:
 - Bath mixer: single lever wall mounted type with double outlets and diverter for shower point connection with removable type aerator/strainer at the spout of the bath mixer;

- Shower mixer: single lever wall mounted type with single outlet for shower point connection;
- All taps identified for use on hot and cold water with either colour coding and/or character identification;
- Corrosion resisting copper alloy with chrome plated finish to body of mixer;
- Threaded end connection to mixer suitable for directly connecting the pipe to which it is installed. S-connection to be covered;
- Nominal size of the mixer as shown on the Drawings.

ii. Pressure and temperature requirements:

- Suitability for both working and test pressure and temperature of the plumbing system in which it is installed and complying with BS 1415:Part 1:1976 on pressure requirements;
- Total pressure drop across the mixer with the hot water tap fully open and cold water tap fully closed not more than 0.25 bar at 7 l/min.

iii. Performance requirements:

Items	Method	Acceptance Standards	Remark
Flow Rate	BS 1415:Part 1:1976: Cl. 12.1	BS 1415:Part 1:1976: Cl.12.3	For bath mixer, both nozzle and shower sides shall be tested.
Water tightness Tests	BS 5412:1996: Cl. 8.2.1 to 8.2.3	BS 5412:1996:Cl. 8.2 & Table 12	
Pressure Resistance Tests	BS 5412:1996:Cl. 9.2	BS 5412:1996: Cl. 9.2.2.2 and 9.2.3.2	
Mechanical Strength Test	BS 5412:1996:Cl. 11	BS 5412:1996: Cl. 11.2.4	
Mechanical Endurance Tests			
- Endurance Test of the Operating Mechanism	BS 5412:1996: Cl. 12.1	BS 5412:1996: Cl. 12.1.4	
- Endurance Test of Diverters (For bath mixer only)	BS 5412:1996: Cl. 12.2	BS 5412:1996: Cl. 12.2.2	
Pressure Drop Test (For bath mixer & shower mixer only)	Please refer to Method No. 1 as given in (a)(iv) below.	Total pressure drop across the mixer with hot water tap fully open and cold water tap fully closed not more than 0.25 bar at 7 litre/ minute.	For bath mixer, test both nozzle and shower sides.
Blend Water Extreme Temperature	BS 5779:1979:Cl. 16 & App K Temp. of supply water: cold water = 20°C ± 1°C hot water = 82°C ± 1°C	BS 5779:1979:Cl. 16	For bath mixer, test both nozzle and shower sides.

iv. Method No. 1:

- For Shower Mixer:
 - Refer to Appendix PLU2/I for arrangement of the testing set-up;
 - To test hot water side:

Set the lever handle of the mixer valve so that hot water side is fully open and cold water side is fully close. Allow maximum flow of water at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ and 7 l/min. $\pm 2\%$ to pass through the sample at the hot water side. Take reading of the pressure gauges to an accuracy of 2%.

Pressure drop should be taken as the difference in flow pressure between the inlet and outlet.

- For Bath Mixer:

- Refer to Appendix PLU2/I for arrangement of the testing set-up;
- Allow water at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ to pass through the sample at 7 l/min. $\pm 2\%$;
- To test hot water side:

The diverter shall be set so that water is discharged only through the connection to the shower hose. Set the lever handle of the mixer valve so that hot water side is fully open and cold water side is fully close. Allow maximum flow of water at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ and 7 l/min. $\pm 2\%$ to pass through the sample at the hot water side. Take reading of the pressure gauges to an accuracy of 2%.

Pressure drop should be taken as the difference in flow pressure between the inlet and outlet.

b. Mixer (Basin):

- i. Chromium plated brass monoblock basin mixer with non-ferrous or corrosion resisting pop-up waste and flexible hose assembly with stainless steel wire braiding;
- ii. Design and construction requirements:
 - Lever type fitted with removable type aerator/strainer at the spout;
 - Fixing to be in accordance with **PLU2.M610**.
- iii. Water efficiency requirements:
 - Grade 2 under the Voluntary Water Efficiency Labelling Scheme on Water Taps by Water Supplies Department with nominal flow rate not less than 6 litres/minute; and
 - The nominal flow rate shall satisfy the calculation in sub-clause (1)(a)(vii).
- iv. Performance requirements:

Items	Method	Acceptance Standards
Mixer		

Flow Rate Test	In accordance with the testing methodology of "Flow Rate Test" specified in Water Supplies Department's "Voluntary Water Efficiency Labelling Scheme on Water Taps".	Flow rate to sub-clause 2(b)(iii). The variation of the actual flow rates under dynamic pressures 150 kPa, 250 kPa and 350 kPa shall be within ± 1 litre/minute of the nominal flow rate registered under Water Supplies Department's "Voluntary Water Efficiency Labelling Scheme on Water Taps". The maximum difference between the highest and lowest average flow rates is not to exceed 2.0 litres/minute
Water tightness Tests	BS 5412:1996:Cl. 8.2.1 to 8.2.3	BS 5412:1996:Cl. 8.2 & Table 12
Pressure Resistance Tests	BS 5412:1996:Cl. 9.2	BS 5412:1996:Cl. 9.2.2.2 and 9.2.3.2
Mechanical Strength Test	BS 5412:1996:Cl. 11	BS 5412:1996:Cl. 11.2.4
Mechanical Endurance Tests - Endurance Test of the Operating Mechanism	BS 5412:1996:Cl. 12.1	BS 5412:1996:Cl. 12.1.4
Blend Water Extreme Temperature	BS 5779:1979:Cl. 16 & App K Temp. of supply water: cold water = $20^{\circ}\text{C} \pm 1^{\circ}\text{C}$ hot water = $82^{\circ}\text{C} \pm 1^{\circ}\text{C}$	BS 5779:1979:Cl. 16
Flexible Hose Assembly with Stainless Steel Wire Braiding		
Leak Tightness under Internal Hydrostatic Pressure	BS EN 13618 : 2011 : Cl. 4.2.3.3 & App B.4	BS EN 13618 : 2011 : Cl. 4.2.3.3
Tensile Stress Resistance	BS EN 13618 : 2011 : Cl. 4.2.3.4 & App B.3	BS EN 13618 : 2011 : Cl. 4.2.3.4
Resistance to Corrosion	BS EN 13618 : 2011 : Cl. 4.2.3.9 & App B.8 BS EN 12540: 2000 : Cl.7.2.3 Duration of corrosion test : Acetic acid salt spray test for 48 hours	BS EN 13618 : 2011 : Cl. 4.2.3.9
Flexibility	BS EN 13618 : 2011 : Cl. 4.2.3.11 & App B.9 For surveillance test in PLU2.T310 , length of test specimen L = length of flexible hose sampled from the Site.	BS EN 13618 : 2011 : Cl. 4.2.3.11

c. Mixer (Kitchen Sink):

- i. Chromium plated brass deck mounted kitchen sink mixer consisting of flexible hose assembly with stainless steel wire braiding;
- ii. Design and construction requirements:

- Single lever type;
 - All taps identified for use on hot and cold water with either colour coding and/or character identification;
 - Corrosion resisting copper alloy with chrome plated finish to body of mixer;
 - Fixing to be in accordance with **PLU2.M610**;
 - Nominal size of the mixer as shown on the Drawings.
- iii. Pressure and temperature requirements:
- Suitability for both working and test pressure and temperature of the plumbing system in which it is installed.
- iv. Water efficiency requirements:
- Grade 2 under the Voluntary Water Efficiency Labelling Scheme on Water Taps by Water Supplies Department with nominal flow rate not less than 6 litres/minute; and
 - The nominal flow rate shall satisfy the calculation in sub-clause (1)(a)(vii).
- v. Performance requirements:

Items	Method	Acceptance Standards
Mixer		
Flow Rate Test	In accordance with the testing methodology of "Flow Rate Test" specified in Water Supplies Department's "Voluntary Water Efficiency Labelling Scheme on Water Taps".	Flow rate to sub-clause 2(c)(iv). The variation of the actual flow rates under dynamic pressures 150 kPa, 250 kPa and 350 kPa shall be within ± 1 litre/minute of the nominal flow rate registered under Water Supplies Department's "Voluntary Water Efficiency Labelling Scheme on Water Taps" The maximum difference between the highest and lowest average flow rates is not to exceed 2.0 litres/minute
Water Tightness Tests	BS 5412:1996:Cl. 8.2 (Tests in Cl. 8.2.4 & 8.2.5 do not apply)	BS 5412:1996:Cl. 8.2 & Table 12
Pressure Resistance Tests	BS 5412:1996:Cl. 9.2	BS 5412:1996:Cl. 9.2.2.2 and 9.2.3.2
Mechanical Strength Test	BS 5412:1996:Cl. 11	BS 5412:1996:Cl. 11.2.4
Mechanical Endurance Tests		
- Endurance Test of the Operating Mechanism	BS 5412:1996:Cl. 12.1	BS 5412:1996:Cl. 12.1.4
- Endurance of Swivel Nozzles	BS 5412:1996:Cl. 12.3	BS 5412:1996:Cl. 12.3.2.4

Blend Water Extreme Temperature	BS 5779:1979:Cl. 16 & App K Temperature of supply water: cold water = 20°C ± 1°C hot water = 82°C ± 1°C	BS 5779:1979:Cl. 16
Flexible Hose Assembly with Stainless Steel Wire Braiding		
Leak Tightness under Internal Hydrostatic Pressure	BS EN 13618 : 2011 : Cl. 4.2.3.3 & App B.4	BS EN 13618 : 2011 : Cl. 4.2.3.3
Tensile Stress Resistance	BS EN 13618 : 2011 : Cl. 4.2.3.4 & App B.3	BS EN 13618 : 2011 : Cl. 4.2.3.4
Resistance to Corrosion	BS EN 13618 : 2011 : Cl. 4.2.3.9 & App B.8 BS EN 12540: 2000 : Cl.7.2.3 Duration of corrosion test : Acetic acid salt spray test for 48 hours	BS EN 13618 : 2011 : Cl. 4.2.3.9
Flexibility	BS EN 13618 : 2011 : Cl. 4.2.3.11 & App B.9 For surveillance test in PLU2.T310 , length of test specimen L = length of flexible hose sampled from the Site.	BS EN 13618 : 2011 : Cl. 4.2.3.11

d. Shower Handset:

i. Shower Handsets consisting:

- 1000 mm shower rail;
- 1500 mm flexible plastic shower hose;
- Shower head with adjustable spray pattern;
- Soap dish.

ii. Shower hose:

- Design and construction requirements:
 - Corrosion resistant, flexible and of durable construction with lock nut/adaptor at both ends for connection to mixer and shower head;
 - 1500 mm long.
- Pressure and temperature requirements:
 - Suitability for both the working and test pressure and temperature of the plumbing system in which it is installed.

iii. Shower head:

- Design and construction requirements:
 - Hand shower type, corrosion resistant and of durable construction with threaded ends for connecting to a shower hose.
- Pressure and temperature requirements:
 - Suitability for both working and test pressure and temperature of the plumbing system in which it is installed.
- Water efficiency requirements:

- Grade 1 under the Voluntary Water Efficiency Labelling Scheme on Showers for Bathing under Water Supplies Department with nominal flow rate not less than 7 litres/minute; and
- The nominal flow rate shall satisfy the calculation in sub-clause (1)(a)(vii).

iv. Performance requirements:

Items	Method	Acceptance Standards
Flow Rate Test	In accordance with the testing methodology of "Flow Rate Test" specified in Water Supplies Department's "Voluntary Water Efficiency Labelling Scheme on Showers for Bathing"	Flow rate to sub-clause 2(d)(iii) The variation of the actual flow rates under dynamic pressures 150 kPa, 250 kPa and 350 kPa shall be within ± 1 litre/minute of the nominal flow rate registered under Water Supplies Department's "Voluntary Water Efficiency Labelling Scheme on Showers for Bathing" The difference between the highest and the lowest average flow rates measured in the nominal flow rate measurement shall not exceed 2.0 litre/minute
Mean Spray Spread Angle	In accordance with the testing methodology of "Mean Spray Spread Angle" specified in Water Supplies Department's "Voluntary Water Efficiency Labelling Scheme on Showers for Bathing"	The mean spread angle shall be between 0° and 8° .
Temperature Drop	In accordance with the testing methodology of "Temperature Drop" specified in Water Supplies Department's "Voluntary Water Efficiency Labelling Scheme on Showers for Bathing"	The temperature drop shall not exceed 3°C .
Hot Water Resistance Test	Please refer to Method No. 2 as given below.	The maximum temperature measured at the shower head shall not be greater than 45°C and the maximum temperature measured at the shower hose shall not be greater than 55°C . No visual defect e.g. melting of any component. The sample shall be able to pass Flow Rate Test after being cooled for 5 minutes. No leakage or defect found in hydraulic test.

v. Method No. 2:

- Allow hot water at $76^\circ\text{C} \pm 1^\circ\text{C}$ to pass through the sample for five minutes at a rate of 7 l/min.;

- Four random points evenly distributed across the surface of the shower head (two points at the handle) and four points along the length of the hose, measure the temperature at these locations to the nearest 0.1°C while the hot water is still running;
 - Visually examine the sample for defect;
 - Stop the hot water running, let the sample be cooled down to 25°C ± 1°C for five minutes;
 - Carry out Flow Rate Test to the sample again;
 - The hose shall also be subject to a static hydraulic pressure test of 5 bars for one minute. Observe for any sign of leakage and defect.
- e. When the mixers and shower handset are supplied for domestic blocks, standard of visual quality shall be comparable with the benchmark samples maintained by the Housing Department.
3. On Site Delivery Verification:
- a. At delivery stage, submit the following documents:
- i. Written confirmation that the material delivered to Site conforms with the Approved sample submitted under sub-clause (1)(a);
 - ii. Original or certified true copy of the Certificate of Origin for every batch of delivery. One batch being the material quantity covered under each delivery note;
 - iii. Delivery notes for all material delivered to Site.
- b. Carry out and submit report on the following verifications for mixers and shower handsets upon delivery on Site. Prior to carrying out the verifications, inform CM's representatives who may present to witness the verifications:
- i. Method:

Verification Items	Method	Acceptance Standards
Surface Quality	Visual	No damage, no staining, no blemish, appearance same as CM's Approved sample.
Logo and label check	Visual	Same as CM's Approval sample

- ii. Frequency:

Verification Items	Sampling Frequency	Representative Batch
Surface Quality	1 sample from each batch	Same batch of material delivered to Site under one Delivery Note
Logo and label check		

- c. Where any of the verifications fail to meet the acceptance standards, either:
- i. Remove the representative batch off Site; or
 - ii. When agreed by the CM, repeat all verification items on three separate samples selected by the CM. In case of failure of any verification to any one sample, remove the representative batch off Site, bear all associated costs, and no extension of time will be allowed.

PLU2.M530.7**VITREOUS CHINA SOAP HOLDERS**

Vitreous china, semi-recessed type with drain spout on descending rim:

1. Length and size to fit design layout;

-
2. Colour: as shown on Drawings or to Approval.

PLU2.M540.7 STAINLESS STEEL TOILET PAPER HOLDER

Stainless Steel, surface mount type, polished surface with plastic roller, size as shown on Drawings.

PLU2.M550.7 VITREOUS CHINA TOILET PAPER HOLDER

Vitreous china, surface mount type, with plastic roller, size as shown on Drawings.

FIXING AND POINTING MATERIALS

PLU2.M610.7 FIXINGS

Provide the following as applicable to the sanitary appliances and mixers being fixed:

1. Fixings:
 - a. Stainless steel grade 304 screws and plastic caps with plastic plugs or;
 - b. Proprietary fixing screws and plastic caps with plastic plugs supplied by the same manufacturer of the sanitary appliances subject to CM's approval.
2. Fixing screws for WC pan and mixers shall be non-ferrous or corrosion resisting materials.

PLU2.M620.7 WC PAN BEDDING MATERIAL

White cement.

PLU2.M630.7 POINTING GROUT

White cement.

PLU2.M640.7 SILICONE SEALANT

As **WAT5.M170**.

WORKMANSHIP

GENERAL

PLU2.W010.7

BRITISH STANDARD

Comply with BS 8000:Part 13:1989, unless specified otherwise in respect of the following:

1. Materials handling and preparation (section 2);
2. Installation of sanitary appliances (sub-section 3.2);
3. Protection (sub-section 3.3).

PLU2.W020.7

HANDLING, STORAGE AND PROTECTION OF APPLIANCES

1. Store components off a levelled, well-drained and maintained hard-standing ground and in a manner which will not result in damage. Protect components from the weather;
2. Prevent contact with harmful elements, such as water, mud, plaster, cement etc;
3. Retain protective coverings in position for as long as possible and in place during fixing wherever practicable;
4. Use dust sheets or polythene sheets as protection when items do not have manufacturer's own packaging;
5. Prevent pre-finished surfaces from rubbing together;
6. Replace any units which have been chipped or scratched either before or after fixing.

JOINTS

PLU2.W110.7

SEALANT JOINTS

Seal joints in accordance with Worksection WAT5 and BS 8000:Part 13:1989, paragraph 3.2.3.

FIXING WC SUITES

PLU2.W210.7

PEDESTAL WC PANS

1. Set pan correctly in relation to finished floor level by using bedding materials;
2. Fix pan securely to floor using fixings in **PLU2.M610**;
3. The fixing screws shall not damage the waterproofing in the floor slab.

PLU2.W220.7

SQUATTING WC PANS

Bed on concrete floor in cement and sand bedding mortar and joint to soil pipe in similar mortar.

PLU2.W230.7

HIGH OR LOW LEVEL FLUSHING CISTERNS

Fix at heights as recommended by the pan manufacturer on brackets screwed to the wall or with stainless steel screws and plastics plugs. Fix supplementary support brackets where supplied by the manufacturer.

PLU2.W240.7**CLOSE-COUPLED FLUSHING CISTERNS**

Fix to WC pan with bracket and bolts supplied by the manufacturer and to wall with stainless steel screws and plastic plugs.

PLU2.W250.7**SYPHONS AND VALVES TO FLUSHING CISTERNS**

Assemble and adjust syphon and operating mechanism; fit float operated valve for fixing to water supply and union for connection to overflow.

PLU2.W260.7**FLUSH PIPES**

Assemble and adjust so that they empty completely after each flush.

FIXING URINALS**PLU2.W310.7****SLAB TYPE**

1. Bed channel outlet to waste connector in proprietary jointing compound;
2. Bed treads in cement sand mortar (1 : 3) with fall towards channel;
3. Fill space behind slabs with cement sand mortar (1 : 5);
4. Rake out joints to a depth of 5 mm and point flush using a proprietary, white grout. Joint width to be 3 mm maximum.

PLU2.W320.7**BOWL TYPE**

Fix bowl and division to wall at centres shown on Drawings using brackets, concealed hangers or screws supplied by manufacture.

PLU2.W330.7**FLUSHING CISTERNS**

Fix at heights as shown on Drawings on brackets securely fixed to the wall or with stainless steel and plastics plugs. Fix supplementary support brackets where supplied by the manufacturer.

FIXING BASINS**PLU2.W410.7****COUNTER TOP OR SEMI-RECESSED WASH BASINS**

1. Seat and fix according to the manufacturer's recommendations approved by CM;
2. Height of rim above finished floor level as shown on Drawings.

PLU2.W420.7**WALL-HUNG WASH BASINS**

1. Fix wash basins directly to walls by installing proprietary screw anchors or threaded rods with flexible washers, plastic plugs (other types to be Approved) to pre-formed fixing holes at the back of the basins;
2. Height of rim above finished floor level as shown on Drawings.

FIXING BATHS AND SHOWERS**PLU2.W510.7****BATHS**

Fix in accordance with the manufacturer's instructions.

PLU2.W520.7 CLEARANCE FOR BATH TRAPS

Pack where necessary to set the bath at a height to suit the depth of trap.

PLU2.W530.7 BATH OVERFLOW

Connect bath overflow to waste trap with proprietary trap connector or union.

PLU2.W540.7 FIXING SHOWER DOORS

Fix in accordance with manufacturer's instructions and with neoprene gasket seal between components and floor/wall.

PLU2.W550.7 FIXING SHOWER CUBICLE AND SHOWER TRAY

1. For vitreous china shower tray, fix in accordance with arrangement drawings. In-situ joints are to be watertight.
2. For acrylic shower tray, fix in accordance with manufacturer's instructions.

TAPS AND VALVES**PLU2.W610.7 TAPS AND MIXERS FITTED TO SANITARY APPLIANCES**

Fix in position shown on Drawings or as Instructed using fixings in **PLU2.M610**. Fix hot taps on the left unless otherwise Instructed. Loosen and re-tighten the joint between body and head prior to fixing.

PLU2.W620.7 FLEXIBLE HOSE ASSEMBLY WITH STAINLESS STEEL WIRE BRAIDING

1. Follow the installation method of the flexible hose recommended by the flexible hose supplier;
2. Comply with the following for the installation of the flexible hose:
 - a. Avoid twisting of the flexible hose during the installation;
 - b. Use suitable length of flexible hose which is not too long to cause unnecessary bending or too short to cause tension. Allow a slight slack on the straight length of the flexible hose as illustrated at Appendix PLU/II to this Worksection;
 - c. Observe minimum bending radius recommended by the flexible hose supplier if bending of the flexible hose is inevitable;
 - d. Avoid acute bending of the flexible hose. Bending shall be formed by a specially made 90° bend component supplied by the flexible hose supplier; and
 - e. Use two wrenches in tightening the hose to the connection points of water supply pipes. Hold the flexible hose steady with one wrench while tighten the hose nut to the connection point with the other wrench as illustrated at Appendix PLU/II to this Worksection.
3. Replace any damaged, kinked, severely twisted or deformed flexible hose.

WASTE OUTLETS**PLU2.W710.7 BEDDING**

Bed waste outlets to wash basins, sinks and baths in proprietary jointing compound.

ANCILLARY FIXINGS

PLU2.W810.7 SOAP HOLDERS

Fix with cement sand mortar to location as specified on Drawings.

PLU2.W820.7 TOILET PAPER HOLDERS

1. Fix vitreous china toilet paper holders with cement sand mortar to location as specified on Drawings;
2. Fix stainless steel toilet paper holders with stainless steel and plastic plugs to location as specified on Drawings.

EQUIPOTENTIAL BONDING

PLU2.W910.7 EQUIPOTENTIAL BONDING TO STAINLESS STEEL SINKS

1. Provide equipotential bonding connection for stainless steel sinks by:
 - a. Weld one end of the earthing lug to sink; and
 - b. Form a 5 mm diameter hole at the other end of the earthing lug for connection of bonding conductor by the Nominated Sub-contractor for Electrical Installation.
2. As **COM2.W465** (6).

TOLERANCES

PLU2.W1100.7 GENERAL

Refer to Appendix H "Schedule of Tolerances" to this Specification.

TESTING

SURVEILLANCE TESTS FOR WCS

PLU2.T110.7

SURVEILLANCE TESTS FOR WC SUITES

1. Test Arrangements:
 - a. When Instructed, surveillance tests shall be carried out by CM's Representative, a Direct Contractor or the Housing Department Material Testing Laboratory;
 - b. Comply with the followings pertaining to surveillance tests:
 - i. Provide attendance on the Site;
 - ii. Provide, deliver and collect samples etc. as directed by CM or as specified.
2. Testing Samples:
 - a. Provide one set of test sample from the batch of material delivered to Site under the delivery note as specified in **PLU2.M110** (3)(a) for single flush WC suites or **PLU2.M115** (3)(a) for dual flush WC suites or as instructed by CM;
 - b. One set of test sample shall consist of three specimens of WC pan, two specimens of cisterns, float-operated valves and flushing devices, or as instructed by CM.
3. Testing methods:
 - a. As per **PLU2.M110** (2)(b) for single flush WC suites;
 - b. As per **PLU2.M115** (2)(b) for dual flush WC suites.
4. Non-compliance:
 - a. In the event that the testing sample fails to meet the testing requirements, follow either one of the following actions:
 - i. Remove the representative batch off Site; or
 - ii. Carry out re-test for the representative batch in accordance with the testing methods as specified in sub-clause (3) in a laboratory that complies with the requirements stated in **PRE.B9.570** on three separate samples selected by the CM from the representative batch. In case of any one sample fails the re-test, remove the representative batch off Site.
 - b. When the representative batch is removed off Site, replace with another new batch and carry out test in accordance with the testing methods as specified in sub-clause (3)(a) in a laboratory that complies with the requirements stated in **PRE.B9.570** for one sample selected by the CM from the replacing batch. In case of such test fails, follow action stated in sub-clause (4)(a);
 - c. Bear all associated costs for the test and re-test required in sub-clauses (4)(a) and (4)(b). No extension of time will be allowed.

SURVEILLANCE TESTS FOR MIXERS (BATH/SHOWER/BASIN/KITCHEN SINK) AND SHOWER HANDSET

PLU2.T310.7

SURVEILLANCE TESTS

1. Test Arrangements:
 - a. When Instructed, surveillance tests shall be carried out by CM's Representative, a Direct Contractor or the Housing Department Material Testing Laboratory;
 - b. Comply with the followings pertaining to surveillance tests:
 - i. Provide attendance on the Site;
 - ii. Provide, deliver and collect samples etc. as directed by CM or as specified.
2. Testing Samples:
 - a. Provide one set of test sample from the batch of material delivered to Site under the delivery note as specified in **PLU2.M510** (3)(a) or as instructed by CM;
 - b. One set of test sample shall consist of two specimens of either bath/shower mixers, basin mixers, kitchen sink mixers, shower handsets, and the accessories, or as instructed by CM.
3. Testing methods:
 - a. As per **PLU2.M510** (2)(a)(iii) for bath/shower mixer;
 - b. As per **PLU2.M510** (2)(b)(iv) for basin mixer and flexible hose assembly with stainless steel wire braiding;
 - c. As per **PLU2.M510** (2)(c)(v) for kitchen sink mixer and flexible hose assembly with stainless steel wire braiding;
 - d. As per **PLU2.M510** (2)(d)(iv) for shower handset.
4. Non-compliance:
 - a. In the event that the testing samples for any type of mixer or shower handset fails to meet the testing requirements, follow either one of the following actions:
 - i. Remove the representative batch of that type of mixer or shower handset off Site; or
 - ii. Carry out re-test for the representative batch of that type of mixer or shower handset in accordance with the testing methods as specified in sub-clauses (3)(a), (3)(b), (3)(c) or (3)(d) in a laboratory that complies with the requirements stated in **PRE.B9.570** on three separate samples selected by the CM from the representative batch. In case of any one sample fails the re-test, remove the representative batch of that type of mixer or shower handset off Site.
 - b. When the representative batch of mixer or shower handset is removed off Site, replace with another new batch and carry out test in accordance with the testing methods as specified in sub-clauses (3)(a), (3)(b), (3)(c) or (3)(d) in a laboratory that complies with the requirements stated in **PRE.B9.570** for one sample selected by the CM from the replacing batch. In case of such test fails, follow action stated in sub-clauses (4)(a);
 - c. Bear all associated costs for the test and re-test required in sub-clauses (4)(a) and (4)(b). No extension of time will be allowed.

APPENDIX PLU2/I

PLU2.APPEND1.7 PRESSURE DROP TEST

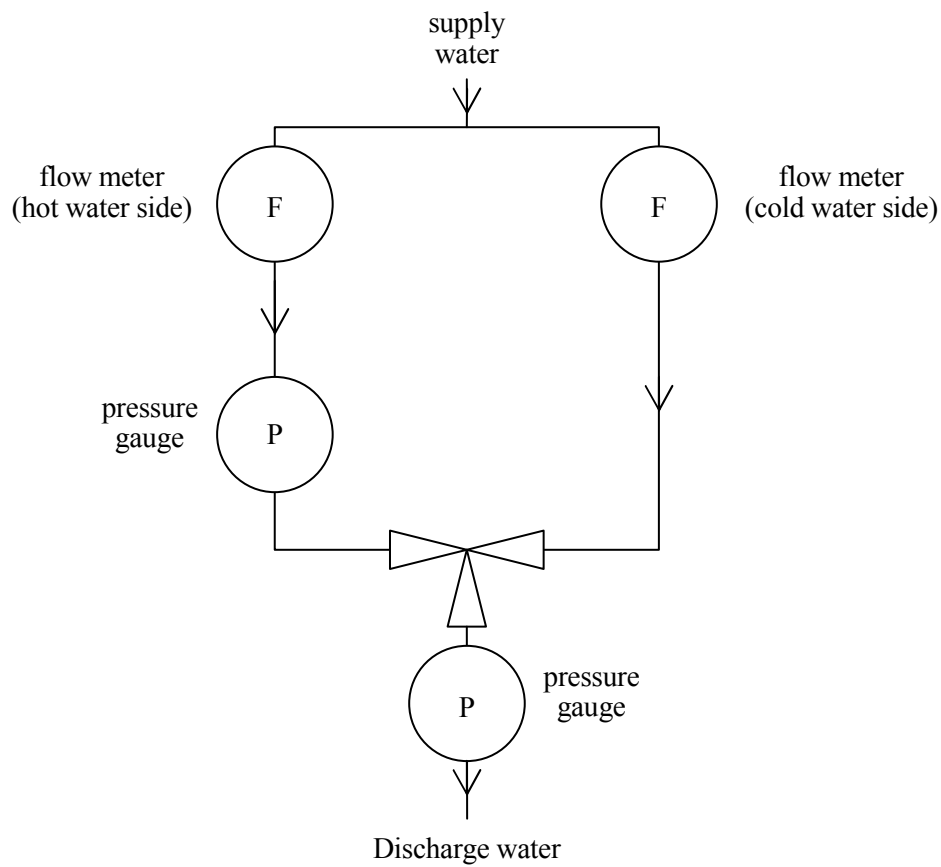
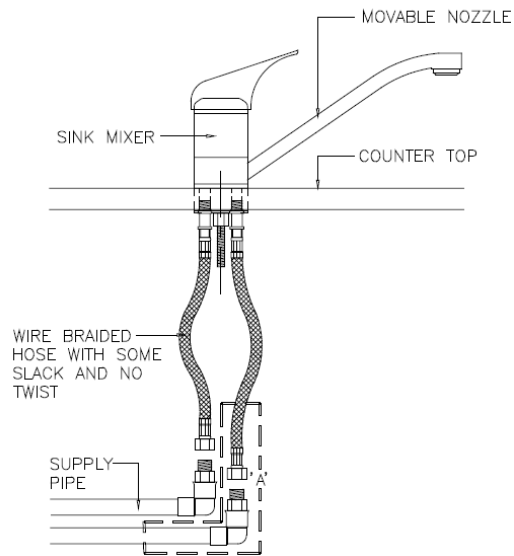


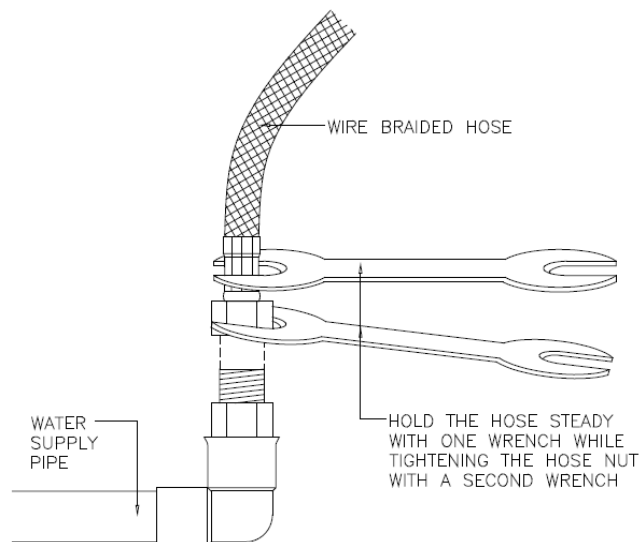
Figure a

APPENDIX PLU2/II

PLU2.APPEND2.7 INSTALLATION OF FLEXIBLE HOSE ASSEMBLY WITH STAINLESS STEEL WIRE BRAIDING



Typical Connection of Flexible Hose



Method of Connection Flexible Hose to Water Supply Pipe



HOUSING DEPARTMENT

SAMPLE SUBMISSION AND APPROVAL FORM

Contract Title :	_____	Ref. No. :	_____
	_____	Date :	_____
		Ref. No. of Previous Submission :	_____
Contract No. :	_____	(1)	_____
File Reference :	_____	(2)	_____

DETAILS OF SUBMISSION

To : Contract Manager's Representative (Attn : _____ / _____)
 *(Name of Consultant for Consultant Projects) via PCOW

From : (State Name of Contractor) _____

The enclosed sample and catalogue* / Product Certificate* /certificate of origin* / technical data* / test report* / job reference* as described below have been checked for compliance with the Specifications and Drawings, and are submitted for approval.

1. General Information

- a. Materials Description : _____

 b. Location : _____
 c. Specification Ref. page : _____ Item : _____
 d. Drawing Ref. No. : _____
 e. B.Q. Ref. No. : _____
 f. Anticipated date of approval : _____

2. Technical Information

The submitted sample has been checked against the specification and drawings as listed below –

Specification Requirements	Submitted Sample (State details against each item)
a. Brand _____ _____ _____	_____ _____ _____
b. Country of Origin _____ _____	_____ _____
c. Manufacturer's Name & Address _____ _____ _____	_____ _____ _____
d. Factory's Name & Address(es) _____ _____ _____	_____ _____ _____
e. Supplier(with Applicator, if any) _____ _____	_____ _____
f. Appearance _____	_____ _____

g. Colour⁺ _____	_____
h. Specification _____ _____	_____ _____
i. Manufacturer's Catalogue _____	_____
j. Test Report (Original/Certified True Copy) _____	_____
k. Previous Job Reference _____	_____
l. Supplementary Information _____	_____

For and on behalf of the Contractor

(Quality Control Coordinator)

CONTRACT MANAGER'S COMMENTS

To : (State Name of Contractor)

From : Contract Manager's Representative

* (Name of Consultant for Consultant Projects)

On the basis of the sample and information given, the above sample submitted is :

(1) * **Approved.**

(2) * **Not approved because** _____

Remarks : _____

Approval does not alter the requirements of the Contract.

Contract Manager's Representative (/)

Date : _____

c.c. Project Clerk of Works with sample

PQS

Contract File

Designated Unit for BMD () w/e catalogue, certificate of origin and test report

(* Delete if inappropriate)

(⁺ For glass or vitreous mosaic tiles, the contractor is required to confirm the colour range(s) of the submitted sample, i.e. a) light and /or medium; or b) dark)

Type of Material : _____

Relevant S.L. Clause No. : _____

PROJECT (Contract No.) : _____ (/)

[illegible]

Remarks by PCOW : _____

Witnessed by :

(PCOW/ACW/WS

Date : _____

Page 1 of 2

GUIDELINE

1. Document check
 - The contractor shall submit written confirmation, certified true copy of certificate of origin, and delivery note, etc. as Specified for checking by CM's representative.
2. Materials check
 - The contractor shall carry out checking of dimension, surface quality and other accessories, etc. in the presence of CM's Representatives. The details of checking shall be referred to relevant Specification Clauses. Alternative record forms are also acceptable, provided that all information as stated in the relevant Specification Clauses for the On Site Delivery Verification is included.
3. Major materials to be checked are as follows and / or as Specified in the contract.

	<u>Description of materials</u>	<u>S.L.Clause ref. no.</u>
a.	Window	COM2.M005
b.	UPVC window	COM3.M010
c.	Timber doorset	COM5.M040
d.	Gateset	COM7.M010
e.	Cooking bench / sink units	COM9.M010
f.	Cement	FIN1.M010
g.	Lime	FIN1.M020
h.	Ready-mixed mortar & Ready-to-used mortar	FIN1.M460, FIN3.M170, FIN4.M140 & MAS3.M330
i.	Glazed ceramic wall tile	FIN5.M210
j.	Non-slip homogeneous floor tile	FIN5.M170
k.	Homogeneous wall tile	FIN5.M220
l.	External facing tile	FIN5.M230
m.	Homogeneous coved skirting tile	FIN5.M240
n.	Unglazed vitreous mosaic wall tile	FIN5.M320
o.	Glass mosaic tile	FIN5.M330
p.	Tile adhesive and tile grout	FIN5.M1010
q.	Emulsion paint	FIN7.M340
r.	Synthetic paint	FIN7.M570
s.	Multi-layer acrylic paint	FIN7.M580
t.	Overhead door closer	IRO1.M530
u.	Mortice dead lock	IRO1.M740
v.	Cylinder rim drawback lock	IRO1.M730
w.	Lever handle furniture & lock	IRO1.M760
x.	Panel wall	MAS1.M210
y.	Close-coupled WC suit	PLU2.M110
z.	Wall hung or counter top or semi-recessed wash hand basin	PLU2.M310
aa.	Porcelain enamelled cast iron bath	PLU.2.M410
ab.	Acrylic shower cubicle / shower tray & sliding shower door	PLU.2.M430
ac.	Mixer & shower handset	PLU2.M510
ad.	Cold liquid applied flexible waterproofing system	WAT6.M010
ae.	Sheet or liquid membrane waterproofing systems	WAT6.M220
af.	UPVC pipe & fitting	DRA1.M150

17 MARCH 2011

PREAMBLE
PREFACE**SCOPE**

1. For the purpose of this Guide, the term "Building Works" is defined as the Works or Services to be carried out by the Main Contractor or Sub-contractors within the scope of the Building Contract and that which is administered by the Project Architect as the Contract Coordinator.
2. This Architectural Site Inspection Guide describes the site administration and inspection of a Building Contract in respect of Construction, Project Completion and Maintenance Stages, to ensure that the works meet the conditions and specifications set down in the contract documents. It also lays down the inspection and testing procedures required to be observed by the Site Inspection Team under the direction of the Contract Coordinator. The practices described in this Guide are applicable under normal circumstances. They are by no means exhaustive or to be followed indiscriminately under any circumstances. Staff shall exercise their professional judgment in discharging their duties with due reference to the Quality Management System Manual for ISO 9001 requirements.
3. This Guide may support other Manuals, Guides, or Quality Plans, by elaborating on the discipline's requirements and may be itself supported by other documentation.
4. The procedures in this Guide are generally advisory, unless otherwise specified in the content as mandatory. For mandatory procedures, should the action officer consider any part of them not applicable to his/her projects or there are more effective alternatives to achieve the same or better results, he/she is permitted to depart from these procedures subject to the conditions as stated in para.5 to 6 below. For advisory procedures, departure is permitted on justifiable grounds as determined by the action officer who may also feedback to the Contact Point.
5. For in-house projects :-
 - ◆ approval from the ACM is required; for departures with time or cost implication, CM's approval shall also be sought.
6. For consultant projects :-
 - ◆ approval from the CM is required; for departures with time or cost implication, PM's approval shall also be sought.
7. This Architectural Site Inspection Guide does not cover other types of contracts for which references are to be made to the following :
 - (a) Landscape Works - Landscape Procedural Guide (DLAP).
 - (b) Engineering Works - Engineering Site Inspection Guide (DEI).
 - (c) Building Services Works - Building Services Site Administration and Inspection Guide (DBSI).
 - (d) Geotechnical Works - Geotechnical Engineering Procedural Guide (DGEP).

AUTHORITY AND RESPONSIBILITY

8. The Quality Management Manual (DQMS) defines the authorities and responsibilities of the Issuing Authority, Reviewing Authority, and Contact Point. The Issuing Authority, Reviewing Authority, and Contact Point of this Guide are listed in the Master List (DMX).

CONTROL

17 MARCH 2011

**PREAMBLE
PREFACE**

9. Any amendments and suggestions for improvement to the Guide can be sent to the Contact Point.
10. The web-based version of this Guide in the e-Housing Portal is a CONTROLLED DOCUMENT. Each sub-section of the Guide can be revised and issued separately. The revision status of each sub-section is identified by the issue date shown on each page. The current revision status of all the sub-sections are summarized in the web "Contents" page of this Guide. Generally, a new issue date will be assigned to each issue of sub-sections but if there only involves updating of the "cross-references", the issue date may be kept unchanged.
11. All copies other than the web-based copy are UNCONTROLLED DOCUMENTS. Officers are reminded to check the web-based version of the Guide for the latest revisions.

01 APRIL 2009

SITE INSPECTION
SITE INSPECTION FOR BUILDING WORKS

ROLES AND RESPONSIBILITIES

1. The production and quality of the Building Works is the responsibility of the Contractor. Development & Construction Division is responsible for controlling the design, selecting suitable contractors, sub-contractors and suppliers, specifying the work required, administering the contract and inspecting the work during construction, with all reasonable skill and care, to ensure that the Contractor fulfills his obligations under the Contract.
2. The Chief Architect is the Contract Manager (CM) for the Building Contract. The Senior Architect is the Assistant Contract Manager (ACM), and the Project Architect is the Contract Coordinator (CC). Selected members of the Contract Team are delegated with the authority under the Contract as CM's Representatives. The responsibilities of the Contract Team in site inspection are outlined in DCMP.
3. The CM is required to maintain an adequate level of inspection to carry out checks, inspections and tests according to the provisions under the Contract. Inspection percentages are determined from time to time by the CC and endorsed by the ACM (see [DASM-202](#)).
4. The Site Inspection Team comprises various ranks of Site Staff (namely Senior Clerk of Works, Clerk of Works, Assistant Clerk of Works and Works Supervisor) and is responsible for the day to day inspection of Building Works, including builder's work requirements for building services works, but excluding building services elements. Each rank of site staff is responsible for the inspection of specified items of work which are categorized with respect to their degree of importance. The items of work and the inspection officer responsible are detailed in the Inspection Guide Book. The inspection officer will conduct inspection with reference to the recommended inspection percentages endorsed by the ACM and to perform duties according to their respective roles (see [DASM-103](#)). CC will undertake the duties of SCOW in consultant projects. They are required to perform the following tasks :
 - (a) inspection of the works;
 - (b) maintenance of inspection records and other site records; and
 - (c) reporting to the CM, ACM, and the relevant CM's Representatives.

01 APRIL 2009

SITE INSPECTION
SITE INSPECTION FOR BUILDING WORKS

5. To establish an acceptable standard of material and workmanship for the project and for training purpose, a system of briefing from supervisory staff is established on the following basis -

Activities	Frequency	Participants
1. Project Based Joint Site Inspection and Briefing	Bi-weekly	PCOW, all ACW and WS of the project
2. Project Based Joint Site Inspection	Monthly	CC & SCOW to attend Bi-weekly Project Based Joint Site Inspection & Briefing held by PCOW with all ACW and WS of the project.
3. Sectional Briefing and Site Visit	Quarterly	CTO(BW), all SCOW, COW and ACW of Section, and WS of Project to be inspected

6. The inspection of building services elements of the Building Works are carried out by the site inspection team of the Building Services discipline. Inspection of specialist works outside the scope of the Building Works (e.g. landscape work) is carried out by other appropriate site inspection teams. All these site inspection teams are required to work in collaboration with one another.
7. The Contractor is required to execute the Works in strict accordance with the Contract, and to comply with Site Instructions, Site Directions on any matters related to the Contract whether mentioned in the Contract or not (GCC 15). The CM's Representatives and Site Inspection Team under the direction of the CM, have a responsibility for ensuring, so far as it is within their capabilities, that the Contractor carries out his obligations. They take necessary steps to examine and check the Contractor's work and to keep the CM closely informed in order to enable him to take action as provided in the Contract when the Contractor fails to meet the required standards. Failure of the CM's Representatives and the Site Inspection Team to disapprove any work or material does not prejudice the power of the CM thereafter to disapprove such work or material (GCC 2).
8. It is the responsibility of the Contractor to provide continuous supervision and all necessary superintendence for proper fulfilment of his obligations under the Contract. The role of the Site Inspection Team is to generally oversee the Contractor's works in the following aspects :
- (a) conformance of Materials;
 - (b) conformance of Workmanship;
 - (c) conformance with Other Obligations; and
 - (d) progress of Works.

Any non-conformities found in site inspections are recorded by the Site Inspection Team in the relevant forms. The Site Inspection Team issues a Site Direction to inform the Contractor of the non-conformities. Procedures to deal with non-conformities are detailed in [DASM-201](#)

10. In the process of site inspection, the Site Inspection Team should not approve or endorse the Contractor's work. The onus is on the Contractor to ensure all works done and materials provided are to the specified or required standard under the Contract.
11. Through site inspections and reports of defects during maintenance period, the Contract Team provides feedback in accordance with DCMP.

01 APRIL 2009

SITE INSPECTION
SITE INSPECTION FOR BUILDING WORKS**INSPECTION IN CASE OF TYPHOONS AND RAINSTORMS**

12. The Contractor is obliged to provide adequate safety and protective measures throughout the contract period in accordance with the conditions of contract. The contractor's site agent and safety officers are required to ensure that the precautionary measures put up are adequate.
13. Immediately after lowering of typhoon signals no. 8 or above or cancelling of black rainstorm warning, the Site Inspection Team inspects the site works immediately and promptly records any damage found.
14. The Project Clerk of Works (PCOW) reports by phone on damage to the CC (ACM or CM if CC is not available) after lowering of typhoon signals no. 8 or above or cancelling of black rainstorm warning. In case of serious damage CC reports to ACM / CM immediately.
15. Subsequent to lowering of typhoon signals no. 8 or black rainstorm warning, PCOW prepares written report to the CC, copied to CTO(BW). Form no. 7004 is used for report after lowering of typhoon signal No. 8 or above or cancelling of black rainstorm warning signal.
16. On receipt of the reports from the PCOWs, CTO(BW) in each section is to submit a consolidated report (Form No. 7001) for all projects in the section to the Contract Manager by facsimile transmission, with copy to the Project Director.
17. In the event of damage which renders the works site unsafe for construction, jeopardizes public safety or leads to consequential effects on time and cost to the Contract, the CC and the other relevant project team members visit the site as soon as possible.
18. Under certain situations, the CM may require the Contractor to carry out remedial works or preventive measures to ensure stability and protection of life, which may be beyond the normal contractual obligation.
19. The Contractor expedites the completion of the remedial works or preventive measures and arranges inspection by the CM and the Site Inspection Team. The PCOW records works done in the Site Record Book or Site Diary in HOMES.

REPORT IN CASE OF FIRE AND ACCIDENT

20. Contractor shall complete the 'Housing Authority Accident / Incident Report Form ([DCMP-F787](#))' and submit to CM via site staff on each "reportable accident" where injury is resulted and sick-leave granted for 3 days or more.
21. In the event of serious fire and fatal accident, PCOW reports to the CC (ACM or CM if CC is not available) in writing.

HOUSING CONSTRUCTION MANAGEMENT ENTERPRISE SYSTEM (HOMES)

22. The Site Inspection Team uses the functions in HOMES after its implementation. In case the HOMES is out of service, the Site Inspection Team should adopt the paper mode of communication and record keeping, and upload these records in HOMES after its resumption.

01 APRIL 2009

**SITE INSPECTION
SITE INSPECTION TEAM**

INSPECTION RESOURCES

1. The establishment of site staff in the Projects Division is based on the workload. Site Staff are allocated to each project on a need basis, subject to the availability of staff resources. Within the allocated resources, the Contract Manager determines the level of site inspection required for the contract.

SITE INSPECTION TEAM

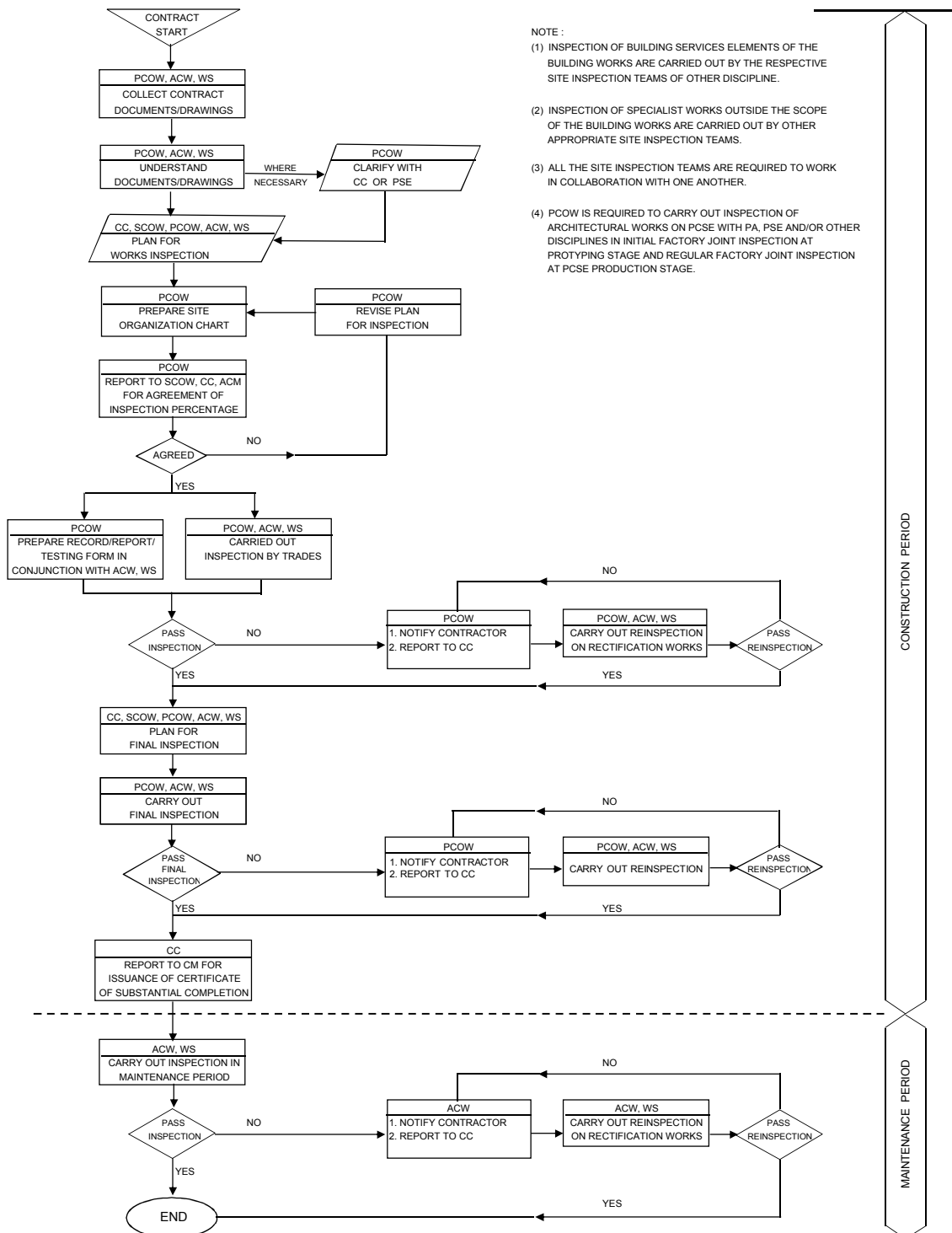
2. The Site Inspection Team is led by the Project Clerk of Works (PCOW).
3. The role of each member of the Site Inspection Team is at [DASM-103](#).
4. The PCOW prepares and maintains an up-to-date organization chart for the Site Inspection Team, showing the deployment of site staff.

INSPECTION OFFICER/RECORDING OFFICER

5. The "Inspection Officer" or "Recording Officer" referred to in this Guide can be the Contract Coordinator, the Senior Clerk of Works, PCOW, ACW or WS in accordance with the organization chart.

SEQUENCE AND FLOW OF TASKS

6. The sequence and flow of tasks which describe the operation of the site administration and Inspection Team are presented in the following flowchart :



30 JUNE 2015

**SITE INSPECTION
ROLE OF SITE INSPECTION TEAM**

INTRODUCTION

1. The tables at para. 2 below describe the duties and responsibilities of the Site Inspection Team undertaken by the Site Staff for the administration of Building Works pertaining to the scope of Architectural discipline. For other duties and responsibilities of the Site Inspection Team for Building Works pertaining to scope of other disciplines, or works executed under separate contracts of other disciplines, the lists are to be read in conjunction with the Site Inspection Guide of respective disciplines.

ROLE OF SITE INSPECTION TEAM

1. The PCOW prepares and maintains an up-to date organization for the Site Inspection Team, showing the detail of duties delegation.
2. The role of each rank of site staff namely the Senior Clerk of Works (SCOW), the Clerk of Works (COW), the Assistant Clerk of Works (ACW) and the Works Supervisors (WS) are detailed at the following tables:-

30 JUNE 2015

SITE INSPECTION ROLE OF SITE INSPECTION TEAM

Role of Site Inspection Team

	Scope of Work	SCOW	COW/SCOW (designated as PCOW)	ACW	WS
1.	Project in Charge		<ul style="list-style-type: none"> Act as PCOW in Building contract 		
2.	Inspection	<ul style="list-style-type: none"> Monitor standard of inspection Advise Project Team on standard Random checking on critical items of work Recommend inspection % to CC Assist CM/ACM in supervision of work 	<ul style="list-style-type: none"> Organize/monitor inspection of project Monitor progress of project Inspect specific items of each trade including off-site architectural works on PCC Random checking on items inspected by ACW/WS Monitor defect/NC rectification work Propose inspection % to SCOW & monitor actual inspection % (for SCOW designated as PCOW, recommend inspection % to CC & monitor actual inspection %) 	<ul style="list-style-type: none"> Inspect specific items of each trade Random checking on items inspected by WS Record defects/NC and follow up on rectification work Attend to remedial works in maintenance period Conduct surprise check to consultant's flat to flat inspection record and water tightness test in frequency as agreed with PM. 	<ul style="list-style-type: none"> Inspect specific items of each trade Report defects to ACW and follow up rectification work
3.	Communication	<ul style="list-style-type: none"> Convey update information to staff on policy and workmanship including N.C. items in PASS Assessment Attend group briefing and joint site visit 	<ul style="list-style-type: none"> Liaise w/ staff, contractor, utilities etc. for completion of project Conduct site briefing Attend site meetings 	<ul style="list-style-type: none"> Liaise w/contractor's foremen on standard of work Attend BS coordination meeting 	
4.	Staff Administration	<ul style="list-style-type: none"> Deploy and manage staff within the group Write/countersign staff appraisal report 	<ul style="list-style-type: none"> Manage staff under his supervision Prepare site organization chart Write staff appraisal report 	<ul style="list-style-type: none"> To check attendance 	

30 JUNE 2015

SITE INSPECTION
ROLE OF SITE INSPECTION TEAM

Role of Site Inspection Team

	Scope of Work	SCOW	COW/SCOW (designated as PCOW)	ACW	WS
5.	Office Administration		<ul style="list-style-type: none"> Administer the site office Act as Document Controller 	<ul style="list-style-type: none"> Assist the setting up of site office Maintain filing and drawing record 	<ul style="list-style-type: none"> Assist in maintaining of site office
6.	Records	<ul style="list-style-type: none"> Inspect regularly records prepared by staff 	<ul style="list-style-type: none"> Check compilation of site records Retain and dispose of site records 	<ul style="list-style-type: none"> Compile Site Record Book or Site Diary in HOMES on weather and visitor Record site inspection and testing carried out 	<ul style="list-style-type: none"> Compile Site Record Book or Site Diary in HOMES on daily activities of the block, including materials, labour and plant Record site inspection and testing carried out
7.	Reports		<ul style="list-style-type: none"> Issue reports, memos and site directives 	<ul style="list-style-type: none"> Check reports on site activities 	<ul style="list-style-type: none"> Prepare reports on site activities
8.	PASS		<ul style="list-style-type: none"> Assist in implementing PASS requirements and CC/PSE/Independent Team in carrying out PASS Check submissions and attend Input PASS 	<ul style="list-style-type: none"> Collect data and prepare reports and documents for PASS assessment and score submission 	
9.	Audit	<ul style="list-style-type: none"> Act as guide/observer in audits 	<ul style="list-style-type: none"> Attend site audits and follow up on corrective actions 		
10.	Sample Submission		<ul style="list-style-type: none"> Check sample and document against specification and make comment to CC/PSE 		

30 JUNE 2015

SITE INSPECTION ROLE OF SITE INSPECTION TEAM

Role of Site Inspection Team

	Scope of Work	SCOW	COW/SCOW (designated as PCOW)	ACW	WS
11.	Material Testing and On-site Tests		<ul style="list-style-type: none"> Agree testing frequency w/ CC/PSE Check term laboratory monthly record Random checking of delivered materials and related documents 	<ul style="list-style-type: none"> Check delivered material against approved sample Arrange material testing and on-site tests Check daily record of term laboratory Monitor the performance of term laboratory 	<ul style="list-style-type: none"> Witness laboratory and site tests Check site laboratory installation and testing equipment
12.	Safety, Security and Environmental Management	<ul style="list-style-type: none"> Advise on policies and practices on site safety and environmental management Maintain consistency and awareness of items requiring special attention 	<ul style="list-style-type: none"> Issue Site Direction to Main Contractor on NC Report to CC/PSE on site safety/security and environmental issues 	<ul style="list-style-type: none"> Check site safety/security and environmental aspects with Safety Officer/Site Agent Monitor on performance of contractor against Safety Plan and Environmental Management Plan 	<ul style="list-style-type: none"> Check safety, security and environmental protection of block and report on NC
13.	Training	<ul style="list-style-type: none"> Identify training needs for site staff in his group 	<ul style="list-style-type: none"> Conduct on-the-job training to ACW, WS 	<ul style="list-style-type: none"> Assist in on-the –job training to WS 	
14.	HOMES	<ul style="list-style-type: none"> Senior Site Staff (SST) 	<ul style="list-style-type: none"> Project Site Staff (PST) Act as Contract Administrator 	<ul style="list-style-type: none"> Assistant Site Staff (AST) 	<ul style="list-style-type: none"> Assistant Site Staff (AST)
15.	Others	<ul style="list-style-type: none"> Assist CTO(BW) in administrative work 	<ul style="list-style-type: none"> Assist SCOW in administrative work 	<ul style="list-style-type: none"> Assist COW in administrative work Check drawings and documents required for the executive of works Maintain site records for preparation of as-built drawings 	

30 JUNE 2015

INSPECTIONS DURING CONSTRUCTION PERIOD

1. The following types of inspection are generally conducted during the construction period:-
 - (a) inspection of Workmanship by trades;
 - (b) inspection of Components;
 - (c) inspection of Materials; and
 - (d) inspection of Other Miscellaneous Works and Other Obligations not covered above.
2. The inspection Officers conduct recommended percentage checks on the above items at those locations which are accessible and can be checked safely. Inspection percentages in [DASM-202](#) are for guidance only.
3. The inspection work commences as soon as any item in a particular trade is ready for inspection.
4. In addition to routine inspections, Inspection Officers are allotted with specific duties at different works stages-
 - (a) Construction of Finishing Trade at Sample Flats & Wings / Sample Panel/Construction Mock-up;
 - (b) Finishing Stage;
 - (c) Pre-completion Stage (6 months before anticipated completion);
 - (d) Final Inspection; and
 - (e) Maintenance Period

Details of inspection duties and the recommended frequency of inspection are listed at the following tables of Site Inspection System. When SCOW designated as PCOW of building project, he is required to conduct joint site inspection with CC on his own project, and he is required to join the joint site inspection at quarterly interval for other projects within his group. Surveillance Team of CTO Supporting Office will conduct regular site visit to establish a consistent acceptance standard of materials and workmanship. The recommended frequency of inspection is for guidance only. The frequency can be reviewed on project basis by CC with endorsement on changes given by the ACM.

Site Inspection System for *Architectural Works* Domestic Block

Stage	Recommended Frequency	Action by	Duties	Inspection percentage
PCSE Prototyping Stage	Initial Factory Inspection	PA PCOW	to check material compliance and inspect the process of window installation and tile fixing on PCSE	-
Construction of Sample Flats & Wings / Sample Panel / Construction Mock-up	-	ACW	to check the material compliance and inspect the process of each trade	Recommended Inspection % as specified in-DASM-202
		PCOW	to check the material compliance and inspect specified item* of each trade and monitor the quality and progress of work	
		SCOW	to monitor the consistency of quality standard and progress	
		PA	to inspect, agree the major trades process & quality standard of work	
Finishing stage	Daily	WS/ ACW	to check the material compliance and inspect specified item* of each trade and monitor the quality of work	Recommended Inspection % as specified in DASM-202
	Weekly	PCOW ACW WS	to conduct joint site inspection in verifying standard of inspection by ACW/ WS and monitor the quality of works	-
	Once per Month	PA SCOW PCOW ACW WS	to conduct joint site inspection to monitor the quality of works and maintain consistency in standard	-
PCSE Production Stage	Quarterly or as directed by CM	PCOW	to conduct factory joint inspection with site staff of other discipline to monitor the quality of works for off-site architectural works on PCSE	
Pre- completion Stage (6 months before anticipated completion)	Daily	WS/ ACW	to inspect specified items* of each trade and/or witness watertightness test	Recommended Inspection % as specified in DASM-202
	Once Per Block* Weekly	PCOW ACW WS	to conduct joint site inspection in verifying standard of inspection by ACW/ WS and monitor the quality of works	-
	5 nos. randomly selected flats per block* per month	PA SCOW PCOW	to identify the major defects and outstanding works and instruct the contractor in writing to complete those works before reporting completion after reporting completion by the contractor, PA, SCOW & PCOW inspect the completed works if the works general conform to contract requirement and the acceptance standard prior to final inspection	- -
Final Inspection (FI)	Before commencement of FI	PA SCOW PCOW	to provide guideline/ standard of inspection to ACW/ WS and/ or AS/ IO of PSP on acceptance standard of final inspection before commencement of final inspection	-
	-	ACW/ WS and/ or AS/ IO of PSP	to carry out final inspection and summarize inspection findings	100%
	One flat per three floors	PCOW with ACW/ WS	to conduct joint site inspection in verifying standard of inspection by ACW/ WS and monitor the quality of works	
		For inspection by PSP, PSP AS with IO	to conduct joint site inspection in verifying standard of inspection by IO and monitor the quality of works	For inspection by PSP, PCOW randomly join : - 50% of the joint site inspection between PSP AS with IO; and - inspection with PSP AS only for one flat per 6 floors
	One flat per six floors	PA SCOW PCOW	to conduct joint site inspection to monitor the quality of works and maintain consistency in standard	
		For inspection by PSP, PSP Supervisor AS	to conduct joint site inspection to monitor the quality of works and maintain consistency in standard	For inspection by PSP, PA or SCOW randomly join 50% of the joint site inspection between PSP Supervisor with AS
Maintenance period	1st - 4th month of MP	PA PCOW	to carry out inspection and report on rectification works and completion of outstanding work	-
	5th - 24th month of MP	COW/DT PCOW		

- a) * - refers to specified items as specified in the Guide Book
b) + - block to block in rotary basis
c) AS - denoted Assistant Supervisor
d) IO - denoted Inspection Officer

30 JUNE 2015

INSPECTION PROCEDURES
INSPECTIONS**INSPECTION LED BY SCOW (Minimum Monthly – refer to item 5(2) of DASM-101)**

5. SCOW shall conduct site inspection to each project with respective project site inspection team within his group on monthly basis. Refer DASM-F7106 for the report format, items of inspection shall cover the following topics:
- (a) Safety Concerns;
 - (b) Environmental and Housekeeping Concerns;
 - (c) Workmanship Concerns;
 - (d) Site Progress Vs Programme/Works Plans;
 - (e) Site Record Checking including HOMES submission; and
 - (f) Others (as required on project basis, e.g. deficiencies in materials, shop drawing/sample submission)

INSPECTIONS OF CONSTRUCTION MOCK-UP/SAMPLE PANELS AND SAMPLE FLATS/WINGS

6. Sample flats/wings and sample panels are required to be completed as specified in the Contract to demonstrate full compliance with the specified requirements under the Contract. Such samples are checked by the Site Inspection Team for full compliance and confirmed by CM for acceptance in standard.
7. The Site Inspection Team checks compliance of the standard of workmanship and materials against the specified requirements under the Contract. The standard of acceptance of all flats in a Contract are to be the same as the standard of sample wings.
8. The following tests are required to be carried out and passed in all the sample flats before confirmation for acceptance in standard is given by the CM :-
- (i) watertightness test to windows/precast facades (refer to Specification Library and Form no. 6209);
 - (ii) watertightness test to bathroom, kitchen, refuse room and others (refer to Specification Library and Form no. 6207 and 6208);
9. For the purpose of keeping inspection records for construction mock-up/sample panels and sample flats/wings, the relevant Forms for inspection by trades, inspection of components etc. shall be used.
10. At the completion of sample flats or wings with Common W-trap System, on site verification "Repetitive Flushing Test (RFT)" should be arranged to various flat types and deposit the test results to ICU for record (Inspection Form 5119). Inspection procedures and guidelines for Repetitive Flushing Test are given in Appendix I (DASM-409).

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INSPECTION PROCEDURES
INSPECTIONS**FINAL INSPECTIONS**

11. At Final Inspection stage, the Inspection Team carries out 100% checking for those items listed in the Form No. 51xx.
12. The results of Final Inspection will override those recorded in the routine inspections. However should site records (Form no. 6006 or Site Direction summary in HOMES) still show outstanding corrective actions with respect to Site Directions previously issued on defective works, the Inspection Team also inspects, ensures and records completion of such corrective actions during Final Inspection.
13. To facilitate recording during inspection, when the same inspection dates are recorded many times in the same final inspection form, entry can be simplified by alphabetical code in the appropriate box. (See the inspection guidelines at back of each Form No. 51XX). The Site Inspection Team also prepares and submits to CC Form No. 7009 reporting status of the Final Inspection.
14. The Inspection Team commences Final Inspection according to the Contractor's proposed programme i.e. usually around two months before contract completion. The Inspection Team inspects an initial batch of flats for one floor to establish a baseline to gauge the Contractor's performance.
15. To ensure efficient deployment of resource, the Inspection Team may, upon agreement of the CC, suspend the Final Inspection if the Works are found not ready after inspection of the initial batch. However, under special circumstances requiring urgent completion/handover of the estate/works, Final Inspection may continue with site staff resources strengthened as necessary.
16. The Site Inspection Team completes the Final Inspection before substantial completion of the Works.
17. Prior to the Occupation Permit Inspection, on-site verification "Multi Flushing Test (MFT)" to verify drainage performance of simultaneous flushing from multiple users should be arranged to one selective drainage stack in each project with Common W-trap System and deposit the findings to ICU for record. Project team should select the soil & waste (S&W) stack with 'the worst' performance scenario for the test. This may cover the one with extensive horizontal pipe run or multiple bends required in the lower zone of the vertical stack connected to the manhole (Inspection Form 5120). Tests are to be carried out in the fitted out bathrooms at 6 nos. of selected floors. The selected floors include the lowest 2 floors, 3 other consecutive floors sharing the same cross vent / balancing pipe of S&W stack and the last selected floor from any other levels discharging to the same S&W stack. Inspection procedures and guidelines for Repetitive Flushing Test are given in Appendix I (DASM-409).

DEMONSTRATION VIDEO CLIPS ON THE PROCESS OF FINAL INSPECTION

18. A copy of demonstration video clips on the process of final inspection shall be given to the contractor by CM at the beginning of the Building Contract. The Project Team shall remind the the contractor and site staff to view the video at the time of preparation of the sample flats/wing; and at the time of final inspection, to refresh the contractor and site inspection team's awareness of how the final inspection will be conducted.
19. For site staff newly deployed to Building Contracts, project SCOW and PCOW shall use the demonstration video clips as an essential tool for training purpose.

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INSPECTION PROCEDURES
INSPECTIONS**NON-CONFORMITIES**

20. Where there are non-conformities found in the inspection, the Site Inspection Team records such non-conformities in the relevant forms and issues a Site Direction (Form No. 5202) or Site Direction through HOMES. The Site Direction requires the Contractor to :-

- (a) identify the unsatisfactory works or materials/causes of defects;
- (b) submit a remedial proposal to the CM;
- (c) rectify the defects by re-working to meet specified requirements; and
- (d) inform the PCOW and CM's representative for re-inspection of the materials/works after rectification, before the works are covered up.

Apart from requiring the contractor to carry out their own inspection and rectification work, Inspection Officers are required to conduct necessary inspection to reveal the full extent of any non-compliance. Where necessary, the relevant CM's representative ascertains the cause of defect in conjunction with the Contractor.

21. Where the rectification of the defective work or replacement of defective material proposed by the Contractor involves the removal and re-execution of the original permanent work, which are likely to generate adverse effects to the progress and the anticipated consequences become onerous, CM determines a satisfactory solution and where appropriate recommends for concessionary acceptance of the works to the Client.
22. The Site Inspection Team prepares Form No. 6006 or the Status of Site Direction extracted from HOMES for submission to CC at monthly site meeting on updated status of corrective actions taken by contractor with respect to Site Directions issued on defective works. CC monitors the progress of corrective actions, issues reminder to the Contractor on repeatedly outstanding corrective actions, if any and where necessary, escalates by referring to ACM/CM for issuance of warning letter to the Contractor. The Site Inspection Team also submits to CC Form No. 6006 or the Status of Site Direction extracted from HOMES on updated status of corrective actions just before start of the Final Inspection and takes onward necessary inspection (see paragraph 10 above).
23. All non-conformities/defects, if identified, shall be rectified before covering-up of the works or the contract completion, whichever is earlier, unless otherwise agreed by the Contract Manager.

POTENTIAL DANGER

24. In the case of work, which is dangerous or is likely to cause injury to any person or damage to any property or works, the Site Inspection Team reminds the Contractor to take safety precautions to alleviate immediate danger through Site Direction (Form No. 5201) or Site Direction through HOMES. CM's representative reviews the situation and where necessary, suspends the affected portions of the Contractor's work under the terms of Conditions of Contract.

WORK OUTSIDE SITE BOUNDARY

25. For work outside site boundary such as erection & demolition of hoarding, erection of bamboo scaffolding and lifting operation etc., site inspection team shall remind the contractor of the following:

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- (a) Submit detailed works plan which includes at least (i) location of works; (ii) programme; (iii) Temporary Traffic Management (TTM) Scheme and (iv) Road Works Advice issued by the Hong Kong Police Force to CM;
 - (b) Apply for Road Works Advice from the Hong Kong Police Force (HKPF) for non-excavation works, and liaise with relevant Government Department such as the Transport Department (TD) to seek for traffic advice and incorporate their comments into the Temporary Traffic Management (TTM) Scheme;
 - (c) Seek Leisure and Cultural Services Department (LCSD) agreement if the works affect LCSD amenity area or old & valuable tree; and
 - (d) Approach the Environmental Protection Department (EPD) for issue of a construction noise permit if so required.
26. For work involving excavation outside site boundary, site inspection team shall remind the contractor of the following:
- (a) Submit information to CM in advance to facilitate the application of Excavation Permit (XP) in accordance with Specification Library (SL) clause PRE.B8.2720. The information required for processing the XP is contained in the Excavation Permit Processing Manual issued by the Highways Department (HyD).
 - (b) Liaise with relevant government departments, namely, Transport Department (TD), Highways Department (HyD) and Hong Kong Police Force (HKPF) to seek traffic advice and incorporate their comments into TTM Scheme;
 - (c) Submit Traffic Impact Assessment (TIA) Studies / TTM Scheme to HKPF and TD for approval;
 - (d) Seek Leisure and Cultural Services Department (LCSD) agreement if the works affect LCSD amenity area or old & valuable tree;
 - (e) Approach the Environmental Protection Department (EPD) for issue of a construction noise permit if so required;
 - (f) Obtain an excavation permit (XP) before actually commence the works on site;
 - (g) Ensure all safety precautionary measures as specified in SL clause PRE.B8.2730 are adhered to; and
 - (h) Submit supervision plan to CM and appoint a Competent Person to supervise the works in accordance with SL clause PRE.B8.2740 to ensure the supervision plan is adhered to.

SAFE SYSTEMS OF WORK IN THE VICINITY OF UNDERGROUND UTILITIES**27. Underground Gas Pipes**

For excavation work close to underground gas pipes, site inspection team shall remind and closely monitor main contractor to follow the proper procedures as stipulated in the "Gas Production & Supply Code of Practice, Avoiding Danger from Gas Pipes" published by the Gas Authority. The following four key elements when working near gas pipes are highlighted for site inspection team's special attention:

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- (a) Plans
Main contractor contacts gas supply companies for information and record plans indicating the positions of their gas pipes in the vicinity of contractor's proposed works area well before locating the pipes on spot.
- (b) Pipe Locating Devices
Use locators to trace gas pipes in or near the proposed work area before digging any trial holes by hand. Locating gas pipes by locator shall be conducted by an operator who has received thorough training in the operation and limitations of the particular type or model being used. Mark the positions of the pipes using paint or other waterproof marking on the ground.
- (c) Trial Holes
Proceed excavation with trial holes using **hand tools** to confirm the physical position of buried gas pipes on proposed works area.
- (d) Safe Digging Practices and Use of Mechanical Excavators
Maintain a clearance of 1 metre or any greater safety distance as required by the gas supply company between the side of any gas pipe and the point where mechanical excavator and hand held power tools were used.

The above extracts from the CoP are not exhaustive, site inspection team shall remind the contractor to follow the details as stated in the CoP to suit the condition of individual site. Gas Production & Supply Code of Practice, Avoiding Danger from Gas Pipes can be downloaded from the EMSD website.

28. Underground Electrical Cables

For excavation work close to underground electricity cables, a safe system of work is stipulated in the "Code of Practice on Working near Electricity Supply Lines" published by Electrical and Mechanical Services Department. Site inspection team should remind and closely monitor contractor to follow the proper procedures as stated in the CoP, in particular the following.

- A. Before the commencement of works, the working party shall:
 - (a) Approach electricity supplier to obtain cable plan;
 - (b) Appoint a Competent Person for cable detection work and ensure that personnel at the works site are fully aware of the details of the U/G cables;
 - (c) Proceed trial hole excavation under the supervision of the competent person who should repeatedly use a cable detection device and frequently update the working personnel as to the most accurate cable location until the target cable is exposed.
 - (d) Obtain Competent Person Written Report which shall include the cable layout plan detailing the alignment of each underground cable based on common reference points (e.g. lamp pole, traffic light post, or hydrant etc.); and depth profile of each underground cable (i.e. cable depth corresponding to each measurement point along the cable alignment).

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- (e) Arrange a site briefing given by the Competent Person to ensure that the site personnel are conversant with the contents of the Report and aware of the required safety precautions.
 - (f) Ensure that the Competent Person marks the alignment and depth of all U/G cables with waterproof crayon, paint or self-adhesive temporary road marking tapes on paved surfaces or with wooden pegs in grass or unpaved areas.
- B. The working party shall follow the general requirements regarding safety working practices for different types of excavation as follows:
- (a) Other than minor shallow excavation, the electricity supplier shall be informed before commencing any excavation in the vicinity of U/G cables of 132kV or above.
 - (b) Maintain adequate minimum clearance between any U/G cable and the point where the equipment is used:
 - i Hand-held power tools - 500 mm in any direction from any U/G cable, except when breaking out paved concrete surface where a horizontal clearance of 250mm is required;
 - ii Mechanical excavators and others – 1m in any direction, for U/G cables of below 132kV and 3m for 132kV or above.
 - (c) Consult the electricity supplier before commencement of works if the required clearance in (a) above cannot be achieved and keep records.
 - (d) Maintain a 500mm minimum safe working distance between the point of vertical penetration such as sheet piling or geotechnical investigation and the ascertained alignment of any U/G cable.
 - (e) Use hand tools for exposing U/G cables. Every effort shall be made to excavate alongside the service rather than directly above it.
 - (f) Support U/G cables uncovered in an excavation. The electricity supplier should be consulted in advance wherever an excavation may cause any U/G cable overhanging within the works site.
 - (g) Reinstate all warning tapes, tiles protection plates or other protection materials in their original position during backfilling.
 - (h) Use the same backfilling materials unless otherwise agreed with the electricity supplier. In general, cement bonded sand or sieved soil of suitable fineness shall be used as covering material for the backfilling.
 - (i) Compact the backfill adequately, particularly beneath the cable, to prevent any settlement which would subsequently damage the cable. No power compaction should take place until a 150mm cover of selected fine or sieved soil had been suitably compacted above the U/G cable.

The above extracts from the CoP are not exhaustive, site inspection team shall remind the contractor to follow the details as stated in the CoP to suit the condition of individual site. Code of Practice on Working near Electricity Supply Lines can be downloaded from the EMSD website.

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INSPECTIONS

29. PCOW should conduct briefing to site inspection team on the above Code of Practice well before the commencement of works in the vicinity of gas pipes and electrical cables, and ensure close supervision is exercised on contractors' compliance with relevant codes and guidelines with respect to the protection of utilities.

SURPRISE SAFETY INSPECTION PROGRAMME (SSIP)

30. According to SSIP, Surprise Safety Inspection (SSI) will be carried out by an independent Safety Inspector appointed by Occupational Safety and Health Council (OSHC) on a quarterly basis to all New Works Contracts including building and engineering. SSI will focus on high risk activities and compliance checks on physical conditions on site as follows:
- (a) Working at Height;
 - (b) Protection against Falling Objects;
 - (c) Housekeeping;
 - (d) Lifting Operations / Tower Crane / Mobile Crane; and
 - (e) Electrical Supply System.
31. Site Inspection Team (PCOW or ACOW if PCOW is not available) shall take part in SSIP as follows:
- (a) Attend short open meeting with contractor's site representatives for the arrangements of site inspection [to be recorded in HA site diary with date and time (duration) of surprise safety inspection];
 - (b) Join the inspection as a normal practice, except for circumstances where there is clash with schedule of work with substantiated justification;
 - (c) Attend closing meeting with contractor's site representatives for rounding up the results of safety inspection;
 - (d) Witness contractor's acknowledgement of results on a signed copy of inspection checklist in the presence of independent Safety Inspector; and
 - (e) Follow up and closely monitor contractor's rectification of non-conformance items. Any imminent danger must be rectified by the contractor immediately.
32. While SSI is not exhaustive, the findings would provide useful pointers to deficiencies or loopholes in site management, imminent danger, unsafe site conditions or safety hazards. From the top to the front-line, all site personnel have to step up vigilance and monitoring of unsafe conditions on site. Site inspection team shall also make reference to the inspection checklist (DCMP-F7107) of SSI in their routine safety inspection.

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INSPECTION PROCEDURES
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33. Cross Reference Documents:

- (a) DCMP-F7107 – Checklist for SSIP;
- (b) DCMP-F7111 – Explanatory Notes on SSIP;
- (c) DCMP-F7112 – Sampling Areas of Inspection; and
- (d) DCMP-F7113 – Target Activities for Inspection.

MONITORING OF MOBILE CRANE ENTERING SITE

34. To alert contractors on the safety of using mobile crane on site, site inspection team shall monitor contractor's checking mechanism for mobile crane entering site. In addition to the checking of all relevant statutory forms and operation of the crane controller, contractor shall be reminded to include a checklist in their lifting plan for checking the actual condition of mobile crane which shall include at least the following items:

- (a) Safe Working Load chart shall have clearly legible characters in English and Chinese, and figures are easily visible to the crane operator;
- (b) Outriggers shall be fully extended during lifting process;
- (c) Float of outriggers shall be securely rested on mat or timber blocking with at least 3 times larger in area than the float during lifting process;
- (d) No obvious damage is noted in all lifting appliances such as shackle, wire rope sling etc.
- (e) No obvious sign of repair such as welding to the jib. If sign of repair is noted, examination certificate should be checked.
- (f) No sign of other defects such as oil leakage in hydraulic system.

Reference document:

Code of Practice for Safe Use of Mobile Cranes published by the Labour Department.

ROUTINE GENERAL MATTERS

- 35. Site Direction in HOMES or Form No. 5201 is used by the Site Inspection Team to remind the Contractor to render the works safe from potential danger, clarification of information, general reminder and other general matters etc.
- 36. The Site Inspection Team prepares Form No. 6005 or extracts the Status of Site Direction from HOMES for submission to CC at monthly site meeting on updated status of corrective actions taken by contractor with respect to Site Directions issued on general matters. CC monitors the progress of corrective actions, issues reminder to the Contractor on repeatedly outstanding corrective actions, if any and where necessary, escalates by referring to ACM/CM for issuance of warning letter to the Contractor.

INSPECTIONS DURING MAINTENANCE PERIOD

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37. For defects identified by the tenants (of both domestic flats and ancillary facilities) and by estate staff, the Site Inspection Team focuses on inspecting rectifications relating to the following four essential aspects:
- (a) Leakage;
 - (b) Safety and Security;
 - (c) Public Concern; and
 - (d) The Contractor disagreeing to carry out rectification or tenants not satisfying with the Contractor's rectification.
38. However, when such defect rectifications are inspected, inspection of other minor defects identified in the same location e.g. within the same flat, should also be conducted.

HANDLING OF DEFECTS IDENTIFIED AFTER MAINTENANCE PERIOD OF BUILDING CONTRACTS (AFTER ISSUE OF MAINTENANCE CERTIFICATE)

39. When handling defects identified after maintenance period of building contracts (after issue of maintenance certificate), site inspection team shall follow the procedures as detailed in Appendix J ([DASM-410](#)). Site inspection team shall also refer to the Flowchart and complete the Defects Report Form ([DASM-F7107](#)); and keep relevant records.

FINAL INSPECTION CARRYING OUT BY PROFESSIONAL SERVICES PROVIDER (PSP)

40. Joint site inspection between HD and PSP staff is required for keeping the consistency of quality standard, the recommended frequency of the Joint Site Inspection is same as table of Site Inspection System of DASM-201, the role of Inspection Officer of PSP should act as Works Supervisor of HD.
41. The Site Inspection Team should carry out random checking for monitoring the overall performance of PSP staff by filling the PSP's Performance Checklist.
42. Before the commencement of Flat-to-Flat final inspection, the Site Inspection Team should arrange a joint site inspection with site staff of PSP at Sample Wing to establish the acceptable quality standard. Moreover, a demonstration Video Clip for showing the process of Flat-to Flat final inspection is also dispatched to PSP to align the supervision practice in terms of visual inspection, functional and operational checks.
43. Site Inspection Team attends various water tightness tests initially of which inspected by PSP so as to ensure the testing and inspection are carried out in accordance with the Contract Specification.

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INSPECTION PROCEDURES
INSPECTION PERCENTAGES**CATEGORIES OF INSPECTION**

1. The three main categories of inspection are as follows :-

Category	<u>Recommended Inspection %</u>
'A'	100%
'B'	10%
'C'	Random (at least 3 times per Block or 3 times per item or trade for external works)

See para. 11 for detail.

INSPECTION PERCENTAGE

2. The inspection percentages as set out in Para. 1 above are based on what is normally required to fulfill the role of the Site Inspection Team as described in this Guide (see DASM-103), with due recognition of the actual strength of the site staff establishment.
3. The recommended inspection percentages may vary according to the nature and scope of the Contract, site conditions and stage of work.
4. The inspection percentages are determined by the CC and are to be reviewed from time to time. At the commencement of the contract, PCOW prepares Forms Nos. 7006 and 7007 via the SCOW, CC to the ACM for endorsement. PCOW reports monthly using Form No. 7008 whether the endorsed inspection percentages have been achieved or not and if required, proposes revised percentage using Report Forms Nos. 7006 and 7007 via the SCOW, CC to the ACM for endorsement.
5. For inspection of domestic and non-domestic blocks, the recommended inspection percentages are applied on a floor-to-floor basis **for both common area and domestic flat** to avoid uneven distribution of inspection. For inspection of external works, the recommended inspection percentages are to be spread evenly on area basis.
6. The recommended inspection percentage of category 'C' inspection for domestic and non-domestic blocks is at the rate of at least 3 times per block which are to be spread evenly; whereas the same for external works is at the rate of at least 3 times per item or trade.
7. The Inspection Officer, assisted by Inspection Guide Book, completes Daily Inspection Form No. 0001 and Monthly Report on Inspection Status Form No. 7008 to PCOW for checking/endorsement.
8. The PCOW endorses Form No. 7008 before submission to CC with copies to SCOW and ACM.
9. The PCOW enters in Form No. 7008 the reason for non-compliances with the inspection percentages (if any), and the follow-up actions to rectify such non-compliances as directed by CC, ACM and CM.

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INSPECTION PERCENTAGES

10. Where major non-conformities are found, PCOW should consult CC and SCOW and increase the inspection percentage of those items to ensure compliance for works done as well as works to be completed. Changes to inspection percentage should be recorded on Form No. 7006 or 7007.

PROJECT SPECIFIC WORKS, SPECIALIST WORKS

11. The standard inspection guidelines do not cover project specific works, specialist works or special proprietary products. The PCOW prepares additional project inspection guidelines for these items, in consultation with the SCOW and CC for endorsement by the ACM. The inspection guideline proforma (Reference no. MIS.01) on "Project Specific Works / Specialist Works / Special Proprietary Products / Miscellaneous Works" is to be used for this purpose.

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INSPECTION PROCEDURES
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LIST OF ITEMS REQUIRING VARIOUS CATEGORY CHECKS

11. The list of Inspection Items requiring various Category Checks is as follows : -

Inspection Guideline Ref. No.	Trade	(A) 100%	(B) 10% Check	(C) Random Check (at least 3 times)
		Item No./Description	Item No./Description	Item No./Description
MAS1.01	Brickwork & Blockwork	(1) Prototype / Sample Work	(2) Wall Ties (4) Laying (5) Bed-Joint Reinforcement (6) Discontinuous Construction (7) Lintel (8) Movement Joint (9) Evenness & Plumb (10) Finish	(3) Wall Thickness
MAS1.02	Panel Wall	(1) Shop Drawing (2) Construction Mock-up	(4) Erection (5) Chases / Recesses (6) Grouting (7) Joint Reinforcement (8) Sealant (9) Moisture Sealer (10) Plumb and Square (11) Finish	(3) Materials, Type & Dimensions
MAS1.03	Glass Block Panel	(1) Shop Drawing	(2) Background Preparation (4) Laying (5) Reinforcement / Wall Ties (6) Movement Joint (7) Evenness & Plumb (8) Finish	(3) Type & Dimensions
MAS2.01	Stonework	(1) Prototype / Sample Work	(2) Shape & Size (3) Wall Ties (4) Laying (5) Bonding Stone (6) Movement Joint (7) Pointing (8) Accuracy (9) Finish	
CON5.01	Precast Facade	(1) Shop Drawing (2) Trial Units	(3) Joint (4) Finish (5) Evenness & Plumb	
WAT1.01	Asphalt Tanking	(1) Background Preparation (6) Termination (8) Soundness	(2) Preparation of Asphalt (3) Asphalt & Isolating Membrane (4) Application & Thickness of Asphalt (5) Asphalt Angle Fillet (7) Asphalt Surface Treatment (9) Protection	
WAT1.02	Asphalt Roofing	(1) Background Preparation (6) Skirting and Termination (7) Flashing and Dressing to Rainwater Outlet (8) Pipe Sleeve Through Roof (10) Soundness (11) Protection (12) Water Flood Test and Infra-red Scan Test	(2) Preparation of Asphalt (3) Asphalt & Isolating Membrane (4) Application & Thickness of Asphalt (5) Asphalt Angle Fillet (9) Asphalt Surface Treatment	
WAT1.03	Roof Tiles	(3) Expansion Joints	(1) Materials, Type & Size (2) Laying (4) Pointing (5) Dressing (6) Evenness (7) Finish	

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INSPECTION PROCEDURES
INSPECTION PERCENTAGES

Inspection Guideline Ref. No.	Trade	(A) 100%	(B) 10% Check	(C) Random Check (at least 3 times)
		Item No./Description	Item No./Description	Item No./Description
WAT6.01	Proprietary Tanking – (Sheet or Liquid Membrane Waterproofing Systems)	(1) Shop Drawing (2) Method Statement / Construction Process Control (3) Background Preparation (7) Termination (8) Soundness (9) Protection	(4) Free of Moisture (5) Application (6) Angle Fillet (not c/s fillet)	
WAT6.02	Proprietary Roofing – (Sheet or Liquid Membrane Waterproofing Systems)	(1) Shop Drawing (2) Method Statement / Construction Process Control (3) Background Preparation (7) Skirting & Termination (8) Flashing & Dressing to Pipe (9) Soundness (10) Protection (11) Water Flood Test & Infra-red Scanning Test	(4) Free of Moisture (5) Application (6) Angle Fillet (other than c/s fillet)	
WAT6.03	Cold Liquid Applied Flexible Waterproofing System	(1) Method Statement / Construction Process Control (2) Construction Mock-up	(3) Background Preparation (4) Materials & Type (5) Application (6) Thickness & Coats (7) Curing & Protection	
WAT6.04	Cementitious Waterproofing System	(1) Shop Drawing (2) Method Statement / Construction Process Control	(3) Background Preparation (4) Materials & Type (5) Application (6) Thickness & Coats (7) Curing & Protection	
TIM1.01	Timber Sub-frame		(1) Materials, Type & Dimensions (3) Hardwood Ground (4) Fixing (5) Preservative (6) Square & Plumb (7) Finish	(2) Moisture Content
TIM1.02	Timber Door Frame (Non-doorsets)		(1) Materials, Type & Dimensions (3) Hardwood Ground (4) Fixing (5) Preservative (6) Primer (7) Square & Plumb (8) Finish (9) Intumescent Seal	(2) Moisture Content
TIM1.03	Timber Architraves / Doors (Non-doorsets)		(1) Architraves a. Materials Type & Dimensions b. Primer c. Finish (2) Doors a. Materials, Type & Dimensions b. Primer c. Intumescent Seal d. Soundness e. Ironmongery f. Finish	

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Inspection Guideline Ref. No.	Trade	(A) 100%	(B) 10% Check	(C) Random Check (at least 3 times)
		Item No./Description	Item No./Description	Item No./Description
TIM1.04	Wood Block / Strip Flooring / Skirting		(1) Wood Block / Strip Flooring a. Floor Base b. Adhesive c. Materials, Type & Size d. Pattern e. Expansion Gap f. Finish (2) Skirting a. Materials, Type & Size b. Preservative c. Primer d. Fixing e. Finish	
MET1.01	Metal Frame		(1) Materials, Type & Dimensions (2) Burrs & Arrises (3) Defects of Weld (4) Welded Surface (6) Fixing (8) Alignment (9) Finish (10) Equipotential Bonding	(5) Galvanized Coating (7) Soundness
MET1.02	Metal Grilles		(1) Materials, Type & Dimensions (2) Burrs & Arrises (3) Defects of Weld (4) Welded Surface (6) Fixing (8) Alignment (9) Finish (10) Equipotential Bonding	(5) Galvanized Coating (7) Soundness
MET1.03	Metal Louvre & Frame		(1) Materials, Type & Dimensions (2) Burrs & Arrises (3) Defects of Weld (4) Welded Surface (6) Fixing (8) Alignment (9) Finish (10) Equipotential Bonding	(5) Galvanized Coating (7) Soundness
MET1.04	Metal Railing		(1) Materials, Type & Dimensions (2) Burrs & Arrises (3) Defects of Weld (4) Welded Surface (6) Fixing (7) Expansion Joint (9) Alignment (10) Finish (11) Equipotential Bonding	(5) Galvanized Coating (8) Soundness
MET1.05	Metal Door & Frame		(1) Materials, Type & Dimensions (2) Burrs & Arrises (3) Defects of Weld (4) Welded Surface (6) Fixing (8) Alignment (9) Finish (10) Equipotential Bonding	(5) Galvanized Coating (7) Soundness

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Inspection Guideline Ref. No.	Trade	(A) 100%	(B) 10% Check	(C) Random Check (at least 3 times)
		Item No./Description	Item No./Description	Item No./Description
MET1.06	Skylight	(1) Shop Drawing (2) Method Statement / Construction Process Control (3) Prototype / Sample Work	(4) Materials, Type & Dimensions – Frame (5) Fixing (6) Welds (8) Sealant – Frame (9) Materials, Type & Dimensions – Glazing / Acrylic (10) Setting Blocks / Gaskets (11) Sealant – Glazing / Acrylic (12) Soundness / Finish (13) Protection (14) Equipotential Bonding	(7) Coating
MET1.07	Metal Frame for Market Stall	(1) Shop Drawing (2) Method Statement / Construction Process Control (3) Prototype / Sample Work	(4) Materials, Type & Dimensions (frame, mesh & grille) (5) Fixing (frame, mesh & grille) (6) Welds (frame, mesh & grille) (8) Soundness / Finish (9) Equipotential Bonding	(7) Coating
MET1.08	Fall Arrest System	(1) Shop Drawing (2) Method Statement (3) Installation Sub-contractor	(4) Materials, Type & Dimensions (5) Installation (6) Equipotential Bonding	
FIN1.01 FIN1.02	Spatterdash (Internal) Spatterdash (External)	(1) Construction Mock-up	(2) Background Preparation (5) Coverage (6) Verification	(3) Materials & Mix (4) Application
FIN1.03 FIN1.04	Rendering (Internal) Rendering (External)	(1) Construction Mock-up (12) Movement Joint	(2) Background Preparation (3) Beads and Stops (4) Steel Lathing (6) Dubbing Out (7) Undercoat (8) Render (9) Waterproof Render (10) Lime Plaster (11) Gypsum Plaster (13) Finish (14) Evenness & Plumb (15) Soundness	(5) Mix
FIN3.01	Screeding	(1) Construction Mock-up (6) Movement Joint / Dividing Strip	(2) Background Preparation (5) Thickness of Screeds (7) Finish (8) Evenness & Fall (9) Soundness	(3) Mix of Screed (4) Laying Screeds
FIN4.01	Granolithic / Terrazzo	(1) Construction Mock-up (3) Contraction Joint, Expansion Joint & Dividing Strip	(2) Background Preparation (5) Type of Finishes (6) Coats & Thickness (7) Plumb, Levels & Falls (8) Finish (9) Soundness	(4) Materials & Mix
FIN5.01 FIN5.02	Wall Tiles (Internal) Wall Tiles (External)	(1) Construction Mock-up (7) Movement Joint	(3) Background Preparation (4) Tiles Preparation (6) Bedding & Fixing (8) Tile Joints (9) Grouting (10) Finish (11) Cleanliness (12) Evenness & Alignment (13) Soundness	(2) Materials, Type and Size (5) Mixing of Bedding

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INSPECTION PROCEDURES
INSPECTION PERCENTAGES

Inspection Guideline Ref. No.	Trade	(A)100%	(B) 10% Check	(C) Random Check (at least 3 times)
		Item No./Description	Item No./Description	Item No./Description
FIN5.03	Floor Tiles	(1) Construction Mock-up (7) Movement Joint	(3) Background Preparation (4) Tiles Preparation (6) Bedding & Fixing (8) Tile Joint (9) Grouting (10) Finish (11) Levels & Falls (12) Alignment of Joints (13) Cleanliness (14) Soundness	(2) Materials, Type and Size (5) Mixing of Bedding
FIN5.04	Marble & Granite Floor Slab	(1) Construction Mock-up	(2) Background Preparation (4) Finishing / Sealer (6) Fixing (7) Cutting (8) Levels & Falls (9) Alignment of Joints (10) Pointing to Joints / Movement Joints (11) Cleanliness (12) Damage & Defects (13) Protection	(3) Materials, Type & Dimensions (5) Mixing of Bedding
FIN5.05	Marble & Granite Wall Slab by Anchoring Method	(1) Shop Drawing (2) Method Statement / Construction Process Control (3) Construction Mock-up	(5) Sealer (6) Fixing (7) Cutting (8) Evenness in Plane (9) Alignment of Joints (10) Pointing to Joints / Movement Joints (11) Cleanliness (12) Finishes & Defects (13) Protection	(4) Materials, Type & Dimensions
FIN7.01 FIN7.02	Painting – Woodwork / Steelwork / Plaster & Masonry Work (Internal) Painting – Woodwork / Steelwork / Plaster & Masonry Work (External)	(1) Construction Mock-up	(2) Background Preparation (3) Wood Preservative / Sealer (4) Stop, Knot and Prime	(5) Mixing & Application of Paint (6) Texture Base (7) Undercoats (8) Finishing Coats (9) Finishes (10) Pipe Work and Machinery
FIN8.01	False Ceiling	(1) Shop Drawing (2) Method Statement (3) Prototype / Sample Work	(5) Fixing (6) Alignment (7) Access (8) Soundness / Finish (9) Equipotential Bonding	(4) Materials, Type & Dimensions
COM2.01	Aluminium Windows Installation (at In-situ Wall)	(2) Opening Rectification	(1) Design Clearance (4) Protection (7) Water Bar (8) Bituminous Paint (9) Fixing Lugs (10) Transom & Mullion Stiffener (11) Square and Plumb (12) Gap Grouting (13) Perimeter Sealant (14) Window Grille (15) Equipotential Bonding	(3) Materials, Type & Dimensions (5) Pivot & Stay (6) Drainage
COM2.02	Aluminium Windows Installation (Precast Façade)		(2) Protection (5) Transom & Mullion Stiffener (6) Square and Plumb (7) Perimeter Sealant (8) Window Grille (9) Equipotential Bonding	(1) Materials, Type & Dimensions (3) Pivot and Stay (4) Drainage

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INSPECTION PROCEDURES
INSPECTION PERCENTAGES

Inspection Guideline Ref. No.	Trade	(A) 100%	(B) 10% Check	(C) Random Check (at least 3 times)
		Item No./Description	Item No./Description	Item No./Description
COM2.03	Aluminium Windows Installation (at Precast Façade Casting Yard)		(3) Bituminous Paint (4) Fixing Lugs (5) Transom & Mullion Stiffener (6) Positioning & Fixing (7) Protection (8) Equipotential Bonding	(1) Pivot & Stay (2) Drainage
COM4.01	Glazing		(1) Preparation of Surrounds (2) Materials, Type & Thickness of Glazing (3) Patterns & Cut Edges (4) Edge Clearance / Edge Cover (5) Setting, Location Blocks / Distance Pieces / Compression Gasket (6) Fixing Glass / Plastic Sheets (7) Protection & Cleaning (8) Broken / Damaged Glazing	
COM4.02	Glazed Cladding / Shop Front	(1) Shop Drawing (2) Method Statement / Construction Process Control (3) Prototype / Sample Work	(4) Materials, Type & Dimensions of Metalworks (5) Burrs & Arrises of Metalworks (6) Defects of Weld (7) Welded Surface (9) Fixing of Metal Works (11) Alignment of Metal Works (12) Materials, Type & Dimensions of Glazing (13) Edge Clearance / Edge Cover (14) Fixing Glass (15) Setting, Location Blocks / Distance Pieces / Compression Gasket (16) Sealant (17) Broken / Damaged Glazing (18) Finish of Metal Works (19) Equipotential Bonding	(8) Galvanized Coating (10) Soundness of Metal Works
COM5.01	Timber Door Frame (Doorsets)		(3) Hardwood Ground	(1) Materials, Type & Dimensions (2) Moisture Content (4) Fixing (5) Preservative (6) Primer (7) Square & Plumb (8) Finish (9) Intumescent Seal
COM5.02	Timber Architraves / Doors (Doorsets)			(1) Architraves a. Materials Type & Dimensions b. Primer c. Finish (2) Doors a. Materials, Type & Dimensions b. Primer c. Intumescent Seal d. Soundness e. Ironmongery f. Finish
COM8.01	Metal Roller Shutter	(1) Shop Drawing (2) Prototype / Sample Work	(3) Materials, Type & Dimensions (4) Fixing (5) Welds (7) Equipotential Bonding	(6) Coating

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INSPECTION PROCEDURES
INSPECTION PERCENTAGES

Inspection Guideline Ref. No.	Trade	(A) 100%	(B) 10% Check	(C) Random Check (at least 3 times)
		Item No./Description	Item No./Description	Item No./Description
COM9.01	Cooking Bench / Sink Units	(1) Shop Drawing (2) Prototype / Sample Work		(3) Materials, Type & Dimensions (4) Installation (5) Protection (6) Lines & Levels (7) Soundness / Finish (8) Equipotential Bonding
COM10.01	Glass Panel Balustrade	(1) Shop Drawing (2) Method Statement / Construction Process Control (3) Prototype / Sample Work	(4) Materials, Type & Dimensions of Metalworks (5) Burrs & Arrises of Metalworks (6) Defects of Weld (7) Welded Surface (9) Fixing of Metal Works (11) Alignment of Metalworks (12) Materials, Type & Thickness Of Glazing (13) Fixing Glass (14) Setting Blocks / Distance Pieces (15) Sealant (16) Broken / Damaged Glazing (17) Finish of Metalworks (18) Equipotential Bonding	(8) Galvanized Coating (10) Soundness of Metal Works
CLA1.01	Metal Profiled Sheet Roofing	(1) Shop Drawing (2) Method Statement (3) Prototype / Sample Work	(4) Materials, Type & Dimensions (5) Fixing (6) Movement Joints (7) Setting Blocks / Gaskets (8) Sealant (9) Protection (11) Soundness / Finish (12) Equipotential Bonding	(10) Defects
CLA2.01	Chinese Tiling	(1) Method Statement / Construction Process Control	(2) Materials, Type & Dimensions (3) Mortar, Chunam Mortar (4) Fixing (5) Soundness and Finish	
PLU1.01	Plumbing – Underground Water Supply Pipes	(3) Expansion Joint (8) Water Pressure Test (9) Connection to Existing In-service Mains	(1) Materials, Type & Dimensions (2) Pipe Joint (4) Pipework Installation (5) Valves & Strainers (6) Pipe Support (7) Protection to Pipe	
PLU1.02	Plumbing – Above Ground Water Supply Pipes	(8) Pipe Testing (10) Cleaning of Water Tank / Pipeline	(1) Pipe Sleeve (2) Materials, Type & Dimensions (3) Pipe Joint (4) Expansion Joint (5) Pipework Installation (6) Valves / Taps / Strainers (7) Pipe Bracket (9) Caulking Pipe Sleeves	
DRA1.01	Drainage Pipe Above Ground	(10) Pipe Testing (11) RFT for Common W-trap System (12) MFT for Common W-trap System	(1) Pipe Sleeve (2) Materials, Type & Dimensions (3) Bracket and Fixing (4) Jointing Pipe and Fitting (5) Level, Alignment & Plumb (6) Floor Drain and Grating (7) Pointing to Pipe Sleeve (8) Protection (9) Equipotential Bonding	

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INSPECTION PROCEDURES
INSPECTION PERCENTAGES

Inspection Guideline Ref. No.	Trade	(A) 100%	(B) 10% Check	(C) Random Check (at least 3 times)
		Item No./Description	Item No./Description	Item No./Description
DRA2.01	Drainage Pipe Below Ground	(1) Existing Invert level (2) Trench Excavation (3) Materials, Type & Size of Pipes and Fittings (12) Line and Invert Level (13) Pipe Testing	(4) Laying & Cutting of Pipes (5) Supports of Pipeline (6) Jointing Materials (7) Jointing & Connection of Pipe (8) Joint Filler for Concrete Bed (9) Bed, Haunch & Surround (10) Protection to Flanged Joints / Couplings & Insulation (11) Defects / Damage (14) Cleaning Pipelines (15) CCTV Inspection	
DRA2.02	Manhole	(1) Manhole (2) Finished Surface of Concrete Works (3) Invert Level (4) Benching (5) Step iron / Cat Ladder (6) Cover and Frame (7) Drop Pipe (8) Fresh Air Inlet & Pipe (9) Pipe Discharging to BIGT and Manhole		
DRA2.03	Channel / Gully		(1) Channel / Gully (2) Movement Joint (3) Finished Surface of Concrete Works (4) Invert Level & Gradient (5) Cover and Frame (6) Gully Grating & Overflow Weir (7) Sealant for Movement Joint	
EXT1.01	Bituminous Roadways	(1) Trial Area (5) Relative Compaction of Sub-base (9) Core Test for Road Base (12) Core Test for Base Course (16) Core Test for Wearing Course (18) Surface Regularity (19) Texture Depth and Permeability	(2) Preparation Work (3) Materials of Sub-base (4) Laying of Sub-base (6) Kerbs and Edgings (7) Materials & Mixing of Bituminous Road Base (8) Laying of Bituminous Road Base (10) Materials & Mixing of Bituminous Base Course (11) Laying of Bituminous Base Course (13) Bituminous Wearing / Friction Course (14) Laying of Bituminous Wearing / Friction Course (15) Alignment and Level of Wearing / Friction Course (17) Protection & Defects (20) Road Marking	

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INSPECTION PROCEDURES
INSPECTION PERCENTAGES

Inspection Guideline Ref. No.	Trade	(A) 100%	(B) 10% Check	(C) Random Check (at least 3 times)
		Item No./Description	Item No./Description	Item No./Description
EXT2.01	Concrete Carriageways	(1) Method Statement (2) Trial Length (6) Relative Compaction of Sub-base (21) Test on Surface Regularity (22) Test on Texture Depth	(3) Preparation Work (4) Materials of Sub-base (5) Laying of Sub-base (7) Kerbs and Edgings (8) Movement Joints (9) Dowel Bar, Tie Bar & Cradle (10) Joint Filler and Groove Forming Strip (11) Reinforcement Bar (12) Laying Polyethylene Sheeting (13) Concrete Mix (14) Placing of Concrete (15) Finishes of Joints / Edges of Carriageway (16) Alignment & Level of Concrete Carriageway (17) Surface Texturing (18) Curing Methods (19) Protection & Defects (20) Joint Sealant (23) Road Marking	
EXT3.01	Pavement – Paving Block	(4) Relative Compaction of Sub-base	(1) Preparation Work (2) Materials of Sub-base (3) Laying of Sub-base (5) Kerbs and Edgings (6) Materials of Bedding Sand (7) Laying of Paving Blocks / Slabs (8) Dressing (9) Materials of Joint Filling (10) Joint Filling & Compaction (11) Level of Paving (12) Protection and Defects (13) Road Marking	
MIS.01	Project Specific Works / Specialist Works / Special Proprietary Products / Miscellaneous Works	PCOW prepares additional project inspection guidelines for these items based on relevant Specification Library, Contract Particular Specification, proprietary products specification and method statement and submits via SCOW and CC to ACM for endorsement		

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INSPECTION PROCEDURES
INSPECTION PERCENTAGES

Inspection/ Record Form No.	Trade	100%	10% Check	Random Check (at least 3 times)
		Item No./Description	Item No./Description	Item No./Description
5004	Thickness of Anodised Coating of Aluminium Elements			All Items
5005	Thickness of Galvanized/ Zinc Sprayed Coating of Metalwork			All Items
5006	Guideline & Checklist for Installation of Floor Spring System at Construction Stage / Maintenance Period Stage	All items		
5101	Final Inspection - Trx. Rm./Main Switch Room/ Generator Room	All Items		
5102	Final Inspection - Pump Rm./TBE Rm./Lift machine Rm./Lift Pit	All Items		
5103	Final Inspection - Utilities/Services Rm.	All Items		
5104	Final Inspection - Water Tanks	All Items		
5108	Final Inspection - Watertightness Test - Plumbing and Drainage Installation Above Ground	All Items		
5109	Final Inspection - Flats	All Items		
5110	Final Inspection - Common Area	All Items		
5111	Final Inspection - Miscellaneous Works	All Items		
5112	Final Inspection - Cleaning of Water Tanks and Supply Pipeworks	All Items		
5113	Final Inspection - External Works Covered Walkway/Pavilion	All Items		
5114	Final Inspection - External Works Fencing/Planter Wall	All Items		
5115	Final Inspection - External Works Paving/Emergency Vehicular Access	All Items		
5116	Final Inspection - External Works Ball Court/Play Area	All Items		
5117	Final Inspection - External Works Refuse Storage Area/ Refuse Collection Point	All Items		
5118	Final Inspection - Connection to Underground Drainage Pipe and Manholes / BIGTs	All Items		
5119	On-site Verification for Common W-Trap System – Repetitive Flushing Test Record	All items		

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INSPECTION PROCEDURES
INSPECTION PERCENTAGES

5120	On-site Verification for Common W-Trap System – Multiple Flushing Test Record	All items		
6207	Final Inspection - Watertightness Test - Bathroom	All Items		
6208	Final Inspection - Watertightness Test - Kitchen/ Refuse Room/Others	2, 3, 4, 5, 6	1	
6209	Final Inspection - Watertightness Test - Windows/Precast Facade	* All Items		

* DASM F6209 item 3 (precast façade) inspection % to be agreed by CM at project base.

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INSPECTION PROCEDURES
RECORDS/REPORTS/TESTING**RECORDS AND REPORTS**

1. The following types of Records and Reports are kept in the site office or relevant functions in HOMES :
 - (a) during Construction Stage
 - Site Record Book or Site Diary (HOMES)
 - Sample Submission Record
 - Builder's Work Shop Drawing Submission Record
 - Record on Site Direction Status
 - Certificates Record for Monthly Site Meeting
 -
 - Record of Trade Tested Workers
 - Record of Dangerous Goods
 - Clerk of Works' Report for Monthly Site Meeting
 -
 - Reports on Weather, Sound level Monitoring and Typhoon and Environmental Issue
 - Report for Agreement of Inspection Percentage - Domestic Block
 - Report for Agreement of Inspection Percentage - Non-domestic Portion
 - Report on Inspection Status
 - (b) at Substantial Completion Stage
 - Record of Taking Over by Estate Management Division
 - Taking Over Charts
 - (c) during Maintenance Period
 - Defects - Maintenance Period
 - Report on Summary of Defects
 - Clerk of Works' Report for Maintenance Period Meeting

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INSPECTION PROCEDURES
RECORDS/REPORTS/TESTING

2. The record forms (nos. 6201 or Builder's Works Shop Drawing Submission Record in HOMES, 6202, 6203, 6204 and 6205.) are developed for the Contractor's representatives (Site Agent or Safety Officer) to fill in, update and submit to PCOW for verification on monthly basis. The PCOW checks and verifies the submitted information and passes back to the Contractor's representatives for incorporation into the Contractor's Report for Monthly Site Meeting. Alternative record forms for the above are also deemed acceptable provided all information and guidelines as stated are included in the records, signed by Contractor's representatives and verified by PCOW.
3. Should there be any non-compliance or deficiencies identified, the PCOW issues a Site Direction (Form No. 5201) or Site Direction through HOMES to the Contractor (see also [DASM-201](#)). The Site Direction serves one of the following functions and requires the Contractor to take necessary actions to rectify the non-compliance or deficiencies :-
 - (a) caution the Contractor on site safety and/or other obligations (e.g. deficiencies in qualified craftsmen provision);
 - (b) clarification of documents; or
 - (c) reminder.

CM's representatives issues reminder to the Contractor, reviews the situation and where necessary, escalates with issuance of warning letter to the Contractor.
4. All superseded drawings on site are chopped 'Superseded' and archived or disposed properly.
5. The PCOW submits reports at specified intervals to the ACM and CC as appropriate and highlights any anomalies or problems identified.
6. Drawings received by the site staff are recorded in the appropriate forms and files or Site Instruction in HOMES.
7. Instructions on the use and guidelines for compilation of the Site Record Book and Site Diary in HOMES are described in Appendix A and A1 respectively.

SAMPLE SUBMISSION AND CHECKING OF MATERIAL

8. For each sample submission, the PCOW checks that the Sample Submission and Approval Form [DCMP-F716](#) or the information of sample submission in HOMES has been completed by the Contractor and that, where applicable, a test certificate or a manufacturer's guarantee for proof of compliance with the specified requirements is provided by the Contractor.

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INSPECTION PROCEDURES
RECORDS/REPORTS/TESTING

9. The PCOW assesses the sample submitted by checking against specification, Bills of Quantities and drawings. The PCOW records his recommendation, findings or areas of non-compliance in the Assessment of Material Sample Form [DCMP-F718](#) or in HOMES. The PCOW then forwards the Sample Submission and Approval Form [DCMP-F716](#), Approval Label [DCMP-F717](#) and the Assessment of Material Sample Form [DCMP-F718](#) or his comments on sample submission in HOMES to the relevant CM's representative for further processing (see DCMP).
10. When samples are approved, the CM's representative signs the Approval Label [DCMP-F717](#). The PCOW fixes the Approval Label onto the sample and retains the approved samples in the sample store room of the site office for reference until Substantial Completion of the Contract. Photographs taken for the approved samples are kept on file. The Site Inspection Team checks compliance with contract requirements for materials delivered to site at randomly selected samples for major trades, against the approved samples, at random basis including first batch according to the report submitted by Contractor on material delivery, using Form No. 6210. See Flow Chart of Material Delivery Check at end of this Section.
11. In addition to the check against approved samples, the Site Inspection Team checks that the materials are properly stored and protected from weather and damage.
12. Any material delivered to site which do not conform to the specified requirements and/or the approved samples, or which are found to be damaged, are required to be removed from site. The Site Inspection Team uses Inspection Form No. 6210 to record the checking. For non-conformities, the PCOW at the same time issues a Site Direction (Form No. 5201 or 5202 whichever is appropriate), or Site Direction through HOMES, to the Contractor together with a copy of the Inspection Form, requiring the Contractor to take necessary action (see [DASM-201](#)). If corrective action is not immediately taken by the Contractor, relevant CM's representative issues an instruction to effect the removal of the unsatisfactory materials (see GCC). If replacement of unsatisfactory material, which does not comply with the Contract, is likely to involve the removal and re-execution of the original permanent work, the direction from the CM is required (see GCC).
13. The Site Inspection Team uses Form No. [DCMP-F722](#) (See [DASM-404](#) Appendix D) to record the Contractor's request and removal of materials off site, or input the Material Removal in the Material Management of HOMES.
14. All sample submissions are recorded in Sample Submission Record Form No. [DCMP-F719](#) or in the Material Management of HOMES.
15. Relevant standard DCMP forms for processing sample submission are listed in Appendix D.

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INSPECTION PROCEDURES
RECORDS/REPORTS/TESTING**TESTING OR CHECKING OF MATERIALS, COMPONENTS AND WORKS**

16. Material/Component Testing Form (Form No. 8001) is used by the Site Inspection Team to send specimens of building materials and/or components to laboratory for testing. Circumstances requiring such testing are described in Guideline on Form No. 8001.
17. Tests required for major building materials are described in Guideline on Form No. 8001 for ease of reference. Refer to the contract specifications on tests required for other building materials and components.
18. Where testing of materials, components or works are required to be carried out on site, PCOW checks on monthly basis that the testing or measuring equipment supplied by the Contractor has not exceeded the calibration interval using Record Form No. 8002. The list of equipments is described in Appendix E. Each time before the required test or check is carried out, PCOW records the following details supplied by the contractor into the Site Record Book or Site Diary (HOMES), or on Form No. 7003 and 8002 (see DCCP and [DASM-401](#)):- Type of equipment/serial number/calibration interval/date of last calibration/date of checking/signature of Site Staff and Contractor's Representative.
19. In case of doubt towards the calibration status of the equipment, or when the Contractor fails to submit evidence, PCOW issues Site Direction, using Form No. 5201 or through HOMES, to the Contractor for remedial action.

MONITORING OF IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT PLAN (EMP)

20. A checklist is available for use by the CC and Site Staff for monitoring the Contractor's implementation of the EMP.
21. The Checklist is in two parts. Part 1 ([DASM-F7104](#)) covers the administration of the EMP and monitoring of the Contractor's compliance with environmental legislation. Part 2 ([DASM-F7105](#)) concerns the checking of environmental aspects of site practice. Both parts are to be completed by Site Staff.
22. The spectrum of items needed for checking in Part 2 and the checking intervals are initially set out in the Particular Specification and may be modified, with a Site Instruction, to suit varying site specific environmental conditions.

SUBMISSION OF MONTHLY RETURNS OF GF527 & GF527A

23. Project team monitors the submission of Monthly Return of Site Labour Deployment and Wage Rates for Construction Works (GF527) and Return on Construction Site Employment (GF527A) to Census & Statistics Department according to the Workflow for Submission of Monthly Returns of GF527 & GF527A in DASM-203 Appendix.A

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SITE INSPECTION
SITE INSPECTION TEAM**Flow Chart of Materials Delivery Check**

Notes : -

(1) QCM/QCCs

- (a) Employed by Contractor with qualification as specified under contract.
- (b) Check delivered materials against Approved samples and documents to be submitted at delivery stage as specified.

(2) Material Delivery Weekly Report includes : -

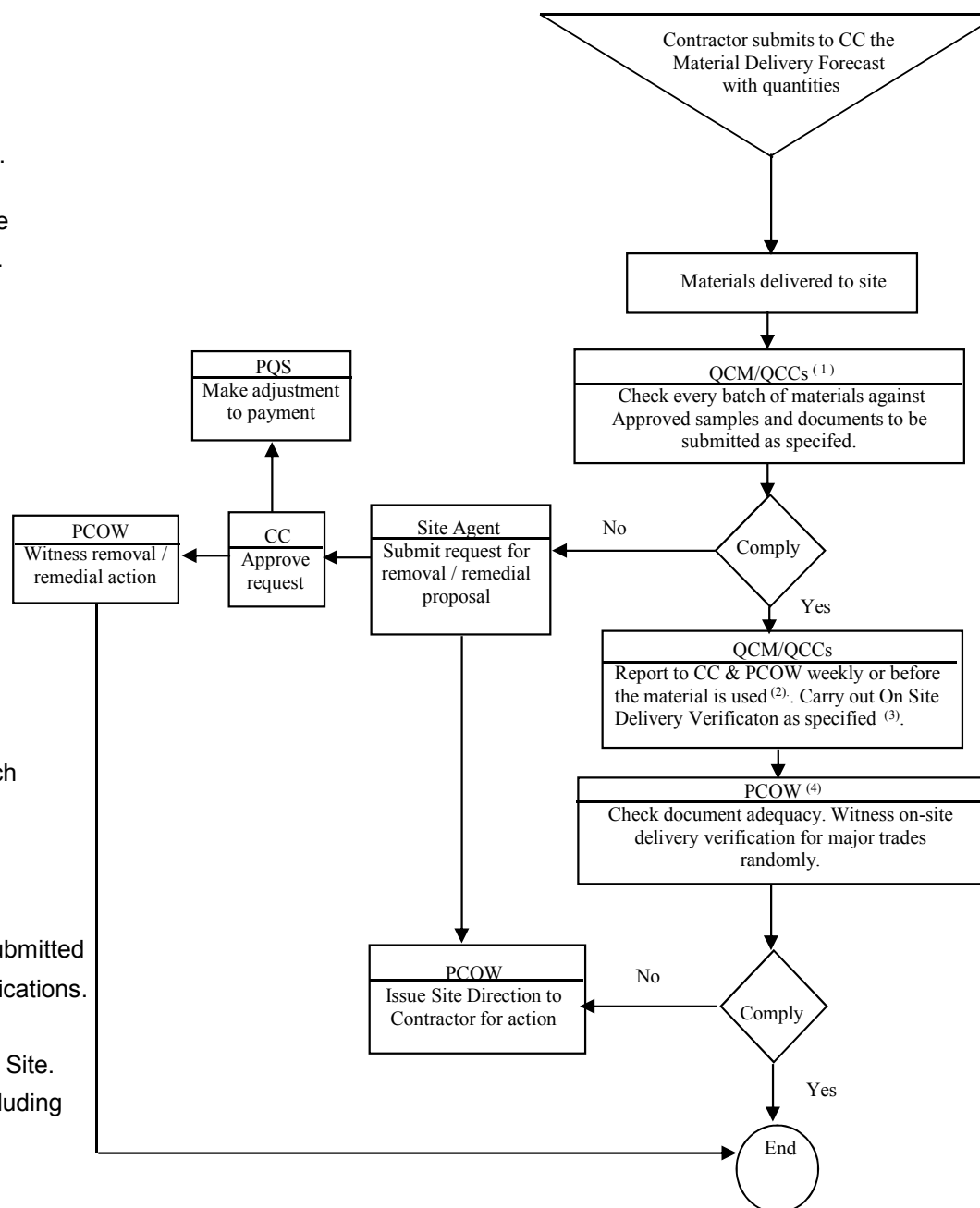
- (a) Weekly material delivery summary with quantities.
- (b) Material storage location plan.
- (c) Written confirmation by QCM/QCCs that materials delivered conform with Approved samples.
- (d) Corresponding delivery notes.
- (e) Other documents required at delivery stage as specified.

(3) On Site Delivery Verification

- (a) Contractor carries out verification of each batch of materials upon delivery to Site as specified.

(4) PCOW's checking includes

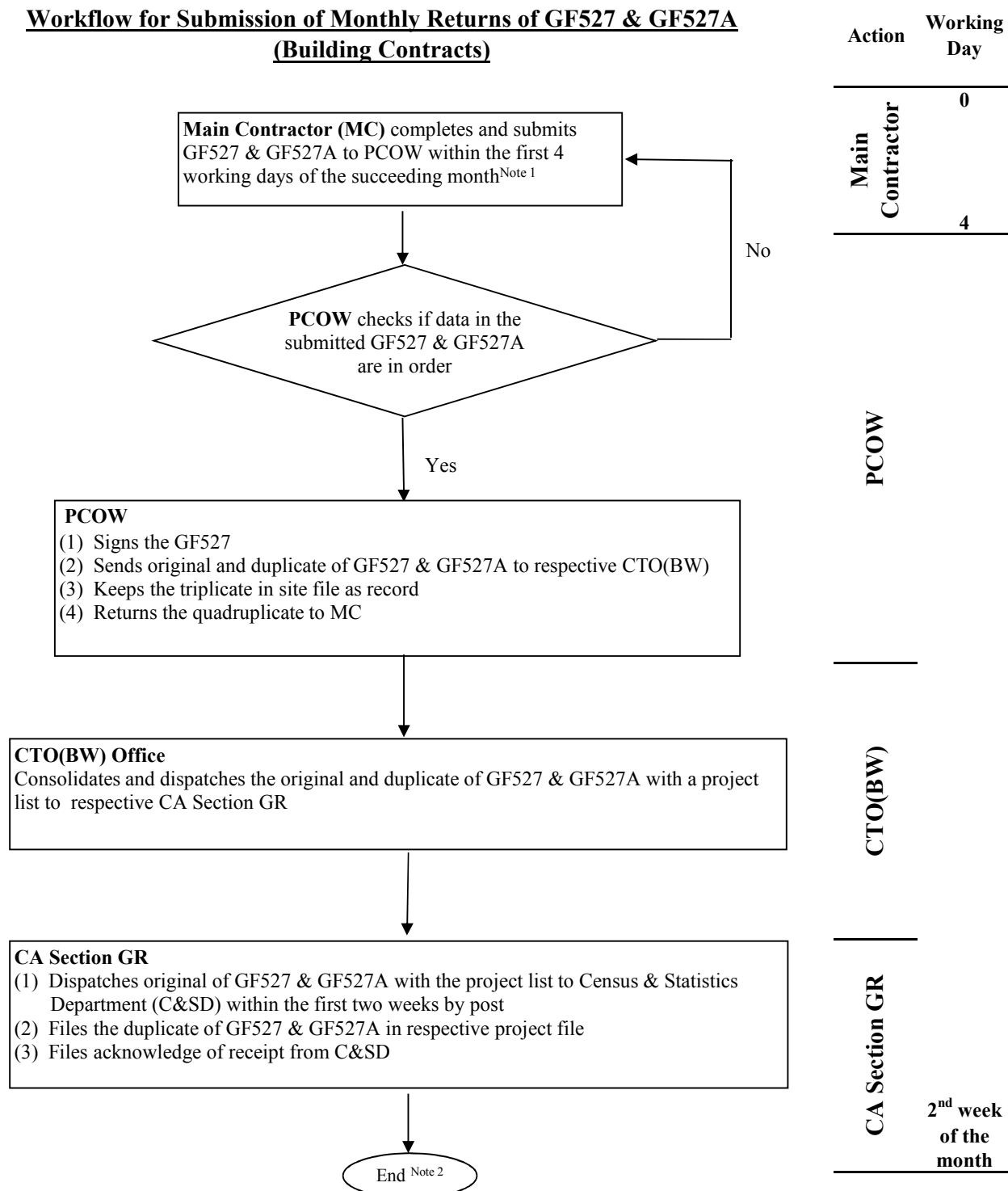
- (a) Adequacy of Contractor's documents submitted at delivery stage against contract specifications.
- (b) Randomly check / witness Contractor's verification of materials upon delivery to Site. (at least 3 times per type of material including the first batch of delivery)
- (c) Materials of major trades



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APPENDIX A

**Workflow for Submission of Monthly Returns of GF527 & GF527A
(Building Contracts)**



Note 1: Contractors are required to submit GF527 and GF527A in accordance with HA Specification Preliminaries Clause Ref. PRE.B6.150 sub-clause 6(xi) whenever there are workers on site even after substantial completion. (Mark on the form "completed without further submission" for no more workers on site). A set of guidelines and explanatory notes for completing the submission can be obtained from DEVB website -

For GF527 : http://www.devb.gov.hk/en/public_forms/form_gf_527/index.html

For GF527A: http://www.devb.gov.hk/en/public_forms/form_gf_527a/index.html

Note 2: Should there be any dubious return for GF527 & GF527A from C&SD, DAS/DC will dispatch them to relevant site staff for follow-up actions.

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INSPECTION FORMS
REFERENCE SYSTEM**FORM and REFERENCE NUMBERING**

1. The Form / Reference Numbering for all Inspection Forms, Inspection Guidelines in the Inspection Guide Book, Site Direction Forms, Record Forms, Report Forms and Testing Forms categorized below are documented in this Guide. A serial number (hereinafter called "Form No." or "Ref. No.") is assigned to each Form and Guideline to facilitate the site staff in cross reference. All Form Nos. are identified with DASM-F and followed by four digit code. For ease of reference in this Guide, only the four digit code is quoted in the text. All Ref. Nos. for Inspection Guidelines in the Inspection Guide Book are derived from the reference code of the corresponding Works Section in 2004 Specification Library and followed by two digit code.

2. Category of Forms

(a)	<u>Inspection Forms</u>	<u>Form No.</u>
	- Daily Inspection	DASM-F0001
	- Other Inspections of a miscellaneous nature during construction period	DASM-F50XX
	- Final Inspections	DASM-F51XX
(b)	<u>Inspection Guide Book</u>	<u>Ref. No.</u>
	- Inspection Guidelines by Trades (Architectural Works) during construction period	MAS1.0X, CON5.0X, WAT1.0X etc.
(c)	<u>Site Direction Forms</u>	<u>Form No.</u>
	- Site Directions to Contractor	DASM-F52XX
(d)	<u>Record Forms</u>	
	- Records (Construction Period)	DASM-F60XX
	- Records (Taking Over By Estate Management Division)	DASM-F61XX
	- Records (For Contractor to enter and update information during Construction Period)	DASM-F62XX

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INSPECTION FORMS
REFERENCE SYSTEM

(e)	<u>Report Forms</u>	<u>Form No.</u>
	- Reports (Construction Period)	DASM-F70XX
	- Reports (Maintenance Period)	DASM-F71XX
(f)	<u>Testing Forms</u>	
	- Testing (Construction Period)	DASM-F80XX

For details see DASM-303 to 307.

FORMAT

- Each category of Forms is designed with one side for recording all the findings of the inspection, and the reverse side setting out all the inspection guidelines, remarks and notes on the completion of the form.
- The Master List DMX shows the updated status of the Forms.

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INSPECTION FORMS
BASIS FOR DOCUMENTATION**BASIS FOR DOCUMENTATION**

1. The basic references for this document are :-
 - (a) General Conditions of Contract for Building Works, 1993 Edition (GCC)
 - (b) Specification Library for Building works, 2004 Edition.
2. The permissible deviations from the above basic references are contained in the following :-
 - (a) Specification Library for Building Works, 2004 Edition.
 - (b) Tolerances stipulated under the Performance Assessment Scoring System (PASS) for items not covered by 2(a) above.

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INSPECTION FORMS & INSPECTION GUIDE BOOK

Unless otherwise specified under contract and in this Guide, the following Inspection Forms and Inspection Guidelines in the Inspection Guide Book are to be used. Inspection Officer shall retrieve for use of the forms from an official source. All standard forms could be viewed and downloaded from the DCD web site of the HA Intranet.

INSPECTION FORMS

Form No.	Title
DASM-F0001	Daily Inspection Form
DASM-F5001	Not used
DASM-F5002	Not Used
DASM-F5003	Storage of Materials
DASM-F5004	Thickness of Anodised Coating of Aluminium Elements
DASM-F5005	Thickness of Galvanised/Zinc Sprayed Coating of Metalwork
DASM-F5006	Guideline & Checklist for Installation of Floor Spring System at Construction Stage / Maintenance Period Stage
DASM-F5007	Checklist for Cleaning of Fresh Water Tanks and Indirect Feed Fresh Water Supply Piping System before Occupation of a New Building or Part of a New Building
DASM-F5101	Final Inspection - Transformer Room/Main Switch Room/ Generator Room
DASM-F5102	Final Inspection - Pump Room/TBE Room/Lift Machine Room/Lift Pit
DASM-F5103	Final Inspection - Utilities/Services Room
DASM-F5104	Final Inspection - Water Tanks
DASM-F5105	Not Used
DASM-F5106	Not Used
DASM-F5107	Not Used
DASM-F5108	Final Inspection - Watertightness Test – Plumbing and Drainage Installation Above Ground
DASM-F5109A	Final Inspection - Flats
DASM-F5109B	Final Inspection - Flats (Chinese Version)
DASM-F5110	Final Inspection - Common Area
DASM-F5111	Final Inspection - Miscellaneous Works
DASM-F5112	Final Inspection - Cleaning of Water Tanks and Supply Pipeworks before Completion of the Works or Phase Completion of Sections of the Works
DASM-F5113	Final Inspection - External Works - Covered Walkway/Pavilion
DASM-F5114	Final Inspection - External Works - Fencing/Planter Wall
DASM-F5115	Final Inspection - External Works - Paving/Emergency Vehicular Access
DASM-F5116	Final Inspection - External Works - Ball Court/Play Area
DASM-F5117	Final Inspection - External Works - Refuse Storage Area/ Refuse Collection Point
DASM-F5118	Final Inspection - Connection to Underground Drainage Pipes and Manholes / BIGTs
DASM-F5119	On-site Verification for Common W-trap System – Repetitive Flushing Test Record
DASM-F5120	On-site Verification for Common W-trap System – Multiple Flushing Test Record

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INSPECTION GUIDE BOOK

Ref. No.	Title of Inspection Guidelines
MAS1.01	Brickwork & Blockwork
MAS1.02	Panel Wall
MAS1.03	Glass Block Panel
MAS2.01	Stonework
CON5.01	Precast Facade
WAT1.01	Asphalt Tanking
WAT1.02	Asphalt Roofing
WAT1.03	Roof Tiles
WAT6.01	Proprietary Tanking – (Sheet or Liquid Membrane Waterproofing Systems)
WAT6.02	Proprietary Roofing – (Sheet or Liquid Membrane Waterproofing Systems)
WAT6.03	Cold Liquid Applied Flexible Waterproofing System
WAT6.04	Cementitious Waterproofing System
TIM1.01	Timber Sub-frame
TIM1.02 / COM5.01	Timber Door Frame (Non-doorsets / Doorsets)
TIM1.03 / COM5.02	Timber Architraves / Doors (Non-doorsets / Doorsets)
TIM1.04	Wood Block / Strip Flooring / Skirting
MET1.01	Metal Frame
MET1.02	Metal Grilles
MET1.03	Metal Louvre & Frame
MET1.04	Metal Railing
MET1.05	Metal Door & Frame
MET1.06	Skylight
MET1.07	Metal Frame for Market Stall
MET1.08	Fall Arrest System
FIN1.01	Spatterdash (Internal)
FIN1.02	Spatterdash (External)
FIN1.03	Rendering (Internal)

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Ref. No.	Title of Inspection Guidelines
FIN1.04	Rendering (External)
FIN3.01	Screeding
FIN4.01	Granolithic / Terrazzo
FIN5.01	Wall Tiles (Internal)
FIN5.02	Wall Tiles (External)
FIN5.03	Floor Tiles
FIN5.04	Marble & Granite Floor Slab
FIN5.05	Marble & Granite Wall Slab by Anchoring Method
FIN7.01	Painting–Woodwork/Steelwork/Plaster/Masonry Work (Internal)
FIN7.02	Painting–Woodwork/Steelwork/Plaster/Masonry Work (External)
FIN8.01	False Ceiling
COM2.01	Aluminium Windows Installation (at In-situ Wall)
COM2.02	Aluminium Windows Installation (Precast Facade)
COM2.03	Aluminium Windows Installation (at Precast Facade Casting Yard)
COM4.01	Glazing
COM4.02	Glazed Cladding / Shop Front
COM8.01	Metal Roller Shutter
COM9.01	Cooking Bench / Sink Units
COM10.01	Glass Panel Balustrade
CLA1.01	Metal Profiled Sheet Roofing
CLA2.0-1	Chinese Tiling
PLU1.01	Plumbing – Underground Water Supply Pipes
PLU1.02	Plumbing – Above Ground Water Supply Pipes
DRA1.01	Drainage Pipe above Ground
DRA2.01	Drainage Pipe below Ground
DRA2.02	Manhole
DRA2.03	Channel / Gully
EXT1.01	Bituminous Roadways
EXT2.01	Concrete Carriageways
EXT3.01	Pavement – Paving Block
MIS.01	Project Specific Works / Specialist Works / Special Proprietary Products / Miscellaneous Works

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INSPECTION FORMS
SITE DIRECTION FORMS

SITE DIRECTION FORMS

Unless otherwise specified under contract and in this Guide, the following Site Directions forms or Site Direction function in HOMES are to be used. Inspection Officer shall retrieve for use of the forms from an official source. All standard forms could be viewed and downloaded from the DCD web site of the HA Intranet.

Form No.	Title
DASM-F5201	Site Direction - General Matters
DASM-F5202	Site Direction - Unsatisfactory Materials/Defective Works

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INSPECTION FORMS
RECORD FORMS**RECORD FORMS**

Unless otherwise specified under contract and in this Guide, the following Record forms or relevant functions in HOMES are to be used. Inspection Officer shall retrieve for use of the forms from an official source. All standard forms could be viewed and downloaded from the DCD web site of the HA Intranet.

Form No.	Title
DASM-F6001	Not used
DASM-F6002	Not Used
DASM-F6003	Not Used
DASM-F6004	Not Used
DASM-F6005	Record on Site Direction Status (General Matters)
DASM-F6006	Record on Site Direction Status (Defective Works)
DASM-F6101	Taking Over by Estate Management Division - Flats
DASM-F6102	Taking Over by Estate Management Division - Others
DASM-F6103	Taking Over Chart - Flats (No. 1 to 20)
DASM-F6104	Taking Over Chart - Flats (No. 21 to 40)
DASM-F6105	Taking Over Chart - Common Area/Services Room
DASM-F6201	Builder's Works Shop Drawing Submission Record
DASM-F6202	Certificates Record for Monthly Site Meeting
DASM-F6203	Site Safety & Security Record for Monthly Site Meeting
DASM-F6204	Record of Trade Tested Workers for Building (New Works) Contract Annex - Name List of Trade Tested Workers
DASM-F6205	Record of Dangerous Goods
DASM-F6206	Not used
DASM-F6207	Final Inspection - Watertightness Test - Bathroom
DASM-F6208	Final Inspection - Watertightness Test – Kitchen/Refuse Room/Others
DASM-F6209	Final Inspection - Watertightness Test – Windows / Precast Facades
DASM-F6210	On Site Delivery Verification
DASM-F6211	Record of Silver Card Holder for All Workers Engaged in the Specified Trades in Building (New Works) Contract

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INSPECTION FORMS
REPORT FORMS**REPORT FORMS**

Unless otherwise specified under contract and in this Guide, the following Report forms are to be used. Inspection Officer shall retrieve for use of the forms from an official source. All standard forms could be viewed and downloaded from the DCD web site of the HA Intranet.

Form No.	Title
DASM-F7001	Consolidated Typhoon/Rainstorm Black Warning Report
DASM-F7002	Weather Report
DASM-F7003	Sound Level Monitoring
DASM-F7004	Typhoon/Rainstorm Black Warning Report
DASM-F7005	Clerk of Works' Report for Monthly Site Meeting
DASM-F7006	Report for Agreement of Inspection Percentage - Domestic Block
DASM-F7007	Report for Agreement of Inspection Percentage - Non-domestic Portion
DASM-F7008	Monthly Report on Inspection Status
DASM-F7009	Report on Final Inspection Status (Flats)
DASM-F7101	Defects - Maintenance Period
DASM-F7102	Summary of Defects - Maintenance Period
DASM-F7103	Clerk of Works' Report for Maintenance Period Meeting
DASM-F7104	Environmental and Site Hygiene Checklist Part 1 – Administration
DASM-F7105	Environmental and Site Hygiene Checklist Part 2 – Site Management
DASM-F7106	Template for Report of Inspection Led by SCOW
DASM-F7107	Defects Report Form

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INSPECTION FORMS
TESTING FORMS**TESTING FORMS**

Unless otherwise specified under contract and in this Guide, the following Testing forms are to be used. Inspection Officer shall retrieve for use of the forms from an official source. All standard forms could be viewed and downloaded from the DCD web site of the HA Intranet.

Form No.	Title
DASM-F8001	Material/Component Testing
DASM-F8002	Equipment Record (Items Supplied by Contractor)

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APPENDICES
**APPENDIX A - GUIDELINES FOR
 COMPILATION OF SITE RECORD BOOK**

ENTRIES AND UPKEEPING OF SITE RECORDS

1. A Site Record Book is maintained for every Building Contract. The pages in each section of the book are sufficient for about 12 month use and therefore more than one book is required for contracts of longer duration. The site records are compiled by Site Inspection Staff on daily basis. Sample signatures are given in the record book to identify the recording officers of inspection. Site Record Books must be kept up-to-date. They must not be removed from the site without prior consent by the CM. The Project Clerk of Works is responsible for maintaining the record, upkeeping the book, and ensuring that it is made available for inspection at any time. Each column/page is completed in ink, with checked entries in blue/black ink and unchecked entries in red ink.
2. Where necessary, the Site Record Books are to be read in conjunction with supplementary record books in connection with Building Services installation. Such Supplementary Record Books are maintained by the Building Services Inspection Team.

ISSUE AND RETURN OF SITE RECORD BOOK

3. Copies of Site Record Books and Supplementary Record Books are available from the appropriate sub-registries of various Sections for collection by the Site Inspection Staff. The sub-registries record details of the issuance and return of the Books in a ledger.
4. After Substantial Completion of a Contract and before the site staff leave the construction site or as when instructed, all Site Record Books are to be returned to the relevant sub-registry. The sub-registries record their return and pass the books to the CM for safe custody.

GUIDELINES IN COMPILING SITE RECORDS

5. Guidelines for compiling site records according to the Site Record Book are as follows :-

(a) Section 1a - Materials General

This section excludes those materials listed under Section 1b, 1c, 1d and Section 1e.

Contractor submits daily records of all plant and materials delivered to site, with copies of invoices, certificates, submissions or vouchers to verify with approved samples. WSI/II enters the details into the Site Record Book.

Wherever possible the quantity of deliveries to site should be checked. If this proves to be impossible, data entry should be in red ink. Priority is to check the delivery of those items subject to cost fluctuations according to the provisions of Contract.

- | | | | |
|-----|------------------------------------|--------------------------|-------------------------|
| (b) | Section 1b | - Materials Concreting - |) |
| | | Site Batching |) |
| (c) | Section 1c | - Materials Concreting - |) See |
| | | Ready Mixed Concrete |) Engineering |
| | | |) Site Inspection Guide |
| (d) | Section 1e - Materials - Steel | |) |
| (e) | Section 2 - Tests - Concrete Cubes | |) |

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APPENDICES
**APPENDIX A - GUIDELINES FOR
COMPILATION OF SITE RECORD BOOK**

- (f) Section 1d - Material Plastering - Instant Mortar
(g) Section 3 - Contractor's Labour and Weather Record

This is the check of labour force on site by Site Staff. It is therefore not intended to be merely a transcript of the Contractor's Daily Returns. Figures for the checked trades are to be entered in blue/black ink. It may not always be possible to head count all labour on site on a daily basis depending on the scale and the stage of the Contracts. Under such circumstances, the Project Clerk of Works is to use discretion to select trades for checking where necessary. The Contractor's returns accepted for the unchecked trades are entered in red ink.

The weather record comprises of a.m. and p.m. records. Assessment of the effect of weather upon work progress is on-the-spot simultaneously. In this context, recording of accumulative wet days and time on the work affected by weather conditions are to be entered.

- (h) Section 4 - Contractor's Plant

All plant on site are to be recorded.

- (i) Section 5 - Diary

The prime purpose of this Section is to give a brief text record of the progress of the work and to draw attention to unusual points not covered in other Sections of the Site Record Book. The 'Remarks' Column is for cross referencing to other Sections should there be a need to draw particular attention to a special event.

The "Remarks" column should also record delays and the factual causes with substantiation, such as: -

- shortage of particular trades of worker with the record nos. of worker head-counted;
- inadequate equipment for watertightness tests or other tests;
- breaking down of equipment and plant;
- interruption of services, power and water supply;
- shortage of particular materials for which the work has been delayed;
- consequential effect of typhoon and heavy rainfall with record of time and labour for repair work etc. and
- time and labour records for variation work issued.

Where there is no suitable form to record the details of the calibration status of the testing or measuring equipment, as supplied by the Contractor before the test, they are recorded in the 'Remarks' column as follows :-

Type of equipment/serial number/calibration interval/date of last calibration/date of checking/signature of Site Staff and Contractor's Representative.

- (j) Section 6 - Visitors to Site

The headings used are self-explanatory.

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APPENDICES
**APPENDIX A1 - GUIDELINES FOR
COMPILATION OF SITE DIARY IN HOMES**

ENTRIES AND UPKEEPING OF SITE RECORDS

1. A Site Diary is maintained in HOMES (Housing Construction Management Enterprise System) for every Building Contract. The site records are compiled by Site Inspection Team on daily basis. The Project Clerk of Works is responsible for compiling and inputting the site records in HOMES with the assistance of the ACW and WS.
2. Where necessary, the Site Diary is to be read in conjunction with supplementary record books in connection with Building Services installation. Such supplementary record Books are maintained by the Building Services Inspection Team.

GUIDELINES FOR COMPILING SITE RECORDS

3. Guidelines for compiling Site Diary are as follows:

- (a) General

Contractor submits Contractor's Daily Report for recording of any labour, plant and materials delivered to site through HOMES, with attached e-copy of invoices, certificates, submissions or vouchers to verify with approved samples. WS makes use of the copying function to enter the details into the Site Diary.

Wherever possible the quantity of labour, plant and material deliveries to site reported by contractor should be checked. If this proves to be impossible, data reported from contractor are to be copied to Site Diary, and only the checked items and any amendments after checking are to be recorded in the text box for 'Remarks'. Priority is to check for those items subject to cost fluctuation according to the conditions of contract.

- b) Labour & Weather Information

This is the check of labour force on site by Site Staff. It is therefore not intended to be merely a transcription of the Contractor's Daily Report. Figures for the checked trades are to be recorded in 'Remarks'. It may not always be possible to head count all labour on site on a daily basis depending on the scale and stage of the Contracts. Under such circumstance, the Project Clerk of Works is to use discretion to select trades for checking where necessary

The weather record comprises of a.m. and p.m. records. Assessment of the effect of weather upon work progress is on-the-spot simultaneously. In this context, time on the work affected by weather conditions is to be entered in 'Remarks'.

- c) Concrete Delivery

To record the grade, quantity of concrete materials and ready mixed concrete delivery.

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APPENDICES
**APPENDIX A1 - GUIDELINES FOR
COMPILATION OF SITE DIARY IN HOMES**

d) Steel Delivery

To record the grade, size, batch number and quantity of steel reinforcement bar / fabric delivery

e) Other Material Delivery

To record the materials other than concrete & steel reinforcement bar / fabric delivered to site.

f) Plant Information

All plants on site are to be recorded.

g) Daily Activity / Remarks

The prime purpose of this Section is to give a brief text record of the progress of the work and to draw attention to unusual points not covered in other Sections of the Site Diary. The 'Remarks' text box is for cross referencing to other Sections should there be a need to draw particular attention to a special event.

The 'Remarks' text box should also record delays and the factual causes with substantiation, such as: -

- shortage of particular trades of worker with the record nos. of worker head-counted;
- inadequate equipment for watertightness tests or other tests;
- breaking down of equipment and plant;
- interruption of services, power and water supply;
- shortage of particular materials for which the work has been delayed;
- consequential effect of typhoon and heavy rainfall with record of time and labour for repair work etc. and
- time and labour records for variation work issued.

Details of the calibration status of the testing or measuring equipment supplied by the Contractor before the test are to be recorded in the 'Remarks' text box as follows :-

Type of equipment / serial number / calibration interval / date of last calibration / date of checking / details of Site Staff and Contractor's Representative.

h) Visitor to Site

The headings used are self-explanatory. Since visitors are not allowed to enter their site visit records directly in HOMES, a site visitor book is to be kept at PCOW's office to record this information, and scanned copy of site visitor record is to be uploaded in HOMES daily.

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APPENDICES
**APPENDIX A1 - GUIDELINES FOR
COMPILATION OF SITE DIARY IN HOMES**

i) Others

To attach miscellaneous record if necessary.

j) Test – Concrete Cubes

This part is to record only the concrete cubes making, and is not applicable if concrete cubes test record as stated in item k of this section is adopted.

k) Concrete Cube Test Record

Separate record in Excel format (refer to Table 1 of this section) is to be used to record and update the details and the test results of the concrete cubes, and such record is to be updated and attached in HOMES daily.

l) Steel Test Record

Separate record in Excel format (refer to table 2 of this section) is to be used to record and update the details and the test results of the steel reinforcement bar / fabric delivered to site, and such record is to be updated and attached in HOMES daily.

APPENDICES

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APPENDIX A1 - GUIDELINES FOR
COMPILATION OF SITE DIARY IN HOMES

Table 1 – Template for Concrete Cube Test Record

Contract Title (Contract No.) : _____													
Test – Concrete Cube													
Cube No.		Date Cast	Location	Checked by	Certificate No.	Grade	Mix I.D.	Date Sent for Test	Age	Result (MPa)			Remarks
										A	B	Av.	
	A/B												
	A/B												
	A/B												
	A/B												
	A/B												
	A/B												

Table 2 – Template for Steel Test Record

Contract Title (Contract No.) : _____														
Material – Steel : Diameter : (use different page for each type & size) _____														
Date	Bar Mark	I.D Colour	Quantity (Tonne)		Running Total (Tonne)	Testing					Laboratory	Result	Certificate Ref.	Remarks
			Delivery	Reject		Date Sent	Site Ref.	Type (no.)						
								Tensile	Bend	Rebend				

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APPENDIX B - SITE INSPECTION GUIDELINES FOR CONCRETE SURFACES TO RECEIVE MOSAIC TILING

PURPOSE AND BASIS

1. The basic control on tolerance limits of concrete wall surfaces are laid down in HD's 2004 Specification Library "Appendix H – Schedule of Tolerances".
2. Inspection on plasterwork for floor and wall tiling are covered by Inspection Guidelines in the Inspection Guide Book with the following Ref. Nos.:-
 - (a) Ref. No. FIN1.03 and FIN1.04 : Rendering (Internal/External)
 - (b) Ref. No. FIN3.01 : Screeding
 - (c) Ref. No. FIN5.01 and FIN5.02 : Wall Tiles (Internal/External)
 - (d) Ref. No. FIN5.03 : Floor Tiles
3. Quality of tiling finishing depends very much on the trueness and keying of backgrounds. For situations where concrete wall surfaces have exceeded the specified tolerance limits, guidelines are provided to outline possible remedial solutions. The guidelines for remedial actions are to be used as general reference if appropriate in considering the Contractor's remedial proposal. Where non-conformities are revealed by site inspections, the Site Inspection Team takes action in accordance with DASM.

GUIDELINES FOR REMEDIAL WORKS TO BACKGROUND

4. The guidelines for remedial works to background are tabled as follows:

<u>Item</u>	<u>Guideline</u>
(a) <u>Plumbness</u> Surfaces exceeding +15mm	Contractor is to obtain PSE's consent to hack off excessive area to a depth related to the immediate surrounding areas which are within the tolerance limit. Wire brushing and thoroughly wash down. Do <u>not</u> re-spatdash. If reinforcement are exposed or covers inadequate, Contractor has to propose remedial measures for PSE's approval.
(b) <u>Plumbness</u> Surfaces exceeding -15mm	(i) <u>For surfaces under or equal to 0.1 sq. m.</u> Make up the 'depressed' area with sand and cement render in single coats each of 8 to 13 mm thick, scratched and cured.

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APPENDICES
APPENDIX B - SITE INSPECTION GUIDELINES
FOR CONCRETE SURFACES TO RECEIVE MOSAIC TILING

Item	Guideline
(ii)	For surfaces over 0.1 sq. m.

Fix galvanized welded-fabric reinforcing mesh consisting of 50mm x 50mm and 2.5mm dia., with 50mm drive pins and 0.8mm thick zinc plated sheet (50mm x 50mm) shot fixing at 450mm c/c. Mesh must be fixed when the dubbing reaches 25mm thick. For fixing position of mesh see diagram.

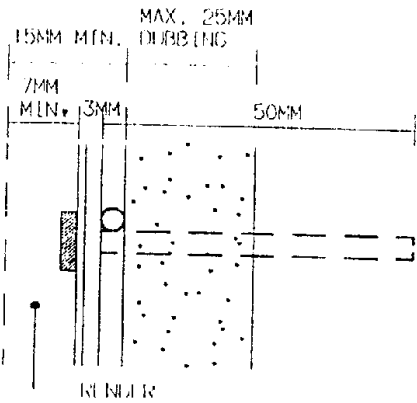


DIAGRAM 1

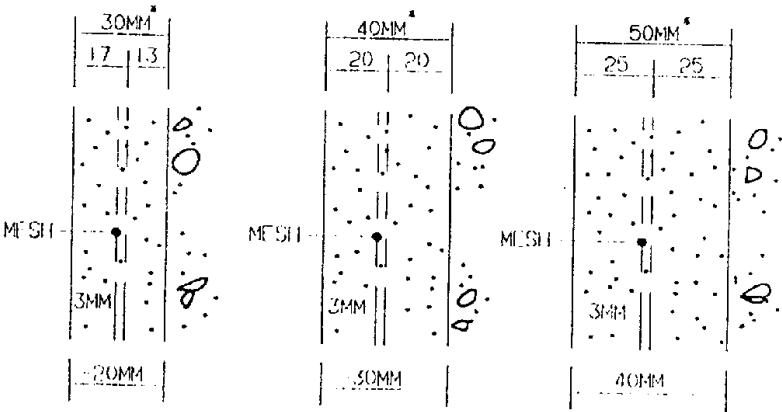


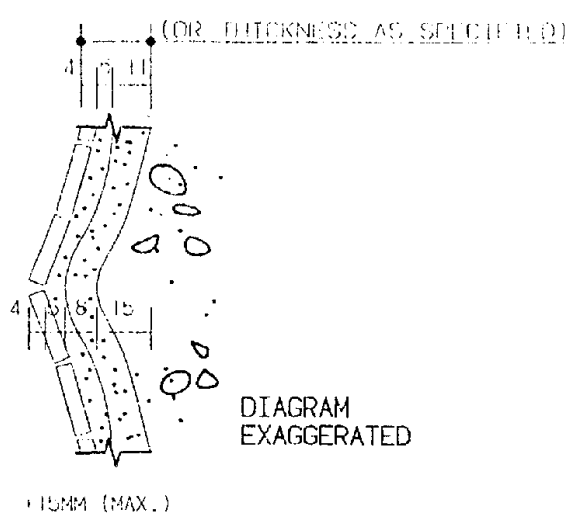
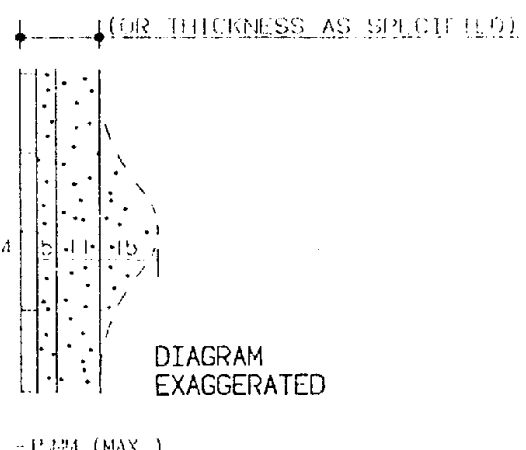
DIAGRAM 2 DIAGRAM 3 DIAGRAM 4

FIXING POSITION OF REINFORCING MESH

Brush slurry on the dubbed background and the mesh; whilst this is still wet, apply rendering, working around and through the wires and ensuring that the rendering is fully bonded to the background, cross scratch & cure.

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APPENDIX B - SITE INSPECTION GUIDELINES
FOR CONCRETE SURFACES TO RECEIVE MOSAIC TILING

<u>Item</u>	<u>Guideline</u>
(c) <u>Plumbness</u> Surfaces within 15mm	<p>Thickness of backing coat can be reduced to 8mm minimum over the 'projected' area. Such 'projected' area must not be abrupt and the projection to be even cut into the surrounding areas.</p>  <p>DIAGRAM 5</p>
d) <u>Plumbness</u> Surfaces within -15mm	<p>Dub out 'depressed' area with sand and cement render as per FIN1.W170 Cross scratch each coat to provide key and cure. Final backing coat should be on the same plane as the immediate</p>  <p>DIAGRAM 6</p>

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PURPOSE AND BASIS

1. The basic control on tolerance limits and on the execution of work in window installation are laid down in the Specification Library, Contract Drawings and relevant Particular Specification for the Contract.
2. Inspection on window installation, glazing, galvanized/anodized coating, watertightness of windows etc. are covered by the Inspection Guidelines in the Inspection Guide Book with the following Ref. Nos. and also inspection guidelines set out in the following Inspection / Record Forms documented in this Guide:

(a)	Ref. No. COM2.01	: Aluminium Windows Installation (At in-situ Wall)
(b)	Ref. No. COM2.02	: Aluminium Windows Installation (Precast Facade)
(c)	Ref. No. COM2.03	: Aluminium Windows Installation (At Precast Facade Casting Yard)
(d)	Ref. No. COM4.01	: Glazing
(e)	Inspection Form No. 5004	: Thickness of Anodised Coating of Aluminium Elements
(f)	Inspection Form No. 5005	: Thickness of Galvanized/Zinc Sprayed Coating of Metalwork
(g)	Record Form No. 6209	: Watertightness Test – Windows/Precast Facades
3. For situations where the size of structural window openings have exceeded the permissible tolerance limits, guidelines at paragraph 4 are provided to outline possible remedial solutions. The guidelines for remedial works are to be used as general reference if appropriate in considering the Contractor's remedial proposal. Where non-conformities are revealed by site inspections, the Site Inspection Team takes action in accordance with DASM.

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GUIDELINES FOR REMEDIAL WORKS TO WINDOW OPENINGS

4. The guidelines for remedial work for oversized and undersized openings are tabled as follows for general reference if appropriate: -

<u>Item</u>	<u>Guideline</u>
(a) Remedial Work for oversized openings	<p>If the permitted total clearance is exceeded, it shall be made up as follows :-</p> <p>a. 26-40mm Shot fixing wiring mesh onto the concrete side and make up with approved non-shrink render prior to installation of the window.</p> <p>b. 40-110mm Drill dowel bars at 150mm centres into the concrete. Spot-weld horizontal 10mm bars every 15mm or BRC mesh. Scrape the existing concrete surface. Recast concrete mixed with bonding agent.</p>

On no accounts are these gaps to be made up using waterproof cement grout

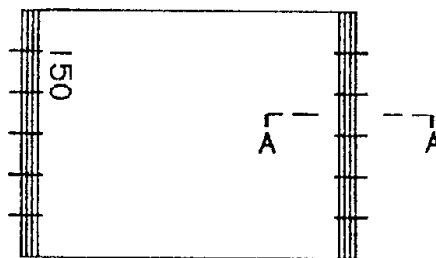


DIAGRAM 1

ELEVATION

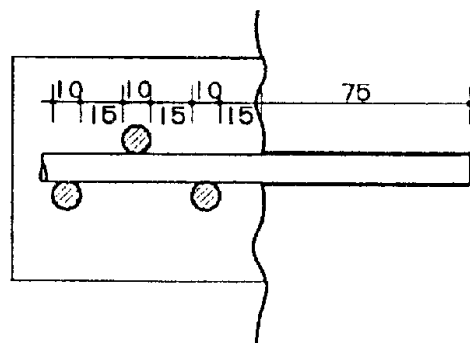


DIAGRAM 2

PLAN A-A

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<u>Item</u>	<u>Guideline</u>
b) Remedial work for undersized openings	For window openings formed in blockwork, fill cores of hollow <u>end</u> block with 30/20 concrete and reinforce with Y16 rods. Details for alternate courses are as follows :-

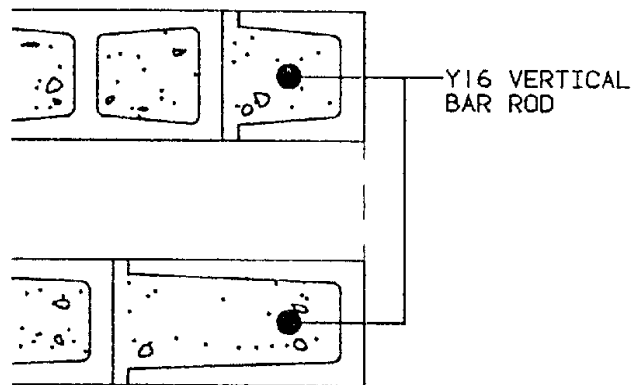


DIAGRAM 3

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APPENDICES

APPENDIX D - RELEVANT STANDARD DCMP FORMS**RELEVANT STANDARD DCMP FORMS**

1. Before HOMES implementation, Inspection Officers shall retrieve for use of the following relevant DCMP forms from an official source e.g. DCD Web site of the HA Intranet:

Form DCMP-F716	Sample Submission and Approval Form
Form DCMP-F717	Approval Label (for use with Form DCMP-F716)
Form DCMP-F718	Assessment of Material Sample
Form DCMP-F719	Samples Submission Record
Form DCMP-F722	Removal of Materials Off Site
Form DCMP-F758	Fatal Accident / Serious Incident Report
Form DCMP-F787	Housing Authority Accident / Incident Report Form

2. After HOMES implementation, Inspection Officers shall record the sample submission and materials removal records in HOMES' Material Management function.
- 3.

**APPENDIX E - LIST OF EQUIPMENT OF WHICH CALIBRATION
STATUS REQUIRED VERIFICATION BY CONTRACTOR**

18 NOVEMBER 2005

1. Where testing of materials or works are required to be carried out on site, PCOW checks that the testing or measuring equipment supplied by the Contractor has not exceeded the calibration interval.
2. The site agent records the details on Form No. 8002 and submits to PCOW for verification.
3. The list of equipment of which calibration status required verification by contractor is as follows :-

Type of Equipment	HD's Reference
Digital measurement probe	PASS-4A/16 & 4B/13 PRE.B10.450
Engineer's try square	PASS-4A/16 & 4B/13 PRE.B10.450
Feeler gauge	PASS-4A/16 & 4B/13 PRE.B10.450
Portable dial thermometer	PRE.B10.450
Pressure gauge	
Sound level meter	PRE.B8.1490
Steel measuring tape	PASS-4A/16 & 4B/13 PRE.B10.450
Vernier calliper	PRE.B10.450
Anodising Meter	PRE.B10.450

4. For equipment not listed above, verification of calibration status from contractor need not be required.

**APPENDIX F - INSPECTION PROCEDURES/GUIDELINES
FOR CLEANING OF WATER TANKS,
SUPPLY PIPEWORKS AND CISTERNS**

6 AUGUST 2012

BACKGROUND (PLU.W910)

1. Contractors are required to clean the water supply system, which includes the water tank, pipework and cistern, in a systematic manner as set out in the Specification, namely,
 - (a) Clean out all the water mains of inside service before they are put into operation
 - (b) Clean out all the completed water tanks, supply pipework and cisterns after completion of the cleaning of the water mains of inside service in sub-clause (1) above and before phased completion of Sections of the Works or completion of the Works
 - (c) Clean out all the completed fresh water tanks and indirect fresh water supply piping system at a date to be instructed by the CM after completion of the Works or phased completion of Sections of the Works but before occupation of a New Building or a part of a New Building. This cleaning shall usually be carried out around 14 days before the issuance of occupation permit.
2. The inspection procedures/guidelines for cleaning of the tank, supply pipeworks and cistern are laid down in a systematic way in the following paragraphs for the reference by all Site Inspection Teams.
3. The Site Inspection Team and the Contractor's representative witness and endorse the cleaning and sterilization process in the Inspection Form No. 5007 and 5112.
4. Cleaning of the system starts after the underground supply mains are thoroughly cleaned. For the fresh water supply system, cleaning starts after the water samples have passed the sterilization tests required by WSD. WSD Circular Letter no. 6/2002 (or the latest prevailing recommendation from WSD as the case may be) on the cleaning and sterilization process shall be followed. The sequence of cleaning starts with the sump tank at the G/F then the roof tanks, the piping systems and finally the cisterns at individual flats and rooms with installed water supply pipework and cisterns.

SAFETY PRECAUTIONS

5. The contractor shall strictly follow the relevant regulations, Code of Practices, guidelines and the requirement stipulated in the Contract, including but not limited to the following:
 - Factories & Industrial Undertakings (Confined Spaces) Regulation; and
 - the Code of Practice Safety and Health at Work in Confined Spaces in carrying out works in confined space, for instance, cleaning in water tanks.
6. When working in confined spaces,
 - all workers shall be certified workers;
 - all workers shall be equipped with proper personal protective equipment (PPE) as required by the risk assessment; and
 - all workers shall wear proper PPE during cleaning which shall at least include
 - a) protective gloves and boots;
 - b) protective goggles; and
 - c) fluid resistant face masks.

PREPARATION AND PLANNING

7. The Contractor shall submit a detailed cleaning action plan demonstrated with vertical plumbing line diagram showing the scope of cleaning and sterilization, the locations where the residual chlorine level will be tested, the test kit to be used for verifying the residual chlorine level and the calculation of amount of dosage of chlorine or other approved chemicals for CM's approval prior to commence the cleaning. PBSE shall review and advise PA on the submission.

APPENDIX F - INSPECTION PROCEDURES/GUIDELINES FOR CLEANING OF WATER TANKS, SUPPLY PIPEWORKS AND CISTERNS

6 AUGUST 2012

8. For reference purpose, a flow chart to illustrate the work flow of the cleaning process required after completion of the Works or phased completion of Sections of the Works but before occupation of a New Building or part of a New Building (PLU1.W960(2)) is shown in the end of this guide
9. In the action plan, the Contractor shall demonstrate the following:
 - The number of fresh water points in the building to be cleaned for programming of work and deployment of adequate resource,.
 - The supply point nearest to the roof tank and the lowest supply point to be tested for the residual chlorine level after flushing with fresh water. Careful planning is required to ensure that the sterilization and draining process can be completed in one day to avoid the chlorinated water stands in the pipeworks for too long.
 - The calculation on the amount of water and chlorine required for the cleaning process. The volume of water in the pipework can be estimated by taking the summation of the product of the pipe run of each pipe size and the respective cross sectional area of the pipe. The amount of chloride of lime or bleaching powder (or other approved means of dosing chlorine) required could then be estimated by multiplying the total volume obtained by 50mg/L and the concentration of the bleaching powder used. As the chlorinated water of the sump tank will be transferred to the roof tank when filling up the upfeed pipe, the calculation of the roof tank dosage should take this fact into account.
 - For reference purpose, two sample calculation tables for the upfeed and downfeed pipes of a typical residential block are shown below –

Sump Tank – an example for reference				
Location	Pipe size (dia.) (mm)	Pipe run (m)	Cross sectional area ($\pi \times r^2$) (m²)	Volume (L)
1. Sump tank				13000
2. Upfeed, Block 1	150	100	0.0707	7069
Total (a) = 1 + 2				20069
Amount of bleaching powder required for the sump tank (assuming bleaching powder contains 33% chlorine by weight) = (a) x 50mg/l x (1/0.33)				3.04kg
Roof Tank – an example for reference				
Location	Pipe size (dia.) (mm)	Pipe run (m)	Cross sectional area ($\pi \times r^2$) (m²)	Volume (L)
3. Roof Tank – (1 + 2) [ie, 45000 - (13000 + 7069)]				24931
4. Flat 1010 to 1020, Block 1	15	100	0.000707	70.69
5. Flat 1010 to 1020, Block 1	22	100	0.001521	152.0
6. Flat 1010 to 1020, Block 1	28	100	0.002463	246.3
Total (b) = 3 + 4 + 5 + 6				25399.99
Amount of bleaching powder required for the roof tank (assuming bleaching powder contains 33% chlorine by weight) = (b) x 50mg/l x (1/0.33)				3.85kg

**APPENDIX F - INSPECTION PROCEDURES/GUIDELINES
FOR CLEANING OF WATER TANKS,
SUPPLY PIPEWORKS AND CISTERNS**

6 AUGUST 2012

INSPECTION PROCEDURES AND GUIDELINES

10. The Site Inspection Team checks that the Contractor cleans the water supply systems according to the following procedures :-

a. For the Sump, Transfer and Roof Water Tanks of Fresh Water and Flushing Water (PLU1.W920)

1. For the cleaning required by Specification sub-clause **PLU1.W910(2)(a)**, which shall be done after completion of the cleaning of the water mains of inside service and before phased completion of Sections of the Works or completion of the Works, the following procedures shall be followed:

- (a) Stop the pumps.
- (b) Turn off the inlet and outlet valves of the water tank.
- (c) Turn on the washout valve and drain the water tank completely. The contractor shall carefully monitor the draining process and the flow condition so that the drainage system and the buffer tank will not overflow;
- (d) Thoroughly clean the inside walls, ceiling and the bottom of the water tank including the inlet/outlet pipes with fresh water.
- (e) Spray with water to ensure that all dirt and debris are removed and drained away.
- (f) Take 2 sets of record photographs of the tank after cleaning.
- (g) Turn off the washout valve.
- (h) Fill the tank with water by turning on the inlet valve.
- (i) Turn on all the outlet valves.
- (j) Start the pump.

2. For the cleaning required by Specification sub-clause **PLU1.W960(2)(b)**, which shall be done after completion of the Works or phased completion of Sections of the Works and before occupation of a New Building or part of a New Building, the following procedures shall be followed:

- (a) Stop the pumps;
- (b) Turn off the inlet and outlet valves of the water tank;
- (c) Turn on the washout valve and drain the water tank completely. The contractor shall carefully monitor the draining process and the flow condition so that the drainage system and the buffer tank will not overflow;
- (d) Thoroughly clean the inside walls, ceiling and the bottom of the water tank including the inlet/outlet pipes with fresh water;
- (e) Spray with water to ensure that all dirt and debris are removed and drained away;
- (f) Turn off the washout valve;
- (g) Scrub the water tank thoroughly with a solution of chloride of lime or bleaching powder containing 50mg/l of chlorine solution;
- (h) Rinse the water tank thoroughly with fresh water;
- (i) Take 2 sets of record photographs of the tank after cleaning;
- (j) Drain away the water through the washout pipe;
- (k) Fill the tank with water by turning on the inlet valve;

**APPENDIX F - INSPECTION PROCEDURES/GUIDELINES
FOR CLEANING OF WATER TANKS,
SUPPLY PIPEWORKS AND CISTERNS**

6 AUGUST 2012

- (l) Turn on all the outlet valves;
- (m) Start the pump.

b. For Indirect Fresh Water Supply Piping System (PLU1.W930)

1. For the cleaning required by Specification sub-clause **PLU1.W910(2)(a)**, which shall be done after completion of the cleaning of the water mains of inside service and before phased completion of Sections of the Works or completion of the Works, the following procedures shall be followed:
 - (a) Check that the roof tank is cleaned and filled with water.
 - (b) Turn on all the main gate valves of the downfeed system at the roof level or the floor below roof and the provided booster pump if any;
 - (c) Check, if applicable, that the break tank is cleaned and filled with water;
 - (d) Turn on the gate valves in front of the water meters.
 - (e) Turn on the water taps of the individual flats/non-domestic units at the lowest supply point of each downfeed pipe and the floor above Pressure Reducing Valve (PRV) system (if provided) for at least 5 minutes and then turn off.
 - (f) Turn on the taps at each of the remaining flats/non-domestic units for at least 2 minutes. Check for satisfactory flow at taps.
 - (g) If flow is unsatisfactory, clean the strainer/aerator of the taps or carry out necessary repair at the taps and re-test until flow is satisfactory.
2. For the cleaning required by Specification sub-clause **PLU1.W960(2)(b)**, which shall be done after completion of the Works or phased completion of Sections of the Works and before occupation of a New Building or part of a New Building, the following procedures shall be followed:
 - (a) Check that the roof tank (and the sump tank if the volume of the pipework to be cleaned exceeds the volume of the roof tank) is cleaned and filled with a homogeneous solution of chloride of lime for sterilization. The concentration of the solution has to meet the requirement that when the water supply piping system is filled up with water, the chlorine in the water will be 50mg/l;
 - (b) Turn on all the main gate valves of the down-feed system at the roof level or the floor below roof and the provided booster pump if any;
 - (c) Check, if applicable, that the break tank is cleaned and filled with water;
 - (d) Turn on the gate valves in front of water meters;
 - (e) Turn on all taps at all locations until the presence of chlorine is confirmed via test kit approved by CM, then shut off the taps;
 - (f) Keep the indirect fresh water supply piping system under sterilization for 2 hours;
 - (g) Thoroughly flush the indirect fresh water supply piping system with fresh water. All taps at all locations shall be turned on to ensure the entire pipework is thoroughly flushed with fresh water. Ensure all taps are closed after flushing;
 - (h) Test at the supply point nearest to the roof tank and the lowest supply point to confirm the residual chlorine level is below 5mg/l after flushing. The test shall be carried out by a laboratory that complies with **PRE.B9.570**. Then resume the system to normal operation condition.

**APPENDIX F - INSPECTION PROCEDURES/GUIDELINES
FOR CLEANING OF WATER TANKS,
SUPPLY PIPEWORKS AND CISTERNS**

6 AUGUST 2012

c. For Direct Fresh Water Supply Piping System (PLU1.W940)

- (1) Turn on all the main gate valves of supply feed pipe at the G/F or 1/F level.
- (2) Turn on the gate valves in front of water meters.
- (3) Turn on all taps at individual flats/non-domestic units for at least 2 minutes. Check for satisfactory flow at taps.
- (4) If flow is unsatisfactory, clean the strainer/aerator of the taps or carry out necessary repair at the taps and re-test until flow is satisfactory.

d. For Flushing Water System (PLU1.W950)

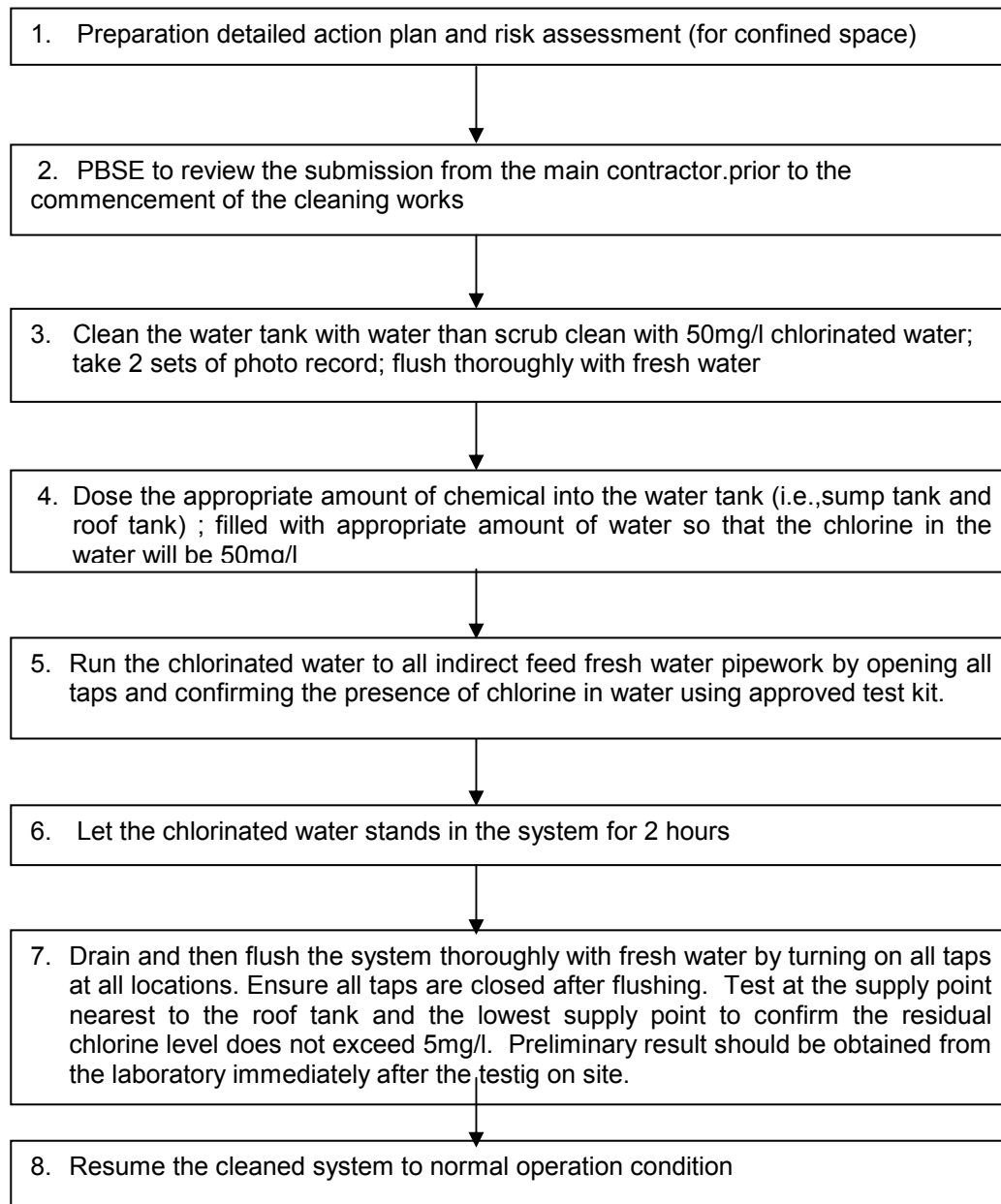
- (1) Check that the roof tank is cleaned and filled with water.
- (2) Turn on all the main gate valves of the downfeed system at the roof level.
- (3) Turn on all inlet valves of flushing cistern in each flat/non-domestic unit.
- (4) Flushing to water cisterns should start with the top most floor and then downwards.
- (5) Flush the water cisterns at the lowest floor of the downfeed system and the floor above Pressure Reducing Valve (PRV) system (if provided) twice, and at the remaining floors twice.
- (6) Check for satisfactory flow at the water inlet, water discharge and any leaks at cisterns.
- (7) If flow is unsatisfactory, carry out repair at the cistern and re-test until flow is satisfactory.

APPENDICES

**APPENDIX F - INSPECTION PROCEDURES/GUIDELINES
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6 AUGUST 2012

**Reference Flow Chart of Cleaning of Fresh Water Tanks and Indirect Fresh
Water Supply Piping System after Completion of the Works but before
Occupation of a New Building**



11 FEBRUARY 2009

**APPENDIX G - CHECKLIST ON PIPEWORKS OF WATER PUMP AND WATER SERVICES
INSTALLATION AND ASSOCIATED BUILDER'S WORK INSIDE AND OUTSIDE PUMP ROOM****BACKGROUND**

To ensure the pump room noise control measure can be fully implemented as stipulated in the archived DCMBI P04/01, checklist on pipeworks of water pump and water services installation and associated builder's work inside and outside pump room is listed below for use by site staff.

Pipework Support

- a. Rubber/neoprene pad between pipe and bracket to wrap fully around the pipe.
- b. Duck foot bend or similar setup to be provided at the bottom of pipe riser.
- c. Neoprene washer bushing to be provided for fixing bolt of duck foot resting on neoprene base pad.
- d. Base plate of duct foot must be large enough to spread the load of pipe riser in order to stay within the allowable load limit specified by the neoprene base pad manufacturer.

Pipework Flexible Connector

- a. Flexible connector to be properly aligned with the connected pipework. Misalignment, if any, shall be within the rated movement (axial extension/compression, lateral deflection, angular rotation, etc.) of the connector as specified by the manufacturer.
- b. Tie rod to be properly adjusted and fixed with neoprene washers/sleeves on connector flanges.

Sleeve for Pipework through Wall or Slab (including floating slab)

- a. Sleeves for openings in non-fire rated walls/floors to be PVC.
- b. Sleeves for openings in fire rated walls/floors to be galvanized mild steel.
- c. No direct contact is allowed between sleeve and pipework.
- d. Annular space between sleeve and pipework to be free of any debris.
- e. Annular space between PVC sleeve and pipework to be sealed up
- f. Annular space between galvanized steel sleeve and pipework to be caulked with mineral wool or approved equivalent material to maintain the required FRP of the walls / floor slabs, and are durable and effective in sound insulation.

Water Hammer created at Upfeed Pipework during Pump Stop

- a. Source of water hammer (usually at bends connecting long horizontal pipe runs at roof level and upfeed vertical risers), if any, to be identified.
- b. Water hammer arrester to be added at the source location.
- c. Water hammer arrester to be selected in accordance with manufacturer's recommendation.
- d. Tee-off(s) to be provided by Main Contractor for addition of water hammer arrester(s) by the FSWP Sub-contractor.

16 MAY 2008

APPENDICES
**APPENDIX H – SITE INSPECTION GUIDELINES
 FOR DRAINAGE CONNECTION**

PURPOSE

1. For quality control on drainage connection to prevent any mis-connection, detailed inspection procedures for connection of above ground drainage pipes to underground drainage pipes and manholes / BIGTs are laid down in the following paragraphs for reference by all Site Inspection Teams.

INSPECTION PROCEDURES

2. The Site Inspection Team checks the drainage connection according to the following procedures:

A. Construction Stage

Inspection
Frequency

a. Temporary Colour Coding System for Identification of Foul / Waste / Storm Water Drainage Pipelines and Manholes / BIGTs 100

- (1) **Drainage Pipelines** (Above Ground Pipes up to F1 Level and Connecting Underground Pipes for Discharging to Manholes / BIGTs)

- Check colour bands painted around the circumference of the open end(s) according to colour schedule below for identification and traceability for future connection of installed drain pipes (See Sketch 1)
- Colour Identification Schedule

Type of Drain Pipe	Colour	Width of Colour Band
Storm water	White	75mm
Waste water	Yellow	75mm
Soil water	Green	75mm

- (2) **Manholes / BIGTs**

- Check colour bands painted on the top and the edge of the access opening of Manholes and BIGTs according to colour schedule below for identification and traceability for future connection (See Sketch 2)
- Colour Identification Schedule

Type of MH / BIGT.	Colour	Size of Each Colour Mark
Storm water(Manhole)	White	200mm x 100mm
Foul water (Manhole)	Green	200mm x 100mm
Storm water (BIGT)	White	200mm x 100mm
Waste water (BIGT)	Yellow	200mm x 100mm

b. Drainage Pipes Discharging to Manholes / BIGTs 100
(Guide Book Inspection Guidelines Ref. No. DRA2.02 : Manholes)

- Check above ground drainage pipes connected to correct underground drainage pipes and onward to correct manholes / BIGTs
- Check correct nos. & type of discharge pipes connected to manholes / BIGTs

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APPENDICES

**APPENDIX H – SITE INSPECTION GUIDELINES
FOR DRAINAGE CONNECTION**

B. Final Inspection Stage (Recommended to be carried out in the presence of EMD representative before handover)	<u>Inspection Frequency</u>
Check correct connection of drainage down pipes to manholes / BIGTs (use DASM Form No. 5118 to record the inspection)	
a. <u>Soil or Soil & Waste Down pipes</u> <ul style="list-style-type: none"> - use communication device to communicate between personnel on G/F and upper floor - use colour pigmented water and ping pong (the ping pong should be marked with identification no. to identify the stack to be checked) - start the inspection on top floor of the stack - open the foul manhole cover for the respective tested stack and adjacent BIGT covers on ground - flush the W.C. pan with ping pong and colour pigmented water on top floor of the stack - the personnel on ground first checks that there is no ping pong & colour pigmented water discharging into adjacent BIGTs - flush the W.C. pan again of the same flat with ping pong & colour pigmented water and the personnel on ground checks that ping pong and colour pigmented water discharge into the correct manhole - ensure as-built drainage and plumbing layout plans are verified - repeat the testing procedures for next stack 	100
b. <u>Waste Down pipes</u> <ul style="list-style-type: none"> - use communication device to communicate between personnel on G/F and upper floor - use colour pigmented water - start the inspection at top floor of the stack - open the foul manhole and BIGT covers for the respective tested stack on ground - fill wash hand basin or sink with colour pigmented water and unplug to drain (if basin, sink, shower or floor drain discharges into the same stack, separate testing of each outlet is not necessary) - the personnel at ground checks that pigmented water discharges into the correct BIGT and then to the correct manhole - ensure as-built drainage and plumbing layout plans are verified - Repeat the testing procedures for next stack and each floor drain at public area or service room 	100

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**APPENDIX H – SITE INSPECTION GUIDELINES
FOR DRAINAGE CONNECTION**

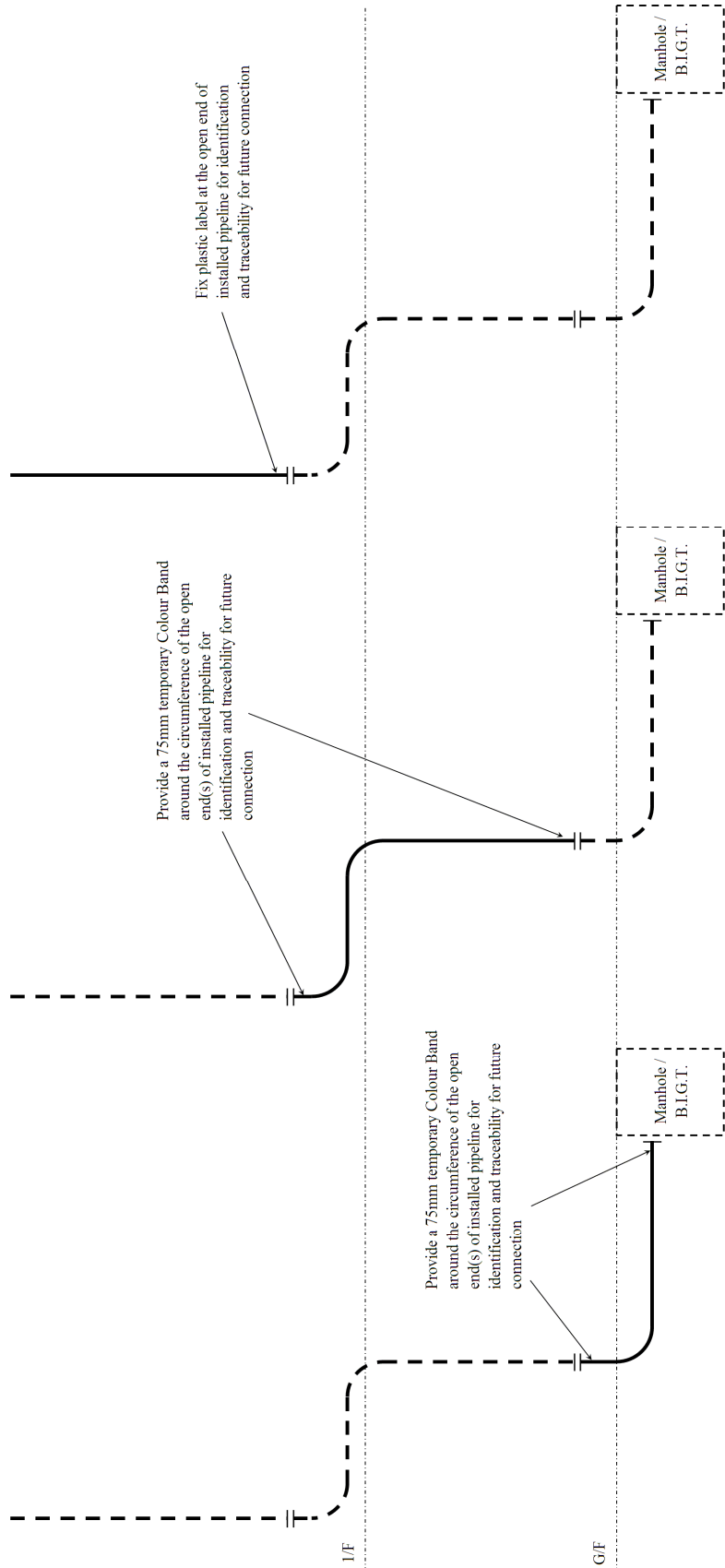
	<u>Inspection Frequency</u>
c. <u>Storm Water Down pipes</u>	100
<ul style="list-style-type: none">- use communication device to communicate between personnel on G/F and F1 canopy / roof- use colour pigmented water- start the inspection at top rainwater outlet of the stack- open the storm manhole and BIGT covers for the respective tested stack on ground- pour sufficient colour pigmented water via roof / F1 canopy rainwater outlet into the pipe- the personnel on ground checks that colour pigmented water discharges into :<ul style="list-style-type: none">(1) correct BIGT and then into the correct manhole(2) surface channel / gully sump and then into the correct manhole(3) correct manhole directly- ensure as-built drainage and plumbing layout plans are verified- repeat the testing procedures for next storm water pipe	

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APPENDIX H – SITE INSPECTION GUIDELINES
FOR DRAINAGE CONNECTION

Sketch 1

Temporary Colour Identification System for Drainage Pipelines



Case 1

Case 2

Case 3

Type of Drain Pipe	Colour	Width of Colour Band
Storm water	White	75mm
Waste water	Yellow	75mm
Soil Water	Green	75mm

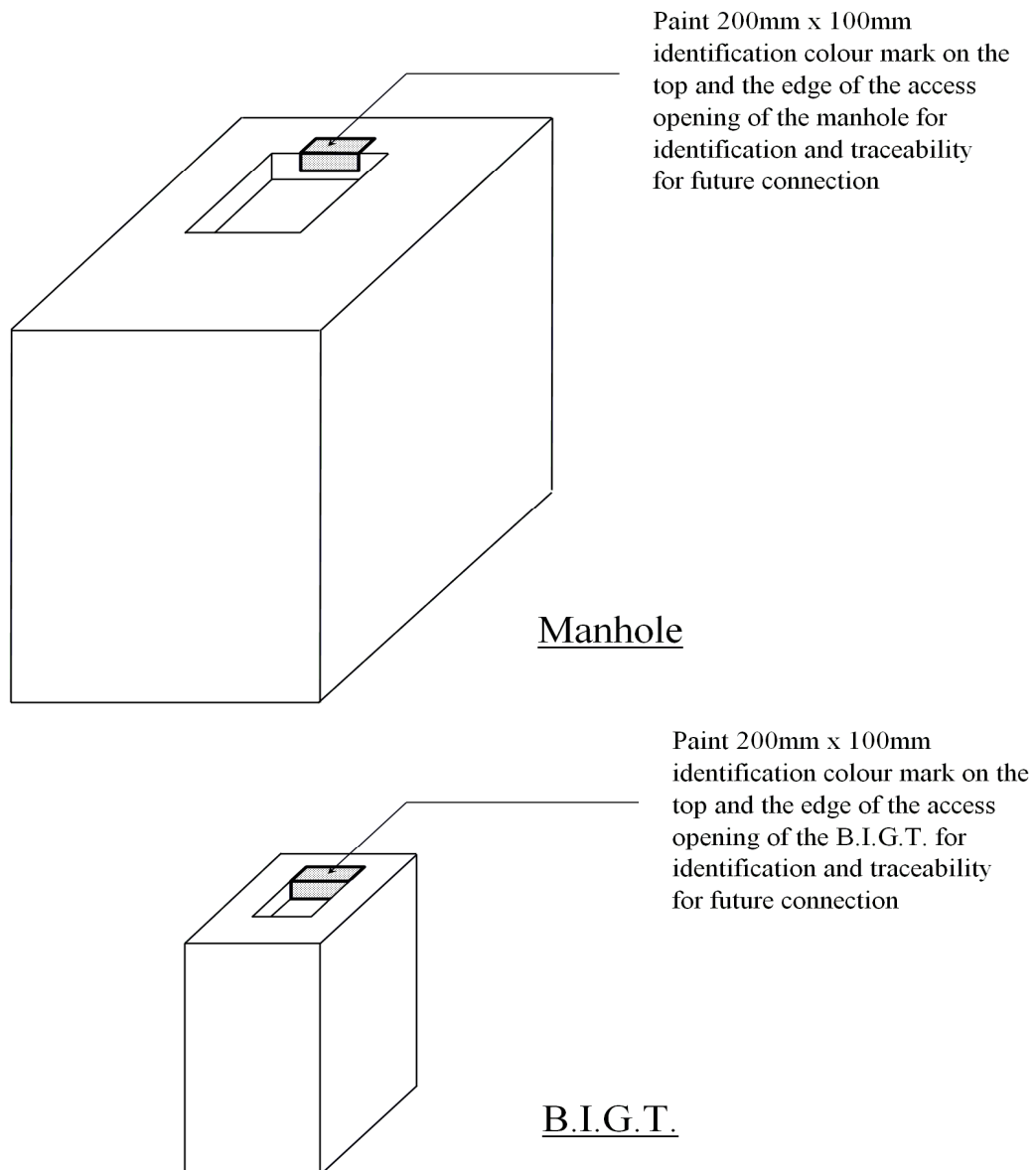
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**APPENDIX H – SITE INSPECTION GUIDELINES
FOR DRAINAGE CONNECTION**

Sketch 2

Temporary Colour Identification System for Manhole / B.I.G.T.



Type of MH / B.I.G.T.	Colour	Size of Each Colour Mark
Storm water (Manhole)	White	200mm x 100mm
Foul water (Manhole)	Green	200mm x 100mm
Storm water (B.I.G.T.)	White	200mm x 100mm
Waste water (B.I.G.T.)	Yellow	200mm x 100mm

APPENDICES

**APPENDIX I - INSPECTION PROCEDURES/GUIDELINES
FOR REPETITIVE FLUSHING TEST
AND MULTIPLE FLUSHING TEST**

01 APRIL 2009

BACKGROUND

1. Common W-trap System should be used to ascertain the provision of self-repriming water seal in the floor trap. The following guidelines should be adapted as basic criteria for the application of “modification” from B(SSFPDW&L) R25(1) in ICU submission of Drainage Plan, vide guidelines in [DCG-D-306](#) for reference.
2. Project teams are reminded to arrange tests for on-site verification to the system at appropriate project stages.
3. At the completion of sample flats or wings, “Repetitive Flushing Test (RFT)” should be arranged to various flat types and deposit the test results to ICU for record (Inspection Form 5119).
4. Prior to the Occupation Permit Inspection, “Multiple Flushing Test (MFT)” to verify drainage performance of simultaneous flushing from multiple users should be arranged to one selective drainage stack in each project with Common W-trap System and deposit the findings to ICU for record. Project team should select the soil & waste (S&W) stack with ‘the worst’ performance scenario for the test. This may cover the one with extensive horizontal pipe run or multiple bends required in the lower zone of the vertical stack connected to the manhole (Inspection Form 5120). Tests are to be carried out in the fitted out bathrooms at 6 nos. of selected floors. The selected floors include the lowest 2 floors, 3 other consecutive floors sharing the same cross vent / balancing pipe of S&W stack and the last selected floor from any other levels discharging to the same S&W stack.
5. Project team shall made reference to a set of demonstration video clips on the process of RFT & MFT as a general guidance and for training purpose. The project team shall show the video clips to the contractors (relevant subcontractors inclusive) and site staff before conducting the testing at the completion of sample flats/wings; and prior to Occupation Permit Inspection. Project teams and contractors shall however note that the demonstration video clips shall be used as a guide on the process of testing. As regards the details of specified standards, the contract requirements stipulated in the individual Building Contract shall prevail.

APPENDICES

**APPENDIX I - INSPECTION PROCEDURES/GUIDELINES
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AND MULTIPLE FLUSHING TEST**

01 APRIL 2009

Inspection Guidelines and Testing Method for Repetitive Flushing Test

*(Based upon laboratory test conducted by City U (To Study the Effectiveness of Self-replenished Common Waste Traps
Proposed for Typical Domestic Flats of Public Housing Estates)*

This test is devised to investigate the possible spillage of foaming waste water from the floor drain after a series of full bowl flushing with simulated use of washing detergent. The test procedures are as follows –

Wash Basin with 40mm dia. W-trap

- (1) Fill the wash basin with water to reach overflow level (approximate 6 litres)*
- (2) Add 10 gram of detergent into the water and stir well to form soap solution (but not to beat up creating large amount of foam)*
- (3) Unplug the outlet and turn on the tap to 0.15lit/s to flush all the residual foam (from 30 seconds to 1 minute) (if any) in the wash basin simultaneously.*
- (4) Observe and record whether any overflowing of foam from the floor drain. **If any foam discharges outside the vertical grating and floods the bathroom or kitchen floor in any cycle, the requisite test is failed and adjourned.***
- (5) Run the test from Steps (1) to (4) for 7 cycles to observe any foam flooding from the floor drain.*
- (6) If failed, record the failure and the number of cycle reaching the yield point.*

Shower Area with 50mm dia. W-trap

- (1) Fill the shower area with water to reach approximate 40mm deep measured at the lowest point.*
- (2) Add 10 gram of detergent into the water and stir well to form soap solution (but not to beat up creating large amount of foam).*
- (3) Unplug the outlet and turn on the tap to 0.1 lit/s to flush all the residual foam (from 1 minute to 2 minutes) from shower head (if any) in the shower area simultaneously.*
- (4) Observe and record whether any overflowing of foam from the floor drain. **If any foam discharges outside the vertical grating and floods the bathroom or kitchen floor in any cycle, the requisite test is failed and adjourned.***
- (5) Run the test from Steps (1) to (4) for 10 cycles to observe any foam flooding from the floor drain.*

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**APPENDIX I - INSPECTION PROCEDURES/GUIDELINES
FOR REPETITIVE FLUSHING TEST
AND MULTIPLE FLUSHING TEST**

01 APRIL 2009

(6) *If failed, record the failure and the number of cycle reaching the yield point.*

Inspection Guidelines and Testing Method for Multiple Flushing Test

(Based upon laboratory test conducted by City U (To Study the Effectiveness of Self-replenished Common Waste Traps Proposed for Typical Domestic Flats of Public Housing Estates))

Testing Method is adapted from the RFT on Common W-trap System with the situational discharge of flushing water from WC. This test is devised to investigate the possible spillage of foaming waste water from the floor drain and / or bubbling in the WC after a series of full bowl flushing with simulated use of washing detergent down the wash basins / shower areas and flushing WCs simultaneously at all six selected floors. The test procedures are as follows: –

Wash Basin with 40mm dia. W-trap

(Following actions to be carried out simultaneously to all wash basins at various floors selected for the test)

- (1) Fill the wash basins with water to reach overflow level (approximate 6 litres)
- (2) Add 10 gram of detergent into the water and stir well to form soap solution (but not to beat up creating large amount of foam).
- (3) At all selected floors, unplug the wash basin outlets, flush the WCs together and turn on the taps to 0.15lit/s to flush all the residual foam *(from 30 seconds to 1 minute)* (if any) in the wash basins simultaneously.
- (4) Observe and record whether any overflowing of foam from the floor drains. **If any foam discharges outside the vertical grating and floods the bathroom or kitchen floor in any cycle, the requisite test is failed and adjourned.**
- (5) Observe the water level movement / bubbling of WCs. **If any bubbling in any of the WC(s) or even flooding onto the bathroom floor(s) in any cycle, the requisite test is failed and adjourned.**
- (6) Observe any abnormal flow speed of discharge from wash basins. **If there is an abnormal low flow speed on the discharging in any cycle, the requisite test may be failed and subject to further investigation.**
- (7) Run the test from Steps (1) to (6) for 3 cycles to observe any foam flooding from the floor drains, bubbling of WCs and abnormal flow speed of discharge from wash basins.
- (8) If failed, record the failure and the number of cycle reaching the yield point.

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**APPENDIX I - INSPECTION PROCEDURES/GUIDELINES
FOR REPETITIVE FLUSHING TEST
AND MULTIPLE FLUSHING TEST**

01 APRIL 2009

Shower Area with 50mm dia. W-trap

(Following actions to be carried out simultaneously to all shower areas at various floors selected for the test)

- (1) Fill the shower areas with water to reach approximate 40mm deep measured at the lowest point.
- (2) Add 10 gram of detergent into the water and stir well to form soap solution (but not to beat up creating large amount of foam).
- (3) At all selected floors, unplug the shower area outlets, flush the WCs together and turn on the taps to 0.1lit/s to flush all the residual foam *(from 1 minute to 2 minutes)* (if any) from shower heads in the shower areas simultaneously.
- (4) Observe and record whether any overflowing of foam from the floor drains. **If any foam discharges outside any of the vertical grating(s) and floods the bathroom(s) or kitchen floor(s) in any cycle, the requisite test is failed and adjourned.**
- (5) Observe the water level movement / bubbling of WCs. **If any bubbling in any of the WC(s) or even flooding onto the bathroom floor(s) in any cycle, the requisite test is failed and adjourned.**
- (6) Observe any abnormal flow speed of discharge from shower areas. **If there is an abnormal low flow speed on the discharging in any cycle, the requisite test may be failed and subject to further investigation.**
- (7) Run the test from Steps (1) to (6) for 3 cycles to observe any foam flooding from the floor drains, bubbling of WCs and abnormal flow speed of discharge from shower areas.
- (8) If failed, record the failure and the number of cycle reaching the yield point.

**APPENDIX J - HANDLING OF DEFECTS IDENTIFIED AFTER
MAINTENANCE PERIOD OF BUILDING CONTRACTS**

30 AUGUST 2013

This Appendix J is extracted from DCMBI No. P06/11 (revised on 26.2.2013) – Handling of defect identified after maintenance period of building contracts.

**Handling of Defects Identified After Maintenance Period
Of Building Contracts****(After issue of Maintenance Certificate)****(A) EMD REPORT OF SUSPECTED LATENT DEFECTS TO CONTRACT MANAGER**

1. Estate Management Division (EMD) notes the defects, considers whether the defects are -

- Scenario A: due to normal fair wear and tear; or
- Scenario B: not due to normal fair wear and tear but still subject to a valid warranty in the building contract; or
- Scenario C: suspected latent in nature and not subject to any valid warranty in the building contract.

2. For **Scenario A**, EMD handles the normal fair wear and tear cases.
3. For **Scenario B**, EMD notifies the Main Contractor (MC) of the building contract who is to carry out the necessary repair. However, if the MC does not exist or ceases business or has been liquidated or is in liquidation, EMD then arranges repair directly themselves.
4. For **Scenario C**, EMD and DCD take actions in accordance with the following and register in the Defect Report Form at Appendix 2 –
 - (i) if the MC does not exist or ceases business or has been liquidated or is in liquidation, then EMD arranges repair directly by themselves despite they are suspected latent defects. *(For contractor in liquidation, the Maintenance Surveyor (MS) of EMD ascertains whether the defect is latent; EMD shall keep complete record of rectification cost associated with the latent defects and provides Contract Manager (CM) an annual summary of the defects with repair costs using the same Defects Report Form. CM shall determine the nature of defects and enter the repair cost with on-cost as appropriate into the Proof of Debt submitted to the Liquidator.)*
 - (ii) for cases other than (i), EMD classifies the suspected defects into (I) **Urgent Case** and (II) **Non-urgent Case**. Based on visual inspection, **EMD prepares an initial investigation report to CM** on the location, appearance and extent of the defects and register in the Defects Report Form maintained by the Defect Team* (DT), with copy to Technical Improvement Unit (Attention: CA/D&S), and where appropriate using DCMB-F748 and F749 respectively.
 - (iii) for defects of repeated nature that occurred, EMD stocktakes the defect nature, and alerts CM if same defects occur more than 10 cases within a consecutive period of 6 months. Project Team (PT) in liaison with DT and EMD to assess the defects and trigger joint-investigation with the Contractor on the way forward. CM considers whether these repetitive cases with/without investigation result should be reported to LGCQ as lesson-to-learn.

[*Refer to DCMBI P26/04 on the centralized defect team (DT). According to the DCMBI, one centralized defect team will be set up for a minimum of three projects comprising one (1) COW and two (2) ACW or WS.]

30 AUGUST 2013

**APPENDIX J - HANDLING OF DEFECTS IDENTIFIED AFTER
MAINTENANCE PERIOD OF BUILDING CONTRACTS**

This Appendix J is extracted from DCMBI No. P06/11 (revised on 26.2.2013) – Handling of defect identified after maintenance period of building contracts.

(B) SCENARIO C - SUSPECTED LATENT DEFECTS**(I) URGENT CASES****CRITERIA**

5. Urgent cases are defects that require immediate and urgent repairs, which would otherwise cause immediate danger on the personal safety, structural safety or hygienic conditions of the tenants.

ACTIONS

6. EMD provides temporary repairs using Maintenance and Improvement (M&I) or Repair Budget to remove imminent danger as necessary to ensure personal safety, structural safety and satisfactory hygienic conditions before any permanent repair is to be executed.
7. CM, upon receipt of defects report from EMD, notifies MC immediately of the defects and the possibility of latent defects. CM requests MC to commence repairs within 2 weeks (or a suitable timeframe at CM's discretion) and if MC fails to commence repairs, EMD will execute the repairs using the AAC^{Note 1} upon confirmation of the fund allocation by CM. All the cost of repairs plus a prevailing on-cost^{Note 2} will be charged to the MC.

For repairs carried out by EMD, the Maintenance Surveyor of EMD (MS) shall ensure the work orders charged to the AAC be issued separately with a caption of "Latent Defect" and keep full records of the defects and repairs, signed by both EMD and MC, as a true record. If MC fails to turn up, CM forwards a copy of MS's records to the MC and notifies MC that such records shall be admitted as the true records. For other repairs not carried out by EMD, CM liaises with MC following the same record keeping arrangement.

8. For repairs carried out by MC, CM supervises and accepts work.
9. When needed, CM agrees with MC the carrying out of investigation^{Note 3} to ascertain the responsibility of the defect, and requires MC's participation in meetings and site inspections etc. and keeps EMD informed. Cost for the investigation is to be agreed with MC and CM seeks the Employer's agreement on the proposed share from Project Vote (PV); or solely provided from AAC, if not agreed by MC.
10. CM and MC should proceed with repair for defects of urgent nature in parallel with the settlement of defect responsibility as described in Part (D) below.

(II) NON-URGENT CASES

11. CM upon receipt of defects report from EMD, notifies MC. When MC disputes on repair liability, CM tries to agree with MC to conduct investigation to ascertain the responsibility of the defects, and requires MC's participation in meetings and site inspections etc., and keeps EMD informed. Cost arrangement for the investigation is to be agreed with MC and CM seeks the Employer's agreement on the proposed share from Project Vote (PV); or otherwise to be provided solely from AAC until settlement of the responsibility of the defects as described below.

30 AUGUST 2013

APPENDIX J - HANDLING OF DEFECTS IDENTIFIED AFTER MAINTENANCE PERIOD OF BUILDING CONTRACTS

This Appendix J is extracted from DCMBI No. P06/11 (revised on 26.2.2013) – Handling of defect identified after maintenance period of building contracts.

(C) CONSIDERATIONS OF WHETHER THE DEFECTS ARE LATENT OR NOT (for both urgent and non-urgent cases)

12. Based on the results of the investigation ^{Note 3}, the CM/CMR and the MS ascertain whether the defects are (1) **latent**; or 2) **not latent**. Any difference between MS and CM in this connection shall be resolved through an ad-hoc **Defects Appraisal Meeting (DAM)** ^{Note 4} chaired by the respective Directorate.

Note 1 : AAC - Development & Construction Division Advance Account "Latent Defect – Building Works Advance Account" no. 355 3550. Each draw of fund from the AAC shall have proper approval sought in accordance with prevailing Financial Instruction on Delegated Financial Authority as a temporary use of HA Fund.

Note 2 : CM should verify with EMD the prevailing rate of on-cost.

Note 3: The investigation should be conducted either by the MC alone, a joint investigation as described in para.9, or an independent survey as described in para. 19. But it should be noted that if the investigation is to be conducted by the MC alone, CM may at his own discretion either accept the findings or dispute the MC's findings. If CM disagrees with the MC's findings, then an independent survey as stated in para. 19 shall still be pursued.

Note 4: The DAM is initially chaired by D1 level representatives of DCD (CM) and attended by D1 level representatives of EMD (CM/M). The Chairman of DAM also decides the line-to-take and the way forward. If agreement on the course of action cannot be reached at D1 level representatives of the DAM, or the proposed decision will exceed the Delegated Financial Authority of CM, CM should refer the case to the D2 level representatives of DAM (formed by D2 level representatives from DCD and EMD) for decision. Should the DAM not agree on the nature of defects, then the Chairman of the DAM could propose settlement by means of Expert Determination.

30 + 30 Days Pledge ^{Note 5}

13. The time to be taken for consideration of the nature (not responsibility) of the defects shall not exceed 30 days ^{Note 5} from referral (receipt) of the defects from EMD to CM. Actual repairs shall start not later than the first 30 days from referral of defects and shall complete within the following 30 days after commencement of repairs. DT would monitor the repair works listed out in Defects Record Form and report to CM regularly. If the pledge cannot be met on special cases, CM shall bring up to the D2 Directorate for an extension; or otherwise report at LGCQ for very special circumstances. CM/EMD shall pre-plan all the relevant activities to ensure conformity to the pledge.

Note 5 – The duration from requesting tenant/owner in-flat inspection/repair to actual in-flat inspection/repair should not be counted in the 30+30 calendar-days pledge. This should be recorded in the Defects Record Form.

CONSIDERATION 1 – Defects Considered Not Latent (either fair wear and tear or other defects not MC's responsibility)

14. For defects considered as fair wear and tear,
- a) Rental estates or rental portion of TPS estates : EMD shall be responsible for the repairs and the cost of repairs. EMD reimburses all costs previously charged to the AAC or PV. CM informs FM/Capital to arrange closure of AAC.
 - b) HOS courts or sale portion of TPS estates : EMD shall inform Incorporated Owners or the management company to follow up the repairs.

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**APPENDIX J - HANDLING OF DEFECTS IDENTIFIED AFTER
MAINTENANCE PERIOD OF BUILDING CONTRACTS**

This Appendix J is extracted from DCMBI No. P06/11 (revised on 26.2.2013) – Handling of defect identified after maintenance period of building contracts.

15. For para.14(a), EMD obtains fund from the respective maintenance account if the defect is identified as fair wear and tear or items identified for repair under the Repair Budget*.

*(*Details refer to prevailing EMDI (no.W02/2008) for improvement works/ repair larger than the actual area with debonded tiles for aesthetic reason/ doing survey of debonded tiles on external walls/ ordering necessary tiles of the main colour to meet min. amount and as reserve for future repairs/ minor defects rectification works like debonded tiles in kitchens and toilets).*

CONSIDERATION 2 – Defects Considered Latent

16. For defects considered as latent, MC should be given the opportunity to affirm the case, and provided with all the findings of the investigation (para.9). The following two situations (X or Y) may result –

(a) SITUATION X - Defects Latent, and MC accepts FULL responsibility

17. Courses of subsequent actions are as follows –

- (i) Request MC to execute repairs at his own cost. CM supervises and accepts the repairs.
- (ii) If MC refuses to execute the repairs himself after meeting with respective Project Director (a D2 Directorate), request EMD to execute repairs on behalf of MC and seeks recovery of the cost of repairs together with charges at the prevailing on-cost rates to be verified by EMD. The cost of repairs is derived by using District Term Contractor or direct quotation / tender by EMD. In brief, CM acts as the liaison officer between MC and EMD. EMD determines the standard and extent of repairs and prepare repair budget to CM. CM agrees cost with MC and provides funding from the AAC (see para.7 on authority to use) to EMD. MC pays the costs and CM arranges to reimburse into AAC.

**(b) SITUATION Y - Defects Latent, but (1) MC does not accept full responsibility; or
(2) MC gives no response**

In the event of (1) or (2) above, the cases are treated as **DISPUTE** and courses of subsequent actions are as follows –

ACTION 1

18. **CM Decides on Execution of Repair**

- (i) CM shall follow the time pledge (as stated in para.13) and requests MC to commence repair works first; failing which CM notifies MC on the decision to request EMD under para. 18(ii) below to take full charge to execute the repair works, with the standard and extent of works to be determined by the CM and funding provided from the AAC.
- (ii) EMD takes full charge of the repair works, prepares all the necessary contract/working documents and proceeds with procurement of contractor to start work within the second 30 days' period (i.e. after clarification of the nature of defect). EMD advises CM on the cost of the repair work and funding required before the works start. EMD supervises and accepts the works.

**APPENDIX J - HANDLING OF DEFECTS IDENTIFIED AFTER
MAINTENANCE PERIOD OF BUILDING CONTRACTS**

30 AUGUST 2013

This Appendix J is extracted from DCMBI No. P06/11 (revised on 26.2.2013) – Handling of defect identified after maintenance period of building contracts.

(iii) MS keeps comprehensive records of all the defects and repair works to form a basis for settling the responsibility of the defects. (para.7 refers)

(iv) CM informs MC of the actions and the estimated cost of repairs and imposition of prevailing on-cost (para.7 refers)

ACTION 2**Settlement of Dispute by an Independent Survey**

19. CM and MC agree to jointly appoint a surveyor to conduct an independent survey to establish the cause(s) of the defects. CM and MC agree on the surveyor to be appointed, the cost split for his fees and expenses and the details of the survey, with MC's and the Employer's acknowledgement that the report from the surveyor shall be final and binding. CM calls quotation from and arranges for the appointment of the surveyor. CM provides funding from PV.
20. If MC does not agree to settle the dispute by an independent survey or does not agree on the surveyor to be appointed, CM notifies MC that the case shall be referred to **ARBITRATION / LITIGATION** and other means of dispute resolution (such as Expert Determination). In the meanwhile, CM may proceed to the actions in para. 22.

(D) FINDINGS FROM THE INDEPENDENT SURVEY –

21. The following 3 possible Outcomes are anticipated -

(a) **Outcome 1: MC is NOT liable**– EMD should carry out the repairs with similar actions as Scenario (A) in para. 2. If the AAC has been used previously, the CM needs to request EMD to reimburse the expenditure in the AAC from EMD vote.

(b) **Outcome 2: MC is FULLY Liable** - If the defect has not been attended to, the case shall be dealt with by the actions as stated in para.17.

(c) **Outcome 3: MC is only PARTIALLY Liable**

(i) **Option 1 (preferred option) – MC to Repair**

MC completes the **WHOLE** of the repair works. CM supervises and accepts the repair works. **CM and MC agree on the split of the cost of repair** (which accounts also the previously agreed cost of independent survey as mentioned in para.19) between the parties, and subject to formal settlement by a Supplemental Agreement. MC is responsible for his own portion of the cost. CM draws the balance of the cost from the PV, or if the AAC has been used previously, reimburses the amount from PV into the AAC. Only if this option fails shall option 2 below be pursued.

(ii) **Option 2 – EMD to Repair**

CM requests **EMD to carry out and complete** the **WHOLE** of the repair works (see para.18(ii)), with funding provided from the AAC. **CM and MC agree on the split of the cost** repair (which accounts also the previously agreed cost of independent survey as mentioned in para.19) between the parties, and subject to formal settlement

30 AUGUST 2013

**APPENDIX J - HANDLING OF DEFECTS IDENTIFIED AFTER
MAINTENANCE PERIOD OF BUILDING CONTRACTS**

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by Supplemental Agreement. MC pays his portion and CM arranges to reimburse such amount into the AAC. CM draws the balance from PV into the AAC.

22. If MC Totally Disagrees on the Findings of the Survey or Gives No Response, the case will be brought to **ARBITRATION / LITIGATION** and other means (**follow para. 20 for course of action upon obtaining the Employer's approval**). If the defect has not been attended to, CM requests **EMD to complete** the WHOLE of the repair works, with funding provided from AAC. In the meantime, CM upon seeking legal advice as appropriate, may consider submitting recommendation to the Employer for setting-off the repair costs. After obtaining the Employer's approval of setting-off the repair costs, CM arranges set-off of the repair costs plus on-cost from the MC (*or the MC's other HA's Contracts as appropriate) and notifies FM/Capital such arrangement. All costs (including on cost) should be recovered through arbitration/litigation, where appropriate.

(E) FLOWCHART

23. A flowchart of the events of the above procedure is at **Appendix 1** ^{Note 6}.

Note 6 - For projects with the 'de-bonded homogenous wall tiles', the handling procedure should refer to CDP Instruction No. 01/2007 under which a settlement deed should be prepared. The project team should follow the stipulations in CDP Instruction No. 01/2007 and the deed made with the Contractor with regard to repairs for 'de-bonded homogenous wall tiles' instead. For other projects not identified in the CDP Instruction No. 01/2007, the project team shall follow this Annex and Appendix 1 accordingly. Project team can request EMD to repair those cases with Settlement Deed on debonded homogenous tiles signed after the lapse of the first 6 year from the completion of the Works.

First Issue on 24 July 2001

Second Issue on 20 July 2011

Third Issue on 26 February 2013

Major Changes include –

- (i) procedures for HOS court;
- (ii) define role of Defect Team;
- (iii) new Appendix 2 – standard template for defects report form;
- (iv) cases for sharing at LGCQ or equivalent venue; and
- (v) early investigation on common defects for easier follow-up.

This Appendix J is extracted from DCMBI No. P06/11 (revised on 26.2.2013) – Handling of defect identified after maintenance period of building contracts.



**RELATED CIRCULARS AND INSTRUCTIONS
INDEX OF CIRCULARS AND INSTRUCTIONS**

Withdrawn on 17/03/2011



INSPECTION FORM

No. 0001

Serial No. : _____

Daily Inspection Form

Date : _____

PROJECT (Contract No.) : _____ (/)

BLOCK NO. (Block Type) : _____ ()

Ref. No.	Location	Works Items Inspected #			Site Direction No. Refer
		Pass	Covered up (not check)	Fail	

Refer Guide book for details

Remarks : _____

Inspected by

()
*PCOW / ACW / WS

Jointly Inspected by

Jointly Inspected by

Form Checked by

()
*PA / SCOW / PCOW / ACW

()
*PA / SCOW / PCOW / ACW

()
PCOW

Date : _____

* Delete as appropriate
See overleaf for guideline

INSPECTION FORM

No. 0001

NOTES

1. Record the inspected item no(s) in the "Works Items Inspected" column.
2. Identify the defects by marking on the spots with appropriate method.
3. Sign and record the date of each inspection.
4. Put "J" to record the joint inspected item.

Example :

Date : 19.06.01

Ref. No.	Location	Works Items Inspected #			Site Direction No. Refer
		Pass	Covered up (not check)	Fail	
MAS1.01	Flat No.2302	2J, 3J, 5J			
MAS1.01	F23, Corridor Wing A	2J		3J	38
FIN1.03	Flat No.1011	3, 4, 5, 6	1, 2		
FIN3.01	Flat No.1001	4, 5, 6			
WAT6.04	Flat No.1002	4J, 5J, 6J			
FIN5.01	F5, Wing A Corridor	2, 3, 7, 8			

Refer Guide book for details

Inspected by

Abc

(A B CHAN)

*PCOW-/ACW / WS

Jointly Inspected by

Jointly Inspected by

Form Checked by

Def

(D E FONG)

*PA-/SCOW /PCOW-/ACW

Lmn

(L M NG)

*PA-/SCOW-/PCOW-/ACW

Rst

(R S TO)

PCOW

Date : 21.06.01

* Delete as appropriate



INSPECTION FORM

No. 5007

Serial No. :

**Checklist for Cleaning of Fresh Water Tanks and Indirect Feed Fresh Water Supply
Piping System before Occupation of a New Building or Part of a New Building**

PROJECT (Contract No.) : _____ (/)

Block No. / Location : _____ Z o _ _ D e U _

Date(s) on which the cleaning process is carried out: _____

The cleaning process should comply with the detailed cleaning action plan approved by the CM's representative (specification clause PLU1.W960(2)(a) refers)

		<u>Result</u>	
		Yes	No
1.	All fresh water tanks have been cleaned in accordance with the specification clause PLU1.W920(2)	<input type="checkbox"/>	<input type="checkbox"/>
2.	Check the following procedures have been complied with in respect to cleaning of indirect feed fresh water piping system		
a.	The correct amount of chloride of lime or approved chemicals are dosed to the water tank(s) in accordance with the approved detailed cleaning action plan (specification clause PLU1.W930(2)(a) refers)	<input type="checkbox"/>	<input type="checkbox"/>
b.	The presence of chlorine in water is confirmed at all taps at all locations by approved test kit (specification clause PLU1.W930(2)(e) refers)	<input type="checkbox"/>	<input type="checkbox"/>
c.	The sterilization period lasts for 2 hours (specification clause PLU1.W930(2)(f) refers)	<input type="checkbox"/>	<input type="checkbox"/>
d.	The indirect fresh water supply piping system is thoroughly flushed (specification clause PLU1.W930(2)(g) refers)	<input type="checkbox"/>	<input type="checkbox"/>
e.	After flushing, the residual chlorine level at the water points nearest to the roof tank and the lowest supply point are confirmed to be less than 5mg/l by a laboratory complies with PRE.B9.570 ((specification clause PLU1.W930(2)(h) refers)	<input type="checkbox"/>	<input type="checkbox"/>
f.	Ensure all taps are closed and the fresh water plumbing system are resumed to operation condition	<input type="checkbox"/>	<input type="checkbox"/>

Floors witnessed by #COW/ACW/WS for items 2b & 2f : _____

Remarks with defects/non-conformities observed : (Record of remedial action should be highlighted)

Checked By Contractor's Representative : _____ Signature : _____
(Name & Post)

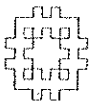
Witnessed by # COW / ACW / WS : _____ Signature : _____
(Name & Post)

Endorsed By Contractor's Site Agent : _____ Signature : _____
or Above (Name & Post)

Date: _____

Legend : # - Delete as inappropriate.

- Notes :
- Individual form shall be submitted for each building.
 - Contractor's Representative for conducting 100% check shall be site foreman or above.
 - Contractor's Representative shall take photos for record during the course of water tank and piping cleaning, and attach the photo record together with this inspection form.
 - Contractor shall submit completed inspection form together with proof of testing for item 2e.
 - HD site staff shall witness all processes except for items 2b, 2d & 2f that shall be randomly witnessed at 3 floors per block.



INSPECTION FORM

No. 5104

Serial No. : _____

FINAL INSPECTION

WATER TANKS

PROJECT (Contract No.) : _____ (/)

BLOCK (Block type) : _____ ()

Check / Date	Item	Pass	Not Completed	Defect	Cleaning Required
	Location & Description				
FRESH WATER TANK	Ext'l Wall Finish				
	Cat Ladder / Safety Guard				
	Overflow / Warning Pipe				
	Washout Pipe				
	Gate Valves				
	Brackets				
	Manhole Cover / Frame				
	Guide Pipe				
	Step Iron				
	Int'l Wall Finish				
	Watertightness Test				
FLUSH WATER TANK	Ext'l Wall Finish				
	Cat Ladder / Safety Guard				
	Overflow / Warning Pipe				
	Washout Pipe				
	Gate Valves				
	Brackets				
	Manhole Cover / Frame				
	Guide Pipe				
	Step Iron				
	Int'l Wall Finish				
	Watertightness Test				
F.S. WATER TANK	Ext'l Wall Finish				
	Cat Ladder / Safety Guard				
	Overflow / Warning Pipe				
	Washout Pipe				
	Gate Valves				
	Brackets				
	Manhole Cover / Frame				
	Guide Pipe				
	Step Iron				
	Int'l Wall Finish				
	Watertightness Test				

Check / Date	Item	Pass	Not Completed	Defect	Cleaning Required
	Location & Description				
SPRINKLER WATER TANK	Ext'l Wall Finish				
	Cat Ladder / Safety Guard				
	Overflow / Warning Pipe				
	Washout Pipe				
	Gate Valves				
	Brackets				
	Manhole Cover / Frame				
	Guide Pipe				
	Step Iron				
	Int'l Wall Finish				
	Watertightness Test				
WATER TANK	Ext'l Wall Finish				
	Cat Ladder / Safety Guard				
	Overflow / Warning Pipe				
	Washout Pipe				
	Gate Valves				
	Brackets				
	Manhole Cover / Frame				
	Guide Pipe				
	Step Iron				
	Int'l Wall Finish				
	Watertightness Test				
WATER TANK	Ext'l Wall Finish				
	Cat Ladder / Safety Guard				
	Overflow / Warning Pipe				
	Washout Pipe				
	Gate Valves				
	Brackets				
	Manhole Cover / Frame				
	Guide Pipe				
	Step Iron				
	Int'l Wall Finish				
	Watertightness Test				

Inspected by (PCOW / ACW / WS) / Date :

Jointly Inspected by (SCOW / PCOW / ACW) / Date:

See overleaf for inspection guideline and notes.



INSPECTION FORM

No. 5108

Serial No. : _____

FINAL INSPECTION

WATERTIGHTNESS TEST - PLUMBING and DRAINAGE INSTALLATION ABOVE GROUND

PROJECT (Contract No.) : _____ (/)

BLOCK No. (Block Type) : _____ () FLAT No. : _____

Check / Date		Item	Pass	Not Completed	Defect	Blockage / Unsatisfactory Flow	
Location & Description							
Bath Room	Wash Hand Basin	Fresh Water Pipe					
		Tap					
		Connection Pipe					
		Trap					
		Waste Pipe					
		Valve					
	W.C. Pan & Cistern	Flush Water Pipe					
		Overflow of Cistern					
		Flushing Pipe					
		Outlet Pipe					
		Valve					
	Bathtub / Shower	Tap					
		Trap					
Pipe Duct	Fresh Water Pipe						
	Flush Water Pipe						
	Soil & Waste Pipe						
	Trap						
Wash Room	Wash Hand	Fresh Water Pipe					
		Tap					
		Trap					
		Waste Pipe					
		Valve					
	W.C. Pan & Cistern	Flush Water Pipe					
		Overflow of Cistern					
		Flushing Pipe					
		Outlet Pipe					
		Valve					
	Kitchen	Main Valve					
		Sink	Fresh Water Pipe				
			Tap				
Connection Pipe							
Overflow Pipe							
Waste Pipe							
Washin		Trap					

Inspected by (PCOW / ACW / WS) / Date : _____

Jointly Inspected by (SCOW / PCOW / ACW) / Date: _____

See overleaf for inspection guideline and notes.

INSPECTION GUIDELINE (Details refer to Contract Specifications)**(1) Domestic Flats**

After cleaning of water tanks supply pipeworks as stipulated in Appendix "F", Inspection Officer checks :-

- No seepage / leakage at the supply pipework, fittings, valves, taps & etc.
- No seepage / leakage at waste pipes, soil pipes, fittings & traps.
- No blockage of drain pipes & traps
- No overflow of cistern
- No unsatisfactory flow at taps

Pass

- the works are completed and satisfactory

Not Completed

- the works are not completed

Defect

- defect is found, rectification works are required

Blockage / Unsatisfactory Flow

- blockage / unsatisfactory flow is found

Remarks : All items to be inspected by WS or above.NOTES

1. Record the inspection by entering the inspection date into the appropriate box. For convenient sake, when the same inspection dates are recorded many times in the same final inspection form, entry can be simplified by alphabetical code in the appropriate box.
 - a " NA " to denote those item of works not applicable in the Contract / Location.
2. Identify the defects by marking the spots with appropriate method.
3. Put down the name and post of the Inspection Officer, sign and record the date of each inspection.
4. Put "J" next to the record at para. 1 for a joint inspection.

Example :

Entry by dates

Check / Date		Item	Pass	Not Completed	Defect	Blockage / Unsatisfactory Flow
Location &						
Bath Room	Fresh Water Pipe		3/1			
	Wash hand basin tap		25/1 J		3/1	3/1

OR Entry by alphabetical code

Check / Date		Item	Pass	Not Completed	Defect	Blockage / Unsatisfactory Flow
Location &						
Bath Room	Fresh Water Pipe		A			
	Wash hand basin tap		BJ		A	A

Inspected by (ACW / WS) / Date :

ABC 3/1/2000

A B CHAN WS/I

DEF 25/1/2000

D E FUN ACW

OR ABC(A=3/1/2000)

A B CHAN WSII

DEF(B=25/1/2000)

D E FUN ACW

Jointly Inspected by (PA / SCOW / PCOW / ACW) / Date :

Rst 25/1/00

R S TO (PCOW)

Rst (B=25/1/00)

R S TO (PCOW)



INSPECTION FORM

No. 5112

Serial No. : _____

FINAL INSPECTION

Cleaning of Water Tanks and Supply Pipework
before Completion of the Works or Phased Completion of Sections of the Works

PROJECT (Contract No.) : _____ (/)
BLOCK No. (Block type) : _____ ()

Check / Date		Item	Pass	Not Completed	Photograph
Location					
SUMP TANKS	Fresh Water				
	Flush Water				
	F.S. Water				
ROOF TANKS	Fresh Water (Upper)	Tank			
		Strainer			
	Fresh Water (Lower)	Tank			
		Strainer			
	Flush Water	Tank			
		Strainer			
	Floor Washing	Tank			
		Strainer			
	F.S. Water	Tank			
		Strainer			
	Sprinkler	Tank			
		Strainer			

Check / Date		Item	Pass	Not Completed
Location				
Indirect Supply Pipework	Lowest supply Point of Downfeed Pipe			
	Downfeed Pipe at the Floor above PRV			
Direct Supply Pipework	Feedpipe at G/F & 1/F			

Inspected by (PCOW / ACW / WS) / Date :

Jointly inspected by (PA / SCOW / PCOW / ACW) / Date :

See overleaf for inspection guideline and notes.

INSPECTION GUIDELINE (Details refer to Contract Specifications)

Inspection Officer checks, according to the Inspection Procedures and Guidelines as stated in Appendix "F".

Inspection Officer is to check that :-

(1) **Pass**

- the cleaning work is completed and satisfactory.

(2) **Not Completed**

- the cleaning out is not completed.

(3) **Photograph**

- record photograph of water tank on completion of cleaning work is taken.

Remarks : All items to be inspected by WS or above.

NOTES

- Record the inspection by entering the inspection date into the appropriate box. For convenient sake, when the same inspection dates are recorded many times in the same final inspection form, entry can be simplified by alphabetical code in the appropriate box.
- Identify the defects by marking the spots with appropriate method.
- Put down the name and post of the Inspection Officer, sign and record the date of each inspection.
- Put "J" next to the record at para. 1 for a joint inspection.

Example :

Entry by dates

Check / Date \ Item		Pass	Not Completed	Photograph
Location				
Sump	Fresh Water	28/1 J	21/1, 28/1 J	28/1
	Flush Water	21/1		21/1
	F.S. Water	28/1 J	21/1	28/1
Tank				

OR

Entry by alphabetical code

Check / Date \ Item		Pass	Not Completed	Photograph
Location				
Sump	Fresh Water	BJ	A, BJ	BJ
	Flush Water	A		A
	F.S. Water	BJ	A	BJ
Tank				

ABC 21 1 00

XYZ 28 1 00

DEF 28 1 00

OR ABC (A-21 1 00)

XYZ (B-28 1 00)

DEF (B-28 1 00)

ABCHAN WSI

XYZOO WSI

DEFUN ACW

ABCHAN WSI

XYZOO WSI

DEFUN ACW

Jointly Inspected by (PA / SCOW / PCOW / ACW) / Date :

RST 28 1 00

R S TO (PCOW)

RST (B-28 1 00)

R S TO (PCOW)



TESTING FORM

No. 8001

Serial No. : _____

MATERIAL/COMPONENT TESTING

PROJECT (Contract No.) : _____ (/)

CONTRACTOR : _____

*To Lab. / DTC (see guideline 5 overleaf) :

Date : _____

Testing of _____

Please carry out testing for the following specimens taken from captioned project :-

<u>(1) Sample Description</u>	<u>(2) Sample Identification</u>	<u>(3) Description of Tests Required</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

(4) Supplier / Manufacturer: _____

(5) Special Instructions: _____

(6) Contact Person: _____ Tel. No.: _____ Fax no.: _____

(7) Result of testing should be sent direct to : The Contract Manager (CA/),
Development and Construction Branch,
Housing Department,
33 Fat Kwong Street, Kowloon, Hong Kong

(8) Please bill direct to :

c.c. CC (A/)
 PQS ()

()
Project Clerk of Works
for Contract Manager

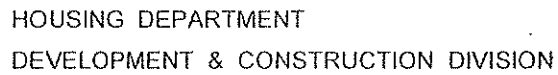
GUIDELINE

- (1) Project Clerk of Works is required to fill in all particulars onto front page and send with the specimens to laboratory for testing.
- (2) Testing of building materials required to be carried out :
 - (i) when the results of vetting of product certificates & on site delivery checks are in doubt.
 - (ii) for those materials registered in the Building Materials Database as advised by JMG.
 - (iii) on tests required by other Government Department.

- (3) Materials testing Specification & Compliance are as follows :-

<u>Material</u>	<u>Relevant B S</u>
Asphalt	BS 5284 : 1993, BS 6925 : 1988 (Type R988 for roofing, Type T1097 for tanking and damp proofing)
Brick	BS 3921 : 1985
Concrete Brick / Block	BS 6073 : Pt. 1 : 1981
Ready Mixed Mortars & Ready-to-use Mortar	BS 4721 : 1981, BS 4551 : Pt. 1 : 1998
Galvanized Coating	BS EN ISO 1461:1999, BS 2569 : Pt. 1 : 1964
Anodized Coating	BS EN 12373-1 : 2001, BS 3987 : 1991
Intumescent Seal	BS 476
Cement	BS 12 : 1996
Lime	BS 890 : 1995

- (4) This Form should be used for testing of materials and components.
- (5)
 - (i) Apart from testings stipulated in Worksections CON 1 to CON 8, Direct Testing Contractor (DTC) shall provide testings of architectural materials and components, such as multi-layer acrylic paint, emulsion paint, synthetic paint, aluminium window, cooking bench, kitchen cabinets and bathroom vanity units, uPVC drainage pipes and fittings, doorset, tile adhesive, tile grout, lever handle, door furniture and lock, overhead door closer and panel wall partitions which are applicable to DTC contract.
 - (ii) For DTC services, Form DCMM-F02 - 'Request for Provision of Testing Services' should be used to apply to SCE/MTM who will issue Form DCMM-F01- 'Works Order' to DTC for the requisite testing.
 - (iii) Surveillance testing samples in (5)(i) should be sent to DTC for testing, full test may or may not be necessary if specific testing items are identified.
 - (iv) In case the specified tests cannot be provided by DTC, other relevant HOKLAS / Approved laboratories may be used.
- (6) Laboratory results for Designated Unit for BMD will be released through the Building Materials Database (BMD) webpage, in cross fertilizing of information and for internal reference by other project teams.



No. 8002

Sheet of

Month :

CONTRACTOR :

Verified By :

[illegible]

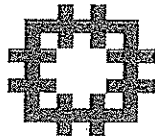
Project Clerk of Works

Date : _____

Page 1 of 2

GUIDELINE

- (1) Contractor's Site Agent updates and completes this form and submits to PCOW for verification at the end of each month.
- (2) PCOW is required to fill in all particulars of the type of equipment supplied by the contractor as listed in Appendix E.



**Inspection Guide Book
Site Inspection Guide
for Building Works
(DASM)**

**Development and Construction Division
HOUSING DEPARTMENT**

November 2005

Ref. No. PLU1.02**Title : Plumbing - Above Ground Water Supply Pipes****Guidelines**

(1/4)

Item No.	Description	Reference	Recommended Inspection %	Inspection Officer
1	Pipe Sleeve <ul style="list-style-type: none">- materials as Specified- PVC sleeve for Non FRP structure- G.I. sleeve for FRP structure- flush with wall finish / ceiling- project 100mm above finish floor level- pipe sleeve is provided to floating slab- no direct contact of sleeve & pipework	PLU1.M430 PLU1.W410	10	WS or above
2	Materials, Type & Dimensions <ul style="list-style-type: none">- materials, type & dimensions as Approved and Specified	PLU1.M010 PLU1.M120 PLU1.M130 PLU1.M170 PLU1.M180 PLU1.M190 PLU1.M200	10	WS or above
3	Pipe Joint <ul style="list-style-type: none">- joint pipes & fittings as Approved and as manufacturer's recommendations.- cut uPVC lined G.I. P. with bandsaw- apply sealant as Specified	PLU1.W210 PLU1.W220 PLU1.W230 PLU1.W240 PLU1.W250 PLU1.W260 PLU1.W270 PLU1.W280	10	WS or above

Ref. No. PLU1.02

Title : Plumbing - Above Ground Water Supply Pipes

Guidelines

(2/4)

Item No.	Description	Reference	Recommended Inspection %	Inspection Office
4	Expansion Joint <ul style="list-style-type: none"> - provide expansion joints as Approved and Specified - in line with structural expansion joint - flexible connector and tie rod with neoprene washer are provided as specified 	PLU1.M210 PLU1.M220 PLU1.M230	10	WS or above
5	Pipework Installation <ul style="list-style-type: none"> - fix pipes in parallel run, vertical & as Specified fall - fix pipes in routing as WSD's Approved drawings - seal off ends to prevent foreign matter - duck foot bend with base plate of adequate size is provided at bottom of pipe riser - neoprene washer bushing is provided to fixing bolt of duck foot resting on neoprene base pad - tee-off for connection of water hammer arrestor is provided, exact location to be agreed with BSI 	PLU1.G010 PLU1.G020 PLU1.G030 PLU1.W030 PLU1.W040 PLU1.W070 PLU1.W080 PLU1.W1010	10	WS or above

DASM - PLU1.02 (04/01/08)

Ref. No. PLU1.02

Title : Plumbing - Above Ground Water Supply Pipes

Guidelines

(3/4)

Item No.	Description	Reference	Recommended Inspection %	Inspection Officer
6	Valves / Taps / Strainers - fix non return valve, gate valve, stop valve and PRV properly as Approved and Specified - valve for $\Phi 65\text{mm}$ & above provided with open / shut indicator	PLU1.M510 PLU1.M610 PLU1.M620 PLU1.M630 PLU1.M640 PLU1.M650 PLU1.M660 PLU1.M710 PLU1.M810 PLU1.M910 PLU1.M920 PLU1.M1010 PLU1.M1020 PLU1.M1030 PLU1.M1040 PLU1.W610 PLU1.W620	10	WS or above
7	Pipe Bracket - stainless steel to Grade 304 or as Approved - lined with plastic for uPVC pipe and copper pipe - type of bracket to suit surface to be fixed - correct spacing for vertical / horizontal pipe support provided as Specified - provide vibrator isolator as Approved and Specified - support pipes on roof as Specified - rubber/neoprene pad between pipe and bracket is provided as specified	PLU1.M410 PLU1.M420 PLU1.W100 PLU1.W310 PLU1.W320	10	WS or above

DASM - PLU1.02 (04/01/08)

Ref. No. PLU1.02

Title : Plumbing - Above Ground Water Supply Pipes

Guidelines

(4/4)

Item No.	Description	Reference	Recommended Inspection %	Inspection Order
8	Pipe Testing - carry out pressure test as Specified - min. 10 bar or 1.5 times of working pressure - no leakage for 1 hour duration. - test to concealed pipes before covering up	PLU1.T040 PLU1.T050	100	WS or above
9	Caulking Pipe Sleeves - void to be free of debris - caulking material as Specified - void pointed with sealant as Approved and Specified - fire collar for uPVC pipe - void filled with mineral wool / sealant for G.I. sleeve	PLU1.M430 PLU1.W410	10	WS or above
10	Cleaning of Water Tank / Pipeline - clean & sterilize as Specified - arrange WSD for sampling & testing	PLU1.W910 PLU1.W920 PLU1.W930 PLU1.W940 PLU1.W950	100	WS or above

PASS

**Architectural Works (INTERIM) Assessment
Score Sheet**



Architectural Works (Interim) Assessment - Score Sheet

Contract Title : _____ (_____)

Assessment Date: _____

AI-1 FLOOR (Functional Area / Common Area)

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
1.1 Grano. / Terrazzo Cement Sand Screed			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												
2.	Evenness	● Laid evenly (MPD: 3mm/1.2m)																												
3.	Level	● Laid to level (MPD: 3mm/1.2m)																												
4.	Fall	● Laid to specified direction of fall																												

Sub-Factor / item		Standard / Remark	Block / Zone : _____ Floor : _____																											
1.1 Grano. / Terrazzo			Location / Flat : _____																											
Cement Sand			Spot: 5				Spot: 6				Spot: 7				Spot: 8															
Screed			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												
2.	Evenness	● Laid evenly (MPD: 3mm/1.2m)																												
3.	Level	● Laid to level (MPD: 3mm/1.2m)																												
4.	Fall	● Laid to specified direction of fall																												
													Collected Sum :																	

Sub-Factor / item		Standard / Remark	Block / Zone :																Floor :																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
1.2 Screeding / Monolithic Screed			Location / Flat :																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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Sub-Factor / item		Standard / Remark	Block / Zone :												Floor :																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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Total No. of page(s)
(Including this page): _____

Architect : _____
Name / Post _____ Signature _____ Date _____

Main Block : _____

Project Clerk of Works : _____
Name / Post _____ Signature _____ Date _____

Back-up Block : _____

Contractor's Representative : _____
Name / Post _____ Signature _____ Date _____

PAT :
A/PAT
+ ACW/PAT _____
+ ACW/PAT _____
+ _____
+ _____



Architectural Works (Interim) Assessment - Score Sheet

AI-1 FLOOR (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone : Floor :																											
1.3 Backing Screed			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
			1. Soundness		● No hollow spot (For whole assessment spot)																									

Sub-Factor / item		Standard / Remark	Block / Zone : Floor :																												
			Location / Flat :																												
			Spot: 5							Spot: 6							Spot: 7							Spot: 8							
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	
1.	Soundness	● No hollow spot (For whole assessment spot)																													
																				A*		A		B		C		D		E	
																				Collected Sum :											

Sub-Factor / item		Standard / Remark	Block / Zone : Floor :																											
1.4 Floor / Skirting Tiles			Location / Flat :																											
			Spot: 1						Spot: 2						Spot: 3						Spot: 4									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Joint Alignment	● Properly aligned (MPD: 1mm, 2mm)																												
2.	Joint Width	● Consistent joint width (MPD: 1mm, 1.5mm, 2mm)																												
3.	Soundness	● Checking of loose / missing tile																												
4.	Evenness	● Laid evenly (MPD: 3mm/1.2m)																												
5.	Level	● Laid to level (MPD: 3mm/1.2m). For levelled surface																												
6.	Fall	● Laid to specified direction of fall																												
7.	Stepped Joint	● Level with adjacent tiles (MPD: 1.25mm)																												
8.	Dressing/Cutting	● Neatly cut & properly dressed around pipes & fittings																												
9.	Finish	● Free from chips and cracks																												

Sub-Factor / item		Standard / Remark	Block / Zone : Floor :																											
			Location / Flat :																											
			Spot: 5							Spot: 6							Spot: 7							Spot: 8						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Joint Alignment	● Properly aligned (MPD: 1mm, 2mm)																												
2.	Joint Width	● Consistent joint width (MPD: 1mm, 1.5mm, 2mm)																												
3.	Soundness	● Checking of loose / missing tile																												
4.	Evenness	● Laid evenly (MPD: 3mm/1.2m)																												
5.	Level	● Laid to level (MPD: 3mm/1.2m). For levelled surface																												
6.	Fall	● Laid to specified direction of fall																												
7.	Stepped Joint	● Level with adjacent tiles (MPD: 1.25mm)																												
8.	Dressing/Cutting	● Neatly cut & properly dressed around pipes & fittings																												
9.	Finish	● Free from chips and cracks																												
																	Collected Sum :							A*	A	B	C	D	E	

Signature of : _____ Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-2 Internal Wall Finishes

Sub-Factor / item		Standard / Remark	Block / Zone :												Floor :														
2.1 Brickwork & Blockwork			Location / Flat :																										
			Spot: 1						Spot: 2						Spot: 3						Spot: 4								
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Lintol	● (i) Embedded length (ii) Constructed to drawing/spec.																											
2.	Evenness	● Laid evenly (MPD: 6mm / 1.2m)																											
3.	Plumb	● Laid vertically (MPD: 6mm / 1.2m)																											
4.	Joint Width	● Joint width to be 10mm (MPD: ±6mm)																											
5.	Joint Mortar	● Recess or projection ≤6mm																											
6.	Finish	● No broken, chips or cracked brick / block																											

Sub-Factor / item		Standard / Remark	Block / Zone :												Floor :													
2.1 Brickwork & Blockwork			Location / Flat :																									
			Spot: 5						Spot: 6						Spot: 7						Spot: 8							
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D
1.	Lintol	● (i) Embedded length (ii) Constructed to drawing/spec.																										
2.	Evenness	● Laid evenly (MPD: 6mm / 1.2m)																										
3.	Plumb	● Laid vertically (MPD: 6mm / 1.2m)																										
4.	Joint Width	● Joint width to be 10mm (MPD: ±6mm)																										
5.	Joint Mortar	● Recess or projection ≤6mm																										
6.	Finish	● No broken, chips or cracked brick / block																										
															Collected Sum :													

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
2.2 Panel Wall Partitions : Installation			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1. Fixing	● Securely fixed in position																													
2. Chases / Recesses	● Cut / formed according to approved shop drawings																													
3. Reinforcement Tapes	● No peeling off, fish-mouth, detaching etc																													
4. Grouting	● Fully grouted & no hole, no crack etc																													
5. Sealant	● No gap, no hole, detached sealant etc																													
6. Moisture Sealer	● Fully applied to surfaces facing interior of kit. & bathroom																													
7. Evenness	● Installed evenly (MPD: 3mm / 1.2m)																													
8. Plumb	● Installed vertically (MPD: 3mm / 1.2m)																													
9. Joint	● Close joint between conc. wall & panel wall (MPD: +15mm)																													
10. Finish	● Free from defects including improper or untidy patch up																													
11. Stepped Joint	● No stepped joint (MPD: 1.25mm)																													

Sub-Factor / item		Standard / Remark	Block / Zone : Floor :																										
2.2 Panel Wall Partitions : Installation			Location / Flat :																										
			Spot: 5						Spot: 6						Spot: 7						Spot: 8								
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1. Fixing	● Securely fixed in position																												
2. Chases / Recesses	● Cut / formed according to approved shop drawings																												
3. Reinforcement Tapes	● No peeling off, fish-mouth, detaching etc																												
4. Grouting	● Fully grouted & no hole, no crack etc																												
5. Sealant	● No gap, no hole, detached sealant etc																												
6. Moisture Sealer	● Fully applied to surfaces facing interior of kit. & bathroom																												
7. Evenness	● Panel surface are even (MPD: 3mm / 1.2m)																												
8. Plumb	● Panels are installed vertically (MPD: 3mm / 1.2m)																												
9. Joint	● Close joint between conc. wall & panel wall (MPD: +15mm)																												
10. Finish	● Free from defects including improper or untidy patch up																												
11. Stepped Joint	● No stepped joint (MPD: 1.25mm)																												
																						Collected Sum :							

Signature of : _____ Architect

PCOW

Contractor's Representative



AI-2 Internal Wall Finishes (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone :																Floor :																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
			Location / Flat :																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
			Spot: 5								Spot: 6								Spot: 7								Spot: 8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
1.	Coverage	● (i)Uncovered area<0.01m ² (ii)Spacing ½ strokes <50mm																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												</

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Architectural Works (Interim) Assessment - Score Sheet

AI-2 Internal Wall Finishes (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
2.6 Cement Rendering for Paint Finish			Location / Flat :																											
			Spot: 1						Spot: 2						Spot: 3						Spot: 4									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												
2.	Evenness	● Laid evenly (MPD: 3mm /1.2m)																												
3.	Plumb	● Laid vertically (MPD: 3mm /1.2m)																												
4.	Int. / Ext. Corners	● Corners are square (MPD: 1.5mm / 250mm)																												
5.	Finish	● Free from cracks and/or other defects																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
2.6 Cement Rendering for Paint Finish			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												
2.	Evenness	● Laid evenly (MPD: 3mm /1.2m)																												
3.	Plumb	● Laid vertically (MPD: 3mm /1.2m)																												
4.	Int. / Ext. Corners	● Corners are square (MPD: 1.5mm / 250mm)																												
5.	Finish	● Free from cracks and/or other defects																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
2.7 Cement Rendering for Tile Finish			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												
2.	Evenness	● MPD: 3mm/1.2m for Mosaic; 6mm/1.2m for glazed tile																												
3.	Plumb	● MPD: 3mm/1.2m for Mosaic; 6mm/1.2m for glazed tile																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												
2.	Evenness	● MPD: 3mm/1.2m for Mosaic; 6mm/1.2m for glazed tile																												
3.	Plumb	● MPD: 3mm/1.2m for Mosaic; 6mm/1.2m for glazed tile																												
																	Collected Sum :													

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
2.8 Lime Plaster on Solid Background			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												
2.	Evenness	● Laid evenly (MPD: 3mm / 1.2m)																												
3.	Plumb	● Laid vertically (MPD: 3mm / 1.2m)																												
4.	Finish	● Free from cracks and/or other defects																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
2.8 Lime Plaster on Solid Background			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												
2.	Evenness	● Laid evenly (MPD: 3mm / 1.2m)																												
3.	Plumb	● Laid vertically (MPD: 3mm / 1.2m)																												
4.	Finish	● Free from cracks and/or other defects																												

Signature of : _____ Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-2 Internal Wall Finishes (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
2.9 Wall Tiles			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Joint Width	● Consistent joint width (MPD: 1mm, 1.5mm & 2mm)																												
2.	Joint Alignment	● Properly aligned (MPD: 1mm, 2mm)																												
3.	Grouting	● (i) Full, even, no void, no blisters (ii) Neat																												
4.	Dressing	● Neatly cut & dressed around pipes & openings etc																												
5.	Soundness	● No loose / missing tile																												
6.	Evenness	● Laid evenly (MPD: 3mm / 1.2m)																												
7.	Plumb	● Laid vertically (MPD: 3mm / 1.2m)																												
8.	Finish	● Free from chip, crack and / or other defects																												
9.	Stepped Joint	● Level with adjacent tiles (MPD: 1.25mm)																												
10.	Tile Coverage	● Fully covered w/o gap exceeding 10mm																												
11.	Int. / Ext. Corners	● Corners are square (MPD: 1.5mm / 250mm)																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
2.9 Wall Tiles			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Joint Width	● Consistent joint width (MPD: 1mm, 1.5mm & 2mm)																												
2.	Joint Alignment	● Properly aligned (MPD: 1mm, 2mm)																												
3.	Grouting	● (i) Full, even, no void, no blisters (ii) Neat																												
4.	Dressing	● Neatly cut & dressed around pipes & openings etc																												
5.	Soundness	● No loose / missing tile																												
6.	Evenness	● Laid evenly (MPD: 3mm / 1.2m)																												
7.	Plumb	● Laid vertically (MPD: 3mm / 1.2m)																												
8.	Finish	● Free from chip, crack and / or other defects																												
9.	Stepped Joint	● Level with adjacent tiles (MPD: 1.25mm)																												
10.	Tile Coverage	● Fully covered w/o gap exceeding 10mm																												
11.	Int. / Ext. Corners	● Corners are square (MPD: 1.5mm / 250mm)																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
2.9 Wall Tiles			Location / Flat :																											
			Spot: 9						Spot: 10						Spot: 11						Spot: 12									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Joint Width	● Consistent joint width (MPD: 1mm, 1.5mm & 2mm)																												
2.	Joint Alignment	● Properly aligned (MPD: 1mm, 2mm)																												
3.	Grouting	● (i) Full, even, no void, no blisters (ii) Neat																												
4.	Dressing	● Neatly cut & dressed around pipes & openings etc																												
5.	Soundness	● No loose / missing tile																												
6.	Evenness	● Laid evenly (MPD: 3mm / 1.2m)																												
7.	Plumb	● Laid vertically (MPD: 3mm / 1.2m)																												
8.	Finish	● Free from chip, crack and / or other defects																												
9.	Stepped Joint	● Level with adjacent tiles (MPD: 1.25mm)																												
10.	Tile Coverage	● Fully covered w/o gap exceeding 10mm																												
11.	Int. / Ext. Corners	● Corners are square (MPD: 1.5mm / 250mm)																												

	A*	A	B	C	D	E
Collected Sum :						

Signature of : _____ Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-2 Internal Wall Finishes (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
2.10 Mosaic Tiles			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Joint Alignment	● Properly aligned (MPD: 1mm)																												
2.	Dressing	● Neatly cut & dressed around pipe etc (gaps<10mm)																												
3.	Soundness	● Checking for loose/ missing tiles																												
4.	Evenness	● Laid evenly (MPD: 3mm / 1.2m)																												
5.	Plumb	● Laid vertically (MPD: 3mm / 1.2m)																												
6.	Finish	● Free from chip, crack and / or other defects																												
7.	Stepped Joint	● Level with adjacent tile (MPD: 1.25mm)																												
8.	Tile Coverage	● Fully covered w/o gap exceeding 10mm																												
9.	Grouting	● Full, even, no void, no blisters																												
10.	Int. / Ext. Corners	● Corners are square (MPD: 1.5mm / 250mm)																												

Sub-Factor / item 2.10 Mosaic Tiles		Standard / Remark	Block / Zone :												Floor :													
			Location / Flat :																									
			Spot: 5						Spot: 6						Spot: 7						Spot: 8							
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D
1.	Joint Alignment	● Properly aligned (MPD: 1mm)																										
2.	Dressing	● Neatly cut & dressed around pipe etc (gaps<10mm)																										
3.	Soundness	● Checking for loose/ missing tiles																										
4.	Evenness	● Laid evenly (MPD: 3mm / 1.2m)																										
5.	Plumb	● Laid vertically (MPD: 3mm / 1.2m)																										
6.	Finish	● Free from chip, crack and / or other defects																										
7.	Stepped Joint	● Level with adjacent tile (MPD: 1.25mm)																										
8.	Tile Coverage	● Fully covered w/o gap exceeding 10mm																										
9.	Grouting	● Full, even, no void, no blisters																										
10.	Int. / Ext. Corners	● Corners are square (MPD: 1.5mm / 250mm)																										

Sub-Factor / item		Standard / Remark	Block / Zone : Floor :																										
2.10 Mosaic Tiles			Location / Flat :																										
			Spot: 9						Spot: 10						Spot: 11						Spot: 12								
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Joint Alignment	● Properly aligned (MPD: 1mm)																											
2.	Dressing	● Neatly cut & dressed around pipe etc (gaps<10mm)																											
3.	Soundness	● Checking for loose/ missing tiles																											
4.	Evenness	● Laid evenly (MPD: 3mm / 1.2m)																											
5.	Plumb	● Laid vertically (MPD: 3mm / 1.2m)																											
6.	Finish	● Free from chip, crack and / or other defects																											
7.	Stepped Joint ▶	● Level with adjacent tile (MPD: 1.25mm)																											
8.	Tile Coverage	● Fully covered w/o gap exceeding 10mm																											
9.	Grouting	● Full, even, no void, no blisters																											
10.	Int. / Ext. Corners	● Corners are square (MPD: 1.5mm / 250mm)																											

	A*	A	B	C	D	E
Collected Sum :						

Signature of : _____ Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-2 Internal Wall Finishes (Cont'd)

Sub-Factor / item		Block / Zone :		Floor :	
2.11 Stone Tiles		Standard / Remark		Location / Flat :	
		Spot: 1		Spot: 2	
		Spot: 3		Spot: 4	
		A*	A	B	C
		D	E	N	
1. Joint Alignment	● Properly aligned (MPD: 1mm, 2mm)				
2. Sealant	● Applied as specified				
3. Defects/Finish	● Free from chipping, crack, dent, stain & damage				
4. Fixing	● Securely assembled as approved				
5. Evenness	● Articles are even (MPD: 3mm / 1.2m)				
6. Plumb	● Articles are vertical (MPD: 3mm / 1.2m)				

Sub-Factor / item		Block / Zone :		Floor :	
2.11 Stone Tiles		Standard / Remark		Location / Flat :	
		Spot: 5		Spot: 6	
		Spot: 7		Spot: 8	
		A*	A	B	C
		D	E	N	
1. Joint Alignment	● Properly aligned (MPD: 1mm, 2mm)				
2. Sealant	● Applied as specified				
3. Defects/Finish	● Free from chipping, crack, dent, stain & damage				
4. Fixing	● Securely assembled as approved				
5. Evenness	● Articles are even (MPD: 3mm / 1.2m)				
6. Plumb	● Articles are vertical (MPD: 3mm / 1.2m)				
				A*	A
				B	C
				D	E
				Collected Sum :	

Sub-Factor / item		Block / Zone :		Floor :	
2.12 Undercoated Surfaces for Skim Coat		Standard / Remark		Location / Flat :	
		Spot: 1		Spot: 2	
		Spot: 3		Spot: 4	
		A*	A	B	C
		D	E	N	
1. Surface Condition	● (i)Even (ii)Step joint(≤2mm)/Broken edge(≤50¢ coin)				

Sub-Factor / item		Block / Zone :		Floor :	
2.12 Undercoated Surfaces for Skim Coat		Standard / Remark		Location / Flat :	
		Spot: 5		Spot: 6	
		Spot: 7		Spot: 8	
		A*	A	B	C
		D	E	N	
1. Surface Condition	● (i)Even (ii)Step joint(≤2mm)/Broken edge(≤50¢ coin)				
				A*	A
				B	C
				D	E
				Collected Sum :	

Sub-Factor / item		Block / Zone :		Floor :	
2.13 Skim Coat		Standard / Remark		Location / Flat :	
		Spot: 1		Spot: 2	
		Spot: 3		Spot: 4	
		A*	A	B	C
		D	E	N	
1. Evenness & Smoothness	● (i) Even (MPD: 3mm/1.2m) (ii) Smooth				
2. Surface Irregularities	● No (i) Blowholes/Blisters (ii) Scratch mark (iii) Blemishes				
3. Cracks or Broken Edges	● No (i) Step joints (ii) cracks (iii) Chipped/Broken edges				

Sub-Factor / item		Block / Zone :		Floor :	
2.13 Skim Coat		Standard / Remark		Location / Flat :	
		Spot: 5		Spot: 6	
		Spot: 7		Spot: 8	
		A*	A	B	C
		D	E	N	
1. Evenness & Smoothness	● (i) Even (MPD: 3mm/1.2m) (ii) Smooth				
2. Surface Irregularities	● No (i) Blowholes/Blisters (ii) Scratch mark (iii) Blemishes				
3. Cracks or Broken Edges	● No (i) Step joints (ii) cracks (iii) Chipped/Broken edges				
				A*	A
				B	C
				D	E
				Collected Sum :	

Signature of : _____ Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-2 Internal Wall Finishes (Cont'd)

Sub-Factor / item	Standard / Remark	Block / Zone :														Floor :																	
2.14 Panel Wall Partitions (Material)		Location / Flat :																															
		Spot: 1						Spot: 2						Spot: 3						Spot: 4													
		A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N				
1. Package	● (i) Properly packed & protected according to manual																																
2. Protection	● (i)No damage (ii)Protection to conduits / switch boxes																																
3. Product Accessories	● (i)Fixing & tape (ii)Sealant & sealer (iii)Additive/admixture																																
4. Accessories Protection	● Properly stored under weather protection																																
5. Surface Quality	● (i) No crack, hole, loose powder (ii) No Chipped edge																																
6. Dimension	● (i)Approved (ii)Flatness: ±1.5mm/1.2m																																
7. Cover to Reinforcement	● Adequate cover to reinforcement to approved drawings																																
8. Storage	● (i)Level, hard surface & protected (ii)H<2m & >3 layers																																
9. Open-up Inspection	● Constituent, surface quality,dimensions as approved																																
10. Surveillance Test	● one or more failure item(s) (Record check)																																

Sub-Factor / item 2.14 Panel Wall Partitions (Material)		Standard / Remark	Block / Zone :														Floor :													
			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Package	● (i) Properly packed & protected according to manual																												
2.	Protection	● (i)No damage (ii)Protection to conduits / switch boxes																												
3.	Product Accessories	● (i)Fixing & tape (ii)Sealant & sealer (iii)Additive/admixture																												
4.	Accessories Protection	● Properly stored under weather protection																												
5.	Surface Quality	● (i) No crack, hole, loose powder (ii) No Chipped edge																												
6.	Dimension	● (i)Approved (ii)Flatness: ±1.5mm/1.2m																												
7.	Cover to Reinforcement	● Adequate cover to reinforcement to approved drawings																												
8.	Storage	● (i)Level, hard surface & protected (ii)H<2m & >3 layers																												
9.	Open-up Inspection	● Constituent, surface quality,dimensions as approved																												
10.	Surveillance Test	● one or more failure item(s) (Record check)																												
																	Collected Sum :													

Signature of : _____
Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-2 Internal Wall Finishes (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone :												Floor :														
2.15 Emulsion Paint - Internal / External (Material)			Location / Flat :																										
			Spot: 1						Spot: 2						Spot: 3						Spot: 4								
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Package	● (i)Brand (ii) Manufacturer's/Supplier's name & address																											
2.	Identification	● (i) Batch No. (ii)Expiry date (iii)Capacity (iv)Product info.																											
3.	Product	● (i) No contamination, dry out etc (ii) No expired																											
4.	Storage	● Stored in cool, well ventilated , covered place																											
5.	Surveillance Lab.Test	● One or more failure item(s) (Record check)																											

Sub-Factor / item		Standard / Remark	Block / Zone :												Floor :														
2.15 Emulsion Paint - Internal / External (Material)			Location / Flat :																										
			Spot: 5						Spot: 6						Spot: 7						Spot: 8								
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1. Package	● (i)Brand (ii) Manufacturer's/Supplier's name & address																												
2. Identification	● (i) Batch No. (ii)Expiry date (iii)Capacity (iv)Product info.																												
3. Product	● (i) No contamination, dry out etc (ii) No expired																												
4. Storage	● Stored in cool, well ventilated , covered place																												
5. Surveillance Lab.Test	● One or more failure item(s) (Record check)																												
															A* A B C D E														
															Collected Sum :														

Sub-Factor / item		Standard / Remark	Block / Zone :												Floor :														
2.16 Tile Adhesive & Grouting (Material)			Location / Flat :																										
			Spot: 1						Spot: 2						Spot: 3						Spot: 4								
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Package	● (i)Brand, address, name, etc(ii)Min 3 plys packing paper																											
2.	Identification	● (i)Batch No, pot life, open time (ii)Procedures, application																											
3.	Manu.Date & Shelf Life	● Manufacturing date & shelf life shown																											
4.	Product	● (i)Consistent colour of powder (ii)No air set lump found																											
5.	Storage	● No overload stacking or storage in vicinity of water																											
6.	Surveillance Lab.Test	● One or more failure item(s) (Record check)																											

Sub-Factor / item		Standard	Block / Zone :												Floor :														
2.16 Tile Adhesive & Grouting (Material)			Location / Flat :																										
			Spot: 5						Spot: 6						Spot: 7						Spot: 8								
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1. Package	● (i)Brand, address, name, etc(ii)Min 3 plys packing paper																												
2. Identification	● (i)Batch No, pot life, open time (ii)Procedures, application																												
3. Manu.Date & Shelf Life	● Manufacturing date & shelf life shown																												
4. Product	● (i)Consistent colour of powder (ii)No air set lump found																												
5. Storage	● No overload stacking or storage in vicinity of water																												
6. Surveillance Lab.Test	● One or more failure item(s) (Record check)																												
															A* A B C D E														
															Collected Sum :														

Signature of : _____ Architect

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Architectural Works (Interim) Assessment - Score Sheet

AI-2 Internal Wall Finishes (Cont'd)

Sub-Factor / item	Standard / Remark	Block / Zone :														Floor :													
2.17 Panel Wall Partitions (Material-BS Items)		Location / Flat :																											
		Spot: 1						Spot: 2						Spot: 3						Spot: 4									
		A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1. Dimension	● Conc. Cover to Conduit (Min. 30mm)																												
2. Open-up Inspection	● (i) Marks & brand name (ii) Tight joint w/ glue																												
3. Conduit Box	● (i) Setting-out, No damage (ii) Marks & brand name																												
4. Conduit System	● (i) Draw wire provided, ends plugged (ii) Size																												
5. Cert. for System	● (i) Form WR1(A) (ii) Test Cert. for conduits & fittings etc																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
2.17 Panel Wall			Location / Flat :																											
Partitions			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
(Material-BS Items)			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Dimension	● Conc. Cover to Conduit (Min. 30mm)																												
2.	Open-up Inspection	● (i) Marks & brand name (ii) Tight joint w/ glue																												
3.	Conduit Box	● (i) Setting-out, No damage (ii) Marks & brand name																												
4.	Conduit System	● (i) Draw wire provided, ends plugged (ii) Size																												
5.	Cert. for System	● (i) Form WR1(A) (ii) Test Cert. for conduits & fittings etc																												

		A*	A	B	C	D	E
Collected Sum :							

Signature of : _____
BSE

BSI

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-3 External Wall Finishes

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
3.1 Spatterdash			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Coverage	● (i)Uncovered area<0.01m ² (ii)Spacing 1/2 strokes<50mm																												
2.	Strength	● Not easily be removed																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
3.1 Spatterdash			Location / Flat :																											
			Spot: 5							Spot: 6							Spot: 7							Spot: 8						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Coverage	● (i)Uncovered area<0.01m ² (ii)Spacing 1/2 strokes<50mm																												
2.	Strength	● Not easily be removed																												
																	Collected Sum :													

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
3.2 Cement Rendering for Paint Finish			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												
2.	Evenness	● Laid evenly (MPD: 3m/1.2m)																												
3.	Plumb	● Laid vertically (MPD: 3mm/1.2m)																												
4.	Finish	● Free from cracks and/or other defects																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
3.2 Cement Rendering for Paint Finish			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												
2.	Evenness	● Laid evenly (MPD: 3m/1.2m)																												
3.	Plumb	● Laid vertically (MPD: 3mm/1.2m)																												
4.	Finish	● Free from cracks and/or other defects																												
																	Collected Sum :													

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
3.3 Plasterwork - Cement Rendering for Tile Finish			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												

Sub-Factor / item		Standard / Remark	Block / Zone : _____ Floor : _____																											
3.3 Cement Rendering for Tile Finish			Location / Flat : _____																											
			Spot: _____ 5							Spot: _____ 6							Spot: _____ 7							Spot: _____ 8						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												
																	Collected Sum : _____													

Signature of : _____ Architect

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Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-3 External Wall Finishes (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
3.4 Stone Tiles / Slates / Marble / Granite Slabs			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Joint Alignment	● Joints are properly aligned (MPD: 1mm, 2mm)																												
2.	Sealant	● Sealant are properly applied as specified																												
3.	Defects / Finish	● Free from chip, crack, dent, stain & damage																												
4.	Fixing	● Securely assembled as approved																												
5.	Evenness	● Articles are even (MPD : 3mm /1.2m)																												
6.	Plumb	● Articles are vertical (MPD : 3mm /1.2m)																												

Sub-Factor / item		Standard / Remark	Block / Zone : Floor :																											
3.4 Stone Tiles / Slates / Marble / Granite Slabs			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Joint Alignment	● Joints are properly aligned (MPD: 1mm, 2mm)																												
2.	Sealant	● Sealant are properly applied as specified																												
3.	Defects / Finish	● Free from chip, crack, dent, stain & damage																												
4.	Fixing	● Securely assembled as approved																												
5.	Evenness	● Articles are even (MPD : 3mm /1.2m)																												
6.	Plumb	● Articles are vertical (MPD : 3mm /1.2m)																												



Architectural Works (Interim) Assessment - Score Sheet

AI-3 External Wall Finishes (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
3.6 Multi-layer Acrylic Paint - w/ & w/o texture (Material)			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Package	● (i)Brand (ii) Manufacturer's/Supplier's name & address																												
2.	Identification	● (i) Batch No. (ii)Expiry date (iii)Capacity (iv)Product info.																												
3.	Product	● (i) No contamination, dry out etc (ii) No expired																												
4.	storage	● Stored in cool, well ventilated , covered place																												
5.	Surv. Lab. Test	● One or more failure item(s) (Record check)																												

Sub-Factor / item	Standard / Remark	Block / Zone :														Floor :													
		Location / Flat :																											
		Spot: 5						Spot: 6						Spot: 7						Spot: 8									
		A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1. Package	● (i)Brand (ii) Manufacturer's/Supplier's name & address																												
2. Identification	● (i) Batch No. (ii)Expiry date (iii)Capacity (iv)Product info.																												
3. Product	● (i) No contamination, dry out etc (ii) No expired																												
4. storage	● Stored in cool, well ventilated , covered place																												
5. Surv. Lab. Test	● One or more failure item(s) (Record check)																												

Collected Sum :		A*	A	B	C	D	E

Signature of : _____
Architect

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Architectural Works (Interim) Assessment - Score Sheet

AI-4 Ceiling

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
4.1 Plasterwork - Cement Rendering for Paint Finish			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												
2.	Finish	● Free from chips and /or other defects																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
4.1 Plasterwork - Cement Rendering for Paint Finish			Location / Flat :																											
			Spot: 5							Spot: 6							Spot: 7							Spot: 8						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness	● No hollow spot (For whole assessment spot)																												
2.	Finish	● Free from chips and /or other defects																												
																	Collected Sum :													

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
4.2 Undercoated Surfaces for Skim Coat			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Surface Condition	● (i)Even (ii)Step joint(≤2mm)/Broken edge(≤50 ¢ coin)																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
4.2 Undercoated Surfaces for Skim Coat			Location / Flat :																											
			Spot: 5							Spot: 6							Spot: 7							Spot: 8						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Surface Condition	● (i)Even (ii)Step joint(≤2mm)/Broken edge(≤50 ¢ coin)																												
																	Collected Sum :													

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
4.3 Skim Coat			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Evenness & Smoothness	● (i) Even (MPD: 3mm/1.2m) (ii) Smooth																												
2.	Surface Irregularities	● No (i) Blowholes/Blisters (ii) Scratch mark (iii) Blemishes																												
3.	Cracks	● No (i) Step joints (ii) cracks																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
4.3 Skim Coat			Location / Flat :																											
			Spot: 5							Spot: 6							Spot: 7							Spot: 8						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Evenness & Smoothness	● (i) Even (MPD: 3mm/1.2m) (ii) Smooth																												
2.	Surface Irregularities	● No (i) Blowholes/Blisters (ii) Scratch mark (iii) Blemishes																												
3.	Cracks	● No (i) Step joints (ii) cracks																												
																	</													

Signature of : _____ Architect

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Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-5 Window

Sub-Factor / item	Standard / Remark	Block / Zone :														Floor :													
5.1 Metalwork - Window Installation (After Grouting)		Location / Flat :																											
		Spot: 1							Spot: 2							Spot: 3							Spot: 4						
		A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1. Gap Grouting	● Evenly, neatly grouted, free from crack and void																												
2. Verticality	● Frames installed vertically (MPD: 3mm/1.2m)																												
3. Protection	● Protected surface w/ strippable coating or masking tape																												
4. Sealant	● Properly and neatly applied, leaving no gaps and smears																												
5 Installation	● (I) Ironmongery firmly fixed (ii) S.S. hinge free from rust																												

Sub-Factor / item	Standard / Remark	Block / Zone :														Floor :													
5.1 Metalwork - Window Installation (After Grouting)		Location / Flat :																											
		Spot: 5							Spot: 6							Spot: 7							Spot: 8						
		A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1. Gap Grouting	● Evenly, neatly grouted, free from crack and void																												
2. Verticality	● Frames installed vertically (MPD: 3mm/1.2m)																												
3. Protection	● Protected surface w/ strippable coating or masking tape																												
4. Sealant	● Properly and neatly applied, leaving no gaps and smears																												
5. Installation	● (I) Ironmongery firmly fixed (ii) S.S. hinge free from rust																												

Collected Sum :		A*	A	B	C	D	E

Signature of : _____
Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-5 Window (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
5.2 Window Opening			Location / Flat :																											
			Spot: 1						Spot: 2						Spot: 3						Spot: 4									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Height	● MPD: ±15mm for ≤ 500mm, ±20mm for >500mm																												
2.	Width	● MPD: ±15mm for ≤ 500mm, ±20mm for >500mm																												
3.	Structural Pocket	● Correct size, type & spacing etc (MPD: +20mm/specified)																												
4.	Plumb	● Jams to be vertical (MPD: 6mm / 1.2m)																												
5.	Level	● Sill to be horizontal (MPD: 6mm / 1.2m)																												
6.	Corner	● Corner to be square (MPD: 5mm in 250mm)																												
7.	Defects	● (i) 1chip ≤50 ¢ coin (ii) Box out for lugs (iii)No honeycomb/cracks																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :														
5.2 Window Opening			Location / Flat :																												
			Spot: 5							Spot: 6							Spot: 7							Spot: 8							
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	
1.	Height	● MPD: ±15mm for ≤ 500mm, ±20mm for >500mm																													
2.	Width	● MPD: ±15mm for ≤ 500mm, ±20mm for >500mm																													
3.	Structural Pocket	● Correct size, type & spacing etc (MPD: +20mm/specified)																													
4.	Plumb	● Jams to be vertical (MPD: 6mm / 1.2m)																													
5.	Level	● Sill to be horizontal (MPD: 6mm / 1.2m)																													
6.	Corner	● Corner to be square (MPD: 5mm in 250mm)																													
7.	Defects	● (i) 1chip ≤ 50 ¢ coin (ii) Box out for lugs (iii) No honeycomb/cracks																													
																			A*	A	B	C	D	E							
																			Collected Sum :												

Signature of : _____
Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-5 Window (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
			Location / Flat :																											
			Spot: 1						Spot: 2						Spot: 3						Spot: 4									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Package	● (i) Masking tape etc (ii) Lock & glazing bead wedged																												
2.	Protection	● Surface in contact w/ conc. painted w/ bituminous paint																												
3.	Surface Quality	● No damages and obvious scratch																												
4.	Friction Pivot /Stay	● (i)GMS flat installed (ii)Size of hinge (iii)Brand of hinge																												
5.	Fixing of Hinge	● No. of stainless steel screws (min 3 nos)																												
6.	Operation	● (i)Top hung<90°, ≥ 70mm (ii)Side hung<90°, ≥ 100mm																												
7.	Weather Strip	● (i)Fixed in dovetail groove, joints welded (ii)0.5mm filler																												
8.	Window Dimensions	● (i) Joints (ii) Diagonal																												
9.	Member Dimension	● (i)38mm Sect.(ii)Stru. wall(iii)Non-stru. wall(iv)Glaz. bead																												
10.	Step Joint for Flatness	● Tolerance : +0.5mm																												
11.	Anodizing	● General th. : AA25 & local spot : ≥ AA20																												
12.	GMS Stru. Rebar	● (i)Size & th. in accordance w/ drg.(ii)Existence by magnet																												
13.	Lock	● Die-cast zinc alloy w/o damage																												
14.	Fixing / Earthing Lug	● Made by galvanized steel plate																												
15.	Sealant	● Applied to all joints & screws/rivets																												
16.	Surv. Lab. Test	● One or more failure item(s) (Record check)																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Package	● (i) Masking tape etc (ii) Lock & glazing bead wedged																												
2.	Protection	● Surface in contact w/ conc. painted w/ bituminous paint																												
3.	Surface Quality	● No damages and obvious scratch																												
4.	Friction Pivot /Stay	● (i)GMS flat installed (ii)Size of hinge (iii)Brand of hinge																												
5.	Fixing of Hinge	● No. of stainless steel screws (min 3 nos)																												
6.	Operation	● (i)Top hung<90°, ≥ 70mm (ii)Side hung<90°, ≥ 100mm																												
7.	Weather Strip	● (i)Fixed in dovetail groove, joints welded (ii)0.5mm filler																												
8.	Window Dimensions	● (i) Joints (ii) Diagonal																												
9.	Member Dimension	● (i)38mm Sect.(ii)Stru. wall(iii)Non-stru. wall(iv)Glaz. bead																												
10.	Step Joint for Flatness	● Tolerance : +0.5mm																												
11.	Anodizing	● General th. : AA25 & local spot : ≥ AA20																												
12.	GMS Stru. Rebar	● (i)Size & th. in accordance w/ drg.(ii)Existence by magnet																												
13.	Lock	● Die-cast zinc alloy w/o damage																												
14.	Fixing / Earthing Lug	● Made by galvanized steel plate																												
15.	Sealant	● Applied to all joints & screws/rivets																												
16.	Surv. Lab. Test	● One or more failure item(s) (Record check)																												
																	Collected Sum :													

Signature of : _____ Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-6 Plumbing / Drainage

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
6.1 Plumbing - Above Ground (Fresh/Flush Water)			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Type & Size	● Type & size of pipes & brackets approved																												
2.	Pipe Brackets	● (i)Neat, correct centres (ii)Clearance 25mm (iii)Lined																												
3.	Pipe Sleeve	● (i)Correct projection (ii) Void caulked																												
4.	Soundness	● (i) No stain, paint & etc. (ii) Open end covered (iii) No rust																												
5.	Plumb	● Installed vertically (MPD: 3mm/1.2m)																												
6.	Level / Fall	● Installed horizontally(MPD:3mm/1.2m) or to direction of fall																												

Sub-Factor / item		Standard / Remark	Block / Zone :												Floor :															
6.1 Plumbing - Above Ground (Fresh/Flush Water)			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Type & Size	● Type & size of pipes & brackets approved																												
2.	Pipe Brackets	● (i)Neat, correct centres (ii)Clearance 25mm (iii)Lined																												
3.	Pipe Sleeve	● (i)Correct projection (ii) Void caulked																												
4.	Soundness	● (i) No stain, paint & etc. (ii) Open end covered (iii) No rust																												
5.	Plumb	● Installed vertically (MPD: 3mm/1.2m)																												
6.	Level / Fall	● Installed horizontally(MPD:3mm/1.2m) or to direction of fall																												
															Collected Sum :															

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
6.2 Drainage - Above Ground (Soil / Rain Water Pipes)			Location / Flat :																											
			Spot: 1						Spot: 2						Spot: 3						Spot: 4									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Type & Size	● Approved type & size of pipes and brackets																												
2.	Pipe Brackets	● (i)Neat, correct centres (ii)Clearance 25mm (iii)Lined																												
3.	Joints	● Approved jointing materials & jointing method																												
4.	Pipe Sleeve	● (i) Correct Projections (ii) Void caulked																												
5.	Outlet Grating / Trap	● Provided as specified																												
6.	Soundness	● (i) No stain, paint & etc. (ii) Open end covered (iii) No rust																												
7.	Level/Fall	● No back fall																												
8.	Plumb	● Installed vertically (MPD: 3mm/1.2m)																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
6.2 Drainage - Above Ground (Soil / Rain Water Pipes)			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1. Type & Size	● Approved type & size of pipes and brackets																													
2. Pipe Brackets	● (i)Neat, correct centres (ii)Clearance 25mm (iii)Lined																													
3. Joints	● Approved jointing materials & jointing method																													
4. Pipe Sleeve	● (i) Correct Projections (ii) Void caulked																													
5. Outlet Grating / Trap	● Provided as specified																													
6. Soundness	● (i) No stain, paint & etc. (ii) Open end covered (iii) No rust																													
7. Level/Fall	● No back fall																													
8. Plumb	● Installed vertically (MPD: 3mm/1.2m)																													

Signature of : _____ Architect

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Contractor's Representative



AI-6 Plumbing / Drainage (Cont'd)

[illegible]07.2011-6th Issue (10/2014) AWISS-20



Architectural Works (Interim) Assessment - Score Sheet

AI-7 Components

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
7.1 Carpentry /Joinery - Sub-frame/Architrave / Door Frame			Location / Flat :																											
			Spot: 1						Spot: 2						Spot: 3						Spot: 4									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Fixing	● Dowels, fixing cramps or fixing bolts properly fixed																												
2.	Wood Preservative	● Fully & properly applied																												
3.	Corner	● Frame squared (MPD: 1.5mm/250mm)																												
4.	Plumb	● Frame & sub-frame installed vertically (MPD: 3mm/1.2m)																												
5.	Finish	● Sanded down smooth & no defect																												

Sub-Factor / item		Standard / Remark	Block / Zone : Floor :																											
			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Fixing	● Dowels, fixing cramps or fixing bolts properly fixed																												
2.	Wood Preservative	● Fully & properly applied																												
3.	Corner	● Frame squared (MPD: 1.5mm/250mm)																												
4.	Plumb	● Frame & sub-frame installed vertically (MPD: 3mm/1.2m)																												
5.	Finish	● Sanded down smooth & no defect																												
																	Collected Sum :													

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
			Location / Flat :																											
			Spot: 1						Spot: 2						Spot: 3						Spot: 4									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Fixing	● (i)Function properly, joints are tight (ii)Screws tightly fitted																												
2.	Gap (Door/Frame)	● Side Gap (MPD: 3mm)																												
3.	Gap (Door/Floor)	● Bottom Gap (MPD: Fire Rated: ≤4mm, others: ≤10mm)																												
4.	Glazing Bead	● Fixed properly																												
5.	Finish	● Smooth & no defect																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Fixing	● (i)Function properly, joints are tight (ii)Screws tightly fitted																												
2.	Gap (Door/Frame)	● Side Gap (MPD: 3mm)																												
3.	Gap (Door/Floor)	● Bottom Gap (MPD: Fire Rated: ≤ 4mm, others: ≤ 10mm)																												
4.	Glazing Bead	● Fixed properly																												
5.	Finish	● Smooth & no defect																												
																	Collected Sum :													

Signature of : _____ Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-7 Components (Cont'd)

Sub-Factor / item		Block / Zone : Floor :	
7.3 Metalwork - Frame/Grille/Louver/ Railing/Cupboard/ Panel		Location / Flat :	
Standard / Remark		Spot: 1 Spot: 2 Spot: 3 Spot: 4	
		A* A B C D E N A* A B C D E N A* A B C D E N A* A B C D E N	
1. Fixing	● Securely assembled according to drawing		
2. Alignment	● Aligned vertically and horizontally (MPD: 3mm/1.2m)		
3. Welding	● Ground smooth , no flux & no slag		

Sub-Factor / item		Block / Zone : Floor :	
7.3 Metalwork - Frame/Grille/Louver/ Railing/Cupboard/ Panel		Location / Flat :	
Standard / Remark		Spot: 5 Spot: 6 Spot: 7 Spot: 8	
		A* A B C D E N A* A B C D E N A* A B C D E N A* A B C D E N	
1. Fixing	● Securely assembled according to drawing		
2. Alignment	● Aligned vertically and horizontally (MPD: 3mm/1.2m)		
3. Welding	● Ground smooth , no flux & no slag		

Sub-Factor / item		Block / Zone : Floor :	
7.3 Metalwork - Frame/Grille/Louver/ Railing/Cupboard/ Panel		Location / Flat :	
Standard / Remark		Spot: 9 Spot: 10 Spot: 11 Spot: 12	
		A* A B C D E N A* A B C D E N A* A B C D E N A* A B C D E N	
1. Fixing	● Securely assembled according to drawing		
2. Alignment	● Aligned vertically and horizontally (MPD: 3mm/1.2m)		
3. Welding	● Ground smooth , no flux & no slag		

Sub-Factor / item		Block / Zone : Floor :	
7.3 Metalwork - Frame/Grille/Louver/ Railing/Cupboard/ Panel		Location / Flat :	
Standard / Remark		Spot: 13 Spot: 14 Spot: 15 Spot: 16	
		A* A B C D E N A* A B C D E N A* A B C D E N A* A B C D E N	
1. Fixing	● Securely assembled according to drawing		
2. Alignment	● Aligned vertically and horizontally (MPD: 3mm/1.2m)		
3. Welding	● Ground smooth , no flux & no slag		

Sub-Factor / item		Block / Zone : Floor :	
7.3 Metalwork - Frame/Grille/Louver/ Railing/Cupboard/ Panel		Location / Flat :	
Standard / Remark		Spot: 17 Spot: 18 Spot: 19 Spot: 20	
		A* A B C D E N A* A B C D E N A* A B C D E N A* A B C D E N	
1. Fixing	● Securely assembled according to drawing		
2. Alignment	● Aligned vertically and horizontally (MPD: 3mm/1.2m)		
3. Welding	● Ground smooth , no flux & no slag		

Sub-Factor / item		Block / Zone : Floor :	
7.3 Metalwork - Frame/Grille/Louver/ Railing/Cupboard/ Panel		Location / Flat :	
Standard / Remark		Spot: 21 Spot: 22 Spot: 23 Spot: 24	
		A* A B C D E N A* A B C D E N A* A B C D E N A* A B C D E N	
1. Fixing	● Securely assembled according to drawing		
2. Alignment	● Aligned vertically and horizontally (MPD: 3mm/1.2m)		
3. Welding	● Ground smooth , no flux & no slag		

Collected Sum :		A* A B C D E

Signature of : _____ Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-7 Components (Cont'd)

Sub-Factor / item		Block / Zone : _____ Floor : _____																											
7.4 Metalwork-Roller Shutter/Metal Gateset/Metal Door		Location / Flat : _____																											
		Spot: 1							Spot: 2							Spot: 3							Spot: 4						
		A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Fixing	● (i)Securely assembled, joints are tight (ii)No dislodgment																											
2.	Alignment	● Aligned vertically and horizontally (MPD: 3mm/1.2m)																											
3.	Welding	● Ground smooth , no flux & no slag																											
4.	Corner	● Frame squared (MPD: 1.5mm/250mm)																											

Sub-Factor / item			Block / Zone :														Floor :															
7.4 Metalwork-Roller Shutter/Metal Gateset/Metal Door			Location / Flat :																													
			Spot: 5						Spot: 6						Spot: 7						Spot: 8											
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N		
1.	Fixing	● (i) Assembled securely, joint tightened (ii) No dislodgment																														
2.	Alignment	● Aligned vertically and horizontally (MPD: 3mm/1.2m)																														
3.	Welding	● Ground smooth , no flux & no slag																														
4.	Corner	● Frame squared (MPD: 1.5mm/250mm)																														



Architectural Works (Interim) Assessment - Score Sheet

AI-7 Components (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone :												Floor :														
7.6 Wooden Doorset - (Material)			Location / Flat :																										
			Spot: 1						Spot: 2						Spot: 3						Spot: 4								
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Package	● (i)Firmly protected (ii) Manufacturing date & Serial No.																											
2.	Material	● Frame, architrave, etc, comply with HA requirement																											
3.	Preservative	● Applied to unexposed surfaces of door frame																											
4.	Surface Quality	● No surface damage, defects & scratches																											
5.	Painting (1)	● (i)Top, knot, fill (ii)Painting defect (iii)Colour																											
6.	Painting (2)	● (i)Predrilled holes, etc (ii)Lacquer (iii)Final coat no defect																											
7.	Joint	● (i)Tightly fitted, V joint provided (ii)No step joint																											
8.	Timber	● (i)No fungus & insect infestation (ii)No checks, no split																											
9.	Ironmongery	● (i) Hinge size & th. (ii) Screw size																											
10.	Storage	● (i) Stacking ht. ≤ 1.6m (ii) Covered when at external																											
11.	Dimensions	● Accuracy & squareness (i)Door leaf (ii)Door Frame																											
12.	Evenness	● Permissible Deviation (i)50mm bridge (ii)200mm bridge																											
13.	Timb. Moisture Content	● 13% ~ 17% (±2%)																											
14.	Open-up Inspection	● Construction & material as approved (Record check)																											
15.	Surv. Lab. Test	● One or more failure item(s) (Record check)																											

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
7.6 Wooden Doorset - (Material)			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Package	● (i)Firmly protected (ii) Manufacturing date & Serial No.																												
2.	Material	● Frame, architrave, etc, comply with HA requirement																												
3.	Preservative	● Applied to unexposed surfaces of door frame																												
4.	Surface Quality	● No surface damage, defects & scratches																												
5.	Painting (1)	● (i)Top, knot, fill (ii)Painting defect (iii)Colour																												
6.	Painting (2)	● (i)Predrilled holes, etc (ii)Lacquer (iii)Final coat no defect																												
7.	Joint	● (i)Tightly fitted, V joint provided (ii)No step joint																												
8.	Timber	● (i)No fungus & insect infestation (ii)No checks, no split																												
9.	Ironmongery	● (i) Hinge size & th. (ii) Screw size																												
10.	Storage	● (i) Stacking ht. ≤1.6m (ii) Covered when at external																												
11.	Dimensions	● Accuracy & squareness (i)Door leaf (ii)Door Frame																												
12.	Evenness	● Permissible Deviation (i)50mm bridge (ii)200mm bridge																												
13.	Timb. Moisture Content	● 13% ~ 17% (±2%)																												
14.	Open-up Inspection	● Construction & material as approved (Record check)																												
15.	Surv. Lab. Test	● One or more failure item(s) (Record check)																												

	A*	A	B	C	D	E
Collected Sum :						

Sub-Factor / item		Standard / Remark	Block / Zone :																Floor :																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
7.7 Synthetic Paint - (Material)			Location / Flat :																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
			Spot: 1								Spot: 2								Spot: 3								Spot: 4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
1.	Package	● (i)Brand (ii) Manufacturer's/Supplier's name & address																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

Sub-Factor / item		Standard / Remark	Block / Zone :												Floor :														
7.7 Synthetic Paint - (Material)			Location / Flat :																										
			Spot: 5						Spot: 6						Spot: 7						Spot: 8								
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Package	● (i)Brand (ii) Manufacturer's/Supplier's name & address																											
2.	Identification	● (i) Batch No. (ii)Expiry date (iii)Capacity (iv)Product info.																											
3.	Product	● (i) No contamination, dry out etc (ii) No expired																											
4.	Storage	● Stored in cool, well ventilated , covered place																											
5.	Surveillance Lab.Test	● One or more failure item(s) (Record check)																											

	A*	A	B	C	D	E
Collected Sum :						

Signature of : _____
Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-8 Precast Components

Sub-Factor / item		Standard / Remark	Block / Zone :												Floor :														
8.1 Precast Facade			Location / Flat :																										
			Spot: 1						Spot: 2						Spot: 3						Spot: 4								
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Joint Grouting	● (i) Neat & full (ii) No stepped joint, crack & void																											
2.	Crack / Damage	● (i) Free from crack/chipping (ii) No broken edge etc																											
3.	Sealant	● Properly pointed, leaving no gap/smears.																											
4.	Erection	● Installed vertically (MPD: 6mm/element)																											
5.	Level	● Installed horizontally (MPD: 3mm/1.2m)																											

Sub-Factor / item			Standard / Remark	Block / Zone :												Floor :													
8.1 Precast Facade				Location / Flat :																									
				Spot: 5						Spot: 6						Spot: 7						Spot: 8							
				A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D
1.	Joint Grouting		● (i) Neat & full (ii) No stepped joint, crack & void																										
2.	Crack / Damage		● (i) Free from crack/chipping (ii) No broken edge etc																										
3.	Sealant		● Properly pointed, leaving no gap/smears.																										
4.	Erection		● Installed vertically (MPD: 6mm/element)																										
5.	Level		● Installed horizontally (MPD: 3mm/1.2m)																										
																						A*	A	B	C	D	E		
																						Collected Sum :							

Sub-Factor / item		Standard / Remark	Block / Zone :												Floor :													
			Location / Flat :																									
			Spot: 1						Spot: 2						Spot: 3						Spot: 4							
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D
1.	Joint Grouting	● (i) Neat & full (ii) No crack & void																										
2.	Surface Defects	● (i) Free from crack/chipping (ii) No broken edge etc																										
3.	Fall	● Laid to specified direction																										
4.	Stepped Joint	● No stepped joint at landing (MPD: 1.25mm)																										
5.	Nosing Tiles	● (i) Loose (ii) Step (iii) Chip/crack (iv) Jt. width, grouting																										

Sub-Factor / item		Standard / Remark	Block / Zone :												Floor :														
8.2 Precast Staircase			Location / Flat :																										
			Spot: 5						Spot: 6						Spot: 7						Spot: 8								
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Joint Grouting	● (i) Neat & full (ii) No crack & void																											
2.	Surface Defects	● (i) Free from crack/chipping (ii) No broken edge etc																											
3.	Fall	● Laid to specified direction																											
4.	Stepped Joint	● No stepped joint at landing (MPD: 1.25mm)																											
5.	Nosing Tiles	● (i)Loose (ii)Step (iii)Chip/crack (iv)Jt. width, grouting																											
																					A*	A	B	C	D	E			
																					Collected Sum :								

Signature of : _____ Architect

PCOW

Contractor's Representative



AI-8 Precast Components (Cont'd)

[illegible]

Signature of : _____



Architectural Works (Interim) Assessment - Score Sheet

AI-9 Waterproofing

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
9.1 Waterproofing (Bathroom / Kitchen)			Location / Flat :																											
			Spot: 1						Spot: 2						Spot: 3						Spot: 4									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Soundness (Floor)	● No visual defect (i)no crising,etc (ii)no broken & damage																												
2.	Soundness (Wall)	● No visual defect (i)no crising,etc (ii)no broken & damage																												
3.	Waterproof C/S screed	● Laid as approved and specified																												
4.	Angle Fillet	● (i)Material as specified (ii)Constructed to drawings, etc																												
5.	Upstand	● Height as drawing or approved																												
6.	Coverage	● Evenly applied and fully covered																												
7.	Protection	● Provided as specified																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
9.1 Waterproofing (Bathroom / Kitchen)			Location / Flat :																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1. Soundness (Floor)	● No visual defect (i)no crissing,etc (ii)no broken & damage																													
2. Soundness (Wall)	● No visual defect (i)no crissing,etc (ii)no broken & damage																													
3. Waterproof C/S screed	● Laid as approved and specified																													
4. Angle Fillet	● (i)Material as specified (ii)Constructed to drawings, etc																													
5. Upstand	● Height as drawing or approved																													
6. Coverage	● Evenly applied and fully covered																													
7. Protection	● Provided as specified																													
											Collected Sum :							A*	A	B	C	D	E							

Signature of : _____
Architect

PCOW

Contractor's Representative



AI-10 Shop Front and Cladding

	A*	A	B	C	D	E
Collected Sum :						

	A*	A	B	C	D	E
Collected Sum :						

Contractor's Representative



AI-10 Shop Front and Cladding (Cont'd)

	A*	A	B	C	D	E
Collected Sum :						

	A*	A	B	C	D	E
Collected Sum :						

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-10 Shop Front and Cladding (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :															
			Location / Flat :																													
			Spot: 1						Spot: 2						Spot: 3						Spot: 4											
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N		
1.	Fixing	● Fixed properly all lugs, dowels, brackets, hangers, etc																														
2.	Welds	● Welded surfaces ground smooth, free from flux & slag																														
3.	Verticality	● Installed vertically (MPD: 3mm/1.2m)																														
4.	Sealant	● Properly applied.																														
5.	Soundness	● Securely assembled.																														

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :																													
			Location / Flat :																																											
			Spot: 5						Spot: 6						Spot: 7						Spot: 8																									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N																
1.	Fixing	● Fixed properly all lugs, dowels, brackets, hangers, etc																																												
2.	Welds	● Welded surfaces ground smooth, free from flux & slag																																												
3.	Verticality	● Installed vertically (MPD: 3mm/1.2m)																																												
4.	Sealant	● Properly applied.																																												
5.	Soundness	● Securely assembled.																																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :															
			Location / Flat :																													
			Spot: 1						Spot: 2						Spot: 3						Spot: 4											
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N		
1.	Fixing	● Fixed properly all lugs, dowels, brackets, hangers, etc																														
2.	Welds	● Welded surfaces ground smooth, free from flux & slag																														
3.	Verticality	● Installed vertically (MPD: 3mm/1.2m)																														
4.	Sealant	● Properly applied.																														
5.	Soundness	● Securely assembled.																														

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :																						
			Location / Flat :																																				
			Spot: 5						Spot: 6						Spot: 7						Spot: 8																		
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N									
1.	Fixing	● Fixed properly all lugs, dowels, brackets, hangers, etc																																					
2.	Welds	● Welded surfaces ground smooth, free from flux & slag																																					
3.	Verticality	● Installed vertically (MPD: 3mm/1.2m)																																					
4.	Sealant	● Properly applied.																																					
5.	Soundness	● Securely assembled.																																					

Signature of : _____ Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-10 Shop Front and Cladding (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
10.7 Metal Cladding - Internal			Location / Flat :																											
			Spot: 1						Spot: 2						Spot: 3						Spot: 4									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Fixing	● Fixed properly all lugs, dowels, brackets, hangers, etc																												
2.	Welds	● Welded surfaces ground smooth, free from flux & slag																												
3.	Verticality	● Installed vertically (MPD: 3mm/1.2m)																												
4.	Sealant	● Properly applied																												
5.	Soundness	● Securely assembled																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :															
			Location / Flat :																													
			Spot: 5						Spot: 6						Spot: 7						Spot: 8											
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N		
1.	Fixing	● Fixed properly all lugs, dowels, brackets, hangers, etc																														
2.	Welds	● Welded surfaces ground smooth, free from flux & slag																														
3.	Verticality	● Installed vertically (MPD: 3mm/1.2m)																														
4.	Sealant	● Properly applied																														
5.	Soundness	● Securely assembled																														

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
			Location / Flat :																											
			Spot: 1						Spot: 2						Spot: 3						Spot: 4									
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Fixing	● Fixed properly all lugs, dowels, brackets, hangers, etc																												
2.	Welds	● Welded surfaces ground smooth, free from flux & slag																												
3.	Verticality	● Installed vertically (MPD: 3mm/1.2m)																												
4.	Sealant	● Properly applied																												
5.	Soundness	● Securely assembled																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :																											
			Location / Flat :																																									
			Spot: 5						Spot: 6						Spot: 7						Spot: 8																							
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N														
1.	Fixing	● Fixed properly all lugs, dowels, brackets, hangers, etc																																										
2.	Welds	● Welded surfaces ground smooth, free from flux & slag																																										
3.	Verticality	● Installed vertically (MPD: 3mm/1.2m)																																										
4.	Sealant	● Properly applied																																										
5.	Soundness	● Securely assembled																																										

Signature of : _____ Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-10 Shop Front and Cladding (Cont'd)

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
			Location / Flat :																											
			Spot: 1							Spot: 2							Spot: 3							Spot: 4						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Fixing	● Fixed properly all lugs, dowels, brackets, hangers, etc																												
2.	Welds	● Welded surfaces ground smooth, free from flux & slag																												
3.	Verticality	● Installed vertically (MPD: 3mm/1.2m)																												
4.	Sealant / Gasket / Mastic	● Properly applied																												
5.	Soundness	● Securely assembled																												

Sub-Factor / item		Standard / Remark	Block / Zone :														Floor :													
			Location / Flat :																											
			Spot: 5							Spot: 6							Spot: 7							Spot: 8						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Fixing	● Fixed properly all lugs, dowels, brackets, hangers, etc																												
2.	Welds	● Welded surfaces ground smooth, free from flux & slag																												
3.	Verticality	● Installed vertically (MPD: 3mm/1.2m)																												
4.	Sealant / Gasket / Mastic	● Properly applied																												
5.	Soundness	● Securely assembled																												

	A*	A	B	C	D	E
Collected Sum :						

Signature of : _____
Architect

PCOW

Contractor's Representative



Architectural Works (Interim) Assessment - Score Sheet

AI-11 Record Check of Interim Assessment

Sub-Factor / item		Standard / Remark (Record Check)	Block / Zone :										Floor :																
11.1 Pull-off Test to completed tiles			Location / Flat :																										
			Spot:					Spot:					Spot:					Spot:											
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Pull-off Test	● (i)Pass (ii)Pass in re-test (iii)Failed in re-test																											

Sub-Factor / item		Standard / Remark (Record Check)	Block / Zone :										Floor :																
11.1 Pull-off Test to completed tiles			Location / Flat :																										
			Spot:					Spot:					Spot:					Spot:											
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Pull-off Test	● (i)Pass (ii)Pass in re-test (iii)Failed in re-test																											

Sub-Factor / item		Standard / Remark (Record Check)	Block / Zone :										Floor :																
11.1 Pull-off Test to completed tiles			Location / Flat :																										
			Spot:					Spot:					Spot:					Spot:											
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Pull-off Test	● (i)Pass (ii)Pass in re-test (iii)Failed in re-test																											

Sub-Factor / item		Standard / Remark (Record Check)	Block / Zone :										Floor :																
11.1 Pull-off Test to completed tiles			Location / Flat :																										
			Spot:					Spot:					Spot:					Spot:											
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Pull-off Test	● (i)Pass (ii)Pass in re-test (iii)Failed in re-test																											

Sub-Factor / item		Standard / Remark (Record Check)	Block / Zone :										Floor :																
11.1 Pull-off Test to completed tiles			Location / Flat :																										
			Spot:					Spot:					Spot:					Spot:											
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Pull-off Test	● (i)Pass (ii)Pass in re-test (iii)Failed in re-test																											

Sub-Factor / item		Standard / Remark (Record Check)	Block / Zone :										Floor :																
11.1 Pull-off Test to completed tiles			Location / Flat :																										
			Spot:					Spot:					Spot:					Spot:											
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Pull-off Test	● (i)Pass (ii)Pass in re-test (iii)Failed in re-test																											

Sub-Factor / item		Standard / Remark (Record Check)	Block / Zone :										Floor :																
11.1 Pull-off Test to completed tiles			Location / Flat :																										
			Spot:					Spot:					Spot:					Spot:											
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E
1.	Pull-off Test	● (i)Pass (ii)Pass in re-test (iii)Failed in re-test																											

Collected Sum :		A*	A	B	C	D	E

Signature of : _____ Architect

PCOW

Contractor's Representative



AI-11 Record Check of Interim Assessment (Cont'd)

	A*	A	B	C	D	E
Collected Sum :						

Contractor's Representative



AI-11 Record Check of Interim Assessment (Cont'd)

Sub-Factor / item		Standard / Remark (Record Check)	Block / Zone :														Floor :													
11.3 Tanking - Asphalt (Waterproofing)			Location / Flat :																											
			Spot:							Spot:							Spot:							Spot:						
			5							6							7							8						
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.	Isolating Membrane	● Laid dry with lapped joints as specified																												
2.	Coats	● Laid in specified coats, thickness & breaking joints																												
3.	Angle Fillet	● Formed in coats and thickness as specified																												
4.	Skirting	● (i)Ht. & th. (ii)Top edge splayed & tucked w/ reinf.																												
5.	Dressing	● Pipes and outlets dressed as specified																												
6.	Protection	● Provided as specified																												
7.	Soundness	● Free from damage and other surface defects.																												

Signature of : _____
Architect PCOW Contractor's Representative



AI-11 Record Check of Interim Assessment (Cont'd)

Sub-Factor / item		Standard / Remark (Record Check)	Block / Zone :														Floor :																	
11.5 Proprietary Roofing (Waterproofing)			Location / Flat :																															
			Spot: 9							Spot: 10							Spot: 11							Spot: 12										
			A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N				
1.	Background Preparation	● Clean, dry and accepted by specialist before work start																																
2.	Application	● Lapping dimension approved (for sheet membrane)																																
3.	Angle Fillet	● Constructed as drawing or approved																																
4.	Groove / Skirting	● (i)Groove formed (ii)Skirting H & Th (iii)Top tucked in groove																																
5.	Dressing	● Pipes and outlets dressed as specified																																
6.	Protection	● Provided as specified																																
7.	Soundness	● Free from damage and other surface defects.																																
																	<div>Collected Sum :</div> <div> <div>A*</div> <div>A</div> <div>B</div> <div>C</div> <div>D</div> <div>E</div> </div>																	

Contractor's Representative



AI-11 Record Check of Interim Assessment (Cont'd)

[illegible]

Sub-Factor / item		Standard / Remark (Record Check)	Quarter:		Year:				
11.7 Repeated Non-conformities			Month :						
			A*	A	B	C	D	E	N
1.	Repeated non-conformities		● No repeated non-conformities						
			A*	A	B	C	D	E	N
			Collected Sum :						

Contractor's Representative

PASS

SAFETY ASSESSMENT

Score Sheet



Safety Assessment - Score Sheet for General Site Safety Factor - SA3 by PAT # / PT #

Project Title : _____

Contract No. : _____

Assessment Quarter : _____

SA3 - General Site Safety

Assessment Date : _____

Sub-factor	Item	Zone	Assessment Standard (Refer Manual for Detail)							Grading
			(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	
3.1 Earthwork - Mass Excavation / Slope / Stockpile	a. Barrier to mass excavation... exceeding 2m									
	b. Barrier to mass excavation... % 1.2m ~ 2m									
	c. Stability									
	d. Excavated Materials									
	e. Surface Water Run-off									
	f. Access and Egress									
	g. Earth-moving Machinery									
3.2 Earthwork - Trench / Pit	a. Barrier to mass excavation... exceeding 2m									
	b. Barrier to mass excavation... % 1.2m ~ 2m									
	c. Stability									
	d. Excavated Materials									
	e. Surface Water Run-off									
	f. Access and Egress									
	g. Earth-moving Machinery									
	h. Fresh Air Supply									
3.3 Scaffolding, Screens & Working Platforms	a. Construction & Inspection of Scaffolding									
	b. Nylon Mesh or Similar Covering									
	c. Catch-fans									
	d. Working Platform - General									
	e. Working Platform - Guardrails & Toeboards									
	f. Safety Harness & Independent Lifelines									
	g. Dismantling									
3.4 Storage & Removal of Materials	a. Storage of Materials									
	b. Removal of Waste / Debris									
	c. Catch-fans									
3.5 Safety Equipment for Personal Protection	a. Safety Helmet									
	b. Personal Protective Equipment									
	c. Machine Guards									
	d. Respirator / Breathing Apparatus									
3.6 Fire Prevention	a. Street Fire Hydrants									
	b. Dangerous Goods Store / Use of Dangerous Substances									

Record Check Period : _____ to _____
(D/M/Y) (D/M/Y)

Signed by
Project COW : _____ PAT # / PT # : _____ Contractor's Representative : _____
() () ()

Note : ✓ : Compliance PAT : PASS Assessment Team # : Delete as appropriate * : A* item
x : Non-compliance PT : Project Team N : Not Applicable



Safety Assessment - Score Sheet for General Site Safety Factor - SA3 by PAT # / PT #

Project Title : _____

Contract No. : _____

Assessment Quarter : _____

SA3 - General Site Safety

Assessment. Date : _____

Sub-factor	Item	Zone	Assessment Standard (Refer Manual for Detail)							Grading
			(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	
3.7 Lifting Appliances, Lifting Gears and Plant Safety	a. Lifting Appliances - Notices/Certificates & Loading (Record check)									
	b. Lifting Appliances - Falling/Overturning of objects (Record check)									
	c. Mobile Cranes - Notices/Certificates and Loading (Record check)									
	d. Mobile Cranes - Outriggers									
	e. Mobile Cranes - Falling/Overturning of objects (Record check)									
	f. Mobile Cranes - Signallers									
	g. Tower Cranes - Notices/Certificates and Loading (Record check) *									
	h. Tower Cranes - Anti-Collisions (Record check) *									
	i. Tower Cranes - Operations within site (Record check) *									
	j. Tower Cranes - Falling/Overturning of objects (Record check)									
	k. Tower Cranes - Signalers									
	l. Tower Cranes - Fencings									
	m. Mobile Cranes (excluding crawler cranes) - Plant Deployment (Record check)									
	n. Mobile Cranes (excluding crawler cranes) - Age of Plant (Record check) *									
	o. Mobile Cranes (excluding crawler cranes) - Breakdown Rate (Record check)									
	p. Mobile Cranes (excluding crawler cranes) - Certification (Record check)									
	q. Truck-Mounted Cranes - Plant Deployment (Record check)									
	r. Truck-Mounted Cranes - Age of Plant (Record check) *									
	s. Truck-Mounted Cranes - Breakdown Rate (Record check)									
	t. Truck-Mounted Cranes - Certification (Record check)									
	u. Tower Cranes - Plant Deployment (Record check)									
	v. Tower Cranes - Age of Plant (Record check) *									
	w. Tower Cranes - Breakdown Rate (Record check)									
	x. Tower Cranes - Certification (Record check)									
	y. Derrick Cranes - Plant Deployment (Record check)									
	z. Derrick Cranes - Age of Plant (Record check) *									
	aa. Derrick Cranes - Breakdown Rate (Record check)									
	ab. Derrick Cranes - Certification (Record check)									

Record Check Period : _____ to _____
(D/M/Y) (D/M/Y)

Signed by
Project COW : _____ PAT # / PT # : _____ Contractor's Representative : _____
() () ()

Note : ✓ : Compliance PAT : PASS Assessment Team # : Delete as appropriate * : A* item
x : Non-compliance PT : Project Team N : Not Applicable



Safety Assessment - Score Sheet for General Site Safety Factor - SA3 by PAT # / PT

Project Title : _____

Contract No. : _____

Assessment Quarter : _____

SA3 - General Site Safety

Assessment. Date : _____

Sub-factor	Item	Zone	Assessment Standard (Refer Manual for Detail)							Grading
			(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	
3.8 Passenger Hoist, Material Hoist, Gondola and Plant Safety	a. Passenger Hoists - General									
	b. Passenger Hoists - Operators									
	c. Material or Skip Hoists									
	d. Gondolas - General (Record check)									
	e. Gondolas - Operators (Record check)									
	f. Gondolas - Operations									
	g. Gondolas - Falling of objects/Excessive tilting (Record check)									
	h. Material Hoists - Plant Deployment (Record check)									
	i. Material Hoists - Age of Plant (Record check) *									
	j. Material Hoists - Breakdown Rate (Record check)									
	k. Material Hoists - Certification (Record check)									
	l. Gondolas - Plant Deployment (Record check)									
	m. Gondolas - Age of Plant (Record check) *									
	n. Gondolas - Breakdown Rate (Record check)									
	o. Gondolas - Certification (Record check)									
3.9 Existing Utilities Installation	a. Damage (Record check)									
	b. Precautionary Measures									
	c. Site Superintendence (Record check)									
3.10 Green/Silver Card Provision, Caring Programme for New Workers (including Probationers and New Comers)	a. Green/Silver Card Provision (Record check)									
	b. Silver Card (Record check)									
	c. Caring Programme for Probationers									
	d. Caring Programme for New Comers									
3.11 Accident, Dangerous Occurrence & Incident	a. Reportable Accidents and Dangerous Occurrences (DO) (Record check)									
	b. Incident (Record check)									
3.12 Repeated Non-conformities	a. No repeated non-conformities (Record check)(Including SA3 and SA4)									

Record Check Period : _____ to _____
(D/M/Y) (D/M/Y)

Signed by

Project COW : _____
()

PAT # / PT # : _____
()

Contractor's

Representative : _____
()

Note : ✓ : Compliance
x : Non-compliance

PAT : PASS Assessment Team
PT : Project Team

: Delete as appropriate
N : Not Applicable

* : A* item



Safety Assessment - Score Sheet for General Site Safety Factor - SA3 by PAT # / PT #

Project Title : _____

Contract No. : _____

Assessment Quarter : _____

SA3 - General Site Safety

Assessment. Date : _____

Sub-factor	Item	Zone	Assessment Standard (Refer Manual for Detail)							Grading
			(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	
3.13 Temporary Electrical Installation	a. Fixing and Precautions									
	b. Protection Against Electrical Shock and Danger									
	c. Circuit Isolation and Protection									
	d. Temporary Lighting									

Record Check Period : _____ to _____

(D/M/Y)(D/M/Y)

Signed by

PBSI# / ITBSI# : _____ PAT # / PT # : _____

() () ()

Note : ✓ : Compliance

x : Non-compliance

PAT : PASS Assessment Team

PT : Project Team

: Delete as appropriate

N : Not Applicable



Safety Assessment - Score Sheet for Block Related Safety Factor - SA4 by PAT # / PT

Project Title : _____ Contract No. : _____

Assessment Quarter : _____

SA4 - Block Related Safety Block No.: _____ Assessment Date : _____

Sub-factor	Item	Floor	Assessment Standard (Refer Manual for details)							Grading
			(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	
4.1 Fences, Rails and Barriers	c. Lift Openings	0								
	g. Access to Block	0								
	a. External Openings	WF								
	b. Floor Openings	WF								
	c. Lift Openings	WF-2								
	d. Access to Working Floor	WF								
	e. Permanent Staircases	WF								
	f. Permanent Staircases - Railing & sign	WF								
	j. Openings at Tower Crane	WF								
	k1. Installation & Handling of Precast Façades	WF								
	k2. Installation & Handling of Precast Staircases	WF-2								
	k3. Installation & Handling of Precast Elements	WF								
	l. Working Platforms - General	WF								
	m. Working Platforms - Railing	WF								
	n. Temporary Works	WF								
	a. External Openings									
	b. Floor Openings									
	c. Lift Openings									
	e. Permanent Staircases									
	f. Permanent Staircases - Railing & sign									
	h. Opening at Material Hoist									
	i. Landing at Passenger Hoist									
	j. Openings at Tower Crane									
	a. External Openings at G/F and/or 1/F	0/1								
	b. Floor Openings at G/F and/or 1/F	0/1								
	e. Permanent Staircases at G/F and/or 1/F	0/1								
	f. Permanent Staircases - Railing & sign at G/F and/or 1/F	0/1								
4.2 Storage and Removal of Materials	a. Storage of Materials at G/F and/or 1/F	0/1								
	b. Removal of Waste / Debris at G/F and/or 1/F	0/1								
	c. Corridors at G/F and/or 1/F	0/1								
	d. Staircase at G/F and/or 1/F	0/1								
	e. Overloading Structural Members at G/F and/or 1/F	0/1								
	f. Overloading Canopies	* 1								
	a. Storage of Materials									
	b. Removal of Waste / Debris									
	c. Corridors									
	d. Staircase									
4.3 Safety Equipment for Personal	e. Overloading Structural Member									
	a. Safety Helmet	0								
	b. Protective Equipment	0								
	c. Machine Guards	0								
	d. Respirator / Breathing Apparatus	0								
	a. Safety Helmet	WF								
	b. Protective Equipment	WF								
	c. Machine Guards	WF								
	d. Respirator / Breathing Apparatus	WF								
	a. Safety Helmet									
4.4 Fire Prevention	b. Protective Equipment									
	c. Machine Guards									
4.5 Temporary Refuse Chute	d. Respirator / Breathing Apparatus									
	a. Portable Fire Fighting Provision									
	b. Water Relaying Facilities									
	a. Construction - Assessment at G/F	0								
	b. Barriers and Notice - Assessment at G/F	0								
	c. Construction - Assessment at floor other than G/F									
	d. Screens and Barriers - Assessment at floor other than									
	e. Hoppers - Assessment at floor other than G/F									
	f. Accumulation of Debris - Assessment at floor other than G/F									

Record Check Period : _____ to _____
(D/M/Y) (D/M/Y)

Signed by

Project COW : _____ PAT # / PT # : _____ Contractor's _____
() () ()

Note : ✓ : Compliance
x : Non-compliance

PAT : PASS Assessment Team
PT : Project Team

: Delete as appropriate
N : Not Applicable

* : A* item



Safety Assessment - Score Sheet for Block Related Safety Factor - SA4 by PAT # / PT

Project Title : _____ Contract No. : _____
 _____ Assessment Quarter : _____
 SA4 - Block Related Safety Block No.: _____ Assessment Date : _____

Sub-factor	Item	Floor	Assessment (Refer Manual for details)							Grading
			(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	
4.6 Temporary Electrical Installation	a. Fixing and Precautions	0								
	b. Protection Against Elect. Shock & Danger	0								
	c. Circuit Isolation & Protection	0								
	d. Temporary Lighting	0								
	a. Fixing and Precautions	Random Floor (/F)								
	b. Protection Against Elect. Shock & Danger									
	c. Circuit Isolation & Protection									
	d. Temporary Lighting									
	a. Fixing and Precautions	WF-3								
	b. Protection Against Elect. Shock & Danger	WF-3								
	c. Circuit Isolation & Protection	WF-3								
	d. Temporary Lighting	WF-3								

Record Check Period : _____ to _____
 (D/M/Y) (D/M/Y)

Signed by

PBSI# / ITBSI# : _____ PAT # / PT # : _____ Contractor's Representative : _____
 () () ()

Note : ✓ : Compliance
 x : Non-compliance

PAT : PASS Assessment Team
 PT : Project Team

: Delete as appropriate
 N : Not Applicable

PASS

Environmental and Other Obligations

Assessment Score Sheet



Environmental and Other Obligations - Score Sheet

Project Title : _____ Contract No: _____

Quarter : _____

001 - Environmental, Health and Other Provisions

Assessment Date: _____ Serial No.: _____

Sub-factor	Item	Zone	Standard	Asses't	Grading
1.1 Nuisance & Environmental Protection	a. Recycling - water recycling plant		(i) Construct and maintain waste water recycling plant.		
	b. Recycling - packaging paper		(i) sort and collect packaging paper on-site for recycling.		
			(ii) Return packaging materials to suppliers or their agents.		
	c. Noise (Noise Permit: Date of commencement: _____ Expired Date: _____)		(i) Comply w/ requirements of Noise Control Ordinance & Noise Permit and contract requirements. (Record Check)		
			(ii) Comply w/ Noise Mitigation Plan of approved EMP. (Record Check).		
			(iii) No complaint from EPD nor adjoining occupant. (Record Check).		
			(iv) Provide & maintain mufflers/suitable noise suppressors on all pneumatic drills, compressors & other plants		
	d. Dust Control		(i) Comply w/ Dust Mitigation Plan of approved EMP. (Record Check).		
			(ii) Provide & maintain automatic water sprinkler system for dust control.		
			(iii) Cover / Shelter / Spray chemical to dusty materials over 1m high.		
			(iv) Cover / Shelter debris over 500mm high.		
			(v) No load material higher than the tail or side boards and cover open compartment of vehicle w/ tarpaulin.		
	e. Tree Protection and Preservation		(i) Preserve and protect all existing trees and shrubs as required and in compliance with the contract requirements.		
	f. Acid Cleaning		(i) No acid for cleaning on site.		
	g. Removal of water (Record Check) (Approval Letter from EPD: Date of Issue: _____ Expired Date: _____)		(i) Before site water is discharged, obtain the approval of the appropriate Authority.		
			(ii) Comply with all instructions and requirements under the Water Pollution Control Ordinance and valid EPD License		
	h. Environmental Management Plan (Record Check)		(i) Submit & update Environmental Management Plan.		
			(ii) Maintain the calculated average score (A) at 85% or above Env. & Site Hygiene Checklist.		
	i. Construction Waste Management (Record Check)		(i) Proper disposal of hazardous waste & dangerous goods.		
			(ii) Dispose & monitor construction waste in accordance with Waste Management Plan.		
			(iii) Sort, segregate for re-use, recycling & disposal, label & store construction & demolition waste.		
	j. Trip Ticket System		(i) Provide and maintain weight bridge.		
			(ii) No record of overloaded dump trucks to disposal facilities. (Record Check)		
			(iii) All dump trucks for disposal of construction and demolition waste used weight bridge before leaving site. (Record Check)		
			(iv) No record of weight difference for dump trucks leaving site and arriving at disposal facilities.(Record Check)		

Record Check Period : _____ to _____
(dd/mm/yy) (dd/mm/yy)

Signed by

Project COW : _____ PAT # / PT # : _____ Contractor's Representative : _____
() () ()

Note : ☒ Compliance PAT : PASS Assessment Team # Delete as appropriate
☐ Non-compliance PT : Project Team N Not Applicable



Environmental and Other Obligations - Score Sheet

001 - Environmental, Health and Other Provisions

Sub-factor	Item	Zone	Standard	Asse't	Grading
1.1 Nuisance & Environmental Protection (Con't)	k. Mosquito (Record Check) (Date of Material Submission: _____ Date of Approval: _____)		(i) Receive no warning letter/memo from FEHD and no complaint from adjoining occupants.		
			(ii) Approved pesticides and larvicides are used in accordance with manufacturers' recommendation.		
			(iii) Water receptacles are to be covered, emptied or prevented from collecting water.		
			(iv) Treat standing water at least once a week or as required.		
			(v) Display and maintain warning posters in Chinese/english		
	l. Bonfires (Record Check)		(i) No bonfire lit on site.		
1.2 Site Drainage	a. Haul Roads within the Site		(i) Provide & maintain haul roads, tracks, crossing & hard standings with adequate drainage.		
			(ii) Tracks, crossing & hard standings w/o serious depression.		
			(iii) Free from obstruction.		
	b. Site Drainage - General		(i) Provide & maintain temp. channels, ditches, catchpits,...etc to keep the site clear of water, silt, mud.		
			(ii) Provide & maintain earth bunds, sand bag barriers and etc to prevent storm water, excavated materials, silt or debris from being deposited/run off into extg. drainage system, watercourse, sea and adjacent land.		
			(iii) Comply w/ approved drainage diversion system & temp. storm water drainage system. (Record Check)		
	c. Site Drainage - Others		(i) No complaint from EPD or other gov. dept. (Record Check)		
			(ii) No blockage of temporary channels, ditches, catchpits, silt pits and /or traps.		
	d. Wheel Washing		(i) Provide & maintain wheel washing facilities at exit(s) including drainage w/ a silt pit.		
			(ii) No discernable debris outside site exits.		
	e. ★ Hard Paved Construction		(i) Working zone hard paved.		
	f. Contamination of Groundwater/Drain (Record Check)		(i) Prevent groundwater/drain contamination to comply with all instructions and requirement under Water Pollution Control Ordinance (Cap 358)		
1.3 Curing Rooms	a. Curing Rooms		(i) Provide & maintain standard steel container w/ full equipment.		
	b. Curing Tanks		(i) Provide & maintain adequate no. of standard curing tanks with full equipment. (ii) Provide and maintain temporary silt pits and/or traps for water discharged from curing tanks.		
1.4 Sanitary Provisions	a. Toilet Accommodation		(i) Provide toilet accommodations according to Contract.		
			(ii) Maintain toilet accommodations in sanitary condition.		
	b. Temporary Latrines		(i) Provide 1 male and 1 female temporary latrine including hand washing facilities on or adjacent to the ground floor. (ii) Maintain temporary latrines in a sanitary condition.		
1.5 Repeated Non-conformities (Record Check)	a. Repeated non-conformities. (Record Check)		(i) No repeated non-conformities.		

Signed by

Project COW : _____
()

PAT # / PT # : _____
()

Contractor's

Representative : _____
()



Environmental and Other Obligations - Score Sheet

002 - Site Security, Access and Storage of Materials

Sub-factor	Item	Zone	Standard	Asses't	Grading
2.1 Storage and Handling of Materials	a. Steel Fabricating Yard		(i) All steel reinforcement stored securely and orderly.		
			(ii) All steel reinforcement well stored off the ground.		
			(iii) No contamination		
			(iv) Same types and sizes of reinforcement tied securely and stored horizontally.		
			(v) Identify all tested steel.		
	b. Other Metal Work		(i) All metal work stored securely and orderly.		
			(ii) Storage of metal work is to be off ground in a manner which will not result in damage or deformation.		
			(iii) Protected from weather, no rust and no contamination.		
			(iv) Different types and sizes stored separately.		
	c. Timber Work (non-temporary)		(i) All timber work stored securely, orderly & away from heat source.		
			(ii) Stored in dry, well ventilated place & off ground and no damage, distortion & contamination.		
			(iii) Protected from weather.		
			(iv) Different types and sizes stored separately.		
	d. Components (drywall, doorsets, cooking benches)		(i) Different types stored separately.		
			(ii) Stored well off ground.		
			(iii) Protected from weather.		
	e. Batching Plant		(i) Store cement in accordance w/ CON 1.W010 & CON 1.W020.		
			(ii) Store aggregates in accordance w/ CON 1.W030.		
			(iii) Store admixtures & curing compounds in accordance w/ CON 1.W040.		
	f. ★ Precast Concrete Yard/ Precast Elements		(i) Precast units stored securely, orderly & w/o contamination.		
			(ii) Precast yards/storage areas hard paved w/ 50mm blinding.		
			(iii) Precast yards/storage areas well fenced off w/ barriers or fencing mesh.		
			(iv) Barriers w/ warning notice in both Chinese & English.		

Signed by

Project COW :

()

PAT # / PT # :

()

Contractor's

Representative :

()



Environmental and Other Obligations - Score Sheet

002 - Site Security, Access and Storage of Materials

Sub-factor	Item		Zone	Standard	Asses't	Grading
2.1 Storage and Handling of Materials (Con't)	g. ★	Large Panel Formwork		(i) Stored safely & securely according to method statement.		
				(ii) Stored on hard levelled area w/ 50mm blinding.		
				(iii) Stored ≥500mm away from hoarding / site boundaries.		
				(iv) Securely fenced off w/ barriers or fencing mesh.		
				(v) Barriers w/ warning notice in both Chinese & English.		
				(vi) To provide tailored-made storage box for loose components of large panel formwork including lifting operation.		
	h.	Pipes		(i) Stacked not exceeding 2m high.		
				(ii) Different types & sizes stacked separately, securely & orderly.		
				(iii) Stacked on level ground, bottom layer chocked,.		
				(iv) Supported under barrels w/ sockets overhanging.		
	i.	Other Materials	Permanent	(i) Different types & sizes stored separately, securely & orderly.		
				(ii) Stored well off ground.		
		Temporary		(i) Stored separately, securely & orderly.		
				(ii) Stored in a manner which will not result in damage & deformation.		
2.2 Site Access	a.	Site Access Control		(i) Provide Access Control and Recording System.		
				(ii) Maintain the Entrance / Exit Control Unit in good condition.		
				(iii) Keep and update reports generated by ACRS.		
	b.	Identification Record		(i) Provide identity passes to all workers w/ name, trade, company & I.D. number.		
				(ii) Keep daily records of all vehicles & people w/o identity passes.		
	c.	Warning Notices (Vehicular and Pedestrian Entrances)		Post & maintain permanent notices in Chinese & English for:		
				(i) Vehicles entering / exiting.		
				(ii) All workers must show their passes, vehicles and people w/o passes must report to security control.		
				(iii) Trespassers prohibited.		

Signed by

Project COW : _____
()

PAT # / PT # : _____
()

Contractor's

Representative : _____
()



Environmental and Other Obligations - Score Sheet

OO2 - Site Security, Access and Storage of Materials

Sub-factor	Item	Zone	Standard	Asse't	Grading
2.3 Security	a. Security Guards		(i) Provide security guards to oversee gaps < 4m wide in hoarding.		
			(ii) No burglar report (Record Check)		
			(iii) Provided as specified in contract at all times. (Record Check)		
			(iv) Provide security guard at G/F of each blk. adjoining metal gate.		
	b. Accommodation		(i) Provide & maintain adequate number of secure hut(s) each fitted w/ direct tele. line & lock operated internally.		
			(ii) Huts are securely fixed to ground, w/ widows & burglar grilles.		
			(iii) Provide walkie-talkie approved by CMR for each security guard.		
	c. Security to Block near Completion		(i) Provide & maintain security gate at G/F blk entrance		
			(ii) Provide & maintain audible alarm system to each building block.		
			(iii) Provide & maintain fence at space above adjacent parapet.		
			(iv) Access passenger lift from 1/F after security gate installed.		
	d. Handling of Keys on Completion		(i) Lock all premises as specified.		
			(ii) Provide lockable key boxes.		
			(iii) All keys labelled and identified by flat numbers.		
	e. Lighting		(i) Adequate illuminate to guards' accommodation & surroundings, entrances & sheds.		
			(ii) Illuminate gaps<4m wide in hoarding when near completion.		
	f. Vesting of materials, Removal of plant & Equipment. (Record Check)		(i) Provide written notice 24 hours before materials removal.		
			(ii) Provide daily/weekly record of : (a) Materials brought on site. (b) Plant/Equipment off site.		
2.4 Hoarding and Fences	a. Construction		(i) Construct & maintain hoarding, covered walkways, gantries and fences as specified.		
			(ii) Use strong, good & stable materials.		
			(iii) Repair or replace hoardings, covered walkways, gantries and fences as and when required.		
			(iv) Provide and maintain adequate lightings.		
			(v) Provide repainting as and when required.		
	b. Security		(i) No hole or gap may permit unauthorized entry.		
			(ii) Provide & maintain gates / doors to all entrances. All locked outside working hrs. (Record Check)		
	c. Provision When Nearing Completion Stage		(i) Provide 2m high hoarding / chain link fence at boundaries.		
			(ii) Close all gaps / openings necessitated by hoarding removal.		
2.5 Repeated Non-conformities (Record Check)	a. Repeated non-conformities. (Record Check)		(i) No repeated non-conformities.		

Signed by

Project COW : _____

PAT # / PT # : _____

Contractor's

Representative : _____

PASS

Management Input Assessment Score Sheet



Management Input Assessment - Score Sheet

Project Title : _____

Contract No. : _____ Assessment Date: _____ Quarter: _____

IA-1 Management & Organisation of Works

Serial No.: _____

Sub-factor	Item		Assessment
1.1 Management Structure	1.1.1 *	Organisation Structure, Responsibility and Authority	
	1.1.2	Site Agent	
	1.1.3	Registered Structural Engineer (RSE)	
	1.1.4	Qualified Engineer (QE)	
	1.1.5	Quality Control Engineer/Quality Control Manager (QCE/QCM)	
	1.1.6	Registered Safety Officer (RSO)	
	1.1.7	BS Engineer (BSE)	
	1.1.8 *	Responsible Person (RP) for Tower Crane Lifting	
	1.1.9	Listing of Domestic Sub-contractors	
	1.1.10	Time of Submission for the Listing of Domestic Sub-contractors	
	1.1.11	Listing of Nominated Sub-contractors	
	1.1.12	Site Safety Committee	
1.2 Site Planning	1.2.1	Comprehensive	
1.3 Safety Training	1.3.1	Safety Training for Superintendent	
	1.3.2	Safety Training for General Foreman and Foreman	
	1.3.3	Safety Training for Safety Representative	
	1.3.4	Induction Training / Tool Box Talk	
	1.3.5	Safe Working Cycle - General	
	1.3.6	Safe Working Cycle - Hazard Identification Activity (HIA) and Safety Inspection	



Management Input Assessment - Score Sheet

IA-2 Resources

Sub-factor	Item		Assessment
2.1 Labour	2.1.1	Labour Forecast	
	2.1.2	Labour Resource	
	2.1.3	Qualified Craftsmen	
2.2 Plant	2.2.1	Plant Forecast	
	2.2.2	Plant Resource	
2.3 Materials	2.3.1	Material Forecast	
	2.3.2	Material Delivery	
	2.3.3	Material Storage and Handling	



Management Input Assessment - Score Sheet

IA-3 Co-ordination and Control

Sub-factor	Item		Assessment
3.1 General Co-ordination	3.1.1	Co-ordination of Sequence of Work	
	3.1.2	Obtain and Submit Builder's Work Requirements	
	3.1.3	Hold Regular Co-ordination Meetings	
3.2 Quality Control	3.2.1	Control of Workmanship	
	3.2.2	Material Compliance	
	3.2.3	Remedial Works	
3.3 Communications, Compliance & Co-operation	3.3.1	Maintain Good Communications	
	3.3.2	Compliance with Site Directions	
	3.3.3	Response to Meeting Discussions	
	3.3.4	Compliance with Site Instructions	
	3.3.5	Compliance with CMR's Written Directives	
	3.3.6	Compliance with CM's Written Directives	
	3.3.7	Timely Notification of Accident, Dangerous Occurrence and Incident	
	3.3.8 *	Investigation to Accident & Incident and Implementation of Improvement Measures	
3.4 Other Attendance	3.4.1	Provisions Required by Contract	
	3.4.2	Timely Execution of Builder's Work	
	3.4.3	Provision for Testing	
	3.4.4	Timely Handover of Works Areas and Service Areas	
	3.4.5	Care of Works of Others	



Management Input Assessment - Score Sheet

IA-4 Documentation (1)

Sub-factor		Item		Assessment
4.1	Submission of Temporary Works Design	4.1.1	Time of Submission	
		4.1.2	Quality of Submission	
4.2	Submission of Materials for Approval	4.2.1	Time of Submission (Domestic subcontractors)	
		4.2.2	Quality of Submission (Domestic subcontractors)	
		4.2.3	Time of Submission (Nominated subcontractors)	
		4.2.4	Quality of Submission (Nominated subcontractors)	
4.3	Submission of Shop Drawings for Permanent Works	4.3.1	Time of Submission (Domestic subcontractors)	
		4.3.2	Quality of Submission (Domestic subcontractors)	
		4.3.3	Time of Submission (Nominated subcontractors)	
		4.3.4	Quality of Submission (Nominated subcontractors)	
4.4	Statutory Submissions	4.4.1	Time of Submission	
		4.4.2	Quality of Submission	
4.5	Independent Checking Unit Matter	4.5.1	Timing	
		4.5.2	Quality	
4.6	Occupation Permit Application	4.6.1	Time of Submission	
		4.6.2	Quality of Submission	
4.7	Excavation Permit	4.7.1	Timing	
		4.7.2	Quality	



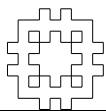
Management Input Assessment - Score Sheet

IA-4 Documentation (2)

Sub-factor		Item		Assessment
4.8	Submission of Monthly Payment Application	4.8.1	Time of Submission	
		4.8.2	Quality of Submission	
4.9	Submission of Quotations, Extension of Time and/or Financial Claims	4.9.1	Time of Submission	
		4.9.2	Quality of Submission	
4.10	Payment to Nominated Subcontractors	4.10.1	Time of Payment	
4.11	Submission of Notice for Inspection/Examination of Works	4.11.1	Time of Submission	
4.12	Safety Documentation	4.12.1	Safety Plan	
		4.12.2	Risk Assessment	
		4.12.3	Report/Record on Accidents/Dangerous Occurrences	
4.13	Implementation on Wage Monitoring System (WMS)	4.13.1	Smart Card Records	
		4.13.2	Employment Records	
		4.13.3	List of Subcontractors	
		4.13.4	ACRS - Access Control and Recording System	
		4.13.5	Wage Payment Records	
		4.13.6	Bank Autopay Achievement	
		4.13.7	Handling of Enquiries / Complaints Relating to Wage Arrears Issues	
		4.13.8	Handling of Request For Information (RFI)	
		4.13.9	Provision of Support for WMS Implementation	
4.14	Information Input to HOMES	4.14.1	Contractor's Daily Report	
		4.14.2	Monthly Labour Return	
		4.14.3	Progress and Record Photographs	

PASS

**Programming and Progress Assessment
Score Sheet**



HOUSING DEPARTMENT

DEVELOPMENT & CONSTRUCTION DIVISION

Progress Assessment - Score Sheet 1

Project Title : _____

Contract No. : _____

Assessment Date: _____

Quarter: _____

Master Construction Programme to be used for assessment :

(A) Original : (i) Submitted Date: _____ (ii) Agreed Date: _____

(B) Revision: (i) No.: _____ (ii) Submitted Date: _____ (iii) Agreed Date: _____

PA1 Programming

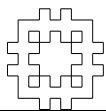
Sub-factor	Item	Assessment																				
		Month1							Month2							Month3						
		A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
1.1 Programme	1.1.1 Comprehensive																					
	1.1.2 Up-to-date																					
1.2 Works Plans	1.2.1 Comprehensive																					
	1.2.2 Up-to-date																					
Sub-total																						

PA2 Milestone Dates - Building Services Related

Sub-factor/Item	Block No.	Assessment																				
		Month1							Month2							Month3						
		A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
2.1 Milestone Dates for Works Prior to Completion (Building Services Related)																						
Sub-total																						

PA3 Milestone Dates - Works Prior to Completion

Sub-factor/Item	Block No.	Assessment																				
		Month1							Month2							Month3						
		A*	A	B	C	D	E	N	A*	A	B	C	D	E	N	A*	A	B	C	D	E	N
3.1 Milestone Dates for Works Prior to Completion																						
Sub-total																						



Progress Assessment - Score Sheet 2

Assessment Date: _____

Quarter: _____

Master Construction Programme to be used for assessment :

(A) Original : (i) Submitted Date: _____ (ii) Agreed Date: _____

(B) Revision: (i) No.: _____ (ii) Submitted Date: _____ (iii) Agreed Date: _____

PA4 Milestone Dates - Structural Works

Sub-factor/Item	Block No.	Assessment																							
		Month1								Month2								Month3							
		A*	A	B	C	D	E	N		A*	A	B	C	D	E	N		A*	A	B	C	D	E	N	
4.1 Milestone Dates for Structural Works																									

Sub-total

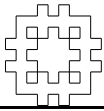
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PA4 Milestone Dates - Structural Works

Sub-factor/Item		Assessment																							
		Month1								Month2								Month3							
		A*	A	B	C	D	E	N		A*	A	B	C	D	E	N		A*	A	B	C	D	E	N	
4.2 Milestone Dates for External (Structural) Works																									

Sub-total

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



Progress Assessment - Score Sheet 3

Assessment Date: _____

Quarter: _____

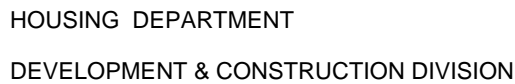
Master Construction Programme to be used for assessment :

(A) Original : (i) Submitted Date: _____ (ii) Agreed Date: _____

(B) Revision: (i) No.: _____ (ii) Submitted Date: _____ (iii) Agreed Date: _____

PA5 Milestone Dates - Architectural Works

Sub-factor/Item	Block No.	Assessment																							
		Month1								Month2								Month3							
		A*	A	B	C	D	E	N		A*	A	B	C	D	E	N		A*	A	B	C	D	E	N	
5.1 Milestone Dates for Sample Flats/Wings																									
5.2 Milestone Dates for Construction Mock Up																									
5.3 Milestone Dates for Architectural Works																									
Sub-total																									



Project Title : _____
Contract No. : _____

Quarter: _____

(A) Original : (i) Submitted Date: _____ (ii) Agreed Date: _____

(B) Revision: (i) No.: _____ **(ii) Submitted Date:** _____ **(iii) Agreed Date:** _____

[illegible]

**Quality Assurance of Precast Concrete Components (PCC)
Manufactured in Mainland China**

- PCC shall be constructed under Qualified Supervision as stipulated in the PNAP APP-143 and relevant Code of Practice;
- Regulatory Requirements
 - Precast factory to be certified to ISO 9001 quality management system;
 - To have a Quality Assurance Scheme (QAS) submitted to the Buildings Department [For HA's projects, submitted to the Independent Checking Unit (ICU) of HA] prior to application for consent to commencement of works;
 - Qualified supervisory personnel to be provided by Registered Structural Engineer (RSE) and Registered Contractor (RC);
 - RSE Stream - RSE to assign a structural quality control supervisor of qualification and experience of Grade T3 Technical Competent Person (TCP) in the Code of Practice (CoP) for Site Supervision to supervise the works in factory at no less than once a week;
 - RC Stream – RC to assign a structural quality control coordinator of qualification and experience of Grade T3 TCP in the CoP for Site Supervision to provide continuous supervision in factory;
 - Both RSE and Authorized Signatory (AS) of RC shall each inspect and audit the factory at least once every month
 - Inspection log book of the supervisory personnel, RSE and AS to be kept in factory, with a copy kept at building sites for inspection by BD (by ICU in HA's projects);
 - RSE to submit both RSE Audit Report and AS Audit Report (with his/her endorsement) to BD (to ICU in HA's projects) for record;
- HA's Requirements
 - Factory to be certified to ISO 14001 environmental management system and OHSAS 18001 occupational health and safety management system;
 - Concrete batching plant to be certified to Quality Scheme for the Production and Supply of Concrete (QSPSC);

- Full time supervision by a team of resident supervisors (RS) from the independent Professional Service Provider in every factory with the lead RS who must have construction experience in Hong Kong;
- A minimum inspection frequency of construction activities to tally with HA's in-situ concrete works;
- A project manager as the team leader to pay factory visits twice every month to review adequacy of supervisory resource and quality issue;
- RSE's audit at a more frequent interval of at least twice every month, and to cover all available type of PCC in every two-month audits;
- Deploying a Registered Electrical Worker (REW) to carry out building services audit monthly;
- Regular surveillance tests of structural materials used; and of the finished products before delivery, including hammer test, cover-meter test, and breaking up test;
- Regular coordination visits by the designated Components & Material (C&M) Team to monitor supervision performance of resident supervisors for consistent quality of PCC production;
- Quarterly PASS assessment of PCC manufactured at factory, with façade and VPB/VPK as mandatory items;
- First joint factory visit of parties concerned to ensure buildability of PCC before mass production;
- Pilot production run to be inspected by HA for factory with no past record of supplying PCC to HA in the last 5 years to ensure the factory's technical capacity and effectiveness of its QAS for quality PCC production;
- Regular surveillance checks of finished products delivered to site, including policing cover-meter test for verification, and routine core test to essential PCC;
- Radio frequency identification (RFID) application to façade for traceability and authenticity from factory production, delivery to installation on site.