

**W** Water Supplies Department  
The Government of the Hong Kong Special Administrative Region

**Agreement No. CE 8/2015 (WS)  
First Stage of Desalination Plant at Tseung Kwan O  
– Investigation, Design and Construction**

**DRAFT BRIEF  
(5 February 2015)**

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**Agreement No. CE 8/2015 (WS)**  
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**Investigation, Design and Construction**

**BRIEF**

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**BRIEF**

**1. Introduction**

- 1.1 This Brief is to be read in conjunction with the Memorandum of Agreement, the General Conditions of Employment of Engineering and Associated Consultants for a Design and Construction Assignment (1997 Edition) [hereinafter referred to as the General Conditions of Employment], the Special Conditions of Employment, the Schedule of Fees, Appendices to this Agreement and any other instructions as may be issued by the Director's Representative (DR) from time to time. For the avoidance of doubt but without prejudice to Clause 7 of the General Conditions of Employment, the performance of the Services specified herein shall be subject to Clause 22 of the General Conditions of Employment.

**2. Description of the Project**

- 2.1 The Total Water Management (TWM) strategy was promulgated in 2008 by the Hong Kong Government. It is an integrated, multi-sectoral approach built on good water demand and supply management initiatives. One of the key supply management initiatives is to diversify the water supply resources and to develop new water resources to better prepare Hong Kong for uncertainties such as acute climate change and low rainfall. Under the TWM strategy, Hong Kong should broaden its strategic investment in advanced water treatment for desalination of seawater.
- 2.2 The general background of the Project is as described in Planning Report No. 3/2011 "Planning and Investigation Study of Desalination Plant at Tseung Kwan O" issued by the Development (2) Division of Water Supplies Department (WSD) dated January 2012.
- 2.3 The following consultancies studies have been completed in 2002 and 2007 respectively on the development of desalination facilities in Hong Kong:-

- (a) CE 71/2000 (WS) "Feasibility Study on Development of Desalination

Facilities in Hong Kong”; and

- (b) CE 97/2002 (WS) “Pilot Plant Study on Development of Desalination Facilities in Hong Kong – Investigation”.

The studies confirmed the technical feasibility of desalination using reverse osmosis (RO) under local conditions to produce potable water complying with the World Health Organisation (WHO) standards.

2.4 In December 2012, WSD engaged a consultant to carry out the feasibility study for the Project under Agreement No. CE 21/2012 (WS) (the Feasibility Study). The preliminary findings, conclusions and recommendations of the Feasibility Study are contained in the draft Final Report and the associated reports and working papers listed in **Appendix I** of this Brief.

2.5 Subject to the investigation review under the Investigation, Design and Construction Assignment (the Assignment), the Project comprises the following:-

- (a) formation of a site in TKO Area 137 to provide sufficient space for a desalination plant with ultimate water production output at 270,000 m<sup>3</sup> per day;
- (b) construction of seawater treatment components of a desalination plant using RO technology with an initial water production output at 135,000 m<sup>3</sup> per day;
- (c) construction of associated facilities (the intake pipes, outfall pipes, administration building, laboratory, maintenance workshop, chemical building, chlorine building, sludge filter press building, seawater intake pumping station, desalinated water pumping station and power supply facilities) and making provision for future expansion of the desalination plant to an ultimate water production output at 270,000 m<sup>3</sup> per day;
- (d) laying of a trunk main with a capacity of 270,000 m<sup>3</sup> per day for the transfer of fresh water produced at the desalination plant to the Tseung Kwan O Fresh Water Primary Service Reservoir (TKOFWPSR); and
- (e) provision of all associated civil, structural, geotechnical, marine, electrical

and mechanical works, including landscaping, permanent and temporary accesses.

- 2.6 The general layout of the proposed works is shown on Sketch No. G14-079 in **Appendix II**.
- 2.7 The Project is classified as a Designated Project under item E.2 of Part I, Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) as the project involves construction of a proposed desalination plant with a capacity of more than 100,000 m<sup>3</sup> per day. Under the EIA Ordinance, an Environmental Permit (EP) from the Environmental Protection Department (EPD) is required for the implementation of the Project.
- 2.8 A project profile for the Project was prepared and submitted to Director of Environmental Protection (DEP) and an EIA Study Brief for the Project was obtained in January 2014 under the Feasibility Study. In applying for the required EP, an EIA report for the Project should be prepared for the approval of the DEP. The EIA report for the Project is being prepared and expected to be submitted to DEP in March 2015 under the Feasibility Study. In the event that variation of the EP is required, a revised EIA report for the Project may be required to be prepared for the approval of the DEP.
- 2.9 Under the Feasibility Study it is recommended that chlorine would be used in the disinfection process and the proposed desalination plant will be classified as a Potentially Hazardous Installation (PHI) since it has a chlorine store exceeding the inventory threshold of 10 tonnes or has any storage in one tonne drums in accordance with Section 4.2, Chapter 12.4 of the Hong Kong Planning Standards and Guidelines (HKPSG). Since the plant is classified as a PHI, a risk and hazard assessment (HA) study to quantify the risks, investigate risk mitigation measures and implement the recommended mitigation measures for the plant during and after construction has been carried out under the Feasibility Study. A Planning Study and an Action Plan will be undertaken by Planning Department (PlanD). As a follow up, it is required under the Assignment to submit a report on the HA to the Coordinating Committee on Land-use Planning and Control relating to Potentially Hazardous Installation (CCPHI) for consideration and endorsement. The action plan and recommendations specified in the report on the HA, the Planning Study and the Action Plan shall be implemented during the Construction and Operational Phases of the Project.

- 2.10 The delivery method of the proposed desalination plant shall be explored under the Assignment. Suitable package of contract(s) for the desalination plant such as intake and outfall pipes, RO treatment plant and water treatment plant, etc shall be studied. The procurement method of the desalination plant by means of a Design-Build-Operate (DBO) or Design and Build (DB) contract shall be considered. Appropriate contract form such as General Conditions of Contract and New Engineering Contract (NEC3 Engineering and Construction Contract (June 2005)(with amendments June 2006 and April 2013), for simplicity, herein and hereinafter referred to as NEC), etc shall be studied.
- 2.11 The exact details of the scope of the works to be procured under the DBO/DB contract arrangement will be dependent upon the results of investigation review and recommendations of the Assignment on the DBO/DB strategy and contract details to be adopted for the desalination plant as described in sub-clauses 2.5 (a), (b), (c) and (e) (the Plant). However, as a preliminary indication, it is generally anticipated that the followings should be included:-
- (i) the arrangement for the DBO/DB contractor(s) to take over the Site, i.e. the site area as shown in Sketch No. G14-079 in **Appendix II**;
  - (ii) the design and construction of the Plant;
  - (iii) the operation and maintenance (O&M) of the facilities of the Plant capable of producing water output under warranted capacity of 135,000 m<sup>3</sup> per day if the Plant is delivered by DBO contract arrangement.
  - (iv) the O&M of the Plant to a good standard duly monitored by means of some key performance indicators established for the Plant if the Plant is delivered by DBO contract arrangement; and
  - (v) the arrangement for the DBO/DB contractor(s) to handover the Plant back to the Employer and/or any other parties as directed by the Employer at the end of the operation period of the DBO contract or upon completion of the DB contract.
- 2.12 DBO/DB contract arrangement may be adopted for implementation of the Plant with an aim to achieving speedy delivery and maximizing cost-effectiveness. The Plant is targeted to commission in 2020.
- 2.13 The overall design and layout of the Plant made by the DBO/DB contractor(s) have to cater for the initial water production output at 135,000 m<sup>3</sup> per day and the ultimate water production output at 270,000 m<sup>3</sup> per day.



- 2.14 Fresh water is currently transferred from the Pak Kong Water Treatment Works to the TKOFWPSR under normal operating condition. Upon commissioning of the Plant, fresh water will also be transferred from the Plant to the TKOFWPSR. The operation mode of the Plant shall cater for the different sources of water to the TKOFWPSR.
- 2.15 There is no access road connecting between the Plant and the public road. The Consultants shall prepare the reference design of the access road for construction stage and early operation stage of the Plant.

### **3. Objectives of the Assignment**

The objective of the Assignment is to provide consultancy services for procurement of the works elements as listed in sub-clauses 2.5 (a), (b), (c) and (e) of this Brief by way of a DBO/DB procurement arrangement to achieve commissioning and initial operation of the Plant (initial operation shall apply to DBO contract arrangement only) through review, survey, design, tendering, project administration and construction supervision with due regard to the following:-

- (a) Timely completion and commissioning of the Plant;
- (b) Optimal life cycle cost of the Plant;
- (c) Cost-effectiveness and value for money;
- (d) Minimisation of footprint of the Plant;
- (e) Minimisation of disturbance caused to the public both in construction and operation;
- (f) Mitigation of impact to physical and social environment;
- (g) Quality and reliability of works and performance;
- (h) High degree of mechanisation and automation with fall-back manual control;
- (i) Proper risk control and management;
- (j) Optimisation of O&M requirements;
- (k) Continuous O&M of the Plant and its uninterrupted supply to TKOFWPSR while complying with the requirements of the updated treated water quality objectives in Clause 6.2.5;
- (l) Safety and health in construction, O&M;
- (m) Energy efficiency with implementation of energy management system to

- ISO 50001;
- (n) Adoption of Reliability Centered Maintenance (RCM) and ISO 55000 Asset Management System in the O&M of the Plant;
  - (o) Adoption and optimal use of renewable energy;
  - (p) Arrangement of classroom and on-site O&M training of the Plant; and
  - (q) Adequate provision on technology and knowledge transfer for operation of the Plant.

#### **4. Description of the Assignment**

- 4.1 For the avoidance of doubt, the Assignment covers the investigation review, design, tender, construction, testing, commissioning and initial operation of the works elements as described in sub-clauses 2.5 (a), (b), (c) and (e) of this Brief. The investigation review, design, tender, construction, testing, commissioning and initial operation of the trunk main as described in sub-clause 2.5 (d) of this Brief is not covered in the Assignment. “initial operation”, “initial operation period” and “Initial Operation and Completion Phase” described in this Brief shall apply to DBO contract arrangement only.
- 4.2 The Assignment comprises all necessary reviews, studies, consultation, co-ordination, investigation, testing, survey, monitoring, risk assessment and management, design, project administration including programme and financial monitoring and control, reference design, DBO/DB strategy evaluation, tendering, cost estimate, DBO/DB contract procurement and contract administration until satisfactory completion, commissioning and initial operation to achieve the objectives stated in Clause 3 of this Brief for the successful completion, commissioning and initial operation of the Plant.
- 4.3 The Consultants shall advise the detailed arrangement in administering the DBO/DB contract(s) during the operation stage of the Plant. It is envisaged that the DBO/DB contract(s) will largely be performance based. It is important that maximum flexibility within the required performance targets, standards and requirements of the Plant is to be built into the DBO/DB contract(s) to ensure that the widest possible choice of water treatment processes, technologies, plants and equipment can be considered by the contractor.
- 4.4 The Assignment covers all investigations, surveys, sampling and testing as necessary for the satisfactory completion of the Assignment. Investigations, surveys, sampling and testing will be procured (i) by direct contracts between

the Employer and the contractors through the Government's procurement/tendering process, or (ii) by placing works orders under relevant Government term contracts, where appropriate.

4.5 The Services to be provided by the Consultants for the Assignment, as set out in Clause 6 of this Brief, are divided into the following stages:

- (a) Investigation Review and Design Phase;
- (b) Tender Phase;
- (c) Construction and Commissioning Phase; and
- (d) Initial Operation and Completion Phase.

The Initial Operation and Completion Phase shall apply to DBO contract only. The Investigation Review and Design Phase shall commence on the date for commencement of the Assignment as provided for in Clause 7.1 of this Brief. The written approval of the DR shall be obtained before commencing work in each of the Tender, Construction and Commissioning, Initial Operation and Completion Phases. The Government shall not be held liable in any way in the event that the Assignment does not proceed from one Phase to the next.

4.6 Investigation Review and Design Phase

- (a) Review, confirm and follow up the findings, conclusions and recommendations of the various reports, papers and documents prepared by the consultant of Feasibility Study listed in **Appendix I** including the practicability and cost-effectiveness of treatment process, design, construction method, construction programme, O&M, energy efficiency and system monitoring requirements based on the latest available information. All expected or known changes, since the issue of the respective reports, information and data shall be taken into account in the review.
- (b) Review the suitability of the site reserved for the Plant and identify alternative sites, if necessary.
- (c) Review the sufficiency of ground investigation so far conducted for the Plant, taking into account available information and data, and make recommendations to the DR on any additional ground investigation work required.

- (d) Review of the restrictions, including hydraulics, imposed by the current and future works of WSD and others (including other Government departments) and recommendation of ways of resolving the same.
- (e) Review the land requirements for implementing the works.
- (f) Prepare a construction and demolition (C&D) material management plan, in accordance with the Section 4.1.3, Chapter 4 of Project Administration Handbook (PAH) and Development Bureau Technical Circulars (Works) (DEVB TCW) No. 6/2010, and submit the plan to the departmental Vetting Committee on C&D material management for endorsement and to the Secretary, Public Fill Committee for his consideration of a disposal ground.
- (g) Review the EIA and the EP taking into account the latest reference design, available information and data, and make recommendations to the DR on any variation of EP is required.
- (h) Carry out systematic risk management.
- (i) Assist the Employer in all matters in public engagement, public consultation and public promotion in connection with the Assignment.
- (j) Prepare documents and presentation materials, and conduct presentations and project promotion tasks in connection with the public engagement, consultation and promotion.
- (k) Review feasible options for the disposal of brine concentrate.
- (l) Review the effect of climate change on the local yield and that on the Dongjiang raw water supply from Guangdong to map out good implementation time frame and strategy for the Plant.
- (m) Assess the minimum plant output with minimum adverse impacts to the plant and the trunk feed system, and review the cost effectiveness of various initial and ultimate water production capacities of the Plant taking into account the availability of the local yield and Dongjiang raw water supply at the time and recommend the most cost effective option.

- (n) Carry out further studies, additional investigations, surveys, testing and field measurements as recommended in the Feasibility Study or required to acquire sufficient information to enable successful completion of the reference design of the Plant.
- (o) Identify and assess the potential impacts arising from the interfaces with temporary magazine for Shatin to Central Link (SCL) project at the TKO Area 137 (Sketch No. 52008/1 in **Appendix II**), The Mines Division of CEDD's barging pier at TKO Area 137 for off-loading explosives (CEDD's barging pier) (Sketch No. 52008/1 in **Appendix II**), Temporary Fill Bank at TKO Area 137, WSD's project of laying a trunk main from the Plant at TKO to TKOFWPSR, TKO Cross Bay Link, TKO – Lam Tin Tunnel, Biodiesel Plant at TKO Industrial Estate, Construction and Demolition Material Handling Facility (C&DMHF), SENT Landfill Extensions, and other projects in the vicinity of the site.
- (p) Update all key requirements, issues and risks affecting the O&M of the completed works which shall form the basis for the reference design of the Plant and the preparation of O&M Manual.
- (q) Update all key issues and risks which may affect the scope of works, programme and cost estimates of the Plant, and finalise scope of works, programme and cost estimates.
- (r) Prepare layout of additional structures/facilities for expansion of the Plant.
- (s) Implement all necessary environmental monitoring, control and mitigation measures.
- (t) Prepare the outline design of the power company electricity supply, electrical, mechanical and other associated installations for the purpose that it is sufficient for tendering and subsequent design and construction by the DBO/DB contractor(s).
- (u) Prepare the reference design of the following elements/structures for the purpose that it is sufficient for prequalification exercise, tendering and subsequent design and construction by the DBO/DB contractor(s): -

- Aesthetic, landscape and layout design for the administration building, laboratory and visitor centre, pre-treatment facilities, RO treatment facilities, post-treatment facilities, chemical buildings, sludge filter press building, sludge thickeners, chlorine contact tank, clear water tank, chlorine building, treated water pumping station, power company substation and transformer compounds.
  - Seawater intake system
  - Pre-treatment system
  - RO treatment system
  - Post-treatment system
  - Backwash and chemical cleaning system
  - Sludge handling system
  - Brine concentrate discharge system
  - Treated water pumping system
  - Monitoring and control system for the operation and maintenance of the Plant at central control room, control rooms at various systems and local control panels for various installations
  - Electrical power supply and distribution system
  - SCADA system for remote monitoring at WSD regional control center
  - Auxiliary systems
  - Landslide and boulder hazard mitigation measures for the natural slope at the northeast boundary of the Plant
  - Access road between the Plant and the public road during construction stage and early operation stage
- (v) Recommend the most appropriate grade for the Plant to be accredited under an internationally or locally recognised environmental assessment system. If there is no appropriate internationally or locally recognised environmental assessment system, the Consultants shall recommend a set of criteria for environmental assessment. The Consultants shall prepare the reference design of the Plant that is sufficient for subsequent design and construction by the DBO/DB contractor(s) to obtain the accreditation or to comply with the assessment criteria recommended by the Consultants.
- (w) Ascertain if the reference design for the Plant is consistent with the assumptions made in the approved HA report, Planning Study, Action

Plan, EIA report, and all other reports prepared in the Feasibility Study.

- (x) Adopt and optimize use of renewable energy in accordance with ETWB TC(W) No. 16/2005.
- (y) Prepare Technical Specifications of the DBO/DB contractor's Building Information Modelling (BIM) model(s) for the elements/structures of the Plant to be incorporated into the DBO/DB contract.
- (z) Prepare and submit planning statement with various technical assessments to support the proposed amendment of the Outline Zoning Plan No. S/TKO/20 (or any Outline Zoning Plan in force at the time of the proposed amendment) to facilitate the development of the Plant at the proposed location.
- (aa) Liaise with PlanD and relevant Government departments for the proposed amendment to the Outline Zoning Plan No. S/TKO/20 (or any Outline Zoning Plan in force at the time of the proposed amendment) and the layout of TKO Area 137.
- (bb) Gazette under Foreshore and Sea-bed (Reclamations) Ordinance and necessary Sediment Quality Assessment for marine works.
- (cc) Prepare and submit a Schedule of Accommodation (SOA) of the Plant to the Property Vetting Committee of Government Property Agency (GPA).
- (dd) Liaise and coordinate with all relevant Government departments and parties to resolve any interfaces for the satisfactory completion and commissioning of the Plant.
- (ee) Liaise and coordinate with power company to provide permanent power supply and temporary power supply design with sufficient details for implementation by the DBO/DB contractor(s) and power company.
- (ff) Complete all the statutory procedures and comply with Government and departmental requirements, standards and guidelines necessary for the implementation of the Assignment.
- (gg) Prepare documents and materials required for compliance with all

relevant statutory and Government and departmental procedures in connection with the Assignment.

- (hh) Provide all necessary and desirable input, assistance and information to other consultants, contractors, the DR and all relevant parties in discharging their duties under their assignments and contracts in connection with the completion and commissioning of the Plant.
- (ii) Solicit interest from the contractors on the List of Approved Suppliers of Materials and Specialist Contractors for Public Works under category of “Supply and Installation of Water Treatment Plant” for the purpose of the subsequent tendering exercises of the relevant DBO/DB contract(s).
- (jj) Review, evaluate, develop and establish the packaging of contract(s), contract procurement strategy, form of contract, steps and procedures.
- (kk) Review the risk sharing between the Employer and the DBO/DB contractor(s).
- (ll) Devise measures to prevent the occurrence of risk or to mitigate the consequences thus ensuring reliability of the selected procurement arrangements.
- (mm) Prepare and distribute the prequalification documents and tender documents to enable the Employer to conduct prequalification exercise and invite tenders from the pre-qualified tenderers to tender for the proposed works and the supply of materials.
- (nn) Advise on procurement of insurance for the Plant.
- (oo) Identify the critical construction activities and structural elements in the design that warrant the formulation of special site supervision requirements for such activities and structural elements.
- (pp) Review, assess and study the detailed M&E O&M requirements of the Plant proposed under the Feasibility Study and recommend the maintenance strategy for the M&E plant, taking into account the requirements of maintenance staff/materials/funding resources and the Employer’s available in-house staff resources, as well as plant warranty



for the completed works and work interfacing amongst the contractors. The Consultants shall identify and propose the most efficient and cost-effective way for delivery of M&E maintenance service, including outsourcing proposals where appropriate, and prepare a study report on the M&E maintenance strategy.

- (qq) Assess, project and estimate the energy consumption and cost of water production per unit of the Plant.
- (rr) Prepare and outline energy efficiency improvement measure and design, including but not limited to, operation data monitoring and storage, plant monitoring and control, pumpset scheduling, adoption of renewable energy, etc.

#### 4.7 Tender Phase

- (a) Assess prequalification applications and prepare recommendations to the Employer as to which tenders to accept.
- (b) Receive inquiries from tenderers.
- (c) Prepare and distribute response to questions and addenda, if required.
- (d) Analyse the tenders and prepare recommendations to the Employer as to which tender to accept.
- (e) Prepare and produce contract documents to enable the Employer to execute Articles of Agreement with the selected tenderer.

#### 4.8 Construction and Commissioning Phase

##### Construction and Commissioning Phase (for both DBO and DB contract arrangement)

- (a) Carry out the duties of the Engineer or the Supervising Officer (SO) under the terms of the Contract or the Supervisor and all other duties delegated by the Employer's Project Manager as defined in the NEC.
- (b) Assist the Employer in dealing with any issues arising from the

construction works.

- (c) Recruit adequate suitably experienced and qualified resident site staff (RSS) for supervision of the construction and commissioning of the works taking into account the nature of the Contract and, in particular, the method of construction adopted by the contractors and the works programme.
- (d) Prepare, update and monitor the design, construction and commissioning programmes of the Assignment.
- (e) Report on the progress, financial situation, variation orders/compensation events, claims for additional payment and requests for extensions of time and all other matters affecting the progress and financial situation of the Assignment.
- (f) Prepare documents and presentation materials, conduct presentations and assist in all consultation and project promotion tasks in connection with the Assignment.
- (g) Liaise and coordinate with all relevant Government departments, utility companies and other relevant parties to resolve any interfaces for the satisfactory completion and commissioning of the Plant.
- (h) Prepare handover schedules, review and submit the DBO/DB contractor's O&M Manuals and as-constructed drawings for all the completed works, including maintenance manuals for any slopes and earth retaining structures formed or modified.
- (i) Administer and supervise all works and services contracts including all necessary liaison and preparation of contract documents.
- (j) Plan, design, co-ordinate and oversee the overall commissioning of the Plant in collaboration with other responsible parties.
- (k) Test and commission the completed works.
- (l) Coordinate handover of completed works to O&M divisions of WSD and other relevant authorities if required.

- (m) Assist the Employer in all matters in connection with public engagement, public consultation or public promotion.
- (n) Prepare documents and materials required for compliance with all relevant statutory and Government and departmental procedures in connection with the Assignment.
- (o) Provide all necessary input, assistance and information to other consultants, contractors, the DR and all relevant parties in discharging their duties under their assignments and contracts in connection with the completion and commissioning of the Plant.
- (p) Assess and recommend the detailed O&M requirements adopting RCM process and ISO 55000 Asset Management System, including staff resources, for the completed works, and establish the level and scope for outsourcing of the M&E maintenance work (where recommended in the M&E Maintenance Strategy Study Report mentioned in Clause 4.6(pp) of this Brief). The Consultants shall prepare draft/sample specification for outsourced maintenance of M&E plant (including overhaul, planned maintenance, breakdown maintenance and emergency maintenance), with full details of plant and equipment and maintenance requirements (including maintenance schedules and materials and spare parts requirements)
- (q) Arrange and monitor Performance Tests for a minimum period of one year after the Commissioning Tests on the Plant, follow up with any necessary improvement works.
- (r) Devise the Water Quality Plan, ISO 9001 Quality Management documentation, ISO 50001 Energy Management documentation and ISO 55000 Asset Management System documentation, including but not limited to Work Instructions, for the Plant.
- (s) Review the construction sequence analysis (4-D) BIM model(s) and final as-built BIM model(s) for the proposed works of the Plant submitted by the DBO/DB contractor and use the 4-D BIM modelling technique to monitor and control the contractor's works.

Construction and Commissioning Phase (for DB contract arrangement only)

- (t) Advise the Employer on the acceptability of the DB contractor's O&M manual.
- (u) Assess and advise staff training needs, formulate training programme, organise and conduct classroom and on-site training for WSD staff (including the production of training materials) for O&M of the Plant.
- (v) Assist the Employer on carrying out of the post-completion review of the Agreement in accordance with ETWB TC(W) No. 26/2003 upon the request of the DR.

4.9 Initial Operation and Completion Phase (for DBO contract arrangement only)

- (a) Carry out the duties of the Engineer or the SO under the terms of the Contract or the Supervisor and all other duties delegated by the Employer's Project Manager or Service Manager as defined in the NEC.
- (b) Administer the DBO contract in regard to the O&M of the Plant up until the expiry of the initial operation period.
- (c) Report on the performance of the DBO contractor, financial situation, variation orders/compensation events, claims for additional payment and all other matters affecting the contractor's performance and financial situation of the Assignment.
- (d) Review the performance measurements and control mechanisms to the O&M of the Plant.
- (e) Advise the Employer the performance of the Plant until the expiry of the initial operation period.
- (f) Examine the O&M plan updated by the DBO contractor and provide necessary advice to the DR.
- (g) Monitor and audit the contractor's O&M work with a view to promoting continual and satisfactory operation of the Plant during the initial operation period.

- (h) Advise the Employer on the acceptability of the DBO contractor's O&M manual.
- (w) Assess and advise staff training needs, formulate training programme, organise and conduct classroom and on-site training for WSD staff (including the production of training materials) for O&M of the Plant.
- (i) Review and assess the energy efficiency of the Plant against the design, propose improvement measures to achieve the maximum energy efficiency.
- (j) Review and assess the O&M performances of the Plant against the design, propose improvement measures to achieve the pre-determined performances.
- (k) Assist the Employer to enable his taking up of the administration of the DBO contract during and after expiry of the initial operation period.
- (l) Handover necessary documents and procedures to the Employer regarding payment arrangement under the DBO contract on O&M aspects and liaison work with the DBO contractor.
- (m) Assist the Employer on carrying out of the post-completion review of the Agreement in accordance with ETWB TC(W) No. 26/2003 upon the request of the DR.

## **5. Deliverables**

- 5.1 Unless otherwise specified in this Brief, the Consultants shall submit the following Deliverables (in hardcopies and softcopies with editable and scanned files in CD-ROMs or other equivalent media) up to the specified number of sets for each version to the DR and other relevant parties as agreed or instructed by the DR for comments/agreements:

No.	Deliverable	Refer to the following Clauses(s) of this Brief	Max. number of copies	Submission Date (within stated number of weeks/ months after commencement of the Agreement)
<b>General</b>				
1.	Certificate of Insurance Policy	Clause S14 of the Special Conditions of Employment	1	Within 60 days from the date of commencement of this Agreement and within 7 days upon the expiry
2.	Programme of Implementation of the Assignment	7	10	2 weeks
3.	Monthly Progress Reports on the Assignment, including current and forecast expenditures	8 & 9	10 (each)	3 working days before progress meeting or within the first 5 working days of the month for which no progress meeting will be held
4.	Monthly Progress Reports on construction works, including contract expenditures, cash flow and programme for the Contract	8 & 9	10 (each)	3 working days before progress meeting or within the first 5 working days of the month for which no progress meeting will be held
5.	Information, plans, drawings and documents relating to the Assignment	6.1.9	10 sets (each)	As and when required
6.	Records of meetings and correspondence with others	-	10 (each)	Within 5 working days from the date of meeting/correspondence
7.	Information papers, in English and Chinese, for each consultation with District Councils, Rural Committees or other public bodies and community groups	6.1.10 & 6.2.3	Up to 120 copies for each consultation	4 weeks prior to the consultation
8.	Presentation materials in both English and Chinese including colour drawings mounted on boards, photographs, animation and slides in connection	6.1.10 & 6.2.3	10 hard copies, 5 digital copy for each consultation	2 weeks prior to the consultation

<b>No.</b>	<b>Deliverable</b>	<b>Refer to the following Clauses(s) of this Brief</b>	<b>Max. number of copies</b>	<b>Submission Date (within stated number of weeks/ months after commencement of the Agreement)</b>
	with the Assignment, programme and progress for consultation with District Councils, Rural Committees or other public bodies and community groups		n	
9.	Records of all public/community consultations and reports of actions arising	-	10 (each)	As and when required.
10.	Land clearance, acquisition and allocation plans including those for any temporary land allocation	6.1.5(kk)	10	As agreed with DR
11.	Records and monitoring reports relating to all survey and monitoring works at appropriate levels agreed with the DR	6.1.12	10 (each)	As and when required
12.	Risk Management Deliverables	6.1.22	10 (each)	As agreed with DR to suit DEVB's requirements
13.	Working papers for Technology Transfer Workshop	6.1.24	100 (each)	Annually
14.	Drawings, designs, plans, specifications, bills of quantities or other documents	Clause 15 of the General Conditions of Employment	10 (each)	As and when required
15.	Working papers on issues covered by the Assignment	-	10 (each)	As and when required
16.	Drawings, notes, papers, plans and other information required for compliance with the statutory procedures required for the	-	10 (each)	As and when required

No.	Deliverable	Refer to the following Clauses(s) of this Brief	Max. number of copies	Submission Date (within stated number of weeks/ months after commencement of the Agreement)
	Assignment			
<b>Investigation Review and Design Phase</b>				
17.	Report on Monitoring Plan	6.2.1(f)	10 (each)	See Clause 6.4.15 of this Brief
18.	Inception Report	6.2.2	10	See Clause 7 of this Brief
19.	Public Engagement Plan	6.2.3	100	2 months
20.	Public Engagement Report	6.2.3	100	12 months
21.	Records and reports of all public engagement activities	6.2.3	10 (each)	Within 7 working days after completion of the activities
22.	Site Review Report	6.2.4	10	2 months
23.	Review Report on Fresh Water Quality Objectives for Desalination Plant at Tseung Kwan O.	6.2.5	10	6 months
24.	Desk Study Report and Proposal for Site Investigation works	6.2.6(b)	10	2 months
25.	Tender Document/Works Order(s), Drawings and QSSP for Site Investigation works	6.2.6(c) to (h)	10	As agreed with DR
26.	Site Investigation Report	6.2.6(g)	10	Within 1 month after the completion of the site investigation works
27.	Sediment Quality Report	6.2.7	10	To be submitted together with the Site Investigation Report
28.	Geotechnical Assessment Report	6.2.8(c)	10	3 months



<b>No.</b>	<b>Deliverable</b>	<b>Refer to the following Clauses(s) of this Brief</b>	<b>Max. number of copies</b>	<b>Submission Date (within stated number of weeks/ months after commencement of the Agreement)</b>
29.	Geotechnical Design Report	6.2.8(d)	10	6 months
30.	Natural Terrain Landslide Hazards Assessment Report	6.2.9	10	6 months
31.	Review Report on EIA Study	6.2.10	10	See Clause 7 of this Brief
32.	Review Report on HA	6.2.11	10	3 months
33.	Procedure for the operation at CEDD's barging pier	6.2.12	10	12 months
34.	Traffic Impact Assessment Report	6.2.13	10	3 months
35.	Marine Traffic Impact Assessment Report	6.2.14	10	3 months
36.	Drainage Assessment Report	6.2.15	10	3 months
37.	Heritage Impact Assessment Report	6.2.16	10	3 months
38.	Tree Survey Report	6.2.17	10	3 months
39.	Hydraulic Assessment and Surge Analysis Report	6.2.18	10	6 months
40.	Energy Efficiency Report	6.2.19	10	6 months
41.	M&E Maintenance Strategy Study Report	6.2.20	10	See Clause 7 of this Brief
42.	Review Report on Seawater Quality Characterization and Seawater Quality Envelope	6.2.21	10	6 months

<b>No.</b>	<b>Deliverable</b>	<b>Refer to the following Clauses(s) of this Brief</b>	<b>Max. number of copies</b>	<b>Submission Date (within stated number of weeks/ months after commencement of the Agreement)</b>
43.	Scheme Design Report	6.2.22(dd)	10	2 month
44.	Design Memorandum	6.2.22(vv)	10	3 months (Draft) 4 months (Final)
45.	Reference Design and Implementation Scheme	6.2.22	10	14 months
46.	Technical Specifications of Building Information Modelling	6.2.24	10	12 months
47.	Schedule of Accommodation	6.2.25	10 (each)	As agreed with DR
48.	C&D Material Management Plans and half-yearly status reports	6.2.27	10 (each)	As agreed with DR to suit DEVB's requirements
49.	Planning submission for amendment to Outline Zoning Plan	6.2.28	10	6 months
50.	Plans, notices and papers for Gazettal under Foreshore and Sea-bed (Reclamations) Ordinance	6.2.29	10	2 month
51.	Quality Site Supervision Plan (QSSP)	6.2.30	5 (each)	Draft and final as agreed with DR
52.	Risk Treatment Plans, Risk Management Plan and Risk Registers	6.2.31	10	3 months
53.	Project Estimate Control Committee (PECC) submission	6.2.34	10 (each)	As agreed with DR
54.	Working Paper on Cost-effectiveness of DBO/DB contract Procurements and Tendering/Negotiation Strategy for the DBO/DB contract(s)	6.2.35(c)	10	See Clause 7 of this Brief
55.	Working Paper on Performance	6.2.35(f)	10	See Clause 7 of this Brief

<b>No.</b>	<b>Deliverable</b>	<b>Refer to the following Clauses(s) of this Brief</b>	<b>Max. number of copies</b>	<b>Submission Date (within stated number of weeks/ months after commencement of the Agreement)</b>
	Measurement and Financial Aspects of the DBO/DB contract(s)			
56.	Working Paper on Administration, Supervision and Monitoring of the DBO/DB contract(s)	6.2.35(h)	10	See Clause 7 of this Brief
57.	Working Paper on Employer's Monitoring Mechanism and Handing-over Arrangement of the Plant	6.2.35(i)	10	See Clause 7 of this Brief
58.	Working Paper on Testing, Commissioning and Acceptance Arrangement of the DBO/DB contract(s)	6.2.35(j)	10	See Clause 7 of this Brief
59.	Final Report on the DBO/DB Contract Procurement	6.2.35(k)	10	See Clause 7 of this Brief
60.	Conditions of Contract/Additional Conditions of Contract for the DBO/DB contract(s)	6.2.36	10	See Clause 7 of this Brief
61.	Prequalification Documents	6.2.36	25	See Clause 7 of this Brief
62.	Marking Scheme for tender assessment and negotiation strategies/procedures	6.2.36	10	See Clause 7 of this Brief
63.	Final Report and Executive Summary on Investigation Review and Design	6.2.37	50	See Clause 7 of this Brief
<b>Tender Phase</b>				
64.	Document and Drawings (A1 size) for tender invitation	6.3.1	25	See Clause 7 of this Brief

<b>No.</b>	<b>Deliverable</b>	<b>Refer to the following Clauses(s) of this Brief</b>	<b>Max. number of copies</b>	<b>Submission Date (within stated number of weeks/ months after commencement of the Agreement)</b>
65.	Report on prequalification submission assessment of DBO/DB contract(s)	6.3.3	10	See Clause 7 of this Brief
66.	The Employer's Requirements, special contract provisions, specifications, drawings, plans, design calculations, bills of quantities and other documents for each works contract required for approval of the DR	Clause 15 of the General Conditions of Employment	25 (each)	As and when required and agreed by DR
67.	Tender Assessment Report	6.3.7	10	See Clause 7 of this Brief
68.	Tender Review and Appraisal Report	6.3.8	10	See Clause 7 of this Brief
69.	Technical Assessment Report	6.3.8	10	See Clause 7 of this Brief
70.	Contract documents and drawings	6.3.10	Clause 5.11	As agreed with DR
<b>Construction and Commissioning Phase (for both DBO and DB contract arrangement)</b>				
71.	Reports on RSS organisation	13.2	5 (each)	To be submitted together with the monthly progress reports
72.	As-built Building Information Modelling model(s)	6.4.5	5	Within 3 months after completion of the DB contract or completion of the works under the DBO contract
73.	Revised QSSP	6.4.14	5 (each)	Upon major modification of the during Construction and Commissioning Phase
74.	Field notes, data (including digitized data) and plans arising from	19.5 and 19.6	5 (each)	As and when required

<b>No.</b>	<b>Deliverable</b>	<b>Refer to the following Clauses(s) of this Brief</b>	<b>Max. number of copies</b>	<b>Submission Date (within stated number of weeks/ months after commencement of the Agreement)</b>
	any construction supervision, investigations, surveys, tests and monitoring in connection with the Assignment			
75.	O&M Manual	6.4.28 and 6.4.29	10 sets (each)	1 month before commissioning of the Plant (Draft) and before expiry of defects liability period or maintenance period of the DB contract (Final) or defects liability period or maintenance period of the works under the DBO contract (Final)
76.	As-constructed drawings	6.4.28 and 6.4.29	10 sets (each)	Ditto
77.	Geotechnical Review Report	6.4.30	10	After completion of the DB contract or completion of the works under the DBO contract and within a period to be agreed by the DR
78.	Maintenance Manuals of Slopes and Retaining Walls	6.4.31	10	Ditto
79.	Application for GEO Checking Certificate(s)	6.4.31	10	Ditto
80.	Water Safety Plan	6.4.33	5	Ditto
81.	ISO 9001 Quality Management documentation	6.4.33	5	Ditto
82.	RCM documentation	6.4.33	5	Ditto
83.	ISO 55000 Asset Management	6.4.33	5	Ditto

<b>No.</b>	<b>Deliverable</b>	<b>Refer to the following Clauses(s) of this Brief</b>	<b>Max. number of copies</b>	<b>Submission Date (within stated number of weeks/ months after commencement of the Agreement)</b>
	documentation			
84.	Environmental Assessment System Accreditation documentation or Environmental Assessment documentation	6.4.34	5	Ditto
85.	Commissioning Report of the Plant	6.4.47	10	See Clause 7 of this Brief
86.	Design calculations and certificates	Clause 11	5 (each)	As agreed with DR
<b>Construction and Commissioning Phase (for DB contract arrangement only)</b>				
87.	Classroom and on-site O&M training plan	6.4.48	10	Ditto
88.	ISO 50001 Energy Management Documentation	6.4.49	10	Ditto
89.	Post-completion Review Report	6.4.50	10	See Clause 7 of this Brief
<b>Initial Operation and Completion Phase (for DBO contract arrangement only)</b>				
90.	Operation Performance Report	6.5.9	10 (each)	within 5 working days after the expiry of each reporting period
91.	Review Report on the Performance Measurements and Control Mechanisms to the O&M of the Plant	6.5.10	10 (each)	See Clause 7 of this Brief
92.	Classroom and on-site O&M training plan	6.5.12	10	After completion of the initial operation period and within a period to be agreed by the DR
93.	ISO 50001 Energy Management Documentation	6.5.13	10	Ditto
94.	Post-completion Review Report	6.5.14	10	See Clause 7 of this Brief

5.2 The Employer shall become the exclusive owner of all intellectual property

rights of all Deliverables and shall be free to use, reproduce, copy, promulgate or distribute the Deliverables in any form. The Consultants shall draw the Employer's attention to any Deliverables that are under licence, have any pre-existing copyright or patent or have any other restrictions whatsoever affecting the Employer's use of the same and, if required by the DR, to establish the existence of any licence, copyright, patent or restriction.

- 5.3 When requested by the DR, the Consultants shall seek the agreement of the owners of the intellectual property rights to allow the Government to copy, distribute or amend those Deliverables in respect of which there is a pre-existing intellectual property right.
- 5.4 The Deliverables shall also include all documents including working papers, reports, technical papers, and any supporting notes, sketches, plans, drawings, photographs, photomontages, charts, models, databases, software programmes, and all digital storage media which are prepared or produced by the Consultants for the purpose of or in connection with or arising out of the Assignment. Such documents and information shall be submitted to the DR when so requested by him during the course of the Assignment.
- 5.5 The Consultants shall prepare and submit the Deliverables required under Clause 5 of this Brief in draft version to the DR and other relevant Government bureaux/departments/offices for comments before issuance of final version. The finalized Deliverables shall contain a summary of the comments received from concerned parties following circulation of the draft version, and responses and actions taken by the Consultants.
- 5.6 Where revised draft or updated version of any papers, reports or documents of any kind are submitted by the Consultants, the Consultants shall, when so requested by the DR, provide a red-lined version highlighting all changes from the draft/previous version for easy reference by the readers.
- 5.7 The Deliverables shall generally be in A4 size and accompanying drawings should be of convenient sizes but not exceeding A3 size unless otherwise specified or approved by the DR. All drawings produced for circulation other than those incorporated in the reports and working papers shall be in A1 size unless otherwise specified or approved by the DR.
- 5.8 The Consultants shall adopt the following green measures in preparing the

Deliverable required above:

- (a) all reports, technical notes, working papers, prequalification documents, tender documents, contract documents and other relevant documents including their draft forms should be of single line spacing and should be printed on both sides of recycled paper using environmentally friendly ink. Recycled paper with not less than 50% recycled materials and not exceeding 80 gsm shall be used as a general rule. Bleached paper should not be used if possible. The logo of recycled paper should preferably be printed in prominent area of the reports;
- (b) unnecessary of excessive use of plastic laminates, glossy covers or double covers shall be avoided as far as possible. Use of recyclable non-glossy art board paper as document covers shall be encouraged;
- (c) excessive white space around the borders and in-between the paragraphs of all documents prepared by the Consultants should be avoided. A margin of 2 cm should be sufficient. Excessive use of blank papers should also be avoided; and
- (d) number of pages can be reduced by reducing the size of typeface (font). For example “Times New Roman” or “C.G. Times” of font size not exceeding 10 characters per inch (cpi) or equivalent to point 12 can be used in balancing legibility and clarity against the waste reduction objective. The appearance and readability of the document can be improved by using two columns where the font size used is less than 12 points.

5.9 Drawings shall be prepared by Computer–Aided– Drafting (CAD) in AutoCAD DXF or DWG format conforming to the CAD Standard for Works Projects version 1.03.00 (or later versions as agreed between the Employer and the Consultants from time to time) as posted on the Development Bureau’s web site [http://www.devb.gov.hk/en/construction\\_sector\\_matters/electronic\\_services/cad\\_standard/computer\\_aided\\_drafting/index.html](http://www.devb.gov.hk/en/construction_sector_matters/electronic_services/cad_standard/computer_aided_drafting/index.html). Drawings shall also be submitted in Geographic Information System (GIS) format compatible with WSD Digital Mapping System and prevailing requirements of WSD. As-constructed drawings with a scale of 1:1000 or other scale agreed by the DR (4 hard copies and 1 soft copy in CD-ROM) and completed forms shall be submitted to the DR. The Consultants shall also submit 2 advance copies of the as-constructed drawings showing necessary details for alterations and/or



additions of WSD Mains Record Plans in CAD format and in GIS format, for any sections of works at the time of handing over the works concerned to WSD.

- 5.10 Tender Documents shall include the Electronic Dissemination Package in accordance with Environment, Transport and Works Bureau Technical Circular (Works) (ETWB TCW) No. 11/2005 “Electronic Dissemination of Tender Documents and Electronic Submission of Tender Returns on Removable Media” for issue to prospective tenderers.
- 5.11 Item no. 70 under Clause 5.1 of this Brief includes drawings and other contract documents for the works contract (3 signed and sealed copies of all documents and drawings and 13 certified true copies of documents and 6 certified true copies of drawings for each works contract) for the execution of the Articles of Agreement by the Employer and the contractors, for retention by the DR and for issue to the contractors, RSS and other parties. At the request of the DR some sets of drawings are to be reduced to A2 or A3 size as appropriate. (Sealed copies of documents and drawings for execution of the Articles of Agreement to be submitted 3 working days prior to the execution of Articles of Agreement. Certified true copies of documents and drawings to be submitted within 1 week after the execution of Articles of Agreement.)
- 5.12 The Consultants shall prepare and circulate sufficient copies of working papers, reports, coloured drawings and other supporting documents for discussion among stakeholders in working meetings. These documents shall be circulated to the relevant parties at least two weeks before the meetings.
- 5.13 The Consultants shall design, provide and maintain a fully indexed web-based computer database system for the uploading, storage, updating and retrieval of the softcopy of all Deliverables required under and all documents relevant to the Assignment. The system shall be designed for easy access by the DR or any relevant parties as agreed with the DR, but with appropriate security measures incorporated with a view to achieving confidentiality of the information being stored.
- 5.14 Unless otherwise agreed by the DR, the documents referred to in Clause 5 of this Brief shall be accompanied with the Electronic Document Files.

The Electronic Document Files should be provided in two forms:

- (i) Native Files – They are files containing the contents of the documents in the native format of the application used for creating these files; and
- (ii) Image Files – They are files containing the printed image of the Native Files.

Subject to the agreement from the DR, the following file formats may be used for Electronic Document Files:

<b>Type of File</b>	<b>Format for Native File</b>	<b>Format for Image File</b>
Papers, reports and any other text documents	Microsoft Rich Text Format (RTF), Microsoft Word document (DOC)	Adobe Acrobat portable document (PDF) <i>(in non-raster format to allow for text extraction)</i>
Bills of quantities, schedule of rates and any other schedules	Microsoft Excel format (XLS), Microsoft Rich Text Format (RTF), Microsoft Word document (DOC)	Adobe Acrobat portable document (PDF) <i>(in non-raster format to allow for text extraction)</i>
Scanned text documents	Not applicable	Adobe Acrobat portable document (PDF)
Programmes	Not applicable	Adobe Acrobat portable document (PDF)
Drawings	AutoCAD	Adobe Acrobat portable document (PDF)
Scanned photographs (including project photographs), illustrations, portraits, documents provided by others and documents involving signatures	Not applicable	Tag Image File Format (TIFF), Encapsulated PostScript Files (EPSF), Graphic Interchange File Format (GIF), Joint Photographic Experts Group (JPEG)
Video, movie	MPEG-2 and MPEG-4 (ISO 11172)	Not applicable
Hydraulic model, associated databases	H2OMAP Water	Adobe Acrobat portable document (PDF)
GIS, associated databases	Geographic data files compatible to ESRI's ArcGIS Product	Adobe Acrobat portable document (PDF)

The Electronic Document Files shall be saved on CD-ROM's complying with the requirements of ISO 9660 or other equivalent media and kept in protective cases submitted together with the hardcopy. The compact discs shall be clearly labelled on the surfaces and the protective cases with the date of production of

the compact discs, the Agreement number and title of the Assignment, the name and logo of WSD, and the name and company chop of the Consultants. In addition, the spines of the cases shall be marked with the Agreement number.

- 5.15 The Consultants shall submit to the DR a set of DVD-ROM's in duplicate containing the digital copies of all Deliverables for the Review and Design Phase, Tender Phase, Construction and Commissioning Phase and Initial Operation and Completion Phase respectively upon the completion of each phase mentioned in the Assignment. The format of DVD-ROM's shall make reference to Clause 5.14 of this Brief.

In addition, the DVD-ROM's shall include a digital copy of this Brief to be provided by the DR and an index file in HyperText Markup Language (HTML) (version 4.0 or later) or equivalent format containing the salient points of the Assignment and the following information about each of the digital copies provided:

- (a) Title of the Deliverable;
- (b) Version number and date of issue of the Deliverable;
- (c) File name of the Deliverable;
- (d) Software used to create the Deliverable;
- (e) Version of the software; and
- (f) Highlights of any intellectual property rights belonging to a third party.

## **6. Services to be provided by the Consultants**

### **6.1 General Requirements**

- 6.1.1 The services to be provided by the Consultants shall be as defined in the General Conditions and Special Conditions of the Employment and as amplified, extended and set out in the Brief. The general services as described in all sub-clauses to Clause 6.1 of this Brief below shall, where appropriate and applicable, apply to all Phases of the Assignment.

- 6.1.2 In order to address the objectives in Clause 3 of this Brief and in compliance with the requirements as stated in this Brief, the Consultants shall provide personnel with appropriate qualifications and relevant experience to manage all tasks and shall direct, control and undertake, where appropriate, the services detailed in the following sections. The Consultants shall note that as the Project is complex and multi-disciplinary in nature, well qualified

specialist staff shall be provided as specified in subsequent clauses of this Brief.

- 6.1.3 Comply with all instructions of the DR and with all Government Handbooks, Manuals, Circulars, Instructions, Code of Practice, Technical Memoranda, GEO Guidance Documents, Government Regulations and WSD Instructions and Guidelines that are in force at the relevant time and that may be relevant to the Assignment.
- 6.1.4 Consult and liaise with other Government departments/bureaux, relevant divisions of WSD, public utility companies and other authorities, bodies, consultants, contractors or persons on matters related to the Assignment and developments likely to be affected by the Project, and will be expected to communicate and correspond directly with them. The Consultants shall obtain their approval, where necessary, to the proposed works, the working methods and the programme for the works. Any correspondence, notes or minutes arising from the liaison shall be copied to the DR. The co-ordination works in respect of utilities and other services in connection with the Assignment shall also be the responsibility of the Consultants. Any difficulty encountered in communication, liaison and co-ordination shall be referred to the DR for assistance.
- 6.1.5 In particular, the Consultants shall:
- (a) liaise closely with the Consultants Management Division, Project Management Division, Design Division, Construction Division, Mechanical & Electrical/Projects Division, Mechanical & Electrical/Maintenance Division, New Territories East Region, New Territories West Region, Kowloon Region, Hong Kong & Islands Region, Operations and Slope Safety Unit, Customer Services Division, Development Divisions and Water Science Division of WSD or other parties as may be authorised by the DR in writing and notified to the Consultants from time to time on matters relating to the contract procurement, design, construction, testing, commissioning, operation, and maintenance of the Plant;
  - (b) liaise with the Development (2) Division, Design Division and Construction Division of WSD with regard to projects under planning that may affect/be affected by the Project, in particular the laying of a

trunk main for the transfer of the fresh water to be produced from the Plant to TKOFWPSR under this Project, and to incorporate necessary provisions into the design and construction works to facilitate implementation of the works of the Plant;

- (c) liaise with Chief Geotechnical Engineer/Geotechnical Projects and Chief Geotechnical Engineer/Standards and Testing, Geotechnical Engineering Office (GEO) of Civil Engineering and Development Department (CEDD) on matters relating to ground investigation and the associated laboratory tests respectively;
- (d) liaise with and seek agreement of the GEO and any concerned parties on any matters of geotechnical concern arising from the proposed works. A Geotechnical Team Leader shall be nominated for this Assignment. This person must have a clearly defined position of responsibility in the Consultants' organization and be involved in making key assessments/decisions and taking action in relation to the design, built quality and risk management of the geotechnical works. He/She shall be responsible for detailed design, design reviews and supervision of construction of the geotechnical works required under the Assignment. He shall ensure timely submission of documents to the GEO for their reviews. He shall act as the liaison person with GEO on resolving all geotechnical issues and serve as the geotechnical risk manager for the Plant. His main GEO contact shall be Chief Geotechnical Engineer/Mainland East. The minimum qualification of the Geotechnical Team Leader should be a Registered Professional Engineer (Geotechnical) (RPE(G)) under the Engineers Registration Ordinance, with a minimum of 15 years of relevant post-graduation geotechnical experience (more than 2 years of which must be in Hong Kong), with significant experience in the design and construction of slope and natural terrain hazard study/mitigation works.
- (e) liaise with District Office(s) (DO) and Rural Committee(s) on matters relating to public consultation of the proposed works of the Plant as well as undertake presentations and attend meetings with various bodies;
- (f) liaise with EPD and any member department of CCPHI on the HA, Planning Study and Action Plan;

- (g) liaise with EPD and Agriculture, Fisheries and Conservation Department (AFCD) on the environmental review, and the recommended environmental monitoring and mitigation measures under the Assignment;
- (h) liaise with and seek agreement of Mines Division of CEDD for unloading of their explosives and unloading of chlorine drums and hypochlorite solution at different time at the CEDD's barging pier and any other matters related to the barging pier.
- (i) liaise with District Lands Offices (DLO) on all land matters in regard to lands application, resumption, clearance and acquisition for the use of the Project; and District Survey Offices (DSO) on matters relating to land survey and mapping;
- (j) liaise with the relevant Region of WSD and Leisure and Cultural Services Department (LCSD) on any proposed landscaping works;
- (k) liaise with LCSD on the potential recreational use of the sites;
- (l) liaise with Architectural Services Department (ArchSD) on proposed aesthetic designs for any ancillary buildings for the Assignment;
- (m) liaise with EPD, AFCD, LCSD and Food and Environmental Hygiene Department (FEHD) on the requirements of pollution control measures to limit nuisance during construction of the proposed works and comply with the requirements of the EIA Report on the Project.;
- (n) liaise with Antiquities and Monuments Office (AMO) of LCSD for their requirements on heritage sites as appropriate in accordance with the Heritage Impact Assessment;
- (o) liaise with Fire Services Department (FSD) regarding the fire services requirements for the Plant;
- (p) liaise with Electrical and Mechanical Services Department (EMSD) regarding matters relating to electrical and mechanical issues;
- (q) liaise with Fill Management Division of CEDD on matters relating to

dumping and disposal of construction materials;

- (r) liaise with Port Works Division of CEDD on matters relating to protection and modification of existing marine facilities.
- (s) liaise with GPA regarding matters relating to preparation and submission of SOA.
- (t) liaise with Government departments/parties and their consultants for works entrusted to them. The Consultants will be required to answer queries on the entrustment works and to assist in evaluation of offers made by tenderers and to make recommendations when so required during the course of tender assessment. The Consultants shall undertake the liaison duties as required under WSD Departmental Instruction No. 1254 until the completion of the entrustment works;
- (u) liaise with manufacturers or suppliers of electrical and mechanical plant and equipment to obtain information and details including drawings, specifications and other documents required for the timely completion of the works and the assessment of the suitability of the plant and equipment for use in the Plant;
- (v) liaise with chemical suppliers for unloading of chlorine drums and hypochlorite solution at CEDD's barging pier.
- (w) liaise with manufacturers or suppliers of electrical and mechanical plant and equipment to obtain information and details including drawings, specifications and other documents required for establishment of the O&M requirements and preparation of the draft/sample specification for outsourced maintenance of M&E plant (where recommended in the M&E Maintenance Strategy Study Report).
- (x) liaise with CLP Power Hong Kong Limited (CLP) for provision of reliable electricity supply with sufficient power supply redundancy and assess on the need of any emergency standby power supply to cater for the full load operation of the Plant and its future extension, study the strategy of negotiating for a more favorable electricity tariff from CLP, and apply CLP grid connection of renewable energy resources from the site of the Plant.

- (y) liaise with telecommunication companies for provision of telephone services for telemetry and communication purposes;
- (z) liaise with the consultant of the Feasibility Study to resolve any queries of the Final Report or the associated documents of the Feasibility Study;
- (aa) liaise with all concerned authorities, including Government departments, private organisations and village representatives to obtain proper access, permits and consents in order to execute the Assignment.
- (bb) liaise with relevant Government departments on the amendment to the Outline Zoning Plan of the proposed site of the Plant and road alignment within TKO Area 137 that affect the Plant.
- (cc) liaise with other relevant utility companies, Government departments, authorities, consultants, contractors, organisations or bodies as may be required from time to time during the course of the Assignment or as required by the DR;
- (dd) propose the public relation measures that need to be carried out during the course of the Assignment;
- (ee) submit updated cost estimates and forecast of expenditures;
- (ff) prepare and submit a programme covering the work of the Assignment and such revised programmes as may be necessary in accordance with Clause 7 of this Brief. The Consultants shall review the programme from time to time and explore means to fast-track the Project with a view to completing the proposed works as early as practicable, and in any case not later than the key dates specified in Clause 7.4 of the Brief;
- (gg) prepare the various reports and other documents as stated in Clause 5 of this Brief. The Consultants shall provide Chinese translation of the Information Papers and Executive Summary referred to in Clause 5 of this Brief respectively. This translation shall be carried out by competent translators or translation firms. The translation should be of reasonable quality in rhetoric and phraseology to convey precisely the original meaning of the English version;



- (hh) draw the attention of the DR to the need to consider any implications and consequences arising out of or in relation to the Assignment and any other alternative proposals;
- (ii) consider in detail the economic, financial, technical, environmental, legal and social implications of the Assignment and recommend to the DR an order of preference for the alternative proposals.
- (jj) attend progress meetings at monthly intervals or at such other intervals as required by the DR;
- (kk) assist the DR to take possession of any land required for the purpose of or in connection with the proposed works and handing over the land to contractors or others. The services required include preparation of land requirement, clearance, acquisition and allocation plans, survey fieldwork to establish the site boundary and liaison with DLO, the contractors and the public;
- (ll) identify all facilities, installations and existing rights that may be affected by the Assignment. The Consultants shall liaise with all relevant parties who have an interest in or affected by the Project, in carrying out the Assignment;
- (mm) carry out all necessary water samplings and testings, surveys, levels and soundings and make such investigations and inquiries and search site records as are necessary for the satisfactory completion of the Assignment;
- (nn) consider, formulate and adopt measures for reducing the generation of C&D materials and the disposal of C&D materials; and
- (oo) apply for excavation permits in connection with the Plant through the Excavation Permit Management System (XPMS) implemented by Highways Department (HyD) and in accordance with relevant procedures specified by Lands Department (LandsD). The Consultants shall prepare drawings and relevant information required for application of XPs; input, update, maintain and upload/download the data required for XP application through the respective HyD's website. The Consultants

shall be responsible for co-ordinating with HyD and LandsD, relevant authorities and utility undertakings to obtain XPs for investigations and the contract works. The Consultants shall inform the DR the progress and status of the XP applications and identify problems that may cause possible delay to the programme of the Assignment.

6.1.6 Make presentations, as instructed by the DR, on the water treatment processes, RO technologies, and contract procurement arrangements, etc under the Assignment.

6.1.7 Study the requirements of the Ordinances listed below and bring to the attention of the DR any special measures necessary to comply with the requirements of these Ordinances:

- (a) Air Pollution Control Ordinance
- (b) Antiquities and Monuments Ordinance
- (c) Boilers and Pressure Vessels Ordinance
- (d) Building Energy Efficiency Ordinance
- (e) Country Parks Ordinance
- (f) Dangerous Goods Ordinance
- (g) Environmental Impact Assessment Ordinance
- (h) Electricity Ordinance
- (i) Factories and Industrial Undertakings Ordinance
- (j) Fire Services Ordinance
- (k) Foreshore and Sea-bed (Reclamations) Ordinance
- (l) Land (Miscellaneous Provisions) Ordinance
- (m) Noise Control Ordinance
- (n) Occupational Safety and Health Ordinance
- (o) Town Planning Ordinance
- (p) Road Traffic Ordinance
- (q) Waste Disposal Ordinance
- (r) Waterworks Ordinance
- (s) Water Pollution Control Ordinance
- (t) Any other Ordinance having a bearing on the works of the Assignment.

6.1.8 Take cognizance of and comply with relevant provisions, where applicable, all relevant Ordinances, regulations, procedures, standards, guidelines, manuals, circulars, handbooks in use by the Employer including but not limited to those as listed at **Appendix III** during the course of the Assignment. Should any

documents referred to in this Brief, e.g. DEVB TCW, be updated in the course of this Agreement, the Consultants shall make use of the updated versions for performing the Services unless directed otherwise by the DR.

- 6.1.9 Provide all relevant information, plans, drawings, documents, etc., relating to the Project as may from time to time be required by the DR.
- 6.1.10 Provide technical support for the DR to attend meetings with the public and the appropriate authorities and make presentations as necessary to relevant community and consultation groups including Rural Committees, District Councils, Heung Yee Kuk, green groups, local organisations, Town Planning Board, Advisory Committee on Water Resources and Quality of Water Supplies, CCPHI, Panels of the Legislative Council (LegCo), Public Works Sub-committee, Finance Committee and any other meetings/conferences/open forums, etc, in connection with the implementation of the Project. This assistance is to include the preparation of briefing notes and information papers (including the required information on greening works in accordance with ETWB Technical Circular (Works) No. 34/2003) and presentation materials such as coloured drawings, photographs, transparencies and slides (in both English and Chinese) in both hard copies and computerised format, and to attend the meetings.
- 6.1.11 Respond to queries, findings and recommendations arising out of various kinds of audit carried out by WSD and other Government departments (including, but not limited to, technical audit, quality audit and other audit made by Director of Audit).
- 6.1.12 Develop a monitoring plan to carry out monitoring of structures, utilities and infrastructures that may be affected by the construction works under the Assignment. The monitoring plan shall include the locations of the monitoring stations, devices/instruments to be used, installation details, baseline condition survey, frequency of monitoring, supervision, measurement method, checking procedures, acceptance criteria, action plans if trigger level is exceeded, etc., for all monitoring and surveying works to be carried out for the Plant. Installation of survey and monitoring devices/systems may be carried out under the site investigation contract if programme permits. Survey and monitoring field works shall generally be carried out by the contractors. Nevertheless, the RSS and its surveying team shall be required to carry out the survey and monitoring where the resources at the particular

time allow and where the situation warrants or upon request by the DR. The Consultants shall assess, interpret, depict and report the results of all survey and monitoring works to the DR and/or GEO. The Consultants shall prepare and submit monitoring reports to the DR and/or GEO at intervals to be agreed with the DR.

- 6.1.13 Identify, take cognizance of the findings, conclusions and recommendations, and resolve any potential or actual conflicts and interface issues that may arise between the Plant and all other projects being or to be undertaken by various Government departments, other projects and/or developments undertaken by private sectors or public utility installation carried out by utility undertakings. The Consultants shall liaise with all relevant parties responsible for projects which have interface with the Plant, assess the effects on the works and programme of the Plant, and make recommendations to resolve interfacing problems. In particular, the Consultants shall identify, assess and manage the interfaces between the Plant and the following projects and/or assignments as well as others arising in the course of the Assignment and, where appropriate, shall comment on proposals relating to those proposals and/or assignments which are in progress: -
- (a) Temporary magazine site for the SCL project at the TKO Area 137;
  - (b) The Mines Division of CEDD's barging pier at TKO Area 137 for off-loading explosives; and
  - (c) Cross Bay Link, Construction and Demolition Material Handling Facility (C&DMHF), SENT Landfill Extensions in the vicinity of the site.
  - (d) WSD's project of laying a trunk main from the Plant at TKO to TKOFWPSR.
- 6.1.14 Nominate a professional acceptable to the Employer to be named as the contact person of the Employer in applications for excavation permits and, where applicable, emergency excavation permits pursuant to the requirements of the Land (Miscellaneous Provisions) Ordinance, Cap 28.
- 6.1.15 Carry out all duties imposed upon the Employer under the Land (Miscellaneous Provisions) Ordinance, Cap 28 or under the conditions of the excavation permits and, where applicable, emergency excavation permits in so far as such duties have not been imposed only on the Contractor under the Ordinance or under the Contract.

- 6.1.16 Notwithstanding Clause 6.1.15, the Consultants shall not be liable to the Employer in respect of obligations stipulated under the following conditions of the excavation permits and, where applicable, emergency excavation permits: -
- (a) the condition stipulated in the excavation permits and, where applicable, the emergency excavation permits relating to the obligation and liability of the Permittee to indemnify the Government against all losses and claims for injury or damage to any person or property, nuisance, disruption or interference whatsoever which may arise out of or in consequence of the work of the Permittee, and against all claims, demands, proceedings, damages, costs, charges or expenses whatsoever in respect thereof or in relation thereto; and
  - (b) the condition stipulated in the excavation permits and, where applicable, emergency excavation permits relating to the obligation and liability of the Permittee to make good or pay for any works as a result of or in consequence of the work of the Permittee.
- 6.1.17 Clause 6.1.16 is without prejudice to Clause 22 of the General Conditions of Employment.
- 6.1.18 Ensure that the Contractors comply with the permit conditions imposed by the Authority under the Land (Miscellaneous Provisions) Ordinance, Cap 28, including those conditions stipulated in the excavation permits and, where applicable, emergency excavation permits to be observed by the Nominated Permittee or by both the Permittee and the Nominated Permittee and those stipulated in the excavation permits and, where applicable, emergency excavation permits to be observed by the Permittee but which the Contractors are required to comply with under the Contracts.
- 6.1.19 In respect of permit conditions which are stipulated in the excavation permits and, where applicable, emergency excavation permits to be complied with by the Permittee but which are required to be complied with by the Contractors under the Contracts, if notwithstanding Clause 6.1.18 the Contractors have failed to comply with these conditions, the Consultants shall take such actions so as to ensure that these conditions are complied with by the Employer in his capacity as the Permittee irrespective of whether these actions are required to be carried out by the Contractors under the Contracts.

- 6.1.20 Clauses 6.1.14 to 6.1.19 above shall apply only with respect to excavation in street maintained by the HyD that requires excavation permits and, where applicable, emergency excavation permits under the Land (Miscellaneous Provisions) Ordinance for execution of the Works.
- 6.1.21 Engage a competent person to supervise the excavation works on behalf of the Employer, maintain a documented system for supervising the excavation works and maintain a documented system to ensure that the Contractors comply with their duties in relation to excavation works. The attention of the Consultants is drawn to section 10T(5) and (6) of the Land (Miscellaneous Provisions) Ordinance, Cap 28.
- 6.1.22 Perform Systematic Risk Management in accordance with ETWB TCW No. 6/2005 and ETWB Risk Management User Manual to identify risks and uncertainties associated with the part of the Project covered by this Agreement and recommend treatment measures aiming to reduce these risks and uncertainties to acceptable level and to ensure timely completion of the Project and within budget and to the required quality. This may include arranging risk management workshops, meeting with relevant stakeholders, preparing the risk treatment plans, risk management plans and risk registers, etc. The Consultants shall employ a dedicated professional staff equipped with relevant experience in this field to perform the duty of the Risk Manager.
- 6.1.23 Upon completion of the detailed design, the Consultants are required to prepare a QSSP in accordance with Clause 6.2.30 and their own quality management system. The QSSP and its execution shall be subject to Employer's technical audits. The consultants shall also review the QSSP with the RSS during the construction stage and the initial operation period.
- 6.1.24 Technology Transfer Workshop
- (a) Provide annually technology transfer workshops and working papers in order to transfer the experience gained, including the desalination/water treatment process, design considerations, contract strategy, construction difficulties, contract administration and project management, during the course of the Assignment. The purpose of the workshops and the working papers is to assist Government staff to appreciate the implementation scheme of the Plant and the associated fresh water transfer facilities.

- (b) The working papers shall provide detailed technical aspects in the implementation scheme, including the desalination/water treatment process and hydraulic aspects, during the course of the Assignment. The workshop will be attended by a maximum number of 100 staff members from the Government.
- (c) Propose the contents of the working papers, the dates, time and venue(s) of the workshop and the facilitator for convening the workshop for the approval of the DR. The working paper shall be available at least one month prior to the workshop. The Consultants shall also arrange for the venue(s) for convening the workshops and shall pay for the charges for renting the venue(s) and all other associated costs including the working papers. The Consultants shall provide all necessary hardware, software, training aids and training materials for the workshops.

6.1.25 The Assignment covers all investigations, surveys, sampling and testing as necessary for the satisfactory completion of the Assignment. Investigations, surveys, sampling and testing will be procured (i) by direct contracts between the Employer and the contractors through the Government's procurement/tendering process, or (ii) by placing works orders under relevant Government term contracts, where appropriate, subject to prior agreement from the DR before incurring any such expenses. The Consultants shall prepare all necessary drawings, plans, specifications and documents for carrying out these works. The Consultants shall prepare the tender documents, tender assessment criteria, marking schemes, invitation documents, print tender documents, call for quotations/tenders, answer tender queries, prepare tender addenda, conduct pre-tender briefings, carry out tender assessments and prepare tender reports with recommendations, prepare award documents, and contract documents, administer and supervise for the corresponding Government contracts. The Consultants shall follow the procedures stipulated in the Stores and Procurement Regulations and other relevant Government procedures for the procurement/tendering process and ensure that a fair and competitive procurement/tendering process is undertaken and the tender sums/rates are reasonable and present the best value for money.

## 6.2 Investigation Review and Design Phase

## 6.2.1 General

- (a) Critically review, confirm and follow up the findings, conclusions and recommendations in the various reports, papers and documents as listed in **Appendix I** prepared by the consultant of Feasibility Study, other related studies and all available relevant information, data and constraints (including buildings/structures, service/utilities, land matters, geotechnical, hydrogeological issues and environmental issues, etc.) taking into account the practicability and cost-effectiveness of the design, construction method, construction programme, O&M requirements, risk control and management, safety and health, quality, minimal disturbance caused to the public both in construction and operation, social and physical environment, reliability at work and performance and maintenance requirements. The Consultants shall explore opportunities and identify practical means for further accelerating the work to achieve earlier completion of the Plant. The Consultants shall recommend, with justifications and implications, any modifications/deviations from the findings, conclusions and recommendations based on the review to the DR for approval.
- (b) Carry out further studies and investigations necessary to obtain information not available from the Feasibility Study but which is a prerequisite for the detailed design or reference design to commence, as agreed by the DR. The services provided in respect of this kind of further studies and investigations, other than those specified in this Brief, shall be considered as being work carried out under Clause 5 of the Schedule of Fees.
- (c) Consult and liaise with all concerned Government departments and other concerned parties on any specific requirements and incorporate them into the design.
- (d) Accept the appointment as Engineer's Representative under the terms of WSD Term Contracts and carry out the duties of Engineer's Representative and other necessary duties for advance works carried out under WSD Term Contracts. The work of supervising the advance works shall be considered as being work carried out under Clause 5 of the Schedule of Fees.



- (e) Identify the existing utilities facilities, installations and existing rights that require diversion, relocation or modification to suit the proposed works and establish the procedures, practicalities and programme for doing so.
  
- (f) Conduct a condition survey covering both topographic survey of the ground and pre-condition survey of existing buildings, structures, surface, subsurface infrastructures and utilities, and other properties that may be susceptible to damage or affected by the implementation of the proposed works of the Plant. The survey shall aim to assess and baseline the existing conditions and to record any existing trend of movement of ground surface/subsurface, structures, infrastructures and utilities that may potentially affect or be affected by the Plant prior to commencement of construction. The Consultants shall identify, survey, assess and document the existing condition of these structures/buildings, etc., and establish the temporal behaviour of sensitive facilities resulting from changes in ambient conditions, such as temperature, humidity, loading/unloading, tidal effects, water table draw down, etc, as far as possible, and shall establish the effects of previous events, such as previous construction, on the behaviour of the facilities and their residual capacity to cope with new events that may arise from the construction of the proposed works. The Consultants shall employ a specialist to oversee all survey and monitoring works. Upon completion of the survey works, the Consultants shall prepare a Condition Survey Report to assemble and document the results, findings and conclusions of the survey carried out. The Consultants shall also prepare a Report on Monitoring Plan to recommend measures for further monitoring and survey of selected structures, infrastructures, utilities and ground surface/subsurface prior to and during construction and also for a reasonable period after construction. Baselineing and monitoring of ground water levels shall also be covered in the Condition Survey Report and Report on Monitoring Plan respectively.
  
- (g) Design all permanent geotechnical works, including but not limited to, rock discontinuity mapping of rock slopes/faces, slope protective and mitigation works, rock slope design, boulder survey, natural terrain hazard study and the associated mitigation works.

## 6.2.2 Inception Report

Prepare an Inception Report for implementing the Assignment. The content of the Inception Report shall include the following: -

- (a) the understanding and appreciation of the objective of the Assignment;
- (b) identification of the key issues and stakeholders;
- (c) forecast expenditure of the Assignment;
- (d) quality assurance plan, detailing all procedures and measures safeguarding the quality of the Assignment as well as the calibration requirements and validation procedures for all equipments and software to be used for the Assignment;
- (e) a review of previous work carried out by WSD in relation to the Assignment and a framework for all aspects required for the efficient planning, management, administration, programming, financial control and monitoring of all the processes and procedures required for project implementation by way of the DBO/DB procurement arrangement throughout the course of the Assignment. The review and framework is expected to:
  - (i) review the planning, investigations, studies previously carried out to see if previous work done could be incorporated into this consultancy, where appropriate, with a view to facilitating a more effective and efficient implementation of the Assignment;
  - (ii) identify and include a general overview of the important issues, methodologies and procedures required for implementation of the Assignment;
  - (iii) draw together and integrate these requirements into an appropriate set of overall programmes and strategies;
  - (iv) include estimates of funding and resources required to implement the proposed works of the Plant;

- (v) define and set priorities, targets and standards to be achieved;
  - (vi) identify methodologies and procedures for monitoring the standard of project management and for financial control;
  - (vii) include such other information, estimates and programmes as are necessary in order to keep a good overview, for ensuring good standards of project management and for planning ahead and monitoring an appropriate DBO/DB strategy; and
  - (viii) include the approach for establishing the mode, system, mechanism and structure to administer, supervise and monitor the performance of the DBO/DB contract. The Consultants shall propose the structure of the Monitoring Team of the Employer throughout the execution of the DBO/DB contract and, where appropriate, the required accommodation at the Plant.
- (f) deliverable distribution matrix, to ensure that the deliverables will be effectively disseminated and to avoid distribution of materials to unconcerned parties;
- (g) the approach and methodology for undertaking the key elements of the Assignment including the project review, design development, contract and procurement strategy, requirements of prequalification and tender assessment, environmental auditing, project administration, risk management and site supervision, approval procedures of the Contractors' technical proposals and the relevant authorities to be consulted, where applicable;
- (h) the approach for reviewing existing site investigation and survey records and establishing any additional site investigations including water samplings and testings, and surveys required for implementation under the Assignment;
- (i) a preliminary geotechnical appraisal for identifying geotechnical constraints and risks affecting cost and programme, man-made slopes and retaining structures affecting or to be affected by the project, and needs for further geotechnical studies;

- (j) the approach and methodology for establishing the envelope of performance criteria, targets, standards and requirements for defining the quality of water as well as all other relevant environmental performance of the Plant so that it would form the basis for developing the DBO/DB contract(s) and assessing the acceptability of the designs proposed by tenderers of the DBO/DB contract(s);
- (k) the approach and methodology for reviewing the EIA studies including the Environmental Monitoring and Audit proposals, and required environmental control measures for the Project;
- (l) the approach and methodology for reviewing various seawater intake options, water treatment processes and desalination systems, disinfection systems and handling of brine, that can be adopted for the Plant to meet the required targets, standards and requirements, as well as selecting the most appropriate one for proceeding with the reference design;
- (m) the approach for reviewing, evaluating, developing and establishing the DBO/DB contract procurement strategy, framework, steps and procedures;
- (n) the approach for completing the DBO/DB contract documentation;
- (o) a comprehensive Programme of Implementation for the Assignment containing all activities, their timing, advertisement, consultation and/or gazette required, key dates for receipt of approvals, interfaces with the public engagement exercise, reporting and meetings; a schedule detailing the submission of reports, working papers, technical notes and executive summary, etc shall also be included; and
- (p) details of the Consultants' organization and staffing of the project team, including specialists/sub-consultants as well as respective responsibilities and curricula vitae of each key personnel in scheme/treatment process review team, design team, contract strategy development team, contract procurement team and contract administration team.

### 6.2.3 Public Engagement/Consultation

- (a) Consult relevant government departments like Home Affairs Department

(HAD), etc. for the needs and scope of the public engagement.

- (b) Identify District Councils, relevant committees, public consultation bodies and community groups with whom public consultations are to be made and prepare a strategy and programme for doing so.
- (c) Prepare public engagement materials with Chinese translation as appropriate and attend meetings of the public bodies to be consulted and assist with the presentation as necessary. The number of such meetings is estimated to be sixty over which the Employer shall pay the extra cost on a time charge basis.
- (d) Prepare a Public Engagement Plan, for the DR's approval, which shall comprehensively address the following:
  - (i) public engagement strategy, approaches, methodologies and interfaces;
  - (ii) identification of target stakeholders to be consulted;
  - (iii) types of public engagement activities;
  - (iv) types of public engagement materials including but not limited to information papers, presentation materials and animations of the proposed works of the Plant with flash interactive user interface;
  - (v) effective method for liaising, consulting, meeting and clarifying with the public and stakeholders and gaining their support and understanding on the importance and benefits of the Project;
  - (vi) ways and actions to handle reactions from the public and stakeholders;
  - (vii) approaches to consolidate and evaluate the comments, views, etc. received from the public, stakeholders and mass media and respond to their comments, views, etc.;
  - (viii) programme of the public engagement, highlighting the key meeting dates of established councils, boards, and committees to be

consulted, dates of public engagement activities and submission of public engagement materials, etc.; and

- (ix) forecast expenditure of the public engagement.
  
- (e) Submit the updated Public Engagement Plan, together with a summary of public engagement activities conducted, consultation meetings/briefings, complaints/enquiries from the public, stakeholders and mass media and corresponding responses, relevant correspondences, etc. at monthly intervals or at such other intervals as the DR may require for the DR's agreement.
  
- (f) After the completion of the public engagement exercise, the Consultants shall prepare the Public Engagement Report, covering the activities undertaken, issues discussed, summary of received comments, views, etc. and their responses, conclusions/consensus reached, etc. The Public Engagement Report should also highlight the relevant key comments/views, analyse the pros and cons of the key comments/views, and provide commentary on the suitability of incorporating them into the study process. The Public Engagement Report shall be in a bilingual version of Chinese and English, self-contained and written in easily understandable language. The Consultants shall draft the Chinese version first and then produce the bilingual version after the DR has agreed to the Chinese version. The Consultants shall be responsible for the design and artwork of the documents.

#### 6.2.4 Review of Proposed Site for the Plant

- (a) Review the proposed site for the Plant and identify any alternatives and make recommendation that will:
  - (i) result in a more cost effective solution;
  - (ii) minimize the footprint of the Plant with provision for future expansion;
  - (iii) maximize energy efficiency;
  - (iv) reduce the impact on the environment of the surroundings;

- (v) reduce the disruption to marine, vehicular and pedestrian traffic;
  - (vi) reduce the inconvenience to the public;
  - (vii) phase in more readily with works by others including WSD, utility undertakings and other Government departments;
  - (viii) reduce the risk to or the effect on adjacent country parks, slopes and pier; and
  - (ix) facilitate future O&M.
- (b) Examine all facilities, installations and existing rights that may be affected by the proposed works.
  - (c) Identify the route(s) for construction of the access road between the proposed site for the Plant, the CEDD's barging pier and the public road during construction stage and early operation stage.
  - (d) Identify the need for resumption of land, clearance or reprovisioning and liaise with the relevant bodies to determine the practicalities and programme for doing so.
  - (e) Identify any additional land requirements, such as borrow areas, dumping areas, works areas, storage areas and access roads necessary for the completion of the works.
  - (f) Prepare necessary land plans and other relevant information to enable arrangements for land acquisition and clearance for the works and the works areas to be made.
  - (g) Liaise and assist in negotiations with relevant bodies on matters of land resumption, clearance and reprovisioning works.
  - (h) Identify locations on the proposed and existing drainage systems that are considered suitable to receive connections from the overflow and washout pipes of the Plant and the washout points on the proposed alignments for the water mains in the Plant.

- (i) Identify locations where special geotechnical considerations are necessary to meet requirements of GEO and describe the considerations to be made.

#### 6.2.5 Water Treatment Process

- (a) Review, make reference to and take into account the requirements of the treated water quality objectives in **Appendix IV** of this Brief and relevant water quality parameters of significance for desalination processes, or any updated requirements in the Feasibility Study and provided by WSD, during the course of the Assignment. Due consideration shall also be given to the cost, efficiency, hydraulic, land, environment, operation, maintenance, the trend of sea water quality and the application of the most suitable treatment process (including pre-treatment, RO membrane system, post-treatment, backwash systems, etc.) for the Plant to a reliable output of 135,000 m<sup>3</sup> per day (expandable to 270,000 m<sup>3</sup> per day).
- (b) Consult the Department of Health on the updated treated water quality objectives.
- (c) Prepare and submit a Review Report on Fresh Water Quality Objectives for Desalination Plant at Tseung Kwan O.
- (d) Review and evaluate the water treatment process (including pre-treatment, RO membrane system, post-treatment, backwash systems, etc.), taking into consideration the requirements of this Brief, and the findings and conclusions revealed in the Feasibility Study. The Consultants shall recommend to the DR for approval the most suitable option together with full justifications on the cost effectiveness, capital costs, recurrent costs, life cycle cost and implementation programme.
- (e) Review and propose additional measures if necessary to be implemented in the design of the Plant so that the water quality parameters of significance, including but not limited to boron, total dissolved solid and bromide for desalination processes are in compliance with the requirements of the Department of Health. The Consultants shall also review the requirements and recommend appropriate post-treatment



process for disinfection and maintenance of residual disinfectant in the desalinated water. The Consultants shall address the need and means for stabilisation and conditioning of the desalinated water to reduce its corrosivity and aggressiveness prior to distribution.

- (f) Incorporate the findings and recommendations of the above review, studies and investigations into the reference design.

#### 6.2.6 Site Investigation (including Land Ground Investigation (GI), Marine GI, Geophysical Surveys for Seabed, Seawater Sampling/Monitoring, Laboratory Testing and Utility Surveys)

- (a) Review all available geological, topographical, SI data and the results of all previous SI and survey works including but not limited to those carried out under the Feasibility Study, and recommend, design, manage and supervise any additional ground investigations, laboratory testing and utility surveys by the use of drill holes, trial pits, ground probing radar or other techniques to determine the location of existing services and other underground structures and to prove the suitability of the proposed site for the Plant. Site investigation, including the ground investigation works shall also be planned for review of the natural terrain hazard study, if required. The Consultants shall observe and follow the guidance given in (i) <http://www.cedd.gov.hk/eng/about/organisation/doc/gin.pdf> and (ii) <http://www.cedd.gov.hk/eng/publications/laboratory/doc/testdir.pdf> with respect to ground investigation and the associated laboratory testing. The site investigation and laboratory testing shall be extensive enough to provide adequate information for the detailed design of the proposed works to be carried out. The Consultants shall provide an adequate number of qualified and experienced professionals to plan and direct the site investigation. The recommendations of Geoguide 2 regarding requirements of the personnel for supervision of GI and laboratory testing should be followed. The Consultants shall obtain the approval from the DR before carrying out the site investigation and laboratory testing.
- (b) Prepare a Site Investigation Desk Study Report for the proposed site investigation and laboratory testing. The report shall document the information examined (including available reference documents, aerial photographs and site investigation and testing reports, with Geotechnical Information Unit reference where appropriate), describe the geological

setting of the site, and indicate the location of utilities within and around the site and the land status. It shall state the need, scope and objectives of the proposed additional site investigation and laboratory testing, and give the estimated depths of proposed drill holes and the likely amount of rock drilling. It shall also include a proposed supervision plan for both the site investigation and laboratory testing works, giving the names and curriculum vitae of the proposed supervisory personnel. The Consultants shall arrange for the report to be vetted and signed by a qualified and experienced professional if the report has not been prepared by such a person. A copy of the Desk Study Report shall be passed to the nominated supervisory personnel to convey to them the available information and the aims of the proposed site investigation and laboratory testing.

- (c) If the site investigation works are estimated to cost less than the financial limits stated in Ground Investigation Note No. 1/2011 or its latest version, they may be carried out under the GEO term contract for GI works. The associated laboratory testing works may be carried out at Public Works Laboratories (PWL) or under a GEO term contract for laboratory testing. The Consultants shall liaise with Chief Geotechnical Engineer/Geotechnical Projects (CGE/GP) and Chief Geotechnical Engineer/Standard and Testing (CGE/S&T) respectively to establish the programme of site investigation and laboratory testing. The Consultants shall pass a copy of the Desk Study Report to CGE/GP together with the request for arranging the site investigation and laboratory testing. The Consultants shall obtain the necessary permissions and approvals for carrying out the site investigation works. The Consultants shall allow a lead time of 3 months between submission of the request for site investigation works and laboratory testing and the actual commencement of the respective works and allow time required for the production of the site investigation and laboratory testing reports. The Consultants shall carry out planning and supervision of site investigation works and laboratory testing, check site investigation and laboratory testing reports produced under the term contracts, review and amend the site investigation and laboratory testing proposals if necessary during the execution of the site investigation works and testing. CGE/GP and CGE/S&T shall be advised of any proposed special testing, as well as any rock testing required, at an early stage of the Assignment. A list of tests available under the GEO term contracts and associated test methods

specified can be obtained from CGE/GP and CGE/S&T.

- (d) Liaise with GEO Term Contractor and/or WSD Term Contractor regarding those site investigations to be carried out by them. For those site investigation to be carried out by WSD Term Contractor, the Consultants shall prepare and enter the details of works to be carried out by WSD Term Contractor into WSD's Maintenance Works Management System (MWMS) including cost estimate for issuing works orders, processing of payment, issuing variation orders, administration and management of works order, etc. The Consultants shall be allowed to access to MWMS terminals located as WSD's Regional Offices (address to be confirmed by the DR) for extraction and input of data.
- (e) Liaise with EPD, CEDD, MD and any other concerned parties on any special requirements and incorporate them into the design of site investigation works.
- (f) Liaise with MTRCL regarding those site investigation works to be carried out by their contractor within MTRCL's sterilization zone.
- (g) If the individual estimated cost of the site investigation exceeds \$3 million, contractors on DEVB's List of Approved Suppliers of Materials and Specialist Contractors for Public Works Category of Ground Investigation Field Work will have to be engaged by letting individual contracts to carry out the site investigation. The Consultants shall submit the draft tender documents for the individual contracts to CGE/GP for comment in accordance with WBTC No. 13/90 at least six weeks prior to the intended date for tendering. The Consultants shall also submit the priced contract documents, quarterly reports on the performance of the contractors and final Site Investigation Report to the GP Division of GEO in accordance with WBTC No. 13/90. Prepare all necessary drawings, plans, specifications and documents sufficient for calling for tenders, and assist the Employer in calling tenders for carrying out these works.
- (h) Engage competent specialist contractors to carry out special surveys, site investigation and laboratory testing as necessary. Prepare sketches and other documents for any special surveys, site investigation and laboratory testing, invite and analyse tenders from specialist contractors, submit

tender reports to make recommendations to the DR on acceptance of tenders for acceptance. The successful contractor will be employed by the Employer by means of service orders issued in accordance with the Stores and Procurement Regulations.

- (i) Liaise with the WSD Term Contractor, the GEO Term Contractor, other contractors including specialist contractors engaged under sub-clause (f) above, utility companies and all Government departments and authorities concerned to obtain permissions for the site investigation including the application for excavation permits and access permission. Provide and enter relevant information for obtaining excavation permits and any extensions thereof through the XPMS administered by HyD. Prepare temporary traffic arrangement schemes as required.
- (j) Identify all utilities, facilities, installations and existing rights that may be affected by the site investigation. Liaise with and obtain consent from the concerned parties for carrying out the site investigation, including the consent for diversion or relocation of the utilities, facilities and installations if necessary.
- (k) Carry out all necessary surveys, setting out, levels and sounding, make such investigation and inquiries and search site records as are necessary for the satisfactory completion of the site investigation. Payment of such works shall be deemed to be included in the Lump Sum.
- (l) Supervise the site investigation including reinstatement, and ensure that pedestrian and vehicular traffic arrangements and the provisions for supporting, watching, guarding and lighting of any excavations are to a standard that will enhance the public image of WSD. Report on the contractor's performance. Take measurements of findings and photographs. Take measurements of work done and prepare quantities for payment for the works. Supervise laboratory testing. The Consultants shall provide adequate qualified and experienced personnel to plan, direct and supervise the site investigation and laboratory testing. The recommendations of Geoguide 2 regarding the requirements of the personnel for supervision of site investigation and laboratory testing should be followed.
- (m) The work of supervising site investigation and laboratory testing shall be

considered as work carried out under Clause 5 of the Schedule of Fees.

- (n) Prepare and submit reports on the results, findings and conclusions of the site investigation and laboratory testing including drawings to show the location of all existing services, underground structures and obstructions.
- (o) Determine the extent of the excavations that will be carried out in rock or artificial hard materials and assess the volume of rock and artificial hard materials to be excavated.
- (p) Determine the quantity of earthworks, develop a fill sourcing and disposal strategy and design dump sites and associated haul roads, in consultation with Public Fill Committee of CEDD and EPD, and explore and identify suitable recycled inert C&D material to be used for site formation and road and drainage construction. Draw up a C&D Material Management Plan (C&DMMP) for vetting by the Vetting Committee of WSD as required by Section 4.1.3, Chapter 1 of PAH. Attend the Vetting Committee Meeting to present the plan if necessary. The C&DMMP shall be endorsed by CEDD Vetting Committee. The endorsed C&DMMP shall be submitted to the PFC for approval.

#### 6.2.7 Sediment Quality Assessment

- (a) Make reference to the sediment quality assessment under the Feasibility Study and assist the Employer to obtain agreement of Secretary of MFC to the rationale for necessary sediment removal and shall subsequently carry out quality assessment of the sediment to be dredged in accordance with ETWB TCW No. 34/2002.
- (b) Prepare and submit test proposals, reports, a Preliminary Sediment Quality Report and a Sediment Quality Report to DEP with a copy to the Secretary of MFC for approval as described in the relevant Circulars.

#### 6.2.8 Geotechnical Assessment

- (a) Make reference to the geotechnical assessment under the Feasibility Study and follow up with the identified locations where special geotechnical considerations, assessments and geotechnical submissions are necessary to meet requirements of the GEO of CEDD and describe

the considerations to be made in the geotechnical submissions to GEO.

- (b) Liaise with and seek agreement of GEO and any other concerned parties on any matters of geotechnical concern arising from the proposed works.
- (c) Prepare and submit a Geotechnical Assessment report to GEO for approval. This report, which shall identify any fundamental geotechnical constraints at the proposed sites and the geotechnical feasibility of the proposed works, should include the following information:
  - (i) An outline of the topography, geology and groundwater conditions of the site.
  - (ii) A general description of the proposed works and discussions of how the existing geotechnical features, such as slopes, retaining walls and adjacent foundations, will affect or be affected by such works. A list of features affected by the proposed works shall be included in the Geotechnical Assessment Report.
  - (iii) A discussion that demonstrates the feasibility of the proposed works, including descriptions and evaluation of construction methods and sequence of works.
  - (iv) Schematic plans and sections of the proposed site formation works and foundation works, taking the above discussion into account.
  - (v) A plan showing the scope and extent of the proposed ground investigation specifying, by reference to Section 15.3 of Geoguide 2: Guide to Site Investigation, the level of independent site supervision of the works to be undertaken.
  - (vi) Recommendations on any investigations of the stability of existing slopes and retaining walls as well as any preventive or remedial works that may be needed.
  - (vii) Description of intended study to assess the potential natural terrain hazards arising from landsliding and boulder/rock falls and any mitigation measures that may be needed.

- (viii) Determine the extent of any further site investigations, surveys and studies required for detailed design purposes. The requirements for any further site investigation required for detailed design and for preparing reference design of major temporary works which can have contract implications shall be given in the Geotechnical Assessment Report.
- (d) Submit to GEO a Geotechnical Design Report for checking the geotechnical design of all slopes and retaining walls formed or modified under the Assignment, and any necessary natural terrain hazard mitigation works, together with the findings of geotechnical investigations and studies on existing slopes and earth retaining structures which may affect or be affected by the proposed works in accordance with ETWB TCW Nos. 29/2002 and 29/2002A.
- (e) Submit and present proposal to the Vetting committee on Slope Appearance of WSD if shotcreting is proposed for the upgrading to the slopes.
- (f) All geotechnical reports/deliverables/tasks shall be undertaken by a Registered Professional Engineer (Geotechnical) (RPE(G)).

#### 6.2.9 Natural Terrain Landslide Hazards Assessment

Natural terrain landslide hazards assessment shall be undertaken by a Registered Professional Engineer (Geotechnical) (RPE(G)) following the guidelines given in GEO Report No. 138 and shall include, but not limited to the following: -

- (a) Make reference to the Natural terrain landslide hazards assessment under the Feasibility Study and take into account the proposed study area as shown in Sketch No. 52008/2 in **Appendix II** and follow up with the identified study area for the agreement of the GEO.
- (b) Undertake a thorough review of all available geotechnical and geological information relevant to the study area.
- (c) Carry out an Aerial Photograph Interpretation (API) using all available aerial photographs of the study area, geological maps, Natural Terrain

Landslide Inventory, Boulder Field Inventory, existing ground investigation information and relevant geotechnical reports, to identify any significant past events and the current status of the study area.

- (d) Undertake all necessary field work to validate the findings of the desk study and to provide sufficient detailed information about drainage lines, rock outcrops, significant boulders and boulder fields, soil exposures, landslide scarps, seepages and stream flows, open slope and drainage line morphology and vegetation for the preparation of a well reasoned assessment of the landslide hazard that may affect the proposed site.
- (e) Based on the information obtained from the desk study and the fieldwork, judge the most likely sources of instability on the slopes above the proposed site, the likely magnitude of such instability, including the volume of landslide debris, the paths that such debris would follow and the estimated debris travel distance of the resulting debris.
- (f) Recommend the types of measures that would be appropriate to mitigate against the assessed hazards. These may include in-situ stabilisation, mitigation works in the travel path to retard, store or deflect debris or protective works on the proposed site itself. The mitigation measures shall minimize impact to the areas of country parks. Prepare preliminary designs of the mitigation measures with a plan and a rough order of the cost of the measures. Prepare a detailed maintenance schedule with an estimate of the related capital and recurrent costs.
- (g) Prepare and submit a report presenting the results of the study to GEO for approval. The report shall contain all necessary photographs, tables, figures and drawings, including cross sections, to adequately illustrate the reasoning given in the text of the report. In particular, the report shall contain the following key drawings:
  - (i) Cross-sections down each debris travel path from the identified potential landslide source locations and boulder/rock fall locations to the proposed site.
  - (ii) An Engineering Geology Map at a scale of 1:1,000 showing:
    - the solid and superficial geology of the study area;



- the locations of exposures of soil and rock, annotated with key information about the nature of such materials;
- sites of past instability, e.g. landslip scars, annotated with key information of the instability; and
- drainage courses with comments regarding any areas of seepage or likely seepage.

(iii) A Natural Terrain Hazards Map at a scale of 1:1,000 showing:

- likely landslide sources, annotated;
- likely boulder fall and/or rock fall locations;
- debris flow paths from landslide sources with the likely distance that debris will travel; and
- boulder fall and/or rock fall trajectories with the likely travel distance of the boulders and the rock blocks.

(iv) A Mitigation Measures Strategy Map at a scale of 1:1,000 showing preliminary layout and suggested mitigation measures.

#### 6.2.10 Environmental Impact Assessment Review

- (a) Carry out an EIA review with reference to the EIA Report for the Project submitted to DEP under the Feasibility Study and the latest development of the Project, and submit a Review Report on EIA study. The Consultants shall review and update all available information and seek all such additional information as may be required for the completion of the EIA review. The Consultants shall define the scope of any environmental monitoring and audit required for the Project during the construction and operation stages of the Project. The Review Report on EIA study shall detail all and additional environmental considerations, control and mitigation measures that need to be implemented under the Project to ensure compliance with current EIA Ordinance and other relevant ordinances, regulations and guidelines for issues related to environmental matters and recommend whether variation of the EP is required. The Consultants shall summarize and include in the Review Report on EIA study an implementation schedule containing all the environmental assessment recommendations, monitoring and mitigation measures with reference to the implementation programme. If agreed and upon an instruction by the DR as an additional Services, the Consultants shall

conduct supplementary environmental assessments necessary for the implementation of the Project and include the assessment results in the Review Report on EIA study.

- (b) In the event that variation of the EP is required, the Consultants may be required to prepare and submit a revised EIA report for the Project for the approval of the DEP upon an instruction by the DR as an additional Services under the Assignment.
- (c) Prepare specification clauses required to effect the environmental measures necessary to mitigate the impact of the construction activities and permanent installations on the public.
- (d) Advise and assist the Employer in preparation of the Environmental Implications Paragraph for submission of the Public Works Subcommittee (PWSC) Paper. For this purpose, the Consultants shall provide an estimation with breakdown and total cost of implementing the environmental mitigation measures required in the EIA report approved by the DEP for the Project.
- (e) Incorporate all findings and recommendations of the above EIA review into the reference design.
- (f) Based also on the results of the EIA review, the Consultants shall establish other environmental standards including, inter alia, noise, air and visual aspects for construction and operation of the Plant. Together with the findings obtained from the EIA review, the Consultants shall also establish a full set of performance requirements of the Project for the subsequent implementation under DBO/DB contract(s). The performance requirements shall be agreed by the DR.

#### 6.2.11 Hazard Assessment, Planning Study and Action Plan

- (a) Review, make reference to and take into account the results, findings and recommendations of the HA under the Feasibility Study.
- (b) Prepare and submit a Review Report on HA with updated information on the results, findings and recommendations of the HA and draw the attention of the Employer if further assessment is required.

- (c) Prepare a report presenting the results of the HA and submit the HA report with the Planning Study and Action Plan to be prepared by PlanD to the CCPHI for consideration and endorsement.
- (d) Liaise with PlanD, EPD and any member of CCPHI on the HA, the Planning Study and the Action Plan.
- (e) Present the results of the review/studies to all concerned parties or persons including District Councils if necessary.

#### 6.2.12 Interfacing Requirements and Restrictions from Work by Others

- (a) Identify those works being carried out or to be carried out by others, including WSD, utility undertakings, other Government departments, that may have impact on the works and identify appropriate measures including entrustment, special working methods, phasing or programming for the works to minimize road excavations, resolve interfacing issues, overcome the difficulties caused by these restrictions and to minimize disruption to the public.
- (b) The Fill Management Division of CEDD operates a Temporary Fill Bank at TKO Area 137 for temporary stockpile of C&D materials. It would be operated until end 2018. CEDD targets to remove the stockpile at TKO Area 137 to facilitate the construction of the Plant. The Consultants shall liaise with CEDD regarding the removal of the stockpile at proposed site of the Plant.
- (c) At present, the MTRCL has set up a temporary magazine for the SCL project at the TKO Area 137. The temporary magazine encroach considerably upon the reserved site for the Plant and carry a “no works by others – sterilized/separation zone” requirement, precluding non-MTRCL’s contractors to do any works within this zone and excluding any activities during operation of the magazine. The temporary Government land allocation for the temporary magazine site will be expired by 1 March 2016 and it will be returned to CEDD. The Consultants shall liaise with Railway Development Office of HyD regarding the temporary magazine site at the TKO Area 137.

- (d) The Mines Division of CEDD operates a pier at TKO Area 137 (TGLA No. SK 567) for off-loading explosives from vessels. This pier is used for the explosives delivery operation from the Government Explosives Depot at Kau Shat Wan, Lantau, to projects throughout the HKSAR. The temporary allocation of the land for the explosive off-loading facilities will be ended at 30 June 2015 and CEDD is arranging extension of the temporary allocation of the land. The Consultants shall review the feasibility of explosives unloading facilities (either the current pier or a new/modified pier at the same location or in the vicinity) co-existing with the Plant, and investigate the impact, including potential hazards relating to the explosives off-loading operation, on the design, construction and operation of the Plant. The Consultants shall propose suitable hazard and risk mitigation measures necessary to enable co-existence, including the estimated costs and an assessment of the implication on the project. The Consultants shall incorporate the findings in the Review Report on HA in Clause 6.2.11.
- (e) Prepare and submit a document detailing the procedure for the operation at CEDD's barging pier such as unloading of chlorine drums and hypochlorite solution at the pier. Communication lines between WSD, the DBO/DB contractor(s), suppliers, the Consultants, CEDD and other relevant parties with respect to the operation at the shall be included.
- (f) There are other on-going and planned projects like Cross Bay Link, C&DMHF; SENT Landfill Extensions, etc in the vicinity of the site. The Consultants shall resolve all related interface issues. The Consultants shall consider the SENT Landfill Extension as an existing facility and a landfill gas HA shall be included in the EIA review.
- (g) Liaise and coordinate with Design Division and Construction Division of WSD with regard to the laying of the trunk main from the Plant at TKO to the TKOFWPSR.
- (e) Conduct detailed investigation to avoid possible conflicts with existing and planned utilities.

### 6.2.13 Traffic Impact Assessment

- (a) Review, make reference to and take into account the results, findings and

recommendations of the Traffic Impact Assessment (TIA) under the Feasibility Study and carry out further TIA necessary for the proposed works of the Plant, including the site investigation works under the Assignment, where appropriate, in accordance with the Guidelines on TIA and Daytime Ban Requirements for Road Works on Traffic Sensitive Routes issued by the Research and Development Division of HyD referenced RD/GN/021 and dated July 1995 or later version (Guidelines on TIA). The assessment should cover the cumulative traffic impact arising from the proposed works and other projects in the vicinity, including WSD's project of laying a trunk main from the Plant at TKO to TKOFWPSR and explosives deliveries undertaken by Mines Division of CEDD during construction and operation phases of the Plant.

- (b) The TIA for road works should cover the roads/road junctions to be affected by the works. Finalize and agree with Transport Department (TD) the boundaries of the study area prior to the commencement of the study.
- (c) Carry out traffic counts at the critical junctions and links and perform junction and road link analysis for the TIA.
- (d) Identify any traffic lights that will need adjustment and any traffic diversions or road closures required to facilitate the carrying out of the proposed works.
- (e) Identify those parts of the works that will require special measures for pedestrian traffic and recommend how the provisions for these special measures are to be made.
- (f) Review the standard requirements of an excavation permit issued by HyD and identify those parts of the proposed works that will require special provisions in the contract documents to effect these measures and recommend how these provisions are to be made.
- (g) Identify any special measures required by HyD, TD and Hong Kong Police Force (HKPF) for carrying out the proposed works and recommend how the provisions for these special measures are to be made in the contract documents for the proposed works.

- (h) Identify those parts of the works that will require special measures for pedestrian traffic and recommend how the provisions for these special measures are to be made in the contract documents for the proposed works.
- (i) Prepare report on the results, findings and conclusions of the study and incorporate the same into the implementation scheme.
- (j) Present the results of the study to all concerned parties or persons including District Councils and Rural Committees as required.
- (k) Update the TIA carried out in the Feasibility Study and under this Clause to obtain consents/approvals from HyD, TD, HKPF and other relevant Government departments/parties and public bodies for construction of the works.

#### 6.2.14 Marine Traffic Impact Assessment

- (a) Review, make reference to and take into account the results, findings and recommendations of the Marine Traffic Impact Assessment under the Feasibility Study and carry out further Marine Traffic Impact Assessment necessary for the proposed works to identify all potential impacts on the existing and future facilities, traffic and operation, including the explosives delivery operation undertaken by Mines Division of CEDD, during construction and operation phases of the submarine intake and outfall proposed.
- (b) Finalize and agree with MD, CEDD and any other concerned parties the boundaries of the study area prior to the commencement of the study.
- (c) Develop appropriate mitigation measures for alleviating any significant marine traffic impacts.
- (d) Identify any special measures required by concerned parties, such as MD, CEDD and HKPF, etc., for carrying out the proposed works and recommend how the provisions for these special measures are to be made in the contract documents for the proposed works.
- (e) Prepare reports on the results, findings and conclusions of the study and

incorporate the same into the preliminary design.

- (f) Present the results of the study to all concerned parties or persons including District Councils and Rural Committees as required.
- (g) Update the Marine Traffic Impact Assessment carried out in the Feasibility Study and under this Clause to obtain consents/approvals from MD, HKPF and other relevant Government departments/parties and public bodies for construction of the works.

#### 6.2.15 Drainage Impact Assessment

- (a) Review, make reference to and take into account the results, findings and recommendations of the Drainage Impact Assessment under the Feasibility Study and recommend any necessary further mitigation measures with respect to temporary and permanent drainage impacts arising from the proposed works.
- (b) Liaise with and seek agreement of DSD, WSD and any other concerned parties or persons on all matters relating to the drainage impacts of the proposed works.
- (c) Prepare report on the results, findings and conclusions of the study and incorporate the same into the reference design.
- (d) Present the results of the study to all concerned parties or persons including DSD, District Councils and Rural Committees as required.

#### 6.2.16 Heritage Impact Assessment (HIA)

- (a) Review, make reference to and take into account the results, findings and recommendations of the HIA under the Feasibility Study and carry out further surveys necessary for the proposed works and confirm to AMO whether there are heritage sites including declared monuments, proposed monuments, sites and buildings graded by the Antiquities Advisory Board, sites of archaeological interest or Government historic sites identified by AMO within or in the vicinity of the project boundary.
- (b) Liaise with and seek agreement of AMO on the revised scope of the HIA

and all matters relating to the heritage impacts of the proposed works.

- (c) After agreement by the DRs, the Consultants shall conduct HIA Study and submit revised HIA Report in accordance with DEVB TCW No. 6/2009.
- (d) Consult the public (e.g. District Councils, Area Committees and other stakeholders on heritage conservation) on the proposed works project if adverse impact on any heritage site is anticipated.
- (e) Incorporate the findings and recommendations of the HIA into the design and make provision in the works contracts for implementation of measures for protection of any sites of cultural heritage that may be affected by the proposed works. The measures may include, but not limited to condition survey of the sites before commencement of the works and monitoring during the course of works.

#### 6.2.17 Tree Survey

- (a) Review, make reference to and take into account the results, findings and recommendations of the Tree Survey Report under the Feasibility Study and identify those areas for which a tree survey will be required.
- (b) Carry out a survey of the trees that will be affected by the proposed works.
- (c) Prepare a drawing showing the location and size of the trees together with a tree schedule showing the species, height, circumference of trunk, tree spread, general condition and photographs. Indicate the trees to be retained, transplanted or felled and the existing and the proposed general levels adjacent to the trees.
- (d) Prepare a drawing showing compensatory landscaping and replanting.
- (e) Make submission and obtain approval from the appropriate authorities such as DLO, AFCD, HyD and LCSD on the tree survey report as required in accordance with DEVB TCW No. 10/2013 – “Tree Preservation”, ETWB TCW No. 2/2004 - “Maintenance of Vegetation and Hard Landscape Features” and ETWB TCW No. 29/2004 -



“Registration of Old and Valuable Trees, and Guidelines for their Preservation”.

- (f) Where tree removal, either by felling or by transplanting, is necessary, the Consultants shall submit tree removal application to the relevant authorities for approval in accordance with DEVB TCW No. 10/2013, and take necessary follow-up action until obtaining approval to the application from the relevant authorities. The tree removal application shall include a tree survey plan and a tree assessment schedule, including tree preservation and protection measures for the trees to be retained and a compensatory planting proposal as required in DEVB TCW No. 10/2013.

#### 6.2.18 Hydraulic Assessment and Surge Analysis for the Plant

- (a) Review, make reference to and take into account the results, findings and recommendations of the Hydraulic Assessment and Surge Analysis under the Feasibility Study and carry out any necessary further hydraulic assessment and surge analysis covering the Plant and treated water transfer systems, taking into account of all anticipated/intended modes of operation of the systems and the effect of climate change on the formation level and the marine structures.
- (b) Recommend appropriate surge protection facilities on proposed waterworks installations.
- (c) Set up a hydraulic profile with hydraulic modelling and/or calculation for the Plant, check and review the overall, hydraulic and treatment, performance of the Plant. If during the study, the Consultants consider there is a need and recommend to set up a physical hydraulic model, subject to the agreement from the DR, the cost of the physical model will be paid by additional Services or by (i) direct contracts between the Employer and the contractors through the Government’s procurement/tendering process, or (ii) placing works orders under relevant Government term contracts, where appropriate.
- (d) Prepare and submit reports to the DR.
- (e) Incorporate the findings and recommendations of the above hydraulic

assessment and surge analysis into the implementation scheme.

#### 6.2.19 Energy Efficiency

- (a) Review, make reference to and take into account the results, findings and recommendations of the Energy Efficiency Report under the Feasibility Study and identify the possible areas of improvement and provide recommendations for more efficient use of electricity in pumps, water treatment process, desalination process, building services, air conditioning plant and lighting facilities, etc.
- (b) Recommend monitoring systems for on-line condition and pumpset performance monitoring of the seawater and fresh water pumpsets to improve their reliability and operating efficiency.
- (c) Recommend a comprehensive energy management system for on-line monitoring of the energy consumption of major plant items in the Plant and the pumping stations.
- (d) Evaluate power supply and distribution requirements, identify energy efficient schemes and explore the feasibility of adopting renewable energy for use within the Plant according to ETWB TCW NO. 16/2005.
- (e) Study each and every energy consumption processes in the Plant and make recommendations on how to minimize energy consumption by adopting the latest cutting edge technology, design and development in RO desalination plant. Carry out detailed studies and make recommendations on the performance, capital costs and savings that can be achieved by the various types of energy recovery devices.
- (f) Liaise with CLP for provision of reliable electricity supply with sufficient power supply redundancy and assess on the need of any emergency standby power supply to cater for the full load operation of the Plant and its future extension, study the strategy of negotiating for a more favorable electricity tariff from CLP, and apply CLP grid connection of renewable energy resources from the site of the Plant.
- (g) Liaise with CLP to agree on a reliable power supply arrangement, transformer and switchgear room requirements and the power supply

circuit route to be adopted for the Plant, and the access arrangement for delivery of bulky/heavy power supply equipment to the CLP substation at the Plant;

- (h) Study the use of renewable energy, including wind farm, wave energy, solar energy, energy generated utilizing landfill gas from the landfill adjacent to the site reserved for the electricity demand of the Plant. For any renewable energy equipment proposed, the Consultants shall liaise with CLP for possible grid connection and assess the probable quantity of carbon dioxide emission and the payback period, if applicable. Should a grid power (from a coal fired electricity generation plant) be recommended to be adopted to meet the electricity demand of the Plant, mitigation measures shall be proposed to minimize the use of grid power and to propose remedial measures to mitigate the additional greenhouses gases so generated.
- (i) Adopt and tie in with ISO 50001 Energy Management System.
- (j) Prepare report on the results, findings and conclusions of the study and incorporate the same into the implementation scheme.
- (k) Carry out an energy efficiency assessment of the proposed plant over the design life to substantiate the design.

#### 6.2.20 Operation and Maintenance Strategy for M&E plants and equipment

- (a) Review, make reference to and take into account the results, findings and recommendations of the working paper on the O&M strategy of all M&E plants and equipment under the Feasibility Study.
- (b) Assess and study the O&M requirements of all M&E plants and equipment and prepare the M&E Maintenance Strategy Study Report.
- (c) Recommend a maintenance strategy for the M&E plants taking into consideration of the most efficient and cost effective way including outsourcing for the delivery of M&E maintenance service. The maintenance strategy should take into account the requirements of maintenance staff, materials and funding resources and the Employer's available in-house staff resources, as well as the plant warranty of the

completed works and work interfacing amongst the contractors.

- (d) Recommend a complete set of performance indicators and acceptance criteria for taking over the M&E plants after completion of the operation phase.
- (e) Recommend an O&M training strategy to WSD staff for the Plant.

#### 6.2.21 Seawater Quality Characterization and Seawater Quality Envelope

- (a) Review and make reference to appropriate seawater quality information available from the Final Report under the Feasibility Study and relevant Government departments such as marine water quality in the relevant water control zones monitored by the EPD and seawater quality for flushing supply monitored by the WSD at TKO Salt Water Pumping Station. The Consultants shall also determine the monitoring timeframe and undertake all necessary sampling and testing work for additional parameters required for a thorough seawater quality characterization.
- (b) Review the seawater quality characterization to determine the performance and operating demands required of the pre-treatment system. The Consultants shall also review the seawater quality envelope for the design of the Plant.
- (c) Review the effect of leachate generated from the landfill site on the seawater quality of the desalination plant site.
- (d) Sampling and testing work as indicated in Clause 6.2.21(a) of this Brief will be procured either by direct contracts between the Employer and the contractors through the Government's procurement/tendering process or by placing works orders under relevant Government term contracts where appropriate, subject to prior agreement from the DR before incurring any such expenses.
- (e) Prepare and submit a Review Report on Seawater Quality Characterization and Seawater Quality Envelope.

## 6.2.22 Reference Design and Implementation Scheme

- (a) Review, make reference to and take into account the results, findings and recommendations of Process and Preliminary Design under the Feasibility Study and prepare reference design including landscaping design, all calculations and drawings. The reference design shall include such basic information which will allow the detailed design of the works to be carried out and shall take into account all requirements, restraints, findings and conclusions identified from the studies required by this Brief, and all requirements and restrictions in the Feasibility Study and from the concerned Government departments and utility companies. The proposed layout and footprint of the Plant shall well suit the configuration of the reserved site. The Consultants shall investigate and recommend a compact footprint of the Plant and its future expansion with multi-storeys pre-treatment/RO/post-treatment facilities and other building structures (laboratory, chemical house, administration buildings, etc.) so that the areas available for future expansion could be maximized. Flexibility shall be incorporated in the design of the Plant so that it can easily be retrofitted with future desalination technology in future expansion.
- (b) Recommend methods of removal and locations for the disposal of the surplus excavated material from the proposed works.
- (c) Consult all authorities having rights or powers in connection with the Plant, the works or the site. Obtain the necessary approval from these authorities for construction of the proposed works.
- (d) Consult Commissioner of Mines and all parties concerned on the safety and environmental requirements of rock blasting if such method is considered necessary for the proposed works, seek approval in principle from Commissioner of Mines and all relevant parties including WSD if there are existing waterworks installations in the vicinity of the proposed sites. The requirements in relation to the assessment of blasting under the design stage of a project are given in Section 4.6.13, Chapter 4 and Section 21.6, Chapter 7 of the PAH.
- (e) Liaise with CEDD, PlanD, TD and other relevant government departments for construction of the access road connecting between the

Plant and the public road for construction stage and early operation stage of the Plant.

- (f) Liaise with the New Territories East Region of WSD for any works associated with the Assignment which may interrupt the operation or reduce the reliability of the existing supply system.
- (g) Liaise with the New Territories East Region, Development, Water Science, Mechanical and Electrical/Projects and Mechanical and Electrical/ Maintenance Divisions of WSD regarding the requirements on mechanical and electrical plant and equipment including remote monitoring and control equipment, and SCADA System.
- (h) Liaise with the New Territories East Region of WSD in respect of requirements for branch tees, sectional valves, washouts, air valves, leakage detection facilities, other necessary devices, the arrangement for connection of the proposed mains to the existing mains, and abandonment of the old water mains.
- (i) Liaise with the New Territories East Region, Development, Water Science, Mechanical & Electrical/Projects, Mechanical & Electrical/Maintenance Divisions of WSD regarding the O&M requirements of the water supply system both during the construction and in future and the requirements for leakage detection facilities.
- (j) Liaise with the New Territories East Region, Development, Water Science, Mechanical and Electrical/Projects, Mechanical and Electrical/ Maintenance Divisions of WSD in respect of requirements for accessibility, the mechanisation and automation of chemical preparation and dosing processes, practical and cost-effective solutions to achieve reduction of the costs for energy, maintenance and operation of the system.
- (k) Liaise with Port Works Division of CEDD regarding the requirements on protection of the existing marine facilities and any modification required in order to facilitate the design and construction of the submarine seawater intake and outfall pipes and structures.
- (l) Consult and liaise with all concerned Government departments

including AFCD, EPD, HyD, TD, MD, CEDD, DSD, HKPF and other concerned parties including MTRCL, District Councils and Rural Committees on any specific requirements and incorporate them into the design.

- (m) Recommend the pipe materials for the proposed fresh water and salt water mains including intake and outfall pipes of the Plant and locations, type and sizes of valves, branch tees, and connections of new mains to existing supply system to suit the operational needs after liaison with the New Territories East Region of WSD.
- (n) Liaise with FSD regarding the requirements of additional fire hydrants.
- (o) Identify locations on the alignments of the water mains in the Plant suitable for any additional fire hydrants as required by FSD.
- (p) Prepare and submit the required Fire Services Installations Layout Plan and Layout Plan of Emergency Vehicular Access for the installations to obtain approval from FSD.
- (q) Review the provision of washout points on the water mains in the Plant and identify locations on the proposed and existing drainage systems that are considered suitable to receive connections from the washout points to improve the efficiency of draining down and flushing the water mains.
- (r) Identify locations on the proposed water mains within the Plant for sectional valves, branch tees and other necessary facilities to suit the operational needs of the Hong Kong & Islands, Kowloon, New Territories East or New Territories West Region of WSD and submit the proposals to the relevant Regions for agreement before incorporating the same into the design.
- (s) Review and recommend the RO treatment system by making reference to latest development in the water treatment industry including but not limited to the following:
  - 8" and 16" diameter of RO membrane elements
  - Horizontal and vertical RO units
  - Pressure centre RO treatment system arrangement

- (t) Review, recommend and prepare the electrical design for the Plant, including but not limited to, demand load analysis, load flow analysis, fault analysis, schematic single line diagram, general plant room layout and control and protection scheme etc.
- (u) Review, recommend and prepare the mechanical design for the Plant, including but not limited to, pump selection, piping and valve selection, general plant room layout, etc.
- (v) Review, recommend and prepare general material and workmanship specifications for the Plant with reference to WSD Standard Specifications in sufficient details for tendering.
- (w) Identify all utilities, facilities, installations and existing rights that may be affected by the proposed works. Liaise with and obtain consent from the concerned parties for construction of the proposed works including the consent for diversion or relocation of the utilities, facilities and installations if necessary.
- (x) Identify any materials or services that are required prior to or separately from the main works contracts.
- (y) Carry out design check on existing structures affected by the proposed works under the Assignment.
- (z) Recommend provisions for waste detection arrangement after liaison with the Water Loss Management Section of WSD.
- (aa) Recommend water supply provision to the fire hydrants and users of the Plant.
- (bb) Liaise with the Government departments/parties and their consultants for the works entrusted to them.
- (cc) Identify and study all existing man-made geotechnical features and natural terrain affected by or related to the proposed works and carry out necessary stability assessment and identify mitigation measures.



- (dd) Review and evaluate the scheme layout and the water treatment process for the Plant and the associated fresh water transfer facilities, taking account of the capital cost, recurrent costs, the requirements of this Brief, and the findings, conclusions and recommendations revealed in the Feasibility Study. Submit a Scheme Design Report with outline scheme and layout as detailed in Clause 6.2.22(ii) of this Brief. The scheme layout shall include the layout of a suitable explosives unloading pier and associated roads to enable vehicular transportation of explosives to and from the pier.
- (ee) Prepare architectural design for the proposed building structures of the Assignment in accordance with ETWB TCW No. 8/2005 for WSD's onward submission to the Design Advisory Panel, ArchSD. Present the design submission to the Panel as required. The Consultants shall engage a Registered Architect to design the building structures of high visual impact as defined in the TCW.
- (ff) Prepare the greenery design in accordance with the standards and requirements on site coverage of greenery for new Government buildings project in accordance with DEVB TCW No. 3/2012. The appearance of the Plant shall well blend with the environment with 'Green' buildings features (rainwater collection system, energy saving devices, green roof, etc) to be incorporated. The reference design of the Plant shall be sufficient for subsequent design and construction by the DBO/DB contractor(s) to obtain the accreditation to the grade under an internationally or locally recognised environmental assessment system or to comply with the standards recommended in Clause 6.2.23(a) as appropriate.
- (gg) The Plant in particular the administration building shall be designed as green government buildings in accordance with DEVB TCW No. 5/2009 with an aim to outperform the Building Energy Codes issued by the Electrical and Mechanical Services Department by at least 5% regardless of the construction floor area of the buildings.
- (hh) Conduct cost and benefit analyses to actively consider other alternatives to chlorine, such as ozone and ultra-violet radiation, for water purification process and residual chlorine in treated water to be applicable to this Plant.

- (ii) Produce and submit a comprehensive scheme including site, building and E&M plant and equipment and building services layouts for the approval of the DR for the Plant and the associated fresh water transfer facilities, with capability of being operated efficiently at various specific capacities ranging between the minimum (including temporary shut down of the plant if necessary) and maximum reliable throughputs to tie in with demand fluctuations and other operational requirements. The scheme shall include sufficient general arrangement layouts, sections and other constraints identified during the study.
- (jj) Review the minimum time to start up the Plant from the shut down mode and the minimum lead time required for varying the output of the Plant to suit the demand.
- (kk) Consult CLP and coordinate any works associated with the requirement of power supplies as necessary for the proposed works. The Consultants shall also assist in negotiation with CLP on all works relating to the provision of power supply for the proposed works.
- (ll) Review and revise as necessary the electrical installation design of the plants and buildings.
- (mm) Prepare architectural and landscaping proposals, agree these with the DR and incorporate them into the reference design. The architectural and landscape proposals shall include details on any green planting, tree felling, transplanting, colour scheme, aesthetic features, architectural finishes and amenity works necessary for the Assignment. The Consultants shall liaise closely with the building and landscape maintenance authority at the onset of producing the reference design to avoid any potential maintenance problems.
- (nn) After receiving the endorsement of the Scheme Design Report from the DR, produce a reference design for the Plant and the associated fresh water transfer facilities. Prepare layout plans, architectural and landscaping plans, drawings, profiles, sections, specifications and calculations. The layout plans, architectural and landscaping plans (on A1 size sheets) should be prepared in 1:1,000 or 1:500 scale, as directed by the DR, showing the implementation scheme of the works. An

outline layout plan (on A1 size sheets) should also be produced to show all the works and site areas for the Assignment and should be of a quality suitable for publicity purposes.

- (oo) Produce reference design of the Plant as appropriate for elements/structures listed in Clause 4.6(u) of this Brief, taking into account of all relevant constraints, ease of operation/maintenance, efficiency, cost effectiveness, reliability, restrictions of land uses induced, geotechnical, social and environmental impact, etc. The reference design shall include details of construction methodology, water treatment process and RO treatment process. The reference design shall demonstrate the feasibility of the works and provide sufficient details for evaluation of works quantities for estimation of the cost and time required for construction. The reference design shall be of sufficient details to be used as a basis for re-measurement or schedule of rate types of contract to be adopted.
- (pp) Review on the results, findings and conclusions on the study of the effect of climate change on the frequency of extremely dry weather condition, which may affect the local yield collected in Hong Kong as well as the Dongjiang raw water supply from Guangdong under the Feasibility Study. In this regard, the Consultants shall seek advice from the hydrology and hydraulics institutes and research centres.
- (qq) Critically review the most appropriate timing for construction of the Plant, recommend a suitable initial capacity and a minimum acceptable plant output as well as the appropriate programme of upgrading the plant to its ultimate capacity based on the latest information on the water demand forecast, local yield collected, Dongjiang raw water supply and the effect of climate change on the water resources reliability. Determine the most appropriate implementation strategy as well as the programmes for the pre-construction activities (such as site investigation, EIA, TIA, application for amendment to Outline Zoning Plan, public engagement, detailed design) and the construction phase, taking into account the international practices and experiences of the construction of desalination plants of similar type and size around the globe.
- (rr) Make recommendations in respect of the operability (ease at which the

Plant can be run and operated, ability of the plant to operate at lower capacity and/or standby mode, the start up time to resume water production from temporary shut down mode, etc), reliability and maintainability of the various components of the Plant. Study and review plant automation with advanced monitoring and control system to increase process reliability and reduce O&M staff requirements and report the findings and make recommendation in these aspects. Make recommendations, including the operability and the most economic mode of operation, etc., in respect of operability range of the Plant within which the fresh water output from the Plant can vary according to the yield condition at the time. Formulate operation plans and procedures of the Plant to suit the change in water demand and the change in water production output from the Pak Kong Water Treatment Works to the TKOFWPSR under different situations.

- (ss) Review the benefit of progressive development of the Plant by making reference to worldwide experiences and practices and make recommendations.
- (tt) Review feasible options for the disposal of brine concentrate including industrial applications and small scale applications with environmental initiatives for education purpose with due considerations in the constraints and operating cost under local conditions.
- (uu) Incorporate into the reference design the action plan and recommendations of the Review Report on HA, Planning Study and Action Plan for the Plant endorsed by the CCPHI.
- (vv) Prepare and submit a Design Memorandum, setting out in sufficient details the design standards, philosophy, criteria, essential and sufficient parameters, assumptions, method of analysis and operation intents, construction methods etc. to be adopted for the design of the Plant. The Design Memorandum shall also include a geotechnical assessment of the area which could be affected by or affect the proposed works. The Consultants shall ensure that the design and specification of all disciplines are compatible with each other to achieve the design intent included in the Design Memorandum. The Design Memorandum shall form the basis for the detailed design of the Plant and the checking procedure to be used in the design after it is approved by the DR and for

drawing up the Employer's Requirements for DBO/DB contract. The Consultants shall be responsible for the overall integrity of the design of the Plant as a whole including structures/elements entrusted to others for construction, and shall ensure that the final design and specification of all disciplines are compatible with each other to achieve the design intent in the Design Memorandum. Should there be any amendment to the Design Memorandum after it has been commented and agreed by the DR, the Consultants shall submit the revised version incorporating all the changes and state the reasons to the DR for agreement before finalisation. The Consultants shall obtain O&M parties agreement to the Design Memorandum and resolve O&M parties' comments on design, drawings, contract specifications and handover and commissioning requirements prior to tendering. On completion of the Investigation Review and Design Phase the Consultants shall update and revise the Design Memorandum to incorporate any changes. The Consultants shall submit the final version of the Design Memorandum upon substantial completion of the works contract taking account of all design matters arising during construction and incorporating the designs made by the contractors.

- (ww) Submit to the DR on completion of the Investigation Review and Design Phase five full sets of design calculations and certificates pursuant to Clause 11 of this Brief.
- (xx) Carry out design check on structures affected by the proposed works.
- (yy) Prepare designs, including landscaping designs, necessary for the works together with specifications, drawings, bills of quantities/activity schedule and all tender documentation using the standard documents listed under Clause 6.1.8 of this Brief as a basis. This work shall be carried out for all works contracts and for procurement of any materials or services required prior to or separately from the main works contracts including works entrusted to other Government departments/parties and advance work to be carried out under WSD Term Contracts.
- (zz) Draw to the attention of the DR any deviations necessary from the standard documents, manuals, instructions and guidelines listed under Clause 6.1.8 of this Brief and explain the reasons for any special conditions of tender, special conditions of contract, particular

specification and particular preambles to the bills of quantities, additional conditions of contract, and other NEC contract documents required to embody these deviations into the contract documents.

#### 6.2.23 Environmental Assessment System Accreditation

- (a) Assess the components of the Plant and recommend the most appropriate grade for obtaining the accreditation under an internationally or locally recognized environmental assessment system. For example, the administration building of the Plant may be accredited to Building Environmental Assessment Method upgraded version (BEAM Plus) in accordance with DEVB TCW No. 5/2009. In the event that there is no appropriate grade for obtaining the accreditation under an internationally or locally recognized environmental assessment system, the Consultants shall recommend a set of criteria for environmental assessment of the Plant.
- (b) Include in the Employer's Requirements of the DBO/DB contract(s) for obtaining the accreditation or complying with the assessment criteria recommended in sub-clause 6.2.23(a) for the Plant as appropriate.
- (c) In preparation of the DBO/DB contract document, the Consultants shall include the requirements of all analysis, site tests, monitoring, auditing and reporting, drawings, diagrams, technical literatures, calculations, procedural documents, manuals and all necessary documents for obtaining the accreditation or complying with the assessment criteria recommended in sub-clause 6.2.23(a) for the Plant as appropriate. Any deficiency which leads to the failure of obtaining the required rating shall be rectified by the DBO/DB contractor(s) before completion of the DBO/DB contract(s).
- (d) Recommend the procedures and documents required for renewal of the accreditation of the environmental assessment system upon the expiry of the accreditation or recommend the documents required for complying with the assessment criteria recommend in sub-clause 6.2.23(a) as appropriate.

## 6.2.24 Building Information Modelling

Prepare and submit the Technical Specifications of the DBO/DB contractor's 3-D, 4-D and as-built BIM model(s) to be incorporated into the DBO/DB contract including but not limited to the following:

- (a) 3-D model(s) (using an appropriate format and at a Level of Development (LOD) to be agreed by the DR) for the elements/structures of the Plant. The LOD shall be in accordance with the LOD definitions in Level of Development Specification (Version 2013 or its latest version) published by BIMForum or equivalent. This 3-D model(s) shall include the surrounding topography such as structures, nearby roads, CEDD's barging pier at TKO Area 137 for offloading explosives, temporary magazine for SCL and other environment interfacing with the proposed works of the Plant.
- (b) 3-D model(s) database with a clash analysis report.
- (c) 4-D model(s) by integrating the 3-D model(s) with the construction work activities and schedule for the proposed works to ensure and demonstrate the constructability of the proposed works, interface arrangements with other contracts/projects and connection to existing structures, and the necessary temporary arrangements during construction and operation stages.
- (d) Potential constructability issues for all the major works activities presented in the models. The issues shall include the impacts on the construction practicability, safety during construction, environment, land traffic, marine traffic, existing roads, underground utilities and stability of adjacent buildings/structures in the surrounding areas during construction.
- (e) Construction sequence animations (totaling about 5 to 8 minutes) with flash interactive user interface to illustrate the construction work activities of the proposed works, including but not limited to the temporary and permanent works for the elements/structures as described in sub-clause 4.6(u).

#### 6.2.25 Schedule of Accommodation

- (a) Prepare and submit a provisional SOA on the size and usage of the accommodation required by the Plant for the agreement of relevant government department and subsequent approval by the Property Vetting Committee. The SOA shall take into account the staffing requirements for the O&M of the Plant.
- (b) Check and review the SOA based on the DBO/DB contractor's submission in the Construction, Commissioning, Initial Operation and Completion Phases.

#### 6.2.26 Land Requirements

- (a) Identify the need for resumption of land, clearance or reprovisioning and liaise with the relevant bodies to determine the practicalities and programme for doing so.
- (b) Identify any additional land requirements, such as borrow areas, dumping areas, works areas, storage areas and access roads necessary for the completion of the works.
- (c) Prepare necessary land plans and other relevant information to enable arrangements for land acquisition and clearance for the works and the works areas to be made.
- (d) Liaise and assist in negotiations with relevant bodies on matters of land resumption, clearance and reprovisioning works.

#### 6.2.27 C&D Material Management Plan

- (a) Determine the extent of the excavation for the construction of the proposed works that will be carried out in rock or artificial hard material and assess the volume of rock and artificial hard material to be excavated at the proposed desalination plant site.
- (b) Determine the quantity of earthworks, develop a fill sourcing and disposal strategy and design dump sites and associated haul roads, in consultation with Public Fill Committee of CEDD and EPD, and



explore and identify suitable recycled inert C&D material to be used for site formation and road and drainage construction. Draw up a C&D Material Management Plan (C&DMMP) in accordance with ETWB TCW No. 33/2002. The C&DMMP shall be endorsed by CEDD Vetting Committee. Attend the Vetting Committee Meeting to present the plan if necessary. The endorsed C&DMMP shall be submitted to the PFC for approval.

- (c) Determine the volume of the marine mud, if any, to be dredged and disposed of, and agree with Marine Fill Committee of CEDD for disposal arrangements.

#### 6.2.28 Amendment to Outline Zoning Plan

- (a) Carry out the necessary study and assessment, investigate and make recommendations to demonstrate the acceptability of the Plant and that it would not jeopardize other potential PHIs to be located in TKO Area 137.
- (b) Prepare and submit all necessary planning statement and assessments in English and extract in Chinese required for the amendment of the approved TKO Outline Zoning Plan No. S/TKO/20 (or any Outline Zoning Plan in force at the time of the proposed amendment) to rezone the area from “Other Specified Uses” annotated “Deep Waterfront Industry” (“OU(DWI)”) to “OU(Desalination Plant)” the Town Planning Ordinance. The Consultants shall also provide technical support to the Employer in the zoning amendment procedures, in particular in the resolution of objections, answering public queries, attending meeting with stakeholders, interested parties, Town Planning Board, etc.
- (c) Liaise with PlanD on the content of the planning submission for the zoning amendment.
- (d) Prepare and submit including subsequent amendments to incorporate comments in English and Chinese as necessary for the DR in connection with the statutory zoning matters. Sufficient time shall be allowed for the procedures under the Town Planning Ordinance to be completed.

#### 6.2.29 Gazettal under Foreshore and Sea-bed (Reclamations) Ordinance

- (a) Prepare and submit all plans, notices and papers in English and Chinese required for gazetting under the Foreshore and Sea-bed (Reclamations) Ordinance (FS(R)O) including any necessary amendments for re-gazettal purpose. The Consultants shall also provide technical support to the Employer in the gazetting procedures under the FS(R)O, in particular in the resolution of objections, answering public queries, attending meeting with objectors and interested parties. If appropriate, the Consultants will be required to consider counter-proposals on the project scheme and propose suitable modifications to the gazette scheme (both engineering scheme and land requirement plans), and assess the implications of such modifications in terms of engineering, land use, programme, cost and other relevant aspects, for the consideration of DR.
- (b) Prepare and submit including subsequent amendments to incorporate comments, all plans, notices, and papers in English and Chinese as necessary for the DR in connection with the statutory gazettal matters. Sufficient time shall be allowed for the procedures under the FS(R)O to be completed.

#### 6.2.30 Quality Site Supervision Plan

Recommend a strategy for site supervision and submit a QSSP in line with the quality management system of the Consultants and the strategy of site supervision recommended in the Investigation Review and Design Phase, and to include, but not limited to, the following details:

- (a) a detailed site supervision arrangement, including arrangements for supervision of construction activities that are required to be carried out outside the normal working hours of the RSS;
- (b) a list of critical construction activities and structural elements that require special attention together with the associated supervision requirements for such items, where appropriate the level of supervision and the rank of staff who should perform the supervision of such items and/or sign the Request for Inspection Form (or a purposely made inspection form for a particular activity or test);

- (c) if necessary, the Consultants shall also specify any critical construction activities, structural elements and particular aspects or details that should be noted by the inspection officer on the Request for Inspection Form for future reference;
- (d) a guideline on the details of inspection to be recorded for specialist works or critical elements; and
- (e) in case it is envisaged that construction or fabrication works will be carried out outside Hong Kong, the Consultants shall formulate supervision requirements and inspection arrangement for such works. The Consultants shall also prepare comprehensive guidelines to be followed by the RSS who need to conduct inspection outside Hong Kong. The guideline shall include the three minimum requirements as given in **Appendix VI**.

The QSSP and its execution shall be subject to Employer's technical audits. The Consultants shall also review the QSSP with the RSS during the Construction and Commissioning Phase.

#### 6.2.31 Systematic Risk Management

- (a) Perform Systematic Risk Management (SRM) in accordance with ETWB TCW No. 6/2005 and ETWB Risk Management User Manual to identify risks and uncertainties associated with the Project and recommend treatment measures aiming at reducing these risks and uncertainties to acceptable level and to ensure timely completion of the Project and within budget and to the required quality. This may include arranging risk management workshops, meeting with relevant stakeholders, preparing the risk treatment plans, risk management plans and risk registers, etc. The Consultants shall employ a dedicated professional staff equipped with relevant experience in this field to perform the duty of the Risk Manager. The Consultants shall present their approaches, methodologies, findings, proposals, recommendations and conclusions for the task in the SRM Report for comments/agreement by the DR and relevant Government bureaux/departments.

- (b) Devise measures to prevent their occurrence or to mitigate the consequences thus ensuring reliability of the selected procurement arrangements. Upon request by the Employer, the risk treatment plans, risk management plans and risk registers, etc and the other findings and developments in the Systematic Risk Management shall be reviewed by an independent expert with adequate experience on DBO/DB contract procurement for Plant. This independent expert shall be engaged and whose services shall be paid for directly by the Employer. The Consultants are however required to advise the Employer the kind of background, qualifications and experience suitable candidates should possess; recommend suitable candidates to the Employer for consideration; draft details of services required to be provided by the independent expert with estimation of costs; and provide all necessary support (including but not limited to the drafting of documents for inviting quotations, assessment of quotations and drafting of engagement agreement) to allow the Employer to procure the services of the independent expert in accordance with the procedures as stipulated in the Stores and Procurement Regulations. The review shall also cover risk sharing between the Employer and the DBO/DB contractor(s). A review report prepared by the expert shall be submitted to the DR for consideration. The Consultants shall modify the risk treatment plans, risk management plans and risk registers, etc taking due consideration of the views of the expert and any further comments the DR may have after considering the expert's report.
- (c) Advise the Employer, based on the Systematic Risk Management performed, on specific insurance needs for the future works contracts in accordance with ETWB TC(W) No. 7/2005. The Consultants shall assess whether insurance procurement is appropriate and, if so, what are the appropriate procurement options, coverage and policy wording for construction insurance. The Consultants shall assess the compatibility of existing Government standard policy on insurance procurement with the current insurance market and, where appropriate, provide recommendation to modify the standard policy to suit prevailing market conditions. The result of the risk-based assessment on insurance procurement, the choice of a procurement method and the determination on the insurance coverage shall be endorsed by the DR.

### 6.2.32 Insurance

The Consultants shall engage insurance experts to advise on specific insurance needs for the construction and operation of the Plant in accordance with ETWB TC(W) No. 7/2005. The Consultants shall adopt a risk-based assessment approach and apply the Systematic Risk Management process to assess whether insurance procurement is appropriate and, if so, what are the appropriate procurement options, coverage and policy wording for construction insurance. The Consultants shall assess the compatibility of existing Government standard policy on insurance procurement with the current insurance market and, where appropriate, provide recommendation to modify the standard policy to suit prevailing market conditions. The insurance expert shall exercise his duties free of conflict of interest.

### 6.2.33 Oversea Visits

The Consultants shall propose and arrange not more than 2 rounds of overseas site visits (total not more than 50 man-days per round, excluding air traveling time, to be spent by the Government officers), where necessary, for WSD's representatives or relevant government officers to sites having high value of reference for the selection of the most suitable option of desalination/water treatment process. The visit shall aim to provide WSD's representatives/relevant Government officers a general understanding of the state-of-the-art desalination/water treatment processes in particular technologies that are uncommon or have not been used in the territory, its O&M, cases of successful installations in relation to legal, land, infrastructural, environmental, and technical issues, and methodologies to overcome key problems from inception to operation. The visit shall include discussion and meetings with parties concerned in the planning, design, construction, operation, and end-users. The costs on traveling, accommodation and food for WSD's representatives or Government officers would be borne by the HKSAR Government. The Consultants shall allow for costs for the arrangement and costs for traveling, accommodation and food for their staff and staff of counter-part organizations in attending the visit. Detailed arrangements and actual timing of the visits shall be agreed with the DR. The Consultants shall collect the relevant information from the owners, designers, contractors and operators of these projects, take record of the site visits and recommend the applicability of any overseas practice and experience to the Assignment.

#### 6.2.34 Contract Strategy, Programme and Cost Estimates

- (a) Review, evaluate and compare the cost of production of potable water by (i) conventional water treatment works; (ii) desalination plant, cost effectiveness and the most appropriate timing of constructing a desalination plant at TKO, taking into account the water supply and demand trend and water production cost in Hong Kong and effect of climate change. Study the effect on the overall water production cost upon the implementation of the Plant taking into account of other raw water sources like local yield and Dongjiang raw water supply and the variation on its effect on the overall water production cost while Plant is working at its various operation capacities. Study and make comparison the water production costs from the three different water sources, namely, local yield, Dongjiang raw water supply and desalinated water at the time of the commissioning of the Plant.
- (b) Review and recommend the contractual arrangement for carrying out each part of the proposed works of the Plant and devise an implementation plan such that all the pre-construction activities including the detailed design will be completed first so as to enable the construction works could be commenced and the Plant could be commissioned.
- (c) Advise on the most suitable package of contract(s) of the proposed works of the Plant including intake and outfall pipes, RO treatment plant and water treatment plant, etc taking into account the comments and advice from key players in the water treatment industry. The Consultants shall study and recommend the procurement method of the Plant such as DBO and DB contract. The Consultants shall assess and recommend the most suitable form of contract such as General Conditions of Contract and NEC for all or any part of the proposed works together with proposals for resident site staff set up.
- (d) Prepare a list of pipe materials and plants that are subject to prolonged delivery and recommend those materials that must be procured prior to inviting tenders for mainlaying work.
- (e) Prepare a programme for the further investigations, surveys, design and construction of the proposed works.

- (f) Prepare an estimate of the cost for carrying out the proposed works and deployment of RSS with the following shown separately:
- (i) Procurement of pipes, valves and fittings.
  - (ii) Procurement of major mechanical and electrical plant.
  - (iii) Construction, with each proposed entrustment, works order or contract shown separately.
  - (iv) Consultants fees and other reimbursable items.
  - (v) Salaries and other reimbursable items for resident site staff.
  - (vi) Contingency items and any other costs.
  - (vii) The estimation of contingency items shall be in accordance with Section 5.1 and Appendix 4.15, Chapter 1 of PAH “Estimating Using Risk Analysis” or any subsequent version. The Consultants shall attend the meetings of PECC of WSD to present the cost estimates and revise estimate taking into consideration of PECC’s comments.
- (g) Prepare a submission for vetting by the PECC of WSD for the DBO/DB contract(s) at least 6 months in advance of the scheduled date of the Public Works Sub-Committee (PWSC) meeting for upgrading the Project or part thereof to Category A in the Public Works Programme, or scheduled tender date of the DBO/DB contract(s), whichever is the earlier. The PECC submission shall contain project estimates and resident site staff estimates using “Estimating Using Risk Analysis” or any subsequent version in accordance with Section 5.1 and Appendix 4.15, Chapter 1 of PAH, recurrent consequences estimates, environmental mitigation measures estimates, breakdown of consultants’ fees for construction stage, priced bills of quantities/activity schedule (where appropriate), draft PWSC paper, drawings (A3 and A4 sizes) and other information as instructed by the DR.

- (h) Prepare a cash flow analysis.
- (i) Prepare the recurrent costs and life cycle cost of the Plant. Recurrent costs shall cover breakdown for staff, energy, material and contract maintenance. The Consultants shall also carry out sensitivity analysis on the capital and recurrent costs including the choice of membranes.
- (j) Prepare pre-tender estimates for the works contract(s) and calculate the liquidated damages to be stated in the tender documents within 2 months before the date programmed for the invitation of tenders and attend vetting committee of WSD to present the pre-tender estimates if necessary.

#### 6.2.35 Contract Strategy Development

- (a) Carry out a comprehensive study on the cost-effectiveness of DBO/DB contract procurement arrangements for implementation of the proposed works of the Plant. In particular, the study shall include life cycle economic and financial assessment between the DBO/DB contract procurement approach and the conventional project procurement method for the proposed works of the Plant. The Consultants shall also identify the most efficient contract form within the DBO/DB contract procurement spectrum for the proposed works of the Plant.
- (b) Identify any materials or services that are required prior to or separately from the main works contract for advance procurement.
- (c) Submit a working paper detailing the findings and recommendation of the study. The Consultants shall also identify, evaluate and compare in the paper the financial aspects for implementation of the proposed works of the Plant under the DBO/DB procurement approach. The paper shall consider financial assessment and programming aspects as well as the post-operational benefits, merits and demerits of total liability and a split of liability between the Employer and the contractor in the DBO/DB contract procurement. The paper shall also consider the tendering and negotiation strategy for the DBO/DB contract(s). The paper shall include, inter alia, the following:
  - (i) identification of the objectives of DBO/DB procurement for the



proposed works of the Plant.

- (ii) identification and comparison of the various possible procurement options for the Plant, in particular under DBO/DB contract arrangement for the proposed works of the Plant and under a separate contract arrangement for the proposed works of the seawater intake pipes and outfall pipes with due reference to local and international practices. The Consultants shall evaluate generically the merits and demerits of the procurement arrangements including but not limited to cost-effectiveness, time of delivery, cost control, programme control, quality of work, susceptibility and settlement of contractual disputes, risk management and mitigation, and flexibility to cope with unforeseen changes arising during project delivery.
- (iii) appraisal of the merits and de-merits of implementing the proposed works of the Plant under DBO/DB contract arrangement in view of the latest situation and development;
- (iv) identification of the constraints among the various DBO/DB procurement options under the existing Government practices and policies and making proposal to overcome any identified constraints for delivery of the proposed works of the Plant.
- (v) the strategy in risk sharing among the various contract options.
- (vi) the anticipated problems during construction of the Plant, and on the O&M of the Plant under the various procurement options. The Consultants shall make proposals to tackle the anticipated problems.
- (vii) in formulating the contract forms, the Consultants shall consider the O&M interfaces between the proposed works of the Plant, WSD's project of laying a trunk main from the Plant at TKO to TKOFWPSR, the existing temporary magazine for the SCL project and the Mines Division of CEDD's barging pier for off-loading explosives at the TKO Area 137.
- (viii) recommendation of the most cost-effective form of DBO/DB

contract arrangement with due reference to the life cycle cost of the Plant. The recommendation shall include the overall benefits for implementation of the proposed works of the Plant.

- (ix) a comprehensive study on the comparison on the merits and demerits of prescriptive and flexible Employer's Requirements.
- (x) a comprehensive market survey and study on the duration of the operation stage of the DBO contract and recommend the most cost-effective contract duration for the implementation of the proposed works of the Plant under a DBO approach for the agreement by the DR. The incentives of the contractor, the financial advantages and disadvantages, the design life of civil and E&M equipment and the aging of the equipment shall be taken into account. The Consultants shall assess the need and propose particular clauses for termination of the contract for certain circumstances arise during execution of the DBO contract. Moreover, the Consultants shall also assess and develop a mechanism on extension of the contract period if the Employer considers appropriate. In the study, the Consultants shall liaise and obtain the view of New Territories East Region, Development, Water Science, Mechanical and Electrical/Projects and Mechanical and Electrical/ Maintenance Divisions of WSD.
- (xi) examples on the recommended contract arrangement both locally and in other countries.
- (xii) a detailed account of steps and considerations to be taken to ensure that the prequalification, tendering and negotiation process is properly conducted giving due regards to government procedures and requirements. Comments from appropriate authorities/bodies including Legal Advisory Division of the Development Bureau (LAD/DEVB) and Financial Services and the Treasury Bureau (FSTB) should be sought in particular regarding potential areas which are opened to negotiation and negotiation strategy. Reference should be drawn from local (e.g. EPD's and DSD's DBO/DB contracts) and overseas DBO/DB experience as appropriate.

- (d) Develop methodology for measuring the performance of the DBO contractor on the O&M of the DBO contract. The methodology shall include the following:
- (i) comparison on the merits and demerits of different performance targets;
  - (ii) comparison on different measurement methods;
  - (iii) recommendations on the most appropriate performance targets and measurement methods;
  - (iv) the methods of performance measurement;
  - (v) duration and schedule of performance measurement;
  - (vi) appraisal system on the DBO contractor's performance;
  - (vii) appropriate forms and appraisal report format;
  - (viii) penalty system to be used once the DBO contractor failed to achieve performance targets; and
  - (ix) any other items the Consultants consider appropriate.
- (e) Identify, evaluate and compare the financial aspects for implementation of the proposed works of the Plant under a DBO/DB procurement approach. The assessment shall include the following:
- (i) method of payment to contractor during construction, commissioning and operation stages including consideration of the need for any guaranteed minimum payment and any ranges of payment required to be set for operating the Plant;
  - (ii) the linkage between payment and performance of the contract;
  - (iii) amount of bond and guarantee, if required;
  - (iv) accounting system including any demerit system with price

deduction for payments due to non-compliance of performance targets;

(v) advise on whether it is appropriate to include a “pain-and-gain” sharing mechanism and if affirmative provide details of such mechanism to be adopted;

(vi) remedies for breach of contract;

(vii) Employer’s right to terminate the DBO/DB contract (e.g. due to poor performance of contractor or for convenience of the Employer); and

(viii) any other aspects the Consultants consider relevant.

(f) Prepare a working paper on performance measurement and financial assessment detailing the findings and recommendations. Upon request by the Employer, the paper shall be reviewed by an independent financial expert. This independent financial expert shall be engaged and whose services shall be paid for directly by the Employer. The Consultants are however required to advise the Employer the kind of background, qualifications and experience suitable candidates should possess; recommend suitable candidates to the Employer for consideration; draft details of services required to be provided by the independent financial expert with estimation of costs; and provide all necessary support (including but not limited to the drafting of documents for inviting quotations, assessment of quotations and drafting of engagement agreement) to allow the Employer to procure the services of the independent financial expert in accordance with the procedures as stipulated in the Stores and Procurement Regulations. A review report prepared by the expert shall be submitted to the DR for consideration. The Consultants shall modify the paper taking due consideration of the views of the expert and any further comments the DR may have after considering the expert’s report.

(g) Develop and recommend the mode, system, mechanism and structure to administer, supervise and monitor the performance throughout the execution of the DBO/DB contract(s) for the proposed works of the Plant with due reference to local and overseas relevant projects (see

examples in **Appendix V**).

- (h) A Design Checker shall be employed independent of the contractor and his designer to check the design and quality of the contractor's works. Based on the Consultants' duties as defined in Clause 6.5 of this Brief, the Consultants shall submit a working paper detailing the control and supervision of the DBO/DB contract(s) for satisfactory implementation of the Assignment. The working paper shall include the assessment and recommendations on the following items:
- (i) review on the Consultants' duties as defined in Clause 6.5 of this Brief for satisfactory control and supervision of the DBO/DB contract(s);
  - (ii) the form of the engagement of the Design Checker, the duties of the Design Checker, the strategy for site supervision and the RSS requirements etc. The Consultants shall identify the critical construction activities and structural elements in the reference design that warrant the formulation of special site supervision requirements for such activities and structural elements;
  - (iii) Employer's input for supervision, monitoring and control of the implementation and operation of the Plant at various stages. In particular, it is considered that an Employer's Monitoring Team should be set up to check the plant performance on O&M aspects before and after the initial operation of the Plant and monitor the DBO contractor's performance in the long term. The Consultants shall advise the role of the Monitoring Team to be played during the Construction, Commissioning, Initial Operation and Completion Phase as well as in the ensuing operation stage with a view to maintaining close liaison among the Monitoring Team, the Consultants and the DBO contractor to ensure proper plant performance on O&M aspects and smooth handover of the monitoring role from the Consultants to the Monitoring Team including training to the Monitoring Team on O&M of the plant equipment and software;
  - (iv) licence holder under the Plant under Water Pollution Control Ordinance, monitoring and reporting mechanism of

environmental issues and legal liability of non-conformity such as non-compliance of discharges, etc.;

- (v) control and supervision of the operation of the existing facilities of the Plant;
- (vi) control on sub-contracting of the proposed works of the Plant;
- (vii) the roles and liabilities of the Design Checker, the Consultants, the DBO/DB contractor(s) and the Employer and their inter-relationship;
- (viii) key items of DBO/DB contract specifications, performance targets and measuring methods for design, construction, commissioning and operation of the Plant;
- (ix) operational constraints and the associated control requirements;
- (x) control on programme and progress;
- (xi) detailed design checking procedures for DBO/DB contract(s);
- (xii) construction checking procedures;
- (xiii) auditing mechanism;
- (xiv) safety and environmental controls on site;
- (xv) supply and stock control of treatment chemicals;
- (xvi) sludge disposal and transport arrangement;
- (xvii) site records checking procedures;
- (xviii) handling complaints from the public;
- (xix) appraisal system on the DBO/DB contractor(s);
- (xx) quality assurance procedures;

- (xxi) computerized data exchange system between the Plant and Government offices;
  - (xxii) contract arrangement and contractor management system during operation stage of the Plant;
  - (xxiii) contingency scheme and contractual provision for DBO contract in case the operator fails to provide the required operation service or the operator stops works;
  - (xxiv) flow chart on major activities and management decision points;
  - (xxv) evaluation of DBO contractor's O&M performance (e.g. failure rate of E&M equipment, occurrence of failure of water production, response time to equipment failure, power and chemical consumption, etc.); and
  - (xxvi) any other items the Consultants consider appropriate.
- (i) It is intended that the Plant may be handed back to the Employer or another contractor for O&M at the end of the DBO/DB contract(s). The Consultants shall develop the handing over arrangement for the Plant and establish the Employer's monitoring mechanism on O&M of the facilities. The Consultants shall submit a working paper which, in particular, includes the following:
- (i) handing over arrangement of the Plant to the Employer/another contractor for O&M at completion or termination of the DBO contract or completion of the DB contract(s) with due regards to concerns such as risks, cost effectiveness, financial aspects, Employer's administration and monitoring, etc. and recommend the most appropriate time frame to hand over the Plant to the Employer/another contractor;
  - (ii) Employer's monitoring mechanism on O&M of essential facilities of the Plant;
  - (iii) the need to provide Maintenance Period or Defects Liability

Period for the Plant upon expiry of the DBO contract period;

- (iv) the need and details of condition survey on the Plant before handing over back to the Employer/another contractor and the timing of the survey; and
  - (v) any other items the Consultants consider appropriate.
- (j) Develop and agree with the DR the methodologies, duration, criteria etc, of the testing, commissioning and acceptance arrangement for equipment, system and process of the Plant. The period for process commissioning shall be 3 months at least or otherwise recommended by the Consultants for the agreement by the DR. The Consultants shall submit a working paper which include the followings:
- (i) the types, details and justifications of the recommended commissioning tests;
  - (ii) the schedule of the tests;
  - (iii) the acceptance criteria of the tests;
  - (iv) the reporting format of the tests; and
  - (v) any other items the Consultants consider appropriate.
- (k) Based on the findings of sub-clauses 6.2.35 (a) to (j) of this Brief, the Consultants shall establish a DBO/DB contract framework for the proposed works of the Plant. In addition, the framework shall also include recommendations on method of tender specification, tendering arrangement, method of selecting the DBO/DB contractor(s), scope of works, cost estimate and the implementation programme. The Consultants shall submit a draft final report on contract procurement detailing the findings and recommendations for the agreement by the DR. The draft report shall be circulated to all relevant Government departments/bureaux for comments. With comments obtained from relevant Government bureaux, the Consultants shall prepare and submit a final report describing the final outcomes in relation to the DBO/DB contract procurement strategy, framework, arrangements, steps and



procedures of the DBO/DB contract procurement for subsequent implementation of the Assignment.

#### 6.2.36 Contract Documentation

- (a) Prepare a draft Conditions of Contract/Additional Conditions of Contract for the DBO/DB contract(s). The Consultants shall incorporate all the outcomes obtained from the Investigation Review and Design Phase.
- (b) In preparation of the Conditions of Contract/Additional Conditions of Contract, the Consultants shall make reference to the Conditions of Contract/Additional Conditions of Contract of local and overseas relevant projects (see examples in **Appendix V**) and shall include all relevant and necessary clauses for the Assignment.
- (c) In carry out the duties, the Consultants shall pay attention to some special features of the Assignment as follows:
  - (i) Prescriptive or flexible Employer's Requirements;
  - (ii) length of period of operation;
  - (iii) design responsibilities of the DBO/DB contractor(s);
  - (iv) duties of the Design Checker and the Consultants;
  - (v) mechanism on terminating the DBO contract;
  - (vi) reliability of operations;
  - (vii) O&M plans;
  - (viii) minimum qualifications and working experience of the DBO contractor's staff to man the Plant;
  - (ix) payment methodology for different stages of the proposed works of the Plant;
  - (x) optional extension of contract period;
  - (xi) handing over of the Plant upon expiry of the contract period;
  - (xii) penalty on non-compliance with EP; and
  - (xiii) any other items the Consultants consider appropriate.
- (d) Seek comments from all relevant Government departments/bureaux, in particular Department of Justice or LAD/DEVB, on the drafting of the Conditions of Contract/Additional Conditions of Contract for the DBO/DB contract(s). The Consultants shall explain and answer to the

queries raised by the Government departments/bureaux. The Consultants shall incorporate comments of all relevant parties, and finalize the Conditions of Contract/Additional Conditions of Contract to the satisfaction of Department of Justice or LAD/DEVB.

- (e) Prepare draft/sample specification for outsourced maintenance of M&E plant (where recommended in the M&E Maintenance Strategy Study Report) as described in sub-clause 6.2.20(b) of this Brief.
- (f) Prepare and submit draft prequalification documents in accordance with the ETWB TC(W) No. 35/2004 for the consideration of the DR. After receiving comments from the DR on the draft documents, the Consultants shall revise the document and seek comments from all other relevant Government departments/bureaux on the revised draft prequalification documents. The Consultants shall incorporate all relevant comments and finalize the prequalification documents.
- (g) Formulate the selection criteria of DBO/DB tenderers for Stage 1 and Stage 2 assessments in accordance with the ETWB TC(W) No. 35/2004 for the agreement of the DR. The selection criteria for Stage 2 assessment shall include the relative weighting determined for each criterion and a marking scheme. The Consultants shall assist the DR to obtain approval from relevant authorities on the selection criteria for assessment.
- (h) Formulate a marking scheme for assessing tenders for the agreement by the DR. The Consultants shall make reference to the Administrative Procedures for D&B Contracts and make appropriate alteration and addition to cater for the cost, O&M aspects and difference in water treatment technologies employed by different tenderers of the DBO/DB contract(s) in formulating the marking scheme. The Consultants shall establish negotiation strategies and procedures as appropriate for the agreement by the DR and other authorities such as the FSTB.
- (i) Prepare draft tender documents of the DBO/DB contract(s), including but not limited to Form of Tender, Conditions of Tender, Employer's Requirements which set out exactly the requirements of the Plant, in consultation with the DR, and other relevant Government departments/bureaux. The Consultants shall make reference to the

Administrative Procedures and make appropriate alteration and addition to cater for the O&M aspects of the Plant in formulating the tender documents.

- (j) Seek comments from relevant Government departments/bureaux on the draft tender documents and incorporate all relevant comments, finalize the tender documents.

#### 6.2.37 Final Report for Investigation Review and Design

- (a) Prepare and submit the Final Report summarising all the work done in this Investigation Review and Design Phase including various assessments, studies, surveys, investigations together with the findings, conclusions and recommendations, and the implementation scheme for the Plant and the associated fresh water transfer facilities for approval by the DR. The Final Report shall, amongst other things, also include the philosophy, criteria, parameters, assumptions, method of analysis and operation intents, cost estimates, implementation programme, recurrent consequences, contract forms, works packages, mechanical and electrical plant and equipment including pumping plant, power supply plant, and water treatment plant and equipment, monitoring and control, SCADA System, DCS, energy management system and alternative proposals/design of the works, proposals, recommendations and conclusions, together with the feedbacks from the public during the public engagement exercise for the whole Assignment. The Final Report shall also include the project delivery strategy and the contract strategy most suitable for timely implementation of the works under the Assignment. Prior to submission of the Final Report, the draft Final Report should be circulated to relevant parties and Government departments for comments.
- (b) Prepare the Executive Summary in a bilingual version of Chinese and English. The Executive Summary shall contain the key information of the Final Report in a condensed form. The Executive Summary shall be written in simple terms and bound separately.

### 6.3 Tender Phase

The Consultants shall not proceed with Tender Phase unless and until they have

received the written instruction of the DR. The services to be rendered under the Tender Phase of the Assignment shall include the following:

- 6.3.1 Prepare and submit the draft Tender Drawings and Documents, matters or things that may be necessary to enable the Employer to invite tenders or place orders for the proposed works in the forms recommended by the Consultants and approved by the DR, together with a summary report with a cost estimate, notes on any deviation from current Government standards, comments from WSD divisions and relevant Government departments, actions taken by Consultants in response to the comments and the final agreement reached. Revise and submit the same to the DR for his agreement taking into consideration of the comments of the DR. The Consultants shall ensure that all works are clearly defined in the documents/drawings and that adequate information, including design lines and levels, ground investigation data appropriate for the form of contract adopted is available to the tenderers.
- 6.3.2 Assist the DR in carrying out the prequalification procedures for Contract in accordance with the ETWB TC(W) No. 35/2004 and the milestone target dates stated in Clause 7 of this Brief, including the preparation of all necessary documents for prequalification purpose, gazette invitation and place advertisement notices for inviting prequalification applications in the media and professional journals both locally and overseas, evaluate prequalification submissions in consultation with the DR and prepare report in accordance with established Government procedures to enable Government to invite from a list of pre-qualified tenderers' tender submissions for the Contract.
- 6.3.3 Prepare copies for inviting applications for prequalification for tendering the DBO/DB contract(s). An insurance policy should be included for pre-qualified tenderers to comment. Electronic tendering shall be required in accordance with the latest technical circulars issued by Development Bureau. The Consultants shall examine prequalification submissions and attend assessment meetings, and prepare Prequalification Assessment Report making recommendation on the selection of pre-qualified tenderers.
- 6.3.4 Assist the Employer to obtain approval of the Central Tender Board on the list containing the pre-qualified tenderers. Due regards shall be given to the provisions of Section 4.3, Chapter 6 of PAH and ETWB TC(W) No. 35/2004 in the prequalification exercises. The Consultants shall make use of the opportunity of the prequalification process to obtain the views of contractors

on the contract and improve the DBO/DB tender documents.

- 6.3.5 Assist the Employer in the invitation of tenders for the proposed works. Draft tender notifications, prepare and distribute tender documents, prepare and issue tender addenda, answer queries and carry out pre-tender briefings if required.
- 6.3.6 Deal with tenderer's queries and request for advice during the tender period and shall provide relevant information relating to their tender submissions.
- 6.3.7 Prepare tender assessments and recommendations, including evaluation of alternative tenders, and submit tender reports to the DR in a standard format as required by the DR.
- 6.3.8 Review all tenders submitted for Contract, considering the completeness and depth of the Contractor's Technical Proposals in each case, and submit a Tender Review and Appraisal Report identifying any non-compliance of Employer's Requirements and the strengths and weaknesses of all submitted tenders. When requested by the DR, arrange to meet the tenderers together with the officers appointed by the DR to discuss individual technical proposals, prepare questions and provide comments on tenderers' replies to the DR as necessary to enable conclusions to be reached about the relative merits of each of the tender schemes submitted. Prepare a Technical Assessment Report summarising the findings of the tender technical assessment and making related recommendations for the acceptance of the tender from the technical point of view.
- 6.3.9 If the Employer finds the recommended tender acceptable, the Consultants shall assist the Employer to seek approval from the Central Tender Board on the recommended tenderer for the DBO/DB contract(s).
- 6.3.10 Prepare Articles of Agreement and other contract documents for signature, for retention by the DR and for issue to contractors, RSS and other parties. The Consultants shall submit contract documents for signing and record purposes. The Consultants shall check and ensure that all formalities required under DEVB TCW No. 7/2014 for executing the Articles of Agreement are carried out.
- 6.3.11 Prepare publicity materials, attend signing ceremonies and any press briefings.

- 6.3.12 Submit duplicated copies of contract documents to the DR after contract signing. The Consultants shall ensure the correctness and completeness of the duplicated copies and certify so on each duplicated copy provided under this sub-clause.
- 6.3.13 Carry out debriefing to unsuccessful bidders in accordance with ETWB TC(W) No. 42/2002 if required.
- 6.3.14 Prepare the brief and all necessary documents to enable the Employer to appoint an Independent Environmental Checker under a separate contract. The Consultants shall observe the specific requirements as stipulated in the approved EM&A Manual, EIA Study Review, and EP of the Project. The Independent Environmental Checker shall not be an associated body of any of the DBO/DB contractor(s), the Consultants or the Environmental Team.

#### 6.4 Construction and Commissioning Phase

##### Construction and Commissioning Phase (for both DBO and DB contract arrangement)

The Consultants shall not proceed with Construction and Commissioning Phase unless and until they have received the written instruction of the DR. The Consultants shall:

- 6.4.1 Accept the appointment as and carry out the duties of the Engineer or the SO under the terms of the Contract or the Supervisor and all other duties delegated by the Employer's Project Manager as defined in the NEC for the design, construction, completion and commissioning of the Plant which shall include the coordination of work carried out by public utility companies and other authorities, bodies or persons for or in connection with or necessitated by the Plant.
- 6.4.2 Administer the DBO/DB contract(s) in regard to the design, construction and commissioning of the works and ensure that the contractor's works are in full compliance with the contract.
- 6.4.3 Extend the Engineer or the SO or the Supervisor and all other duties delegated by the Employer's Project Manager as defined in the NEC supervision duties

to cover the use of the 4-D BIM modelling technique in monitoring and control of the contractors' works.

- 6.4.4 Review and comment on the 4-D BIM model(s) submitted by the DBO/DB contractor(s) with a view to approving a baseline model to be used for monitoring and controlling the construction of the works.
- 6.4.5 Review and submit the DBO/DB contractor's 4-D BIM model(s) and final as-built BIM model(s) to the Employer, and assist the Employer in developing it into a facility management tool for the future O&M of the Plant if desired by the Employer. The Employer shall have the exclusive ownership of the BIM model(s) listed above, in accordance with Clause S15 of the Special Conditions of Employment of this Agreement.
- 6.4.6 Accept the appointment as and carry out the duties of the Engineer's Representatives under the terms of WSD Term Contracts for works carried out under the WSD Term Contracts.
- 6.4.7 For works contract(s) which employs the DBO/DB contract form, the Consultants shall require the Contractor to appoint Design Checker(s), independent of the Contractor and his designer. Time allowed for certain activities shall be stipulated in the Employer's Requirements. According to the Administrative Procedures for Use with the HKSAR General Conditions of Contract for Design and Build Contracts, the SO or the Supervisor has to satisfy himself as to the adequacy of the design check carried out by the Design Checker throughout the design checking procedures.

#### Project Design Plan

The Consultants shall review the Project Design Plan submitted by the Contractor and give approval prior to the start of the bulk of the design process.

#### Approval in Principle (AIP)

In considering the Contractor's AIP submission, the Consultants must be satisfied that, where required the design has been independently checked and return the document endorsed according to one of the following categories: -

- (i) Consent to proceed to detailed design
- (ii) Consent as above but with conditions
- (iii) Consent not granted for reasons to be listed

#### Detailed Design Approval (DDA)

In considering the Contractor's DDA submission, the Consultants or the Supervisor must be satisfied that, where required the design has been independently checked and return the document endorsed according to one of the following categories: -

- (i) Consent to proceed to construction
- (ii) Consent as above but with conditions
- (iii) Consent not granted for reasons to be listed

- 6.4.8 Comment on any insurance policies submitted by the contractors.
- 6.4.9 Co-ordinate the works which are carried out in conjunction with the works of other Government departments, parties and public utility companies.
- 6.4.10 Review the designs as necessary during the construction of the works including works entrusted to other Government departments/parties. Prepare such other designs, specifications and documents as may be necessary for completion of the works and mitigation of the effects of the works on the public.
- 6.4.11 Require the DBO/DB contractor(s) to submit SOA which shall have been certified by the Design Checker. The Consultants shall advise the Employer on the acceptability of the SOA and make recommendations to the Employer if the results are found to be unsatisfactory. The Consultants shall provide assistance to the Employer in submitting the SOA to Property Vetting Committee. The checking and reviewing of the SOA submitted by the DBO/DB contractor(s) shall be carried out by the head office of the Consultants.
- 6.4.12 Arrange and supervise the testing and commissioning of the works including any re-testing necessary as a result of failure of initial tests and commissioning. Prepare reports on the testing and commissioning of the works.



- 6.4.13 Appoint, manage and supervise the RSS. Provide training and refresher courses to the RSS. The Consultants shall also identify special training requirement regarding the supervision of critical construction activities and critical structural elements and provide the necessary training to the RSS.
- 6.4.14 At the commencement of works, review the QSSP (against the activities described by the contractors in their Quality Plans prior to the execution of works if the contractors are required to submit the Quality Plans under the contracts), and conduct regular reviews of the QSSP with the RSS subsequently, and as the need arises, make necessary updating and modification in order to suit the actual circumstances, and the Consultants shall report in the progress reports the status of implementing the QSSP and any major modifications to it as a result of a review. The Consultants shall submit a revised QSSP to the DR if there is a major revision or as requested by the DR.
- 6.4.15 Ensure that monitoring of buildings, structures, utilities and infrastructures that may be affected by the construction works, and monitoring of groundwater level, ground movement, vibration, etc. are properly carried out according to the Monitoring Plan and submit monthly monitoring report to the DR on the monitoring results, and if the situation warrants, submit further reports at weekly intervals or at intervals to be agreed with the DR.
- 6.4.16 Report on the performance of the DBO/DB contractor(s) in the format advised by the DR and submit the performance reports of the DBO/DB contractor(s) to the Employer.
- 6.4.17 Report on the financial situation, variation orders/compensation events, claims for additional payment and request for extensions of time and all other matters affecting the progress and financial situation of the works.
- 6.4.18 Certify payments regarding the interim operation, design, construction and commissioning of the works under the DBO/DB contract(s) to the contractor. The Consultants shall also prepare estimates of monthly and yearly expenditure for the works.
- 6.4.19 Deal with claims, negotiate rates for variations/compensation events and issue necessary variation orders/any instruction giving rise to a compensation event in connection with the contract and assist the Employer in settling disputes or

differences between the Employer and Contractor. For mediation, litigation and arbitration on disputes between the Employer and the Contractor relating to matters which arise before the expiry of the initial operation period for DBO contract and the expiry of the contract period for DB contract, appropriate assistance shall be provided by the Consultants to the Employer, and if any input in these regards are agreed between the Consultants and the DR as additional services, payment of such would be in accordance with the Schedule of Fees.

- 6.4.20 Investigate all complaints including but not limited to those from members of the public, District Councils, local organizations, and the likes regarding the Works and report to the DR.
- 6.4.21 Plan, arrange and, where necessary, direct the inspection and testing of materials and workmanship.
- 6.4.22 Audit the TIA prepared by the contractor and certified by the Design Checker. The Consultants shall assist the contractor, where appropriate, in securing approval of the TIA by relevant Government authorities. The Consultants shall monitor the implementation of temporary traffic measures by the contractor based on the approved TIA for construction, commissioning and operation of the Plant.
- 6.4.23 Liaise with HyD, TD, MD, HKPF and other concerned parties regarding traffic diversions and traffic management proposals made by the contractors.
- 6.4.24 Liaise with Hong Kong & Islands, Kowloon, New Territories East and New Territories West Regions, Mechanical & Electrical/Maintenance Division and Development Divisions of WSD regarding the operation of the water supply system during construction.
- 6.4.25 Ensure that the DBO/DB contractor(s) has sufficient guide and clear requirement to the effect that the monitoring and control system for the Plant is able to exchange essential data with the existing NTE Regional SCADA system. The new monitoring and control system should conform to open standards and user-friendliness that shall allow connection to equipment of different make. Check and comment on or approve the submissions by the contractors for the supply and installation of mechanical and electrical plant and associated instrumentation and SCADA equipment. Vet the inspection

reports of mechanical and electrical pumping plant submitted by the Independent Inspection Agent as necessary. Carry out inspection of the plant and equipment as appropriate to ensure compliance of the requirements;

- 6.4.26 Supervise and coordinate the installation, testing and commissioning of the mechanical and electrical plant and associated instrumentation and SCADA equipment and arrange for the preparation and delivery of the Instruction Manuals for the mechanical and electrical works. Organise and conduct training, in collaboration with the contractors, to the Employer's staff for O&M of the completed works.
- 6.4.27 Review and submit the DBO/DB contractor's O&M manuals in an electronic format to be agreed by the DR.
- 6.4.28 Give three months' notice to the DR of the intention to issue to a contractor a completion or taking-over certificate for the part of the contract works under the DBO/DB contract(s) if required. Arrange a joint inspection, before the issue of the completion certificate, for the purpose of handing over the completed works to Government with representatives of the DR and the relevant O&M authorities. Deliver to the DR, at least one month prior to this inspection, all information, instructions, manuals, calculations and drawings as are necessary for the O&M of the completed works. The Consultants shall require the DBO/DB contractor(s) to compile and prepare an O&M manual for the Plant for certification by the Design Checker. The Consultants shall advise the Employer on the acceptability of the DB contractor's O&M manual. The manual shall include a maintenance plan and a contingency plan for the Plant.
- 6.4.29 After completion of the construction works under the DBO/DB contract(s) and within a period to be agreed by the DR, review and submit to the DR the DBO/DB contractor's as-constructed drawings showing in full details the contract works and utility works as actually carried out together with manuals, calculations and information necessary for the O&M of the contract works and submit all records and accounts relating to the contract works within a period to be proposed by the Consultants and agreed by the DR. The Consultants shall also submit all survey data being used, in a format to be agreed by the DR, to facilitate subsequent input by the Government into the Land Information System in the LandsD. For works to be handed over to Port Works Division of CEDD, the as-constructed drawings together with summary of changes in design criteria, parameters, assumptions or approach for any marine facilities

should be submitted before the handover meeting.

- 6.4.30 Prior to applying for the Checking Certificate(s), a Geotechnical Review Report on the slopes and retaining walls (including natural terrain hazard mitigation measures) formed, studied, modified, affected or removed under the Assignment, together with the associated maintenance manuals, record drawings, construction records and test results should be submitted to the GEO. The Consultants shall also provide Chief Geotechnical Engineer/Slope Safety of GEO the information of all slopes and retaining walls (including natural terrain hazard mitigation measures) formed, studied, modified, affected or removed under the Assignment for updating the Slope Information System in accordance with WBTC No. 9/2000.
- 6.4.31 Prepare maintenance manuals for the slopes and retaining walls including any natural terrain hazard mitigation measures, in accordance with Geoguide 5. The Consultants shall also complete and submit the Certificate of Design and Completion/Stability Assessment of the slopes, retaining walls and natural terrain hazard mitigation measures and obtain the Checking Certificate(s) for Slopes and Retaining Walls from GEO in accordance with ETWB TC(W) No. 20/2004, before the issue of the Certificate of Completion for the works under the DBO/DB contract(s).
- 6.4.32 Arrange a final joint inspection of the contract works with the representatives of the DR and the O&M authorities two months before expiry of the defects liability period or maintenance period of the works contract.
- 6.4.33 Prepare and submit the Water Safety Plan, ISO 9001 Quality Management documentation, RCM documentation and ISO 55000 Asset Management documentation for the Plant after completion of the works under the DBO/DB contract(s) and within a period to be agreed by the DR.
- 6.4.34 Review and submit the Environmental Assessment System Accreditation or the Environmental Assessment documentation prepared by the DBO/DB contractor(s) in accordance with Clause 6.2.23 as appropriate after completion of the construction works under the DBO/DB contract(s) and within a period to be agreed by the DR.
- 6.4.35 Supervise and coordinate the Performance Tests on the Plant after commissioning of the completed works under the Contract. The Performance

Tests shall consist of:

- (a) monitoring the operation of the Plant for a period of not less than one year;
- (b) sampling and testing to a programme, extent of coverage of the treatment process and specific technical details to be approved by the DR;
- (c) operational data collection, evaluation and assessment; and
- (d) provision of technical assistance, advice, guidance and training to the WSD operation staff.

The Consultants shall follow up with any necessary improvement works.

- 6.4.36 Prepare finalised site plans for the completed works so as to enable the return of surplus land to LandsD, the registration of WSD reserves and the finalisation of land allocations.
- 6.4.37 Respond to audit reports.
- 6.4.38 Investigate at the request of the DR including but not limited to the design, quality of works, progress, safety and environmental impacts of the DBO/DB contractor's works.
- 6.4.39 Audit the quality and workmanship of the DBO/DB contractor's works by carrying out monthly quality audits or at a frequency as directed by the DR on the site works as well as the quality records of the DBO/DB contractor(s). The Consultants shall submit quality audit reports to the Employer detailing their findings.
- 6.4.40 Advise the DR of any unsatisfactory works, plant and materials.
- 6.4.41 Advise the Employer on the necessity of ordering of any change of the Plant.
- 6.4.42 Give professional advice to the Employer on any change proposed by the DBO/DB contractor(s).
- 6.4.43 Ensure the compliance of the safety plan submitted by the DBO/DB

contractor(s) and the implementation of the safety measures under the contract by carrying out monthly safety audit or at a frequency proposed by the Consultants and agreed by the DR. The Consultants shall submit safety audit reports to the Employer detailing the findings including, but not limited to, the safety records and performance of the DBO/DB contractor(s) in safety aspects, and giving recommendation on enhancement of safety on site.

- 6.4.44 Ensure the compliance of Waste Disposal Plan and relevant provisions of ETWB TC(W) No. 19/2005 by the DBO/DB contractor(s).
- 6.4.45 Submit additional calculations and certificates for any design work carried out during the Construction and Commissioning Phase.
- 6.4.46 Plan and arrange for the community planting near or after the completion of the works in accordance with ETWB TCW No. 34/2003 if required.
- 6.4.47 Monitor, oversee, and certify the testing and commissioning of the Plant. The Consultants shall submit a Commissioning Report of the Plant within one month after satisfactory commissioning of the Plant detailing the commissioning processes together with all relevant records.

#### Construction and Commissioning Phase (for DB contract arrangement only)

- 6.4.48 Arrange classroom and on-site training for WSD staff, check training materials and programme on the O&M of the Plant. Prepare and submit a classroom and on-site O&M training plan.
- 6.4.49 Implement ISO 50001 Energy Management System in the operation of the Plant. Prepare and submit the ISO 50001 Energy Management System documentation for the Plant
- 6.4.50 Provide full support to the DR in carrying out the post-completion review in accordance with ETWB TC(W) No. 26/2003 and produce a summary report documenting all concerned issues, findings, conclusions and recommendations identified in the post-completion review.

#### 6.5 Initial Operation and Completion Phase (for DBO contract arrangement only)

- 6.5.1 Administer the DBO contract in regard to the O&M of the Plant until expiry of the first 12-month period after commencement of the operation of the Plant (this 12-month period is referred to as the initial operation period). The Consultants shall monitor and manage the contractor to ensure that the O&M of the Plant are in full compliance with the contract.
- 6.5.2 Accept the appointment as and carry out the duties of the Engineer or the SO under the terms of the Contract or the Supervisor and all other duties delegated by the Employer's Project Manager or Service Manager as defined in the NEC for the O&M of the Plant during the initial operation period which shall include the coordination of work carried out by public utility companies and other authorities, bodies or persons for or in connection with or necessitated by the Plant.
- 6.5.3 Accept the appointment as and carry out the duties of the Engineer's Representatives under the terms of WSD Term Contracts for works carried out under the WSD Term Contracts.
- 6.5.4 Advise the Employer on the performance of the Plant until the expiry of the initial operation period. The duties of the Consultants as described in Clauses 6.5.5 to 6.5.12 of this Brief shall be carried out by the head office of the Consultants.
- 6.5.5 Arrange quarterly joint inspections or at time as required by the DR with the Employer on the Plant.
- 6.5.6 The O&M Plan on the Plant submitted by the DBO contractor at Tender Phase will form the basis in monitoring the DBO contractor's performance. The O&M Plan shall contain process monitoring, plant schematic diagram, standard operation procedures, O&M duties and personnel of the DBO contractor. The Consultants shall require the DBO contractor to update the O&M plan as needed. The Consultants shall examine the Plan and provide necessary advice to the DR. The Consultants shall carry out monitoring and auditing of the contractor's O&M work with a view to promoting continual and satisfactory operation of the Plant during the initial operation period.
- 6.5.7 Monitor the sample taking process carried out by the DBO contractor. The Consultants shall require the DBO contractor to submit reports certified by the Design Checker to the Employer on the results of the sampling and testing

within a reasonable time. The Consultants shall advise the Employer on the acceptability of the test results and make recommendations to the Employer if the results are found to be unsatisfactory.

- 6.5.8 Require the DBO contractor to develop and submit the quality records recording the performance of the Plant for the agreement by the DR. The Consultants shall advise the Employer on the acceptability of the quality records and shall liaise with and make recommendations/comments to the DBO contractor or the Employer if the quality records are found to be unsatisfactory.
- 6.5.9 Conduct monthly meetings on the O&M carried out by the DBO contractor up until the expiry of the initial operation period. The Consultants shall complete and submit to the Employer monthly operation performance report including:
- (a) the performance of the DBO contractor in respects of O&M of the Plant;
  - (b) the review of the plant data logged by the SCADA, computerised maintenance management system, on-line monitoring system and other log sheets and reports submitted by the DBO contractor;
  - (c) the quality records detailing the performance of the Plant (e.g. quality and quantity of seawater intake and treated water, etc.);
  - (d) recommendations on improving the O&M of the Plant; and
  - (e) any other items the Consultants consider appropriate.

The Consultants shall respond to queries and make comments on anomalies of the quality and quantity of the treated water which are raised or identified anytime up until the expiry of the initial operation period. The Consultants shall provide recommendations to the DR on resolving problems which are identified anytime up until the expiry of the initial operation period.

- 6.5.10 Carry out reviews on the performance measurements and control mechanisms to the O&M of the Plant carried out by the DBO contractor during the initial operation period. The Consultants shall compile a report on the reviews and make recommendations to the DR on improving the effectiveness and



efficiency of the performance measurements and control mechanisms.

- 6.5.11 Carry out other duties, as required by the DR, which are necessary for monitoring and supervising the DBO contractor's performance on O&M of the Plant. The DR shall raise with the Consultants on the performance of these other duties anytime up until the expiry of the initial operation period. The Consultants shall then hand over the necessary documents and procedures to the Monitoring Team of the Employer regarding the payment arrangement under the DBO contract on O&M aspects and liaison work with DBO contractor.
- 6.5.12 Arrange classroom and on-site training for WSD staff, check training materials and programme on the O&M of the Plant. Prepare and submit a classroom and on-site O&M training plan.
- 6.5.13 Implement ISO 50001 Energy Management System in the operation of the Plant. Prepare and submit the ISO 50001 Energy Management System documentation for the Plant
- 6.5.14 Provide full support to the DR in carrying out the post-completion review in accordance with ETWB TC(W) No. 26/2003 and produce a summary report documenting all concerned issues, findings, conclusions and recommendations identified in the post-completion review.

## **7. Programme of Implementation**

- 7.1 The due date for commencement of the Agreement is **xx 2015**.
- 7.2 Pursuant to Clause 26(B) of the General Conditions of Employment, the Consultants shall submit the draft programme and revised draft programmes and the DR shall agree, or instruct, within the following periods:
  - (a) Submission of the draft programme : Within 2 weeks of the due date for commencement of the Agreement.
  - (b) Agreement of the draft programme or instruction for submission of the : Within 2 weeks from receipt of the draft programme.

revised draft programme

- (c) Submission of the revised draft programme : Within 2 weeks from the instruction of the DR.

7.3 The draft programme and revised draft programmes shall detail the activities to be carried out, key dates for key activities, target dates for particular tasks and any decision dates that may be required for the uninterrupted progress of the Assignment. The Consultants shall discuss with the DR during the above periods to agree the timing of submission of reports, other documents and plans for each of the main elements of the Assignment, for inclusion in the draft programme and revised draft programmes.

7.4 The following key activities of the Assignment are to be completed within the following key dates which are listed in Section 5 of the Brief and the following: -

<b>Key Activity</b>	<b>Key dates (from commencement of the Agreement)</b>
Submission of Inception Report	1 month
Submission of Review Report of EIA	3 months
Submission of Working Paper on Cost-effectiveness of DBO/DB contract Procurement and Tendering/Negotiation Strategy for the DBO/DB contract	3 months
Submission of Working Paper on Performance Measurement and Financial Aspects of the DBO/DB contract	3 months
Submission of Working Paper on Administration, Supervision and Monitoring of the DBO/DB contract	3 months

<b>Key Activity</b>	<b>Key dates (from commencement of the Agreement)</b>
Submission of Working Paper on Employer's Monitoring Mechanism and Handing-over Arrangement of the Plant	3 months
Submission of Working Paper on Testing, Commissioning and Acceptance Arrangement of the DBO/DB contract	3 months
Submission of Final Report on the DBO/DB Contract Procurement	4 months
Submission of draft prequalification documents	4 months
Submission of Marking Scheme for tender assessment and negotiation strategies/procedures	5 months
Submission of final prequalification documents	6 months
Submission of draft Conditions of Contract/Additional Conditions of Contract for the DBO/DB contract(s)	7 months
Submission of M&E Maintenance Strategy Study Report	8 months
Prequalification invitation on DBO/DB contract(s)	8 months
Submission on Report on prequalification submission assessment of DBO/DB contract(s)	10 months
Submission of final Conditions of Contract/Additional Conditions of Contract	10 months

<b>Key Activity</b>	<b>Key dates (from commencement of the Agreement)</b>
for the DBO/DB contract(s)	
Submission on draft tender documents and drawings for DBO/DB contract(s)	12 months
Submission of estimate of the cost of the works and deployment of RSS for DBO/DB contract(s)	12 months
Submission of Final Report and Executive Summary for Investigation Review and Design	13 months
Submission of finalized tender documents and drawings for DBO/DB contract(s)	15 months
Gazetting of tender invitation of DBO/DB contract(s)	15 months
Tender Assessment Report(s) of DBO/DB contract(s)	23 months
Tender Review and Appraisal Report(s) of DBO/DB contract(s)	23 months
Technical Assessment Report(s) of DBO/DB contract(s)	23 months
Commencement of DBO/DB contract(s)	24 months
Commencement of Commissioning	59 months
End of Commissioning	62 months
Submission of Commissioning Report of the Plant	63 months

<b>Key Activity</b>	<b>Key dates (from commencement of the Agreement)</b>
Commencement of Initial Operation Period	63 months
End of Initial Operation Period	75 months
Submission of Review Report on the Performance Measurements and Control Mechanism to the O&M of the Plant	76 months
Post-completion Review Report	81 months
Finalisation of the accounts for the DBO/DB contract(s)	99 months

7.5 The Consultants shall endeavour to ensure that the Assignment and the works contract and other contracts are carried out in accordance with the Programmes and shall submit regular reviews as part of the progress reports referred to in Clause 9 of this Brief.

## **8. Progress Reports**

The Consultants shall submit to the DR progress reports at monthly intervals on all aspects of the Services relating progress to the Programme referred to in Clause 7 of this Brief. The reports shall include a list of those parts of the Services the execution of which are behind the Programme together with proposals to expedite progress, so as to complete the work by the due dates. The reports shall also include updated expenditure forecasts in accordance with Clause 9 of this Brief.

## **9. Financial Management**

9.1 At monthly intervals or at such other intervals as the DR may require, the Consultants shall submit a report on the current and the forecast expenditure on the various elements of the Project during the Construction and Commissioning

Phase and the fees due to the Consultants during all Phases, in a form to be agreed by the DR.

9.2 The Consultants shall closely monitor progress and expenditure on any works contract and be alert to the possibility of the approved contract sum being exceeded. They shall advise the DR immediately if there is any likelihood of the approved contract sum being exceeded. To ensure sufficient time to obtain the necessary authorities and make funds available, the Consultants shall give the DR at least four months notice in writing of the need to increase the approved contract sum to meet contractual payments and shall provide the supporting information, except that if the need cannot be foreseen so far ahead, then the Consultants shall give as much notice as is possible in the circumstances. The following information shall be provided:

- (a) full details of the proposed net increase broken down into the following categories:
  - (i) price fluctuation payment under the contract. An arithmetical derivation based on the projected percentage and the estimated final effective value of work done is required;
  - (ii) additional works and savings arising from the bills of quantities/activity schedule items and variation orders/compensation events. Reasons shall be given for increases and decreases in the earlier estimates; and
  - (iii) claims from the contractors. These shall be the Consultants' estimates of the amounts which will be certified for payment.
- (b) an assessment of increase in the consultancy fees and the RSS costs if the contract period is likely to be extended or additional RSS are required; and
- (c) a revised projected monthly cash flow pattern of contract payments, consultancy fees and site costs.

## **10. Standards and Specifications**

The Consultants shall adopt such technical and design standards and

specifications as are in current use by Government bureaux and departments or, if non-existent, European Standards, British Standards, or other appropriate international standards, Codes of Practice and Specifications. Should instances arise for which suitable standards or specifications do not exist or for which the current standards or specifications appear to require modifications or if by the adoption of current standards the Consultants would incur additional expenses not within reasonable contemplation, the Consultants shall submit recommendations on appropriate alternatives to the DR for agreement.

## **11. Checking and Certification of the Design**

The Consultants shall submit to the DR in accordance with Clause 5 of this Brief, five full sets of design calculations including a statement of the standards, procedures and codes of practice adopted. Each set shall be accompanied by a certificate that the design calculations have been checked by another qualified independent designer in the Consultants' employ and that the drawings are in accordance with the calculated designs. The standard form of "Design Certificate" set out in Appendix 4.7 of the Engineering & Associated Consultants Selection Board Handbook shall be used for this purpose wherever applicable.

## **12. Variations and Other Commitments**

- 12.1 The value of a variation to the contract works or other expenditure commitment for the purposes of Clause 24 of the General Conditions of Employment is \$300,000.
- 12.2 All variations to the contract works shall be covered by a variation order in a form to be agreed by the DR, except that no variation order will be required for increase or decrease in quantities arising from remeasurement of the items in the bills of quantities.
- 12.3 The DR shall advise the Consultants of his approval or otherwise under Clause 24 of the General Conditions of Employment within 14 days of submission. The reasons for non-approval, which may include insufficiency of supporting information provided with the submission, will be provided to the Consultants at the same time. If, because of the need for consultation or referral elsewhere, the

DR is unable to give his decision within the period stated then he shall inform the Consultants immediately and advise them when he will give his decision. Provide that, in any case, a different period can be applied by mutual agreement.

- 12.4 Under sub-clause (iii) of Clause 25(A) of S12 of the Special Conditions of Employment, the Consultants shall report all claims to the DR within 14 days of their receipt. The DR shall provide the Employer's views to the Consultants within 60 days of receipt of the Consultants' principles of assessment of a claim.
- 12.5 Under sub-clause (iv) of Clause 25(A) of S12 of the Special Conditions of Employment, the Consultants shall report all delays to the DR within 14 days of the delay being identified. The DR shall provide the Employer's views to the Consultants within 28 days of receipt of the Consultants' assessment of extension of time.

### **13. Resident Site Staff**

- 13.1 The establishment, duties, appointment, deployment, remuneration, conditions of employment and administration of RSS shall be in accordance with the Special Conditions of Employment, Schedule of Fees and Schedule of RSS standards and duties.
- 13.2 The Consultants shall submit to the DR for approval the proposed establishment of RSS prior to the commencement of the recruitment process.
- 13.3 The Consultants shall recruit RSS in an open and fair manner as far as practicable. Normally, a recruitment notice for any RSS vacancy shall be posted in two local newspapers in bilingual languages (English and Chinese), or other channel(s) agreed by the DR, for open invitation of applications. A recruitment interview shall also normally be conducted for the selection of candidates. For RSS services of a short duration or any urgent or other special circumstances which may render open recruitment impracticable or unjustifiable, the Consultants shall provide justifications and obtain prior approval from the DR. All the Consultants' staff involved in the RSS recruitment exercise must declare whether they have any actual, potential or perceived conflict of interest at the onset of the recruitment exercise or as soon as they become aware of a conflict of interest. If such circumstances have arisen during the recruitment exercise, the Consultants shall implement suitable remedial measures. For instance, the



Consultants' staff having a conflict of interest declared should be abstained from further involvement in the recruitment exercise. For avoidance of doubt over an interest in conflict, where there is any potential RSS candidate from the Consultants' own organization, the employment relationship of itself would not normally be considered as an actual, potential or perceived conflict of interest.

- 13.4 Notwithstanding Clause 13.3 and subject to the approval of the DR, the Consultants may deploy their professional graduates in assistant professional rank in RSS for the purposes of training pertinent to the acquisition of the relevant professional qualification, without embarking on the open recruitment procedure.
- 13.5 For all recruitment exercises for RSS, the Consultants shall submit to the DR 5 copies of a CD diskette containing records of the entire recruitment process. The records should include, but not limited to, the recruitment information, qualification and experience required for the vacancy, selection criteria for recruitment interview and/or job offers, criteria for setting a waiting list with a validity period, interview records and assessment leading to the job offers. It should also include records of declarations of conflict of interest by all the Consultants' staff participating in the recruitment exercise, and any mitigation measures implemented in the case of conflict.
- 13.6 For the employment of the Labour Relation Officer (LRO), the Consultants shall, within 14 days of commencement of the Contract, or as the case may be, within 14 days after being notified by the DR of his disapproval of employment of any person as LRO, submit the name and particulars of the person they intend to employ as the LRO to the DR for his approval. The Consultants shall furnish further information within 7 days pertinent to the employment of such person if required by the DR.
- 13.7 The Consultants shall be provided with free uniform for the RSS under the works contracts. The Consultants shall ensure that RSS, except those who are not involved in site work, such as office-based staff, or those engaged in work requiring personal protective equipment which, in the opinion of the Consultants, render the wearing of uniform unsuitable or impractical, wear the uniform in carrying out their duties of administration and site supervision of the works contracts.
- 13.8 The Schedule of RSS Standards and Duties is at **Appendix VII**. The inclusion

or exclusion of any rank in this schedule is not to be taken as a requirement that the rank must be included or must be excluded from the RSS Establishment.

- 13.9 The qualifications, the experience required and the duties of the RSS are shown in **Appendix VII** but it shall remain the responsibility of the Consultants to ensure that the RSS are suitable in all respects and that all the RSS remain courteous in all dealings relating to this Agreement including the construction works and conduct themselves in a manner that will not bring Government in general or WSD in particular into disrepute or cause embarrassment, publicly or non-publicly.
- 13.10 The RSS provision for supervision of geotechnical works should comprise Cat. I and Cat. III supervisors. The minimum qualifications, experience and duties of the Cat. I and Cat. III supervisors are given in **Appendix VII**.
- 13.11 The Consultants shall submit to the DR at monthly intervals reports on the RSS, structure, establishment and dates of events affecting the deployment of the RSS.

#### **14. Director's Representative**

- 14.1 The DR as defined in the General Conditions of Employment shall be the Assistant Director/New Works of Water Supplies Department or such other person as may be authorized by the Director of Water Supplies in writing and notified to the Consultants. The DR may delegate any of the powers and functions vested in him to other officers. If the Consultants are dissatisfied with a decision or instruction of any such officer the matter shall be referred to the DR for a ruling.
- 14.2 During the course of the Agreement, the Consultants shall report direct to the DR or his delegate as appropriate.

#### **15. Control of the Project and Assignment**

- 15.1 Pursuant to Clause 13 of the General Conditions of Employment, the Consultants shall attend or be represented at all meetings convened by the DR to which they may be summoned. The total amount of this kind of meeting time is estimated to be not more than 600 hours, beyond which the extra cost shall be

reimbursed by the Employer on a time charge basis.

- 15.2 The Consultants shall attend, serve or report to meetings as required by the DR in relation to the Assignment. The method of reporting and the day-to-day administration of the Assignment shall be in the form of progress meetings, working group meetings and other ad-hoc meetings.
- 15.3 Working groups chaired by Chief Engineer/Consultants Management of WSD will be formed to oversee specific tasks/issues of the Assignment and facilitate the liaison amongst the Consultants and concerned Government bureaux, departments and agencies during the course of the Assignment. Representatives from concerned Government bureaux, departments and agencies will be invited to participate in the relevant working groups. Meetings of working groups will be arranged on a need basis as directed by the DR. The Consultants shall liaise with the DR in arranging the venue, date and time of such meetings and act as the convener to notify the group members about the details of such meetings. The Consultants shall attend the meetings to present the findings and recommendations on specific tasks/issues of the Assignment during the meetings and follow up the views and comments from the groups. The Consultants shall summarize the findings, proposals/recommendations, comments received, responses, agreements and conclusions as applicable of the meetings for comments by the DR. The total number of the working group meetings is limited to 32. Additional attending, serving or reporting to such meetings beyond this specified number will be paid as additional Services.
- 15.4 The Consultants when necessary shall communicate and correspond directly with other Government departments/parties, utility undertakers and various divisions of WSD to obtain information in connection with the Project, copying such correspondence to the DR.
- 15.5 Progress meetings shall be held at monthly intervals or at such other intervals as required by the DR. The Consultants shall summarize the findings, proposals/recommendations, comments received, responses, agreements and conclusions as applicable of the meetings for comments by the DR.
- 15.6 For avoidance of doubt, liaison meetings or discussions with relevant Government bureaux, departments and agencies, district councils, utility undertakings, public transport companies and their

consultants/contractors/agencies to address or resolve issues in connection with the Assignment shall not be counted towards any numbers of the meetings in Clauses 15.1 of this Brief.

## **16. Information and Facilities Provided by the Employer**

All available information relevant to the Assignment will be provided to the Consultants. Relevant documents, reports, drawings and other background materials are listed in **Appendix I** to this Brief. The Consultants shall indicate for guidance those documents which they currently hold and those of which a copy may be needed, should the Assignment be awarded to them. A copy of each of the documents indicated as needed will be supplied free of charge by the DR on request from the Consultants, except those currently available from the Sales section of the Information Services Department. In the case of plans and drawings, one transparency and two prints of each plan or drawing shall be provided free of charge if requested by the Consultants.

## **17. Consultants' Office and Staffing**

17.1 The Consultants shall maintain for the duration of this Agreement an office in Hong Kong under the control of the Project Director of the Consultants who shall be responsible for the Assignment. He shall have adequate authority and sufficient professional, technical and administrative support staff in all relevant disciplines to ensure progress to the satisfaction of the DR.

17.2 The Consultants shall provide the staff and manpower input in accordance with the Technical Proposal which was submitted with the Consultants' tender for the Assignment. The DR shall have the right to check the time-log record of the Consultants' staff deployed for the Assignment.

17.3 If the DR considers that the performance of the Consultants is not satisfactory due to inadequate staffing and manpower input allocated to the Assignment, the Consultants shall, upon the request of the DR, forthwith submit to the DR the time-log record of the staff deployed for the Assignment for the DR to check against the Technical Proposal.

17.4 The Consultants' failure to adhere to their staffing proposal, in particular the

employment of core personnel of the Consultants and their sub-consultants, thus causing an adverse impact on the performance of the Services, shall be duly reflected in the Employer's performance report on the Consultants.

- 17.5 If the Consultants are unable to maintain any of the core personnel specified in the Technical Proposal, the Consultants shall as soon as possible report this to the DR and propose, for the DR's approval, a revised personnel arrangement which is equivalent to or better than the existing personnel arrangement, in terms of qualifications, experience and competence.

## **18. Specialist and Sub-consultant Services**

- 18.1 The Consultants shall provide all specialist and sub-consultant services required for the satisfactory completion of the Assignment. No additional fees or expenses for the provision of such services rendered locally or overseas shall be payable by the Employer except as otherwise provided for in the Schedule of Fees.
- 18.2 Without derogating from the generality of Clause 38(i) of the General Conditions of Employment, the Consultants shall, upon the award of this Agreement and save as otherwise agreed by the DR, appoint the sub-consultants as proposed in their Technical Proposal for the Assignment. The DR shall have the right to check the sub-consultancy agreements. If the DR considers that the performance of the Consultants is not satisfactory due to inadequate staffing and manpower input allocated to the Assignment, the Consultants shall, upon the request of the DR, forthwith submit to the DR a certified copy of any or all of the sub-consultancy agreements.

## **19. Surveys**

- 19.1 Two prints of topographical mapping at 1:1000, 1:5000 and 1:20000 scales prepared by the Survey and Mapping Office of the LandsD, where available for the area covered by the Project for which the Assignment forms a part, can be obtained free of charge on application to the DR.
- 19.2 The Consultant may apply for the supply of the series of Digital Map products from LandsD for the exclusive use of the Assignment free of charge.

Applications should be made to the DR by completing and submitting the form “Undertakings by Consultant/Contractor on the Use of Digital Map from Land Information Centre” (SMF-0096) together with a list of the Digital Map products required. The Consultant is required to provide the storage media for the supply of the Digital Map product files unless LandsD advises the otherwise.

- 19.3 All the mapping information provided shall be for the exclusive use of the Assignment. In using the Digital Map products supplied by LandsD, the Consultant shall abide by the terms and conditions as stipulated in the undertaking form. Upon completion of the Assignment, the Consultant shall destroy immediately the supplied Digital Map products and confirm the destruction to LandsD by completing and returning the form “Confirmation by Government’s Consultant/Contractor on the Cessation of the Use of Digital Map from Land Information Centre” (SMF-0097) to the DR within two weeks upon completion of the Assignment.
- 19.4 All the lot boundary information provided is for identification of the approximate location of lot only and is subject to amendments by the LandsD without prior notice. The Consultants shall refer to the DSO of the LandsD for the most up-to-date lot boundary information.
- 19.5 The Consultants shall be responsible for verifying the accuracy and, where necessary, updating all survey and mapping information provided. Unless otherwise provided for in the Assignment, all field survey work required for the proper execution of the Assignment shall be the duty of the Consultants (list any special requirements) A copy of field notes, field data and resultant plans arising from these surveys shall be handed over to the DR in hardcopy (paper, transparency and/ or microfilms) and MicroStation (DGN) file format upon completion of the Assignment. The accuracy as well as presentation of these surveys should be of a standard agreed by the DR.
- 19.6 The Consultant shall be responsible for carrying out as-built surveys (including records of positions and levels on all underground pipelines, etc.) and submission of a set of as-built survey plans in both hardcopy and soft copy to the DR. The as-built drawings shall be submitted upon phase completion of the Plant. The Consultant shall be responsible for submitting survey information which was presented in an acceptable professional standard and in an appropriate scale specified by the DR. A copy of field notes, field data and resultant plans arising from these surveys shall be handed over to the DR in

hardcopy (paper, transparency and/or microfilms) and digital format upon completion. The Consultant is responsible to rectify and re-submit the corrected set of as-built survey plans if errors were found in any survey audits by the DR. After the DR has accepted the survey results, the Consultants shall forward a set of the as-built survey plans in hardcopy and softcopy to the Land Information Centre of the Survey and Mapping Office of the LandsD.

- 19.7 The Consultant shall be responsible for submitting drawing computer files which shall be delivered on compact disc in MicroStation (DGN) file format unless otherwise specified by the DR. The survey drawings shall be in compliance with the CAD Standard for Works Project (CSWP) version 1.03.00 (or later versions as agreed by the DR) as posted on the Development Bureau's web-site and the Drafting Specification for Engineering Survey Rev 2.0 (or later versions as agreed by the DR) as posted on CEDD's web-site.
- 19.8 To assure the provision of the required road inventory records for the asset management of the HyD, as-built surveys of those completed road(s) to be handed over to HyD for maintenance shall follow the engineering survey and geographical information system (GIS) requirements of as-built surveys of HyD.
- 19.9 The Consultants shall provide sets of as-built inventory records of completed road works in ArcGIS or other GIS format fully compatible with the Road Data Maintenance System of HyD and in accordance with the GIS Specifications for Engineering Surveys of HyD Rev. 1.0 (or later version as agreed between the DR and the Consultant/Contractor from time to time) as posted on HyD's web-site. A copy of the submission should also be provided to the Land Information Centre of the Survey and Mapping Office of the LandsD.
- 19.10 The Consultants shall be responsible for all engineering surveys required in connection with the Assignment. The division of responsibility for other surveying between the Consultants, the Lands Administration Office and Survey and Mapping Office as well as the relevant sub-officers at district level of the LandsD in connection with the Assignment shall be as follows:

	<b>Task</b>	<b>Responsibility of</b>
(a)	(i) Provision of basic horizontal and vertical survey control	Survey and Mapping Office (Consultants to download from <a href="http://www.geodetic.gov.hk">www.geodetic.gov.hk</a> )
	(ii) Checking of given control point values and establishment of survey control network(s) based on survey control given vide (i)	Consultants
(b)	(i) Provision of topographic maps (at 1:1,000 scale or other standard scales relevant to the Assignment)	Survey and Mapping Office (excluding those specified as to be provided by the Consultants in the Agreement)
	(ii) Provision of available Digital Map products relevant to the Assignment	Land Information Centre, Survey and Mapping Office
	(iii) Updating and verification of accuracy of information supplied vide (i) and (ii) as necessary in relation to the Assignment	Consultants
	(iv) Carrying out detailed surveys for site investigation and for preparation of design and contract documents as necessary in relation to the Assignment	Consultants
(c)	Supply of existing cadastral plans and records and co-ordinate data	DSO



	<b>Task</b>	<b>Responsibility of</b>
(d)	Computation of detailed dimensioned layouts of roads, drainage and Waterworks reserves, platforms, etc.	Consultants (checked and accepted by DSO)
(e)	Determination of site/lot boundaries, calculation of areas, etc. in connection with the agreed dimensioned layouts	DSO (in liaison with DLO)
(f)	(i) Processing of resumption and surrender for privately owned land in Development Area	DLO (in liaison with DSO and Consultants)
	(ii) Resumption and surrender plans and demarcation of lands to be resumed	DSO (in liaison with DLO and Consultants)
(g)	(i) Setting out of roads, drainage works, formation areas, etc.	Contractors (checked and accepted by Consultants, usually by RSS under their supervision)
	(ii) Initial site survey, and interim and final payment surveys.	Consultants, usually by RSS under their supervision (joint survey with contractors or agreed survey with contractors)
(h)	Preparation of proposal plans for Government land allocations and other land grants relevant to the Assignment	DSO (in liaison with DLO)

	<b>Task</b>	<b>Responsibility of</b>
(i)	Preparation of dimensioned plans and setting out of boundaries of sites and lots for Government land allocation and other land grants relevant to the Assignment	DSO
(j)	As-built surveys on all completed phases of the Works (including records of positions and levels on all underground pipelines, etc.)	Consultants, usually by resident site staff under their supervision.
(k)	Submission of a set of as-built survey plans in hardcopy (paper, transparency and/or microfilms) and soft copy comply with the specifications to the Department submitted upon phase completion of the Works.	Consultants, usually by resident site staff under their supervision.
(l)	Supply a set of as-built survey plans in both hardcopy and softcopy to the Land Information Centre of the Survey and Mapping Office of the LandsD	Consultants, usually by resident site staff under their supervision.
(m)	For as-built surveys of those completed road works to be handed over to HyD for maintenance, submission of a set of road inventory data in GIS format in compliance with the specifications to HyD. A copy of the submission should also be provided to the Land Information Centre of the Survey and Mapping Office of LandsD.	Consultants, usually by resident site staff under their supervision.

## **20. Insurance**

The amount of insurance cover to be maintained in accordance with sub-clause 47(A) of S14 of the Special Conditions of Employment shall be twice the Lump Sum value of the fee, subject to a maximum of HONG KONG Dollars 150 million and a minimum of HONG KONG Dollars 10 million.