



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

Agreement No. CE 21/2012 (WS)
Desalination Plant at Tseung Kwan O
Feasibility Study

BRIEF
(Draft dated 25 June 2012)

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BRIEF

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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 Feasibility Assignment (1997 Edition) [hereinafter referred to as the General Conditions of Employment], the Special Conditions of Employment, Schedule of Fees, Appendices to this Agreement and any other instructions issued by the Director's Representative (DR).

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 following consultancies studies have been conducted 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 under local conditions to produce potable water complying with the World Health Organisation (WHO) standards.

- 2.3 The Assignment will investigate the feasibility and cost-effectiveness of constructing a desalination plant in Tseung Kwan O (TKO) Area 137, together with the associated fresh water transfer facilities to the existing TKO primary fresh water service reservoir (TKOPFWSR).
- 2.4 Subject to the review under the Assignment, the Project comprises the following:-
- (a) construction of a proposed desalination plant in TKO Area 137, with a water production capacity of 50 million cubic metres (mcm) per annum (expandable to 90 mcm per annum);
 - (b) construction of a proposed dedicated trunk feed system for the transfer of fresh water output from the desalination plant to the TKOPFWSR, consisting of a new pumping station, a new fresh water contact tank, about 9 km of 1200 mm diameter fresh water mains along Wan Po Road, Po Hong Road and Tsui Lam Road, and the associated pipeworks and ancillary facilities including fittings/valves, leakage, flow and pressure monitoring facilities, etc; and
 - (c) all the associated civil, structural, geotechnical, electrical and mechanical works, including landscaping, permanent and temporary accesses as may be necessary for the completion of the works elements as listed in sub-clauses (a) and (b) above.
- 2.5 The general layout of the proposed works is shown on Sketch No. SK 62011/500 in **Appendix I**.
- 2.6 The general background of the Project is as described in Planning Report No. 3/2011 issued by the Development (2) Division of Water Supplies Department (WSD) in January 2012.
- 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 m³ 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 should be prepared and submitted to Director of Environmental Protection (DEP) for obtaining EIA Study Brief for the Project under the Assignment. In applying for the required EP, an EIA report for the Project should be prepared for the approval of the DEP under the Assignment.
- 2.9 In the event that chlorine is recommended to be used in the disinfection process, the proposed desalination plant will be classified as a Potentially Hazardous Installation (PHI) if it has a chlorine store exceeding the inventory threshold of 10 tonnes or has any storage in one tonne drums in accordance with Section 4.5, Chapter 12.4 of the Hong Kong Planning Standards and Guidelines (HKPSG). If 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 should be carried out. Submission of the risk and hazard assessment to the Coordinating Committee on Land-use Planning and Control relating to Potentially Hazardous Installation (CCPHI) for consideration and endorsement will be required. EPD shall be consulted in this aspect, in particular whether an off-site chlorine transport hazard assessment is required to be included as part of the HA study under the Assignment.
- 2.10 During the course of the proposed construction works including the testing and commissioning stages, the continuous operation and maintenance of TKOPFWSR need to be maintained.

3. Objectives of the Assignment

- 3.1 The objectives of the Assignment are as follows:-
- (a) To review the findings of all previous consultancies/studies/reports in respect of proposed desalination facilities in Hong Kong by the Government and/or other parties against the latest desalination technologies;
 - (b) To evaluate and recommend the scope of the Project, the extent and details of the works under the Project, and to establish the feasibility of the Project;

- (c) The desalination plant water production capacities of initial 50 mcm/year expandable ultimately to 90 mcm/year are the initial thinking at the time of the preparation of Planning Report No. 3/2011. The Consultants shall study the cost effectiveness of various initial and ultimate water production capacities taking into account the availability of the local yield and Dongjiang raw water supply at the time and recommend the most cost effective option.
- (d) To identify all technical and financial requirements/constraints/impacts of the Project;
- (e) To carry out all necessary studies, investigations, assessments, surveys and submissions to meet statutory and/or other government's requirements (e.g. EIA, TIA, etc);
- (f) To carry out preliminary design of the desalination plant and the associated fresh water transfer facilities;
- (g) To review the justifications and determine the cost effectiveness of the construction of the Project;
- (h) To assess and study the detailed mechanical and electrical (M&E) operation and maintenance requirements of all M&E plants and equipment and to recommend a maintenance strategy for the M&E plants and equipment;
- (i) To understand of the concerns of the public and stakeholders and foster their support and understanding of the Project;
- (j) To review and determine the most appropriate implementation strategy and programme to proceed to the construction of the Project; and
- (k) To prepare the Project Definition Statement and a Technical Feasibility Statement to enable creation of capital works projects under the Public Works Programme for the Project.

4. Description of the Assignment

4.1 This Assignment covers the planning and investigation for the proposed

desalination plant with a planned capacity of 50 mcm per annum and with provisions for future expansion to 90 mcm per annum, and the associated fresh water transfer facilities. It consists of the following:-

- (a) A review of the findings of all previous consultancies/studies/reports in respect of proposed desalination facilities in Hong Kong against the latest desalination technologies.
- (b) A review of the suitability of the site reserved for the proposed desalination plant.
- (c) A review of the suitability of the alignments proposed for the water mains.
- (d) Identification of alternative sites and alignments, if necessary.
- (e) Defining the extent and requirements of site investigation including both land and marine ground investigation, geophysical surveys for seabed, seawater sampling/monitoring for seawater quality characterization, seawater quality envelope, etc. and laboratory testing necessary for the design and completion of the proposed works and supervising site investigation works and laboratory testing. Supervision shall be considered as work carried out under Clause 5 of the Schedule of Fees.
- (f) A 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.
- (g) An assessment of the feasibility of an explosives off-loading pier co-existing with the desalination plant, and the mitigation measures required, if necessary, to enable coexistence, including the estimated cost and implications on the project programme.
- (h) Traffic Impact Assessment.
- (i) Marine Traffic Impact Assessment.
- (j) Drainage Impact Assessment.
- (k) Hazard Assessment.

- (l) Landfill Gas Hazard Assessment, taking into account of the future South-east New Territories (SENT) Landfill Extension as an existing facility.
- (m) Ecological Impact Assessment.
- (n) Natural Terrain Landslide Hazards Assessment.
- (o) Geotechnical Assessment.
- (p) Value Management Studies.
- (q) An assessment of the landscape and visual impact of the proposed works and proposed ways to minimise the same.
- (r) Preparing a construction and demolition (C&D) material management plan, in accordance with the ETWB Technical Circular (Works) Nos. 33/2002 and 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.
- (s) Identifying the need for and carrying out as necessary Heritage Impact Assessment and Tree Survey.
- (t) Preparing a project profile as set out in the Technical Memorandum on Environmental Impact Assessment Process (under the EIA Ordinance S16) and assist the Employer to apply to the DEP in accordance with the EIA Ordinance for an EIA Study Brief.
- (u) Conducting an EIA study and preparation of an EIA report in accordance with the EIA Study Brief issued by the DEP and the EIA Ordinance.
- (v) Advising and assisting the Employer in obtaining approval for the EIA report in accordance with the EIA Ordinance, including public consultation and presentation to the Advisory Council on the Environment if required.
- (w) Advising and assisting the Employer in obtaining environmental permits

for the Employer for constructing and operating the Project in accordance with the EIA Ordinance.

- (x) Carrying out systematic risk management.
- (y) Identification of the land requirements for implementing the works.
- (z) Public engagement/consultation.
- (aa) Liaison with relevant Government departments.
- (ab) Preparation and submission for the revision of zoning for the site reserved for the proposed desalination plant under s.12(A) of the Town Planning Ordinance.
- (ac) Gazettal under Foreshore and Sea-bed (Reclamations) Ordinance and necessary Sediment Quality Assessment for marine works.
- (ad) Liaison with CLP on whether the present electricity provided by grid-supplied power is sufficient to meet the electricity demand for the full operation of the desalination plant and its future extension and whether it is feasible and suitable to use other forms of renewable energy as an alternative. The Consultants shall also study the strategy of negotiating for a more favourable electricity tariff from CLP.
- (ae) A study on 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 desalination plant. Should a grid power (from a coal fired electricity generation plant) be recommended to be adopted to meet the electricity demand of the desalination 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.
- (af) An assessment and study on the detailed M&E operation and maintenance requirements of all M&E plants and equipment and to recommend a maintenance strategy for the M&E plants and equipment.
- (ag) A study on feasible options for the disposal of brine concentrate including,

but not limited to, direct discharge to sea, recovery of useful salt before discharge and use as flushing water. A copy of WSD's water quality objectives of sea water for flushing supply is attached at **Appendix IV** for reference.

- (ah) A review on 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 desalination plant.
- (ai) A study on the cost effectiveness of various initial and ultimate water production capacities of the desalination plant taking into account the availability of the local yield and Dongjiang raw water supply at the time and recommendation of the most cost effective option.
- (aj) A review and determination of the need to conduct a demonstration desalination plant for collecting technical data, financial data and public feedbacks on the real operation of the plant.
- (ak) Preliminary designs for the proposed works taking into account all relevant factors including technical, programme, financial, cost-effectiveness, environmental, traffic, interfacing, operational and maintenance issues.
- (al) Contract strategy, programme and cost estimates for the proposed works, including the demonstration desalination plant if necessary.
- (am) A review of the most suitable timing for fund application to secure funding for a design and construction consultancy for the implementation of the desalination plant including the cost for the construction and residential site staff.
- (an) Assisting the Employer to prepare a Project Definition Statement and a Technical Feasibility Statement in the fund application process for the design and construction of the implementation of the desalination plant.

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 for each version	Submission Date (within stated number of weeks/ months after commencement of the Agreement)
1.	Certificate of insurance policy	SCE Clause S5	1	Prior to the commencement of the Agreement
2.	Programme of implementation of the Assignment	8	10	2 weeks
3.	Inception Report	6.2	30	4 weeks
4.	Public Engagement Plan	6.3	20	2 months
5.	Public Engagement Report	6.3	20	12 months
6.	Information papers in both English and Chinese as requested by the DR for consultation with District Councils, or other public bodies and community groups	6.3	Up to 120 copies for each consultation	4 weeks prior to the consultation
7.	Presentation materials in both English and Chinese including colour drawings mounted on boards, photographs, animation and slides in connection with the Assignment, programme and progress for consultation with District Councils or other public bodies and community groups	6.3	2 hard copies and 1 digital copy for each presentation	2 weeks prior to the presentation
8.	Draft publicity, consultation, presentation, exhibition and participation materials such as briefing notes, consultation papers, newsletters, drawings (engineering and architectural), photographs, photomontages, exhibition panels, leaflets	6.3	20 each time	At least 6 weeks prior to the public engagement activities

No.	Deliverable	Refer to the following Clauses(s) of this Brief	Max. number of copies for each version	Submission Date (within stated number of weeks/ months after commencement of the Agreement)
	posters, banners questionnaires, etc. in both Chinese and English versions for comments/ agreements by the DR and relevant Government bureaux/departments			
9.	Records and reports of all public engagement activities	6.3	20 each time	Within 7 working days after completion of the activities
10.	Progress Reports	9	10	3 workings days before progress meeting or within the first 5 working days of each month for which no progress meeting will be held
11.	Financial Reports	10	10	To be submitted together with the Progress Reports
12.	Site Investigation Desk Study Report	6.6	10	2 months
13.	Site Investigation Report	6.6	10	1 month after the completion of the site investigation
14.	Sediment Quality Report	6.7	10	To be submitted together with the Site Investigation Report
15.	Geotechnical Assessment Report	6.8	10	13 months
16.	Natural Terrain Landslide Hazards Assessment Report	6.9	10	13 months
17.	Site Review Report	6.4	10	6 months
18.	Traffic Impact Assessment Report	6.13	10	9 months
19.	Marine Traffic Impact Assessment Report	6.14	10	9 months
20.	Drainage Impact Assessment Report	6.15	10	9 months
21.	Heritage Impact Assessment Report	6.16	10	9 months
22.	Tree Survey Report	6.17	10	9 months
23.	EIA Project Profile	EIA Ordinance S(16)	10	2 months
24.	EIA Inception Report	6.10(e)	10	6 months (draft) 8 months (final)

No.	Deliverable	Refer to the following Clauses(s) of this Brief	Max. number of copies for each version	Submission Date (within stated number of weeks/ months after commencement of the Agreement)
25.	Working papers in connection with the EIA for the Project to DEP	6.10(m)	50	Upon completion of the respective working papers
26.	EIA Report with Executive Summary with Chinese translation version	6.10	30	11 months (draft) 13 months (final)
27.	Deliverables of EIA Report with Executive Summary (each bilingual in both English and Chinese) to the DEP in accordance with the EIA Study Brief issued by DEP	6.10	As required in accordance with the EIA Study Brief	Upon completion of the EIA Report
28.	Environmental Monitoring and Audit Manual (EM&A)	6.10(p)	30	11 months (draft) 13 months (final)
29.	EIA report approved by the DEP	-	50	Within 1 month upon approval by the DEP
30.	Working paper on seawater quality characterization and seawater quality envelope for the design of the desalination plant	6.21	10	12 months
31.	Working paper on the option evaluation for seawater intake structure	6.22 (v)	10	8 months
32.	Working paper on the option evaluation for seawater outfall structure	6.22 (v)	10	8 months
33.	Working paper on the review of initial and ultimate capacities of the desalination plant	4.1(ai) 6.22(ae)	10	12 months
34.	Options Selection Reports	6.22 (u)	10	8 months
35.	Working paper on the feasibility of coexistence of the explosive off-loading facilities of CEDD	6.12 (c)	10	9 months
36.	Hazard Assessment Report	6.11	10	12 months
37.	Hydraulic Assessment and Surge Analysis Report	6.18	10	12 months
38.	Energy Efficiency Report	6.19	10	13 months

No.	Deliverable	Refer to the following Clauses(s) of this Brief	Max. number of copies for each version	Submission Date (within stated number of weeks/ months after commencement of the Agreement)
39.	Working paper on the operation and maintenance strategy of all M&E plants and equipment	6.20	10	13 months
40.	Process and Preliminary Design	6.22	10	15 months
41.	Working paper on demonstration plant	6.22(ag)	10	14 months
42.	C&D Material Management Plan	6.25	10	9 months
43.	Value Management Studies	6.30	10	1 month after the conduction of Value Management Workshop
44.	Risk Treatment Plans, Risk Management Plan and Risk Registers	6.28	10	4 months (first set); Updated submission at bi-monthly intervals or on request by the DR
45.	Sustainability Assessment Report	6.29	10	9 months
46.	Report on effect of climate change on project implementation strategy and programme	6.22(ae) 6.22(af)	10	13 months
47.	Report on sensitivity analyses on the capital and recurrent costs of the desalination plant	6.23(h)	10	13 months
48.	Report on Project Implementation Strategy and Programme	6.23	10	14 months
49.	Technical papers and working papers in connection with the Assignment	-	10	Upon completion of the respective technical papers and working papers
50.	Technology transfer workshop for Government staff (maximum of 100 staff members) and working paper	6.32	100	The working paper to be made available 1 month prior to the workshop which will be provided towards the end of the Assignment
51.	Records of meetings and correspondence with other	-	1	Within 5 working days from the date of meeting/ correspondence
52.	Project Financial Report	6.23	10	14 months

No.	Deliverable	Refer to the following Clauses(s) of this Brief	Max. number of copies for each version	Submission Date (within stated number of weeks/ months after commencement of the Agreement)
53.	Project Definition Statement	6.33	10	14 months
54.	Technical Feasibility Statement	6.33	10	16 months
55.	Draft Report	6.34	20	As specified in Clause 8.4 of this Brief
56.	Draft Final Report	6.34	20	As specified in Clause 8.4 of this Brief
57.	Final Report	6.34	20	As specified in Clause 8.4 of this Brief
58.	Executive Summary (in both English and Chinese)	6.34	20	As specified in Clause 8.4 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 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.
- 5.8 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.
- 5.9 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:

Type of File	Format for Native File	Format for Image File
Papers, reports and any other text documents	Microsoft Rich Text Format (RTF),	Adobe Acrobat portable document (PDF)

Type of File	Format for Native File	Format for Image File
	Microsoft Word 2003 document (DOC)	<i>(in non-raster format to allow for text extraction)</i>
Bills of quantities, schedule of rates and any other schedules	Microsoft Excel 2003 format (XLS), Microsoft Rich Text Format (RTF), Microsoft Word 2003 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	Primavera SureTrak 3.0	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 this 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.

The CD-ROM shall include a digital copy of this Brief to be provided by the DR and an index file in Hyper Text Markup Language (HTML) (version 4.0 or later) or equivalent format containing the salient points of the Assignment and the following information about the digital copies provided:-

- (a) Title of the Deliverable;

- (b) Version number and date of issue of the Deliverables;
- (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

- (a) Comply with all instructions from the DR and with all relevant Government handbooks, manuals, circulars, instructions, codes of practice, technical memoranda, 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.
- (b) Draw to the attention of the DR the need to consider any implications and consequences arising out of or in relation to the Assignment and any other alternative proposals.
- (c) 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.
- (d) Carry out all necessary water samplings and testings, surveys, levels and soundings and make such investigations and inquiries as are necessary for the satisfactory completion of the Assignment.
- (e) Attend progress meetings at monthly intervals or at such other intervals as required by the DR.
- (f) Liaise with and seek agreement of the Geotechnical Engineering Office and any concerned parties on any matters of geotechnical concern arising from the proposed works.
- (g) Prepare the various reports and other documents as stated in Clause 5 of this Brief.

- (h) Prepare and submit a programme covering the work of the Assignment and such revised programmes as may be necessary in accordance with Clause 8 of this Brief.
- (i) Take cognizance of 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.
- (j) Consult the authorities and parties listed below, as required in addition to any other authority necessary all in accordance with Clause 19 of the General Conditions of Employment, and obtain their approval, where necessary, to the proposed works, the working methods and the programme for the works.

- Agriculture, Fisheries and Conservation Department (AFCD)
- Antiquities and Monuments Office of Leisure and Cultural Services Department (AMO)
- Architectural Services Department (ArchSD)
- Buildings Department (BD)
- Bus Companies
- China Light and Power Company Limited (CLP)
- Civil Engineering and Development Department (CEDD)
- Co-ordinating Committee on Land-use Planning and Control relating to Potentially Hazardous Installations (CCPHI)
- District Lands Office of Lands Department (DLO)
- District Office of Home Affairs Department (DO)
- District Survey Office of Lands Department (DSO)
- Drainage Services Department (DSD)
- Environmental Protection Department (EPD)
- Fire Services Department (FSD)
- Food and Environmental Hygiene Department (FEHD)
- Geotechnical Engineering Office of Civil Engineering and Development Department (GEO)

- Government Property Agency (GPA)
- Government Secretariat: Development Bureau (DEVB)
- Government Secretariat: Environment Bureau (ENB)
- Government Secretariat: Transport and Housing Bureau (THB)
- Highways Department (HyD)
- Hong Kong Police Force (HKPF)
- Housing Department (HD)
- Lands Department (LandsD)
- Leisure and Cultural Services Department (LCSD)
- Planning Department (PlanD)
- Marine Department (MD)
- Marine Fill Committee (MFC)
- Mass Transit Railway Corporation Ltd (MTRCL)
- Public Fill Committee (PFC)
- Railway Development Office (RDO) of HyD
- Transport Department (TD)
- Urban Renewal Authority (URA)
- Water Supplies Department (WSD) including New Territories East Region, New Territories West Region, Kowloon Region, Hong Kong & Islands Region, Customer Services Division, Operations and Slope Safety Unit, Development Divisions, Water Science Division, Design Division, Construction Division, Project Management Division, Consultants Management Division, Mechanical & Electrical/Projects Division and Mechanical & Electrical/Maintenance Division.
- All other relevant utility companies, Government departments and authorities.
- Other consultants and contractors in connection with the Project.

(k) Identify all facilities, installations and existing rights that may be affected by the Assignment.

(l) Identify and take cognizance of the existing and proposed studies and projects and all interfacing issues which may affect or be affected by the

Project and identify and resolve any potential or actual conflicts that may arise when they carry out the Assignment. In particular, the Consultants shall take into account the following projects:-

- (i) Temporary explosives magazines of MTR Corporation Limited (MTRCL) for its Shatin to Central Link (SCL) and Kwun Tong Line Extension (KTE) projects at the TKO Area 137 (Sketch No. SK 62011/604 in **Appendix I**);
 - (ii) The Mines Division of CEDD's barging pier at TKO Area 137 for off-loading explosives (Sketch No. SK 62011/604 in **Appendix I**); and
 - (iii) Cross Bay Link, Construction and Demolition Material Handling Facility (C&DMHF), SENT Landfill Extensions in the vicinity of the site.
- (m) Provide technical support for the DR to attend meetings with District Councils, rural committees, or other public bodies and community groups in public consultations. This assistance is to include the preparation of information papers (including the required information on greening works in accordance with ETWB TCW No. 34/2003) in both English and Chinese and presentation materials such as colour drawings, photographs and slides in both hard copies and digital format, and to attend the meetings.
- (n) Provide Chinese translation of the Reports, Information Papers and Executive Summary referred to in Clauses 5.1 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.
- (o) The Consultants shall perform Systematic Risk Management in accordance with ETWB Technical Circular (Works) No. 6/2005 and ETWB Risk Management User Manual to identify risks and uncertainties associated with the Project 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.

- (p) 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 District Lands Offices, the contractors and the public.
- (q) The Consultants shall 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.
- (r) The Consultants shall 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.
- (s) Notwithstanding Clause (r), 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: -
 - (i) 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

- (ii) 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.
- (t) Clause (s) is without prejudice to Clause 22 of the General Conditions of Employment.
- (u) The Consultants shall 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.
- (v) 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 (u) 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.
- (w) Clauses (q) to (v) 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 Ordinance for execution of the Works.
- (x) The Consultants shall 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.

- (y) Liaise with all relevant parties who have an interest in or are affected by the Project, in carrying out this Assignment.
- (z) Review the programme from time to time and explore means to fast-track the Assignment with a view to completing the proposed works as early as practicable, within the key dates specified in Clause 8.3 of the Brief.

6.2 Inception Report

- (a) The Consultants shall prepare the Inception Report which shall comprehensively address the following:
 - (i) understanding and appreciation of the objectives and requirements of the Assignment;
 - (ii) study approaches, methodologies and interfaces;
 - (iii) identification of the key issues and stakeholders;
 - (iv) programme of the Assignment, highlighting the schedule of tasks, dates of submission of deliverables, meetings of Value Management Workshop, interfaces with the public engagement exercise, etc.;
 - (v) forecast expenditure of the Assignment;
 - (vi) 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;
 - (vii) site supervision plan for the site investigation works including water samplings and testings;
 - (viii) deliverable distribution matrix, to ensure that the deliverables will be effectively disseminated and to avoid distribution of materials to unconcerned parties; and
 - (ix) organization and staffing of the project team, including

specialists/sub-consultants as well as respective responsibilities and curricula vitae of each key personnel.

6.3 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 information papers and presentation materials with Chinese translation 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 forty over which the Employer shall pay the extra cost on a time charge basis.
- (d) The Consultants shall prepare the 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;
 - (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) The Consultants shall 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.

6.4 Review of Proposed Site for Desalination Plant and Alignment of the Water Mains

(a) Review the proposed site for desalination plant and the proposed alignment for the water mains; and identify any alternatives and make recommendation that will:

(i) result in a more cost effective solution;

- (ii) reduce the impact on the environment of the surroundings;
 - (iii) reduce the disruption to marine, vehicular and pedestrian traffic;
 - (iv) reduce the inconvenience to the public;
 - (v) phase in more readily with works by others including WSD, utility undertakings and other Government departments;
 - (vi) reduce the risk to or the effect on adjacent slopes; and
 - (vii) facilitate future operation and maintenance.
-
- (b) Examine all facilities, installations and existing rights that may be affected by the proposed works.
 - (c) 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.
 - (d) 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.
 - (e) 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.
 - (f) Liaise and assist in negotiations with relevant bodies on matters of land resumption, clearance and reprovisioning works.
 - (g) Identify those parts of the proposed alignments for the water mains where the use of a construction technique other than open cut must be used and describe the recommended technique.
 - (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 desalination plant and the washout points on the proposed alignments for the water mains.

- (i) Identify locations on the proposed alignments for the water mains suitable for the fire hydrants required by the Fire Services Department.
- (j) Identify locations where special geotechnical considerations are necessary to meet requirements of GEO and describe the considerations to be made.
- (k) Identify those parts of the proposed alignments for the water mains that are located in carriageways and footways that are subject to road opening restriction.
- (l) Identify the existing utilities and structures that require diversion or modification to suit the proposed alignments for the water mains and establish the procedures, practicalities and programme for doing so.
- (m) Identify locations on the proposed alignments for the water mains for sectional valves, branch tees and connection of new mains to existing mains to suit the operational needs of the New Territories East Region of WSD.

6.5 Water Treatment Process

- (a) Make reference to and take into account the requirements of the treated water quality objectives in **Appendix II** of this Brief, or any updated requirements 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, post-treatment, backwash systems, etc.) for the desalination plant to a reliable output of 50 mcm per annum (expandable to 90 mcm per annum).
- (b) Identify, review, evaluate and conduct detailed comparisons of all available options of water treatment process (including pre-treatment, post-treatment, backwash systems, etc.), taking into consideration the requirements of this Brief, and the findings and conclusions revealed in the studies and investigations of this Assignment. At least three different options have to be prepared and evaluated, taking due account of the constraints that may be imposed. The Consultants shall short-list at least

three different options to be agreed by the DR for detailed assessment and evaluation and to 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.

- (c) Review and propose additional measures if found necessary to be implemented in the design of the seawater desalination plant so that the boron concentration of the fresh water output from the desalination is in compliance with the latest standards as promulgated by the WHO. 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.
- (d) Incorporate the findings and recommendations of the above review, studies and investigations into the implementation scheme.

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

- (a) Define the requirement of the site investigation and laboratory testing required to determine the location of existing services and other underground structures and to prove the suitability of the proposed site for the desalination plant, and the proposed alignments for the water mains by the use of drill holes, trial pits, ground probing radar or other techniques. Site investigation, including the ground investigation works shall also be planned for the natural terrain hazard study. 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 surrounding 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) Site investigation and associated laboratory testing may be carried out under the term contracts administrated respectively by the Geotechnical Projects (GP) and Standards & Testing (S&T) Divisions of the GEO in accordance with GEO Ground Investigation Note No. 1/2011 (or its latest version). The Consultants shall liaise with CGE/GP and 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 reports 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 Excavation Permit Management System (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.
- (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.

6.7 Sediment Quality Assessment

- (a) 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.

6.8 Geotechnical Assessment

- (a) Liaise with and seek agreement of GEO and any other concerned parties on any matters of geotechnical concern arising from the proposed works.
- (b) 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.
- (c) All geotechnical reports/deliverables/tasks shall be undertaken by a Registered Professional Engineer (Geotechnical) (RPE(G)).

6.9 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 the following: -

- (a) Make reference to and take into account the proposed study area as shown in Sketch No. SK 90191/3 in **Appendix I** and propose appropriate 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. 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.

6.10 Environmental Impact Assessment

- (a) The Project is classified as a Designated Project under item E.2 of Part I, Schedule 2 of the EIA Ordinance (Cap. 499). Under the EIA Ordinance, an EP from the Environmental Protection Department (EPD) is required for the implementation of the Project. The Consultants shall prepare a project profile as set out in the Technical Memorandum on EIA Process (under the EIA Ordinance S16) and advise and assist the Employer to apply to the Director of Environmental Protection (DEP) in accordance with the EIA Ordinance for an environmental impact assessment study brief.
- (b) The Consultants shall conduct an EIA for the Project and prepare an EIA report in accordance with the EIA Study Brief issued by the DEP and the EIA Ordinance, and advise and assist the Employer in obtaining approval from the DEP for the EIA report for the Project in accordance with the EIA Ordinance, including public consultation and presentation to the

Advisory Council on the Environment.

- (c) The Consultants shall advise and assist the Employer in obtaining environmental permits for the Employer for constructing and operating Project in accordance with the EIA Ordinance.
- (d) The Assignment shall be conducted and reports shall be prepared with maximum flexibility to respond to change in design requirements and layout of the proposed works during the course of the Assignment. The Consultants are deemed to have taken into account these conditions in submitting the Lump Sum fee proposal.
- (e) The Consultants shall prepare and submit EIA Inception Report to the DR for his approval which shall include the following:
 - (i) the understanding and appreciation of the objectives of the EIA for the Project;
 - (ii) the approach and methodology for the various parts of the EIA for the Project including the identification of the Area of Influence;
 - (iii) a works programme, with major work tasks and key decision points identified and briefly described including a schedule detailing the submission of reports, working papers and technical notes; and
 - (iv) organisation and staffing of the study team and the curricula vitae of the key study team members.
- (f) The Consultants shall on behalf of the Employer apply to the DEP for approval of the EIA report for the Project, and at the same time lodge the application for obtaining the EP for the Project. Upon advised by the DEP, the Consultants shall arrange for the advertisement and public inspection of the EIA report for the Project. When required and as a part of the consultation exercise, the Consultants shall also present the EIA report for the Project to the EIA Sub-committee of Advisory Council on the Environment, Environmental Assessment Panel of the LegCo, District Council, Rural Committee and any other public consultation meetings to brief his/her case against the relevant environmental impacts generated.

- (g) The Consultants shall attend, upon requested by the DR, Environmental Study Management Group meetings convened by the DEP to provide a forum for discussion on the requirements arising from the EIA for the Project, the methodology or the initial findings of the EIA.
- (h) The Consultants shall prepare and supply all necessary drawings, documents and presentations, and attend, serve and report to the meetings.
- (i) The Consultants shall liaise, communicate and correspond directly with the following authorities on behalf of the Employer to obtain information or comments necessary for the completion of the EIA for the Project:
 - (i) EPD on EIA studies, recommended environmental mitigation measures, implementation of environmental protection and pollution control, mitigation measures and monitoring programme, and the application of an EP for the Project;
 - (ii) Antiquities and Monuments Office of Leisure and Cultural Services Department on the historical, archaeological and cultural heritage impact assessment study;
 - (iii) EPD, Food and Environmental Hygiene Department and Leisure and Cultural Services Department on the requirements of pollution control measures to limit water contamination and air, dust, odour, noise and site run-off nuisance during construction of the works under the Assignment;
 - (iv) Leisure and Cultural Services Department on amenity, civic, community, recreational facilities, if necessary;
 - (v) Secretariat, Public Fill Committee on allocation of designated outlet for disposal on inert construction and demolition material;
 - (vi) Fire Services Department on the fire protection and dangerous goods store requirements;
 - (vii) District Lands Office and District Survey Office of Lands Department, Planning Department and Government Property Agency on all land and land related matters including surveying and

mapping;

- (viii) District Office of Home Affairs Department on matters affecting the public interest at large, relating to public consultations of the EIA for the Project as well as undertake presentations and attend meetings with District Offices, various Rural Committee and District Council including their sub-committees;
- (ix) Planning Department on matters relating to landscape and visual impact assessment; and
- (x) Agriculture, Fisheries and Conservation Department on matters relating to ecological impact assessment.
- (xi) Mines Division, CEDD, on matters relating to the storage, transport and use of explosives (Category 1 Dangerous Goods under the Dangerous Goods Ordinance, Cap. 295).

The Consultants should copy relevant correspondence to the DR for information.

- (j) In addition to the above, the Consultants shall liaise with all other parties involved in this Assignment. Any correspondence, notes or minutes arising from these liaisons shall be copied to the DR for information.
- (k) The Consultants shall take into account, where available, the findings of all previous and current relevant environmental impact assessment studies.
- (l) The Consultants shall demonstrate in the EIA Report for the Project that the criteria in the relevant sections of the Technical Memorandum on EIA Process (hereinafter referred to as the TM) are fully complied with. In preparing the EIA Report for the Project, the Consultants shall refer to Annex 11 of the TM for the contents of the report. The Consultants shall also refer to Annex 20 of the TM, which stipulates the guidelines for the review of the EIA Report. The EIA Report for the Project shall contain a summary of the key environmental outcomes arising from the EIA, including the population and recommended, key environmental problems avoided, compensation areas included, the environmental benefits of environmental protection measures recommended and residual impact.

The Consultants shall prepare and contain all the EIA recommendation and mitigation measures with reference to the implementation programme into the EIA Report for the Project.

- (m) The Consultants shall prepare and submit all working papers to, among others, the DR and the DEP for comments.
- (n) As regards compliance with laws, the Consultants shall observe the followings:
 - (i) the EIA for the Project is a tool to identify potential environmental impacts arising from the Project and to provide a basis for decisions for the implementation of the Project, but it does not automatically exempt the Project from licensing requirements and approvals from relevant authorities; and
 - (ii) the Consultants shall comply with and observe all Ordinances, by-laws, regulations and rules for the time being in force in Hong Kong governing the control of any form of pollution for environmental protection.
- (o) The Consultants shall pay due consideration to beneficial and adverse effects, short and long term effects, secondary and induced effects, cumulative effects, synergistic effects and transboundary effects of any potential impacts in the assessment and analysis and make recommendation on the most appropriate measures to effectively mitigate the impact to an acceptable level.
- (p) The Consultants shall prepare and submit Environmental Monitoring and Audit (EM&A) Manual to the DR for his approval which shall include the following:
 - (i) duties of the environmental team with respect to the EM&A requirements during construction stage;
 - (ii) information on project organization and programming of construction activities for the Project;
 - (iii) requirements with respect to the construction schedule and the

necessary EM&A programme to track the varying environmental impact;

- (iv) definition of Action and Limit levels;
 - (v) establishment of event and action plans;
 - (vi) requirements of reviewing pollution sources and working procedures required in the event of non-compliance of the environmental criteria;
 - (vii) requirements of presentation of EM&A data and appropriate reporting procedures; and
 - (viii) any revisions or supplements to the above as may be required by the DR or by the DEP.
- (q) The Consultants shall send sufficient copies of the EIA reports approved by the DEP for the Project to the public reference libraries of Leisure and Cultural Services Department, the Public Enquiry Service Centre of relevant District Office(s) and the library of the Legislative Council Secretariat all in accordance with the ETWB TCW No. 13/2003 (or its latest version).
- (r) The Consultants shall 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.
- (s) The Consultants shall incorporate all findings and recommendations of the above EIA into the preliminary design.

6.11 Hazard Assessment

- (a) Carry out a hazard assessment in consultation with EPD for the desalination plant to a reliable output of 50 mcm per annum (expandable to 90 mcm per annum), and the associated transportation of any dangerous

goods such as liquid chlorine or any other alternative disinfectants, and explosives from the Mines Division, CEDD, explosives unloading pier, to quantify risks and recommend risk mitigation measures to comply with the “as low as reasonably practicable (ALARP)” principle used in the Hong Kong Planning Standards and Guidelines or any updated Guidelines. The Consultants shall take into account any potential or proposed development in vicinity of the proposed desalination plant, if appropriate, including the feasibility of an explosives unloading facility for Mines Division of CEDD to use, co-existing with the desalination plant, when carrying out the Hazard Assessment.

- (b) Prepare and submit a report presenting the results of the study to the CCPHI for consideration and endorsement if necessary.
- (c) Present the results of the review/studies to all concerned parties or persons including District Councils if necessary.

6.12 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) At present, the MTRCL has set up a temporary explosives magazines for its SCL and KTE projects at the TKO Area 137. The temporary explosives magazines encroach considerably upon the reserved site for the desalination 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 explosives magazines. The temporary explosives magazines site will be returned to WSD by 1 October 2015 for the construction of the desalination plant.
- (c) 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 with a lease condition that CEDD will return the site at earlier time if required by WSD for the construction of the desalination plant by giving 6 months written notice. The Consultants shall study and report in this working paper 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 desalination plant, and investigate the impact, including potential hazards relating to the explosives off-loading operation, on the design, construction and operation of the desalination plant. The Consultants shall proposed 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 of this working paper into the Hazard Assessment to be carried out under Clause 6.11.

- (d) There are other on-going and planned projects like Cross Bay Link, Construction and Demolition Material Handling Facility; 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 hazard assessment shall be included in the EIA study.
- (e) The Consultants shall conduct detailed investigation to avoid possible conflicts with existing and planned utilities.

6.13 Traffic Impact Assessment

- (a) Carry out a Traffic Impact Assessment for the proposed works, including the site investigation works under the Assignment, where appropriate, in accordance with the Guidelines on Traffic Impact Assessment 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 other works by WSD and explosives deliveries undertaken by Mines Division of

CEDD during construction and operation phases of the desalination plant.

- (b) The Traffic Impact Assessment for road works should cover the roads/road junctions to be affected by the works, i.e. the roads/road junctions along the proposed alignment of the water mains. Finalize and agree with TD the boundaries of the study area prior to the commencement of the study.
- (c) Carry out traffic counts for the Traffic Impact Assessment.
- (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) Identify any special measures required by HyD, TD and HKPF for carrying out the proposed works and recommend how the provisions for these special measures are to be made.
- (g) Identify those parts of the pipelines that must be constructed by trenchless techniques to avoid unacceptable traffic conditions.
- (h) Prepare report on the results, findings and conclusions of the study and incorporate the same into the implementation scheme.
- (i) Present the results of the study to all concerned parties or persons as required.

6.14 Marine Traffic Impact Assessment

- (a) Carry out a Marine Traffic Impact Assessment 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 as required.

6.15 Drainage Impact Assessment

- (a) Make reference to and take into account the findings and recommendations in Planning Report No. 3/2011 and other relevant reports and studies and carry out studies, field measurements, and investigations on temporary and permanent drainage impacts arising from the proposed works.
- (b) Prepare project profile to define the necessity, scope and requirement of the DIA and, after agreement by the DRs, conduct DIA Study and submit DIA Report in accordance with ETWB TCW No. 2/2006.
- (c) 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.
- (d) Prepare report on the results, findings and conclusions of the study and incorporate the same into the preliminary design.

6.16 Heritage Impact Assessment (HIA)

- (a) Carry out surveys 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) Submit a proposed Study Brief on the scope of the HIA when required by AMO.
- (c) Liaise with and seek agreement of AMO on the scope of the HIA and all matters relating to the heritage impacts of the proposed works.
- (d) After agreement by the DRs, conduct HIA Study and submit HIA Report in accordance with DEVB TCW No. 6/2009.
- (e) 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.

6.17 Tree Survey

- (a) 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 ETWB TCW No. 3/2006 - "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, submit tree removal application to the relevant authorities for approval in accordance with ETWB TCW No. 3/2006, 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 ETWB TCW No. 3/2006.

6.18 Hydraulic Assessment and Surge Analysis for the Project

- (a) Carry out detailed hydraulic assessment and surge analysis covering the proposed desalination plant and treated water transfer systems, taking into account of all anticipated/intended modes of operation of the systems.
- (b) Recommend appropriate surge protection facilities on proposed waterworks installations.
- (c) Set up a hydraulic profile with hydraulic modelling and/or calculation for the desalination plant, check and review the overall, hydraulic and treatment, performance of the desalination plant.
- (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.

6.19 Energy Efficiency

- (a) 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 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 desalination 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 desalination plant according to ETWB TCW NO. 16/2005.
- (e) Study each and every energy consumption processes in the desalination 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) Liaison with CLP on whether the present electricity provided by grid-supplied power is sufficient to meet the electricity demand for the full operation of the desalination plant and its future extension and whether it is feasible and suitable to use other forms of renewable energy as an alternative. The Consultants shall also study the strategy of negotiating for a more favourable electricity tariff from CLP.
- (g) 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 desalination plant. Should a grid power (from a coal fired electricity generation plant) be recommended to be adopted to meet the electricity demand of the desalination 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.
- (h) Prepare report on the results, findings and conclusions of the study and incorporate the same into the implementation scheme.

6.20 Operation and Maintenance Strategy for M&E plants and equipment

- (a) Assess and study the operation and maintenance requirements of all M&E plants and equipment.

- (b) 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.

6.21 Seawater Quality Characterization and Seawater Quality Envelope

- (a) The Consultants shall review and make reference to appropriate seawater quality information available from 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) The Consultants shall conduct a thorough seawater quality characterization to determine the performance and operating demands required of the pre-treatment system. The Consultants shall also develop a seawater quality envelope for the design of the desalination plant.
- (c) The Consultants shall also study the effect of leachate generated from the landfill site on the seawater quality of the desalination plant site.

6.22 Preliminary Designs and Implementation Scheme

- (a) Prepare preliminary designs including landscaping design, all calculations and drawings. The preliminary designs 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 Planning Report No. 3/2011 and from the concerned Government departments and utility companies. The proposed layout and footprint of the desalination plant shall well suit the configuration of the reserved site. The Consultants shall investigate and

recommend a compact footprint of the desalination 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 desalination 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 Project, 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 feasibility stage of a project are given in Chapter 1, para. 8 of Appendix 1.3 of the Project Administration Handbook.
- (e) 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.
- (f) 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.
- (g) 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.

- (h) Liaise with the New Territories East Region, Development, Water Science, Mechanical & Electrical/Maintenance Divisions of WSD regarding the operation and maintenance requirements of the water supply system both during the construction and in future and the requirements for leakage detection facilities.
- (i) 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.
- (j) 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.
- (k) Recommend locations, type and sizes of valves, branch tees, and connections of new mains to existing mains at the proposed water mains and existing supply system to suit the operational needs after liaison with the New Territories East Region of WSD.
- (l) Liaise with FSD regarding the requirements of additional fire hydrants.
- (m) Recommend the pipe materials for the proposed fresh water and salt water mains.
- (n) 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.
- (o) Identify any materials or services that are required prior to or separately from the main works contracts.
- (p) Carry out design check on existing structures affected by the proposed

works under the Assignment.

- (q) Recommend provisions for waste detection arrangement after liaison with the Water Loss Management Section of WSD.
- (r) Review the proposed pipe sizes and the alignments of the proposed water mains. The pipe sizes should be determined as part of the pumping station design to cater for the ultimate capacity of the desalination plant with economic comparison of alternative options of pump capacities and pipe sizing.
- (s) Liaise with the Government departments/parties and their consultants for the works entrusted to them.
- (t) 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.
- (u) Identify, review, evaluate and conduct detailed comparisons of at least three different options of the scheme layout and the water treatment process for the desalination 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 studies and investigations in this Assignment. Submit and present draft Options Selection Reports and recommend to the DR for approval the most cost effective option for the desalination plant with outline scheme and layout as detailed in Clause 6.22(y) of this Brief. Within 2 weeks after the submission of the draft Options Selection Report to the DR, the Consultants shall give presentation on the findings and recommendations of the draft Options Selection Report. The Consultants shall allow a period of 2 months for the Employer to endorse the recommended/selected option for their planning and undertaking of the subsequent preliminary design and the associated investigation/studies for the recommended/selected option. The content for the presentation shall be submitted at least 1 week prior to the presentation for the agreement of the DR. The Consultants' options for 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.

- (v) The Consultants shall summarize their approaches, methodologies, findings, recommendations and conclusions for the seawater intake and outfall structures in a working paper on option evaluation for the seawater intake and outfall structures.
- (w) The appearance of the desalination plant shall well blend with the environment with 'Green' buildings features (rainwater collection system, energy saving devices, green roof, etc) to be incorporated. The design of the desalination plant building shall meet the relevant BEAM Plus standard in green building labeling.
- (x) 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 desalination plant.
- (y) 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 desalination 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.
- (z) Study the minimum time to start up the desalination plant in working mode from the shut down mode.
- (aa) Consult with 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.
- (ab) Review and revise as necessary the electrical installation design of the plants and buildings.

- (ac) Prepare architectural and landscaping proposals, agree these with the DR and incorporate them into the Preliminary 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 Preliminary Design to avoid any potential maintenance problems.
- (ad) After receiving the endorsement of the outline scheme and layout from the DR, produce a Preliminary Design for the desalination 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 Directive's Representative, 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.
- (ae) Critically review the most appropriate timing of construction of the proposed desalination plant and recommend a suitable initial capacity 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, S12 rezoning application, 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.
- (af) Carry out literature review on 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. In this regard, the Consultants shall seek advice from the hydrology and hydraulics institutes and research centres. The

Consultants shall review the implementation details and programme of the Project based on their findings.

- (ag) Critically review and determine whether it is necessary to conduct a medium-sized demonstration desalination plant. The Consultants shall formulate the purpose and objectives of the demonstration plant and if it is affirmative to conduct such a demonstration plant, the Consultants shall advise when and how to conduct the demonstration plant with the details, cost and implementation strategy for the implementation of the demonstration plant.
- (ah) Investigate, study and make recommendations in respect of the operability (ease at which the desalination 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 desalination plant. Study and review plant automation with advances monitoring and control system to increase process reliability and reduce operation and maintenance staff requirements and report the findings and make recommendation in these aspects. Investigate, study and 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 desalination plant can vary according to the yield condition at the time.
- (ai) The Consultants shall study the benefit of progressive development of the desalination plant by making reference to the worldwide experiences and practices and make recommendations.
- (aj) The Consultants shall study the feasible options for the disposal of brine concentrate including, but not limited to, direct discharge to sea, recovery of useful salt before discharge and use as flushing water.

6.23 Contract Strategy, Programme and Cost Estimates

- (a) 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 desalination plant taking into account of other raw water sources like local yield and DJ raw water supply and the variation on its effect on the overall water production cost while the desalination 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, DJ raw water supply and desalinated water at the time of the commissioning of the desalination plant.

- (b) Recommend the contractual arrangements for carrying out each part of the proposed works 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 desalination plant could be commissioned within a crash time frame as a timely response to combat the adverse effects of climate change.
- (c) Advise on the most suitable form of contract 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 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 estimate of contingency items shall be in accordance with WBTC No. 22/93 “Estimating Using Risk Analysis” or any subsequent version. The Consultants shall attend the meetings of the Project Estimate Control Committee (PECC) of WSD to present the cost estimates.
- (g) Prepare a cash flow analysis.
- (h) Prepare the recurrent costs and life cycle cost of the Project. 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.

6.24 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.

6.25 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 and each part of the proposed water mains alignments.

- (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 (PFC) of CEDD and EPD, and explore and identify suitable recycled inert construction and demolition (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.

6.26 Revision of zoning under s.12(A) of the Town Planning Ordinance.

- (a) The Consultants shall carry out the necessary study and assessment, investigate and make recommendations to demonstrate the acceptability of the desalination plant and that it would not jeopardize other potential PHIs to be located in TKO Area 137.
- (b) The Consultants shall prepare and submit all necessary information in English and Chinese required for an amendment on the draft TKO Outline Zoning Plan No. S/TKO/19 (the OZP) to revise the area zoned “Other Specified Uses” annotated “Deep Waterfront Industry” (“OU(DWI)”) zoning to “OU(Desalination Plant)” under s.12(A) of the Town Planning Ordinance (TPO). The Consultants shall also provide technical support to the Employer in the zoning procedures under s.12(A) of the TPO, in particular in the resolution of objections, answering public queries, attending meeting with objectors, interested parties, Town Planning Board, etc.
- (c) The Consultants shall 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 TPO to be completed.

6.27 Gazettal under Foreshore and Sea-bed (Reclamations) Ordinance

- (a) The Consultants shall 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) The Consultants shall 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.

6.28 Systematic Risk Management

The Consultants shall 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.

6.29 Sustainability Assessment

- (a) The Consultants shall, in consultation with the Environment Bureau, undertake a Sustainability Assessment (SA) using the Computer Aided Sustainability Evaluation Tool (CASET) as evaluation framework to evaluate and assess the construction and operation of the Project and options of its elements. In carrying out the assessment, the Consultants shall, based on the sustainability framework and/or guidelines established by the Government, devise or modify the set of guiding principles, indicators and evaluation criteria to assess the sustainability implications. In considering cross-sectoral issues, relevant findings from other studies should be referred to where appropriate.
- (b) The purpose of the SA is to identify, at early planning stage, the economic, social, environmental and cross-sectoral issues and implications of the construction and operation of the Project and options of its elements, with a view to facilitating decision-making and achieving the best implementation scheme.
- (c) The Consultants shall collect all necessary data/information required by the CASET programme, which is underpinned by eight sustainability principles, twenty-seven (27) sustainability indicators and a set of social checklist questions.
(website : <http://www.susdev.gov.hk/html/en/su/sus.htm>).
- (d) The SA should be delivered as a stand-alone document, it contains the information used as input to the CASET, any additional considerations taken, evaluation and analysis of the sustainability implications, key sustainability issues identified and conclusion. A list of discarded sustainability indicators triggered by the CASET should be included in the SA report with adequate justifications. The analysis in the SA report should cover, but not limited to, the following aspects:
 - (i) Environmental concerns during various implementation stages. Relevant findings from environmental assessments on areas including air quality, noise, water quality, ecology, waste generation and disposal, dredging and reclamation, noise, landscape and cultural heritage should be adopted and reflected in the evaluation of

the relevant indicators against the baseline data. Other triggered indicators should also be addressed in details.

- (ii) With regard to impact on social development, assessment on population impacts, community/institutional arrangements, conflicts between local residents and the proposed developments, job opportunities, community infrastructure changes are some of the concerns that should be considered. Analysis should focus on impacts on the general public at large as well as any specific issues to the local community. Views gathered during public engagement are important to gauge the social capital variance and the projection on social acceptance.
- (iii) For economic impact, a detailed cost benefit analysis of the option(s) is essential to meet the CASET's requirements and should be useful for options comparison. It is essential to address the benefit of the proposal to the community.
- (iv) Other impacts, which would be brought about during the study, should be covered in assessment.
- (e) The Consultants shall prepare the Sustainability Assessment Report containing the information used as input to the CASET, any additional considerations taken, evaluation and analysis of the sustainability implications, key sustainability issues identified and conclusion. A list of discarded sustainability indicators triggered by the CASET should be included in the Sustainability Assessment Report with adequate justifications.

6.30 Value Management (VM) Studies

- (a) Identify areas of the Project suitable for the VM studies and recommend for the agreement of the DR on the scope of the VM studies. The VM studies shall be carried out in accordance with Section 1.4.2 of Chapter 1 of PAH and the "Guideline for Value Management Studies" issued by WSD dated February 1999.
- (b) The Consultants shall be responsible for the provision of VM facilitator (inclusive of the facilitator's fee and associated expenses) as well as the

provision and management of the VM venue and facilities including video and audio equipment and catering services for the VM workshop. The VM venue shall be convenient, comfortable and proposed by the Consultants for agreement by the DR. Offices of participants including the Consultants (or their associated organizations) shall not be used as venue. The name of the VM facilitator shall be subject to prior approval of the DR. Alternative facilitator will need to be identified in case agreement cannot be reached. Once agreement has been reached, the Consultants shall engage the facilitator who shall assist in managing the process, including pre-workshop and post-workshop activities. The tasks for the VM workshop shall be agreed with the DR and shall be related to key and strategic matters of the Project. The Consultants shall provide all administrative support throughout all stages of the VM workshop. The Report on VM Workshop shall be submitted to the DR and relevant Government bureaux/departments within four weeks after the workshop is held.

- (c) The VM facilitators must be subject to the prior agreement of the DR.
- (d) Conduct VM studies and workshops, and prepare reports on the results, findings and conclusions of the VM studies.
- (e) Prepare and submit the results, findings and conclusions of the VM studies to WSD.

6.31 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 operation and maintenance, 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. The visits, if required, shall be completed before the completion of the Options Selection Report. 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.

6.32 Technology Transfer Workshop

- (a) The Consultants shall provide a one-day technology transfer workshop and a working paper towards the end of the Assignment in order to transfer the experience gained, including the desalination/water treatment process and hydraulic aspects, during the course of the Assignment. The purpose of the workshop and the working paper is to assist Government staff to appreciate the implementation scheme of the desalination plant and the associated fresh water transfer facilities.
- (b) The working paper 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) The Consultants shall propose the contents of the working paper, the date, time and venue of the workshop and the facilitator for convening the workshop for the approval of the DR. The working paper shall be available at least 1 month prior to the workshop. The Consultants shall also arrange for the venue for convening the workshop and shall pay for the charges for renting the venue and all other associated costs including the working paper. The Consultants shall provide all necessary hardware, software, training aids and training materials for the workshop.

6.33 Project Definition Statement(s) and Technical Feasibility Statement(s)

- (a) The Consultants shall prepare the Project Definition Statement(s) (PDS) for the Project in accordance with Financial Circular No. 11/2001 and Section 3 of Chapter 1 of the PAH for agreement by the DR and relevant Government bureaux/departments to initiate the creation of capital works project(s) under the Public Works Programme (PWP).
- (b) Upon agreement by the DR and relevant Government bureaux/departments, the Consultants shall prepare the Technical Feasibility Statement(s) (TFS) for the Project in accordance with Financial Circular No. 11/2001 and Section 3 of Chapter 1 of the PAH for agreement by the DR and relevant Government bureaux/departments to enable the creation of capital works project(s) under the PWP.
- (c) It is intention to have all the required PDS and TFS for the Project completed in time for inclusion in the Resource Allocation Exercise (RAE). The Consultants shall programme in such a way to suit. The Consultants shall also provide other information as set out in RAE call circulars from the Financial Services and the Treasury Bureau, including for instance the recurrent implications arising from the Project.

6.34 Draft Report, Draft Final Report and Final Report

- (a) The Consultants shall prepare and submit the Draft Report for circulation to Government departments and others involved in or affected by the proposed works for comments. The Draft Report shall be fully comprehensive and detailed enough to show the Consultants' findings and recommendations including, a description of the objectives and requirements of the Investigation, the assumptions and input data, the alternatives considered, the recommended options, the methodology used in arriving at the results and the factors considered in developing the recommendations. The Draft Report shall also include a schedule showing how and where in the Report the items listed in Clause 6 of this Brief have been addressed. All the review, studies and investigations carried out under the Assignment shall also form part of the Draft Report. The Consultants shall submit responses to comments received prior to finalization of the Draft Report. 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-wb.gov.hk/electronic_services/comp_aid_draft_standard/cad_standard/index.aspx?langno=1&nodeid=634. Drawings shall also be submitted in Geographic Information System format compatible with WSD Digital Mapping System. The Consultants shall also submit soft copies of the drawings in CD-Rom.

- (b) The Consultants shall prepare and submit the Final Report summarising all the work done in this Assignment, including various assessments, studies, surveys, investigations together with the findings, conclusions and recommendations, and the implementation scheme for the desalination 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.
- (c) The Consultants shall 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.

7. Response to Queries

7.1 The Consultants shall respond to queries under Clause 20 of the General

Conditions of Employment raised prior to a date 3 months after the final submission of the Deliverables required under the Agreement. Such date shall be confirmed in writing to the Consultants by the DR.

8. Programme of Implementation

- 8.1 The due date for commencement of the Agreement is **xx December 2012**.
- 8.2 The Assignment shall take a total of **24 months** to complete subject to programme to be agreed by the DR.
- 8.3 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 revised draft programme : Within 2 weeks from receipt of the draft programme.
 - (c) Submission of the revised draft programme : Within 2 weeks from the instruction of the DR.

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.

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

Key Activity	Key dates (from commencement of the Agreement)
Submission of Draft Report	18 months
Submission of Draft Final Report	20 months
Submission of Final Report and Executive Summary	23 months

8.5 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.

9. 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 8 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 10 of this Brief.

10. Financial Management

10.1 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 expenditures on the Assignment and the fees due to the Consultants, in a form to be agreed by the DR.

11. Standards and Specifications

11.1 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.

12. Not used

13. Director's Representative

13.1 The Director's Representative (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.

13.2 During the course of the Agreement, the Consultants shall report direct to the DR or his delegate as appropriate.

14. Control of the Project and Assignment

14.1 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 200 hours, beyond which the extra cost shall be reimbursed by the Employer on a time charge basis.

14.2 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.

- 14.3 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..
- 14.4 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 14.1 of this Brief.

15. Information and Facilities Provided by the Employer

- 15.1 All available information relevant to the Assignment will be provided to the Consultants. The relevant reports giving the background information are as follows:
- (a) Planning Report No. 3/2011 ‘Planning and Investigation Study of Desalination Plant at Tseung Kwan O’ issued by the Development (2) Division of WSD dated January 2012.
 - (b) Tseung Kwan O Final Preliminary Design Report of Agreement No. CE 71/2000 (WS) “Feasibility Study on Development of Desalination Facilities in Hong Kong” dated June 2002.
- 15.2 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 Publications Sales Unit 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.

16. Consultants’ Office and Staffing

- 16.1 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.
- 16.2 The Consultants shall provide the staff and manpower input in accordance with the Technical Proposal which was submitted with the Consultants' tender for this Assignment. The DR shall have the right to check the time-log record of the Consultants' staff deployed for the Assignment.
- 16.3 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.
- 16.4 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.
- 16.5 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.

17. Specialist and Sub-consultant Services

- 17.1 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.
- 17.2 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.

18. Surveys

- 18.1 One velograph and two prints of topographical mapping at 1:20,000, 1:5,000 and 1:1,000 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. For the supply of Government digital map data, the Consultants will be charged a fee for handling. This fee shall be included in the Lump Sum.
- 18.2 All field survey work required for the proper execution of the Assignment shall unless otherwise provided for in the Agreement, be the duty of the Consultants. A copy of field notes, field data and resultant plans arising from these surveys shall be handed over to the DR upon completion of the Assignment. The accuracy as well as presentation of these surveys should be of a standard agreed by the DR.
- 18.3 The Consultants shall be responsible for all engineering surveys required in connection with the Assignment. The division of responsibility among the Consultants, the Lands Administration Office, and the Survey and Mapping Office of the Lands Department for other surveying required in connection with the Assignment shall be as follows:

	Task	Responsibility of
(a) (i)	Provision of basic horizontal and vertical survey control	Survey and Mapping Office

Task	Responsibility of
(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 basic mapping (at 1:1,000 scale or other standard mapping relevant to the Assignment)	Survey and Mapping Office (excluding those specified as to be provided by the Consultants in the Agreement)
(ii) Updating and verification of accuracy of information shown on plans supplied vide (i) as necessary in relation to the Assignment	Consultants
(iii) Carrying out detailed surveys for site investigation and for preparation of design and contract documents as necessary in relation to the Assignment	Consultants
(c) (i) Supply of digital data	Land Information Centre, LandsD
(ii) Provision of a plan of the study area to the Land Information Centre for data preparation	DR
(iii) Completion of “Undertakings by Government Department for provision of Digital Data from Land Information Centre, LandsD to Consultants” form	DR
(iv) Completion of Digital Data Order form	Consultants

Task	Responsibility of
(v) Completion of “Undertaking by Consultants on the use of Government Digital Data from the Land Information Centre, Lands Department” form	Consultants
(vi) Before data collection, payment of the charges for the storage media and labour to prepare the data when informed by the Land Information Centre prior to data collection and collection of the Demand Note	Consultants
(d) Supply of existing cadastral plans and records and co-ordinate data	DSO
(e) Computation of detailed dimensioned layouts of roads, drainage and Waterworks reserves, platforms, etc.	Consultants (checked and accepted by DSO)
(f) Determination of site/lot boundaries, calculation of areas, etc. in connection with the agreed dimensioned layouts	DSO (in liaison with DLO)
(g) (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)
(h) Preparation of proposal plans for Government land allocations and grants	DSO (in liaison with DLO)
(i) Preparation of dimensioned plans and setting out of boundaries of sites and lots for Government land allocation and for grants to architects (Government and Housing Authority)	DSO

19. Insurance

19.1 The amount of insurance cover to be maintained in accordance with sub-clause (A) of Clause 47 of the General Conditions of Employment shall be the Lump Sum value of the fee, subject to a maximum of HK\$50 million and a minimum of HK\$2 million.