

Appendix 5.1a

Approved Contamination Assessment Plan (CAP)
for Radar Station

**Agreement No. CE 35/2006(CE)
Kai Tak Development Engineering Study
cum Design and Construction of Advance Works
– Investigation, Design and Construction**

**CONTAMINATION ASSESSMENT PLAN (CAP)
FOR RADAR STATION (REV. 4)**

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1 INTRODUCTION

1.1 Background

- 1.1.1 The former Kai Tak airport started its operation since 1920s and was replaced by the new airport at Chek Lap Kok in 1998. The airport site is located at south east Kowloon and comprised of the north and south aprons and the runway areas extending into the Kowloon Bay. This former airport covered a total land area of about 260 hectares.
- 1.1.2 The North Apron area of the former Kai Tak Airport had been assessed for land contamination under the *Agreement No. CE 86/97 South East Kowloon Development at Kai Tak Airport – Design and Construction for Decontamination and Site Preparation* and were cleaned up from 1998 to 2002, except the area affected by the occupied ex-Passenger Terminal Building and Multi-Storey Carpark Building, which is being cleaned up at present.
- 1.1.3 Recently, the sources of potential land contamination within the South Apron area has been identified and assessed under the *Agreement KDO 02/05 Assessment of Possible Land Contamination Associated with Decommissioned Fuel Pipeline and Hydrant System at South Apron of Former Kai Tak Airport*. Potential contaminated hotspots associated with fuel pipeline and hydrant system at the South Apron were identified and assessed under this Agreement.
- 1.1.4 Following the *EIA Study Brief for Kai Tak Development (ESB-152/2006)*, the present investigation is to assess the extent of residual land contamination associated with the historical operation of the former Kai Tak Airport. Radar Station and ex-Government Flying Services (GFS) building were found to be within the planning boundary of the Kai Tak development and required investigation in details. This Contamination Assessment Plan (CAP) is specifically prepared to cover only the Radar Station site as shown in **Drawing 1.1**. Attention should be drawn to the scope that the ex-GFS building is not covered by this CAP due to current usage and project programming but it will be covered by another CAP under the EIA study for Kai Tak Development.

1.2 Objectives

- 1.2.1 The objectives of this CAP are to (1) present the findings of the desk study and site appraisal to review past and present land use activities that may lead to land contamination, (2) identify potential hotspots of land contamination for intrusive site investigation, and (3) propose a sampling and testing strategy for the site investigation. In addition, in accordance with *Section 3.4.10.4 of the EIA Study Brief for Kai Tak Development (ESB-152/2006)*, this CAP is submitted to seek endorsement from the EPD.
- 1.2.2 On endorsement of this CAP, a contaminated land investigation and assessment will be undertaken accordingly and a Contamination Assessment Report (CAR) will be prepared based on the site investigation results. Should significant contamination is identified within the study area, a Remediation Action Plan (RAP) will be submitted as required in *3.4.10.5 of the EIA Study Brief for Kai Tak Development(ESB-152/2006)*, for formulation of necessary remedial measures.

2 ENVIRONMENTAL STANDARDS AND NON-STATUTORY GUIDELINES

- 2.1.1 Assessment of land contamination sources and the potential impacts to particular development projects should be in accordance with *Professional Persons Environmental Consultative Committees Practice Note 3/94 – Contaminated Land Assessment and Remediation (ProPECC PN 3/94)* and *Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards and Car Repair /Dismantling Workshop (Guidance Notes)* issued by Environmental Protection Department (EPD). In Hong Kong, the “Dutch List” is generally referenced as the criteria for assessing soil and groundwater contamination under the ProPECC PN3/94.

3 LAND CONTAMINATION SITE APPRAISAL

3.1 General Site Context

- 3.1.1 The study area covered by this CAP includes Radar Station (hereinafter called “the Site”) only. The Site was found to be approximately 1,600m² and located next to the ex-GFS site at the end of the South Apron area of the former Kai Tak Airport. Surrounding environment of the Site is mainly industrial and commercial landuses. The general layout plans of the Radar Station have been provided in **Appendix A** and the surrounding environment of the Radar Station has been shown in **Drawing 3.1**.

3.2 Geology and Hydrogeology

Site Geology and Superficial Geological Deposits

- 3.2.1 The subsurface geology is important as contaminants, especially those associated with petroleum hydrocarbon products such as gasoline, fuels and oils, may enter the soil and groundwater through spills or leaks and migrate through the underground medium for some distances. According to the Hong Kong Geological Survey Map (Series: HGM20) – Sheet No. 11 (1:20,000 Scale) on the solid and superficial geology of the Site, the superficial geology of the Site is FILL and SANITARY FILL which are mainly composed of natural earth and waste. Fill materials generally have higher permeability and the ability of potential contaminant migration through this horizon is relatively high.

Review of Previous Ground Investigation Reports

- 3.2.2 A review of previous ground investigation (GI) reports undertaken at or in the vicinity of the Site (kept in the CEDD Geotechnical Information Library) was conducted to obtain available information about the geological and hydrogeological conditions of the Site. The GI reports reviewed are as follows:
- *Airfield Surface Detection Radar at Kowloon Bay Final Report of Site Investigation by Enpack (H.K.) Ltd (1983) (CEDD's Geotechnical Information Unit Report No.3650).*
 - *Ground Investigation: Item 63AA, RHKAAF Relocation Site Investigation Report by Bachy Soletanche Group Hong Kong (1990) (CEDD's Geotechnical Information Unit Report No.13488).*
 - *New Central Materials Test Laboratory Site Investigation Report by Bachy Soletanche Group Hong Kong (1983) (CEDD's Geotechnical Information Unit Report No. 4784).*
 - *Site Investigation: 3030 GG In Category AB of Public Works Programme Vehicle examination centre, Kowloon Bay by Bachy Soletanche Group Hong Kong (1983) (CEDD's Geotechnical Information Unit Report No. 10923).*
 - *Site Investigation:New Tilt Test Platform Vehicle Inspection Centre, Kowloon Bay by Bachy Soletanche Group Hong Kong (1983) (CEDD's Geotechnical Information Unit Report No. 7756).*
 - *Assessment of Possible Land Contamination Associated with Decommissioned Fuel Pipeline and Hydrant System at South Apron of Former Kai Tak Airport, Kowloon Final Factual Fieldwork Report by Fugro Geotechnical Services Ltd (2006). (CEDD's Geotechnical Information Unit Report No.43073).*
- 3.2.3 With reference to the GI reports, the general geological sequence around the Site was fill, marine deposit or alluvium, highly or completely decomposed granites. The immediate top layer of the fill was mainly loose to medium dense, brown, fine to medium sand with some gravel. The layer of concrete encountered was determined to be around 0.3m to 0.7m.

- 3.2.4 According to the groundwater levels recorded in some of the reviewed GI reports, the groundwater level varied from +1.5mPD near Radar Station to +1.3mPD near the Central Materials Test Laboratory. The general groundwater pattern likely flow from North West to South East. It was anticipated that the groundwater level was around 2m to 5m below ground at the Site

3.3 Acquisition of Relevant Information from Government Departments

Environmental Protection Department (EPD)

- 3.3.1 Inquiry letter has been sent to EPD to acquire information about the registered Chemical Waste Producer(s) and records of accidents of spill/leakage of chemical within the Site.
- 3.3.2 According to the information provided by the EPD, there has been no registered chemical waste producer within the Site. A copy of EPD's letter is provided in **Appendix B**.

Fire Services Department (FSD)

- 3.3.3 Inquiry letter has also been sent to FSD to acquire information about the current and past records of (1) dangerous goods (D.G.) storage registration and (2) accidents of spill/leakage of chemical within the study area.
- 3.3.4 According to the information provided by the FSD, no record of dangerous goods storage registration was found within the Site.

3.4 Review of Historical Aerial Photographs

- 3.4.1 A review of historical aerial photographs (**Table 3.1**) covering the Site has been undertaken. The aim of this review is to evaluate any land use changes associated with potential contamination implication within the Site.

Table 3.1 Reviewed Historical Aerial Photographs

Year	Photograph References	Height (ft)
1959	0289	40000
1967	5571	6250
1978	24183	4000
1984	56927	4000
1991	A27411	4000
1993	CN3182	4000
1998	CN21315	4000
2000	CN27476	4000
2004	CW55568	4000
2006	CW72470	4000

Source of historical aerial photographs: Survey and Mapping Office, Lands Department.

- 3.4.2 The findings of the review of historical aerial photographs are summarized as follows:

Year 1959

- The earliest aerial photograph that is relevant to the Site was taken in 1959. As shown from the aerial photograph, the Site was not reclaimed in 1959.

Year 1967

- The Radar Station area was found to be reclaimed in 1967.

Year 1978

- Based on the map, the Site was a car park in 1978.

Year 1984

- Radar Station was constructed in 1984.

Year 1991 – 2006

- No apparent change of the layout of the Site was observed.
- 3.4.3 As concluded from the review of aerial photographs, the Radar station had been constructed for more than 20 years. No significant changes of Site layout were observed since 1991.

3.5 Site Inspection and Interview

- 3.5.1 In general, the Site is approximately 1,600m² and comprises of (1) an underground fuel tank, (2) a standby generator room, (3) a fuel tank room, (4) a pump room and (5) a transformer room. The location and the general layout plan of these facilities are provided in **Appendix A**. Questionnaire has been sent to the current land user, Marine Department (MD), to collect background information of the Site. The completed questionnaire was received on 21 March 2007 and has been provided in **Appendix C**.
- 3.5.2 According to information provided in the questionnaire, the Site was operated by the Civil Aviation Department (CAD) as an air field service detection centre of the former Kai Tak Airport. It has been handed over to MD since July 1998. Currently, the Site is used for providing vessel traffic services for eastern Victoria Harbour. As stated in the questionnaire, materials such as fuels, lubricating oils, hydraulic fluids, engine coolants and battery fluid have been used, stored or generated within the Site and they were disposed through collection by a licensed chemical waste collector. For electrical wiring, they were collected by a municipal solid waste collector. There has been regular check of spillage and leakage of the chemicals handled and the works have been entrusted to Electrical and Mechanical Services Department (EMSD).
- 3.5.3 In order to identify any contamination hotspots within the Site, a site inspection in company with MD representatives was conducted on 23 March 2007. Since some of the places were not accessible during the first visit, an additional site inspection in company with China Light and Power (CLP) representative was undertaken on 16 April 2007.
- 3.5.4 During the site inspections, all accessible areas were inspected as far as practicable, and the representatives of the Site have been interviewed to collect information about the present or historical activities undertaken at the Site. The record of interview during the site inspections are provided in **Appendix D**. Photo-documentation was also undertaken if possible and has been provided in **Appendix E**. Findings of the Site inspection are summarised as follows:

Underground Fuel Tank

- 3.5.5 An underground fuel tank (**Photo 1**) was found at the south western part of the Site. As reported from the site personnel, the tank was used for diesel storage. It had a capacity of about 5,000L and has been operated for more than 10 years. The site staff also reported that the tank was used for supplying fuel to an emergency power generator located at the standby generator room. A regular check of the fuel delivery system would be carried out monthly to check any leakage or spillage from the underground fuel tank.
- 3.5.6 In order to assess any contamination due to the underground tank, 2 boreholes are proposed to be drilled at identified locations as depicted in **Drawing 3.2**.

Standby Generator Room

- 3.5.7 As observed from the Site, the standby generator room (**Photo 2**) was located at the north-western part of the Radar station, around 9 drums and plastic containers were found at the entrance of the room. According to the site personnel, these drums and containers were emptied and would be collected by registered chemical waste collector every six months. As observed, the majority of the drums and containers were labelled as Omala Oil and they were all lidded. The ground was generally well paved with concrete in this area and there has been no sign of contamination stain. Therefore, this area is unlikely to have land

contamination issue.

- 3.5.8 Inside the standby generator room, several plastic containers were also observed during the site inspection. As reported from the site staff, these containers were used for storing Omala Oil after use and have been partially filled. During the site inspection, it was observed that no containment or drip trays were placed underneath the containers. Stains of paint have been found on the ground and based on these observations, this container storage area (**Photo 3**) is likely to have potential land contamination and 1 hotspot is identified as depicted in **Drawing 3.2**.
- 3.5.9 In addition to the container storage area, there has been an electricity generator (**Photo 4**) inside the standby generator room. The generator would be operated for emergency as reported by MD's representative. As observed, drip trays (**Photo 5**) were found under the generator to collect fuel leakage and installed on a concrete block. Although leak preventive measures were implemented in this area, 1 hotspot is still identified as depicted in **Drawing 3.2** due to the operation of the electricity generator.

Fuel Tank Room

- 3.5.10 Inside the fuel tank room, a daily tank (**Photo 6**) of diesel was found with a containment placed underneath. Stains were observed on the concrete paved ground around the tank. The site inspection findings suggested that this area is likely to have potential land contamination and 1 hotspot is identified in the fuel tank room (as shown in **Drawing 3.2**).

Pump Room

- 3.5.11 The pump room (**Photo 7**) was located at the north eastern part of the Site. As reported from the site personnel, this room was used for water pumping only. Since no sign of contamination stain was observed and the ground was generally well paved with concrete, this area is unlikely to have land contamination issue.

Transformer Room

- 3.5.12 During the site inspection, a transformer room was found next to the pump room. According to the MD's representative, the transformer room was managed by China Light and Power Limited (CLP). Questionnaire has been sent to CLP to collect information on site uses, length of operation, and chemicals used and their disposal method. The completed questionnaire was received on 4 April 2007 and has been provided in **Appendix F**.
- 3.5.13 According to information provided in the questionnaire, the transformer station (**Photo 8**) has been operated for more than 20 years. Materials such as engine coolants, battery fluid and electrical wiring have been used, stored or generated from the site and would then be returned to CLPP workshop for disposal. As reported from CLP's representative, inspection and cleaning would be performed every six months for the CLP facilities.
- 3.5.14 During the site inspection with CLP's representative on 16 April 2007, it was observed that high voltage equipment, a transformer and a power supply were located within the transformer room. Interviews with the representative revealed that insulating oil has been used in the transformer and the quality of the oil would be checked annually on site. For the power supply, it was reported to be used for providing energy to the high voltage equipment. The power supply was found to be made up of battery cells and they were all stored in containment and the battery cells would be replaced by a new one when it was used up. The ground was found to be well paved with concrete and no apparent stains have been observed at the site.
- 3.5.15 Although regular substation inspection and cleaning were practices in this area and no oil stain was observed on the ground, 1 hotspot is still identified as depicted in **Drawing 3.2** due to the operation of transformer and handling any chemicals solutions in this area.

- 3.5.16 In order to assess any potential migration of contaminants from the activities described above, 2 additional boreholes as depicted in **Drawing 3.2** are therefore proposed next to the Radar Station's building.

3.6 Potential Land Contamination Impacts

- 3.6.1 As discussed in the above sections, potential sources of land contamination within the Site would arise from the oil containers storage area, the underground fuel storage tank, and the operations of daily tank and electricity generator. Typical contaminants associated with these activities were summarized in **Table 3.2** below.

Table 3.2 Potential Contaminants Associated with Historical/Current Land Uses

Uses	Potential Site Contaminants	Remarks
Containers storage area	Oils/Paints	<ul style="list-style-type: none"> Localized spillages
Underground fuel storage tank	Diesel fuel	<ul style="list-style-type: none"> Spillages during refueling/fueling process Potential tank leakage
Daily tank	Diesel fuel	<ul style="list-style-type: none"> Spillages during refueling/fueling process
Electricity generator	Lubricating oils, hydraulic fluid, engine coolants, diesel fuel	<ul style="list-style-type: none"> Localized spillages from maintenance and dismantling of equipment Mishandling
Transformer room	Polychlorinated Biphenyls (PCBs)	<ul style="list-style-type: none"> Spillage from improper handling of transformer fluids

- 3.6.2 Since the rooms within the Radar Station were generally well paved with concrete and the contamination problem within the building area, if any, were considered to be surmountable.
- 3.6.3 A description of general hazardous properties of typical compounds which may have been used or stored in the potential contaminated areas is presented in **Table 3.3**.

Table 3.3 General Properties of Hazardous Substances Identified in the Potential Contaminated Areas

Typical Substance	General Hazardous Properties
Petroleum hydrocarbons (including benzene, toluene, xylenes and ethyl benzene –BTEX)	<ul style="list-style-type: none"> Toxic by inhalation, ingestion and contact Concentration may be flammable
Oils, oily wastes	<ul style="list-style-type: none"> Toxic by contact Concentration may be flammable
Heavy metals	<ul style="list-style-type: none"> Toxic by contact and ingestion Most are toxic to fish, plants and marine plants (especially copper) Specific precautions may be required in relation to monitoring and dust control in site formation works
Thinners, solvents, degreasants	<ul style="list-style-type: none"> Toxic by contact, inhalation and ingestion
Polycyclic aromatic hydrocarbons (PAHs)	<ul style="list-style-type: none"> Toxic by contact and ingestion
PCBs	<ul style="list-style-type: none"> Toxic by contact and ingestion

4 SAMPLING PLAN FOR SITE INVESTIGATION

4.1 Sampling Locations

- 4.1.1 Information obtained from the desktop studies, site inspections, interviews and site observations were used to determine site investigation (SI) sampling locations. The criteria for identification of contamination hotspots were based upon the site observation of stain or ground discolourisation, machine or chemical storage locations or areas with contaminative activities undertaken.
- 4.1.2 In this land contamination study, a total of 8 contamination hotspots are identified. However, since fuel tank room, standby generator room and the transformer room will still be in operation at the time of the site investigation, only 4 boreholes located at the outdoor area will be constructed under this Study for the purpose of identifying possible land contamination within the hotspot areas. The indicative location plans of the proposed SI sampling locations are illustrated in **Drawing 3.3**.
- 4.1.3 For the 4 potential contamination hotspots identified inside the building (including fuel tank room, standby generator room and the transformer room), it is recommended that a land contamination investigation should be carried out upon the cessation of the operations and prior to the redevelopment. If land contamination is confirmed, proper remedial measures should be formulated and implemented prior to the redevelopment of the site.
- 4.1.4 It should be noted that if significant contamination was revealed during the SI, additional sampling locations would be required to determine the exact extent of contamination. The rationales for selecting the sampling locations are summarized in **Table 4.1**.

Table 4.1 Sampling and Testing Plan for the Study Area
(Concerned Site Area:~1,600m²; Proposed 4 Sampling Locations)

Proposed Sampling Location	Sampling Method	Sample Matrix	Parameters to be Tested					Rationale of Sampling
			TPH	BTEX	PAHs	Phenols	Chlorinated Hydrocarbons	Heavy Metals
RSB-01	Borehole to 6m	Soil	X	X	X	X	X	X
		Soil	X	X	X	X	X	X
		Soil	X	X	X	X	X	X
		Soil	X	X	X	X	X	X
		Soil	X	X	X	X	X	X
		Groundwater	X	X	X	X	X	X
RSB-02	Borehole to 6m	Soil	X	X	X	X	X	X
		Soil	X	X	X	X	X	X
		Soil	X	X	X	X	X	X
		Soil	X	X	X	X	X	X
		Soil	X	X	X	X	X	X
		Groundwater	X	X	X	X	X	X

To assess any contamination due to underground fuel tank. The sampling point would be in vicinity of the underground fuel tanks.

Proposed Sampling Location	Sampling Method	Sample Matrix	Parameters to be Tested						Rationale of Sampling
			TPH	BTEX	PAHs	Phenols	Chlorinated Hydrocarbons	Heavy Metals	
RSB-07	Borehole to 6m	Soil	X	X	X	X	X	X	To assess any potential migration of contaminants from the activities undertaken in the Radar Station.
		Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		Groundwater	X	X	X	X	X	X	
RSB-08	Borehole to 6m	Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		Groundwater	X	X	X	X	X	X	

Remarks:

BBC = Below Base of Existing Concrete Pavement; GW=groundwater; X = testing proposed

* The proposed sampling locations are located inside the building. If there are any spatial and headroom constraints for the proposed sampling locations, trial pit(s) should be considered as an alternative to collect soil samples. The maximum depth of trial pits should be at least 2m -3m BBC subject to site conditions.

4.2 Soil Sampling Method

- 4.2.1 Soil samples shall be taken from boreholes driven by a rotary drilling rig using dry drilling technique or other similar sampling method as agreed by the Engineer and land contamination specialist. For borehole method, U100/U76 (stainless steel) shall be used to collect undisturbed soil samples. If there are any spatial and headroom constraints for the proposed borehole(s), trial pit(s) should be considered as an alternative to collect soil samples.

4.3 Depth of Sampling

- 4.3.1 All soil boring and sampling shall be supervised by a qualified land contamination specialist. At each borehole sampling location, soil samples should be taken at 1m, 2.5m, 3.5m and/or 5m and 6m BBC in order to delineate the vertical profile of contamination as specified in **Table 4.1**. Where there are suspected signs of contamination, extra samples should be taken for laboratory analysis.
- 4.3.2 At each sampling location/depth, sufficient quantity of soil sample (as specified by the laboratory) should be taken. All soil samples should be uniquely labeled. Backup samples should be retained and stored at 0-4 °C in laboratory.

4.4 Strata Logging

- 4.4.1 Strata logging for boreholes shall be undertaken during the course of drilling/digging and sampling by a qualified geologist. The logs should include the general stratigraphic description, depth of soil sampling, sample notation and level of groundwater (if encountered). The presence of rocks/boulders/cobbles and foreign materials such as metals, wood and plastics should also be recorded.

4.5 Free Product and Groundwater Level Measurement

- 4.5.1 The thickness of any free product and ground water level if present at sampling locations should be measured with an interface probe. The free product if encountered in sufficient amount should be collected for laboratory analysis to determine the composition.

4.6 Groundwater Sampling

- 4.6.1 In order to investigate the general conditions of the groundwater, groundwater samples should be collected if groundwater is encountered at the sampling locations.
- 4.6.2 For each proposed location, a groundwater sampling well shall be installed into the boreholes as directed by the land contamination specialist. A typical design of the groundwater sampling well as shown in **Drawing 4.1** should be submitted by the land contamination specialist for the Engineer's approval prior to the commencement of sampling. After installation of the monitoring wells, the depth to water table at all monitoring wells should be measured at the same time with an interface probe in order to delineate the water table contours at the subject site. Well developments (approximately five well volumes) should be carried out to remove slit and drilling fluid residue from the wells. The wells should then be allowed to stand for a day to permit groundwater conditions to equilibrate. Groundwater level and thickness of free product layer, if present, should be measured at each well before groundwater samples are taken.
- 4.6.3 Prior to groundwater sampling, the monitoring wells should be purged (at least three well volumes) to remove fine-grained materials and to collect freshly refilled representative groundwater samples. Time for each groundwater purging/recharge should be recorded as well as the estimated groundwater flow.
- 4.6.4 After purging, one groundwater sample should then be collected at each well using Teflon bailer and decanted into appropriate sample vials or bottles in a manner that minimizes

agitation and volatilization of VOCs from the samples. All samples should be uniquely labelled.

- 4.6.5 If trial pit(s) is/are considered as an alternative for sampling due to any spatial and headroom constraints for the proposed sampling locations, groundwater sample(s) should also be collected at all trial pit(s) if groundwater was encountered during excavation. The trial pit(s) should be pumped to near dry and allowed to stand for 24 hours. Groundwater sample(s) should be collected using decontamination bucket.
- 4.6.6 Immediately after collection, groundwater samples should be transferred to new, clean, laboratory-supplied glass jars for sample storage/transport. The sampling glass jars should be of “darken” type. Groundwater samples should be placed in the glass jars with zero headspace and promptly sealed with a septum-lined cap. Immediately following collection, samples should be placed in ice chests, cooled and maintained at a temperature of about 4°C until delivered to the analytical laboratory.

4.7 Sample Size and Decontamination Procedures

- 4.7.1 All equipment in contact with the ground should be thoroughly decontaminated between each excavation, drilling and sampling event to minimise the potential for cross contamination. The equipment (including drilling pit, digging tools and soil/groundwater samplers) should be decontaminated by steam cleaning or high-pressure hot water jet, then washed by phosphate-free detergent and finally rinsed by distilled/deionised water
- 4.7.2 Prior to sampling, the laboratory responsible for analysis should be consulted on the particular sample size and preservation procedures that are necessary for each chemical analysis.
- 4.7.3 The sample containers should be laboratory cleaned, sealable, water-tight, made of glass or other suitable materials with aluminium or Teflon-lined lids, so that the container surface will not react with the sample or adsorb contaminants. No headspace should be allowed in the containers which contain samples to be analysed for VOCs, TPH or other volatile chemicals.
- 4.7.4 The containers should be marked with the sampling location codes and the depths at which the samples were taken. If the contents are hazardous, this should be clearly marked on the container and precautions taken during transport. Samples should be stored at between 0-4 °C but never frozen. Samples should be delivered to laboratory within 24 hours of the samples being collected and analysed within the respective retention period but should not more than 10 days.

4.8 QA/QC Procedures

- 4.8.1 QA/QC samples shall be collected in the following frequency during the SI. Chain of Custody protocol shall be adopted.
- 1 equipment blank per 20 samples for full suite analysis
 - 1 field blank per 20 samples for full suite analysis
 - 1 duplicated (for soil and groundwater) per 20 samples for full suite of analysis.

4.9 Health and Safety

- 4.9.1 The specific safety measures to be taken depend on the nature and content of contamination, the site conditions and the regulations related to site safety requirements. Workmen Compensation Insurance and third party insurance must be provided for the SI.
- 4.9.2 Extreme care should be exercised when toxic gases or other hazardous materials are encountered.

- 4.9.3 The SI contractor shall establish and maintain a Health and Safety Plan before commencement of the SI that will include the following:
- Instruction of works on work procedures, safe practices, emergency duties, and applicable regulations;
 - Regularly scheduled and impromptu meetings of the workers in which the possible hazards, problems of the job, and related safe practices are emphasized and discussed;
 - Good housekeeping practices; and
 - Availability of and instruction in the location, use and maintenance of personal protective equipment.
- 4.9.4 The SI Contractor shall maintain equipment and supplies reasonably required in an emergency, including lifesaving, evacuation, rescue and medical equipment in good working order and condition at all times. The SI Contractor shall use all reasonable means to control and prevent fires and explosions, injury to personnel and damage to equipment of property. Without limiting the foregoing, the SI Contractor shall:
- Maintain proper safety devices, barriers to minimize hazards during performance of the work;
 - Prohibit smoking and open flames and the carrying of matches and lighters;
 - Develop and maintain a written emergency plan applicable to the Work and Site;
 - Maintain equipment in good operating condition and have emergency and first aid equipment ready for immediate use, where applicable;
 - Conduct equipment tests to ensure that equipment is properly placed and in good operating condition, and that workers are able to respond to emergency situations;
 - Require all workers employed or retained by the Contractor, or a subcontractor, to at all time wear clothing suitable for existing work, weather and environmental conditions; and
 - The personnel are required to wear respirator and gloves for vapour exposure protection, if necessary. Safety helmet and protective boots should be worn.

4.10 Laboratory Analysis

- 4.10.1 Laboratory analysis covering total petroleum hydrocarbons, BTEX, PAHs, phenols, chlorinated hydrocarbons, PCBs and heavy metals, is proposed in order to screen the presence of potential contaminants that are of concern at the study area. **Table 4.2** summarizes the parameters, detection limits and reference methods for the laboratory analyses of soil and groundwater samples for this Study.

Table 4.2 Parameters, Detection Limits and Reference Methods for Laboratory Analyses

Item	Parameter	Soil		Groundwater	
		Detection Limit (mg/kg) or otherwise stated	Reference Method	Detection Limit (µg/L) or otherwise stated	Reference Method
1	Total Petroleum Hydrocarbons (TPH)	C6-C9: 2 C10-C14: 50 C15-C28: 100 C29-C36: 100	USEPA 8260 USEPA 8015	C6-C9: 20 C10-C14: 25 C15-C28: 25 C29-C36: 25	USEPA 8260 USEPA 8015
2	Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	0.4 for meta- & para-Xylenes; 0.2 for others	USEPA 8260	1 for benzene 15 for others	USEPA 8260
3	Polyaromatic Hydrocarbons (PAHs) ^a	0.05 for individuals	USEPA 8270	0.1 for individuals	USEPA 8270

Item	Parameter	Soil		Groundwater	
		Detection Limit (mg/kg) or otherwise stated	Reference Method	Detection Limit (µg/L) or otherwise stated	Reference Method
4	Phenols ^b	0.2 for individuals	USEPA 8270	0.5 for individuals	USEPA 8270
5	Chlorinated Hydrocarbons - Aliphatics ^c	0.5 for individuals	USEPA 8260	2 for individuals	USEPA 8260
6	Heavy Metals				
	Cadmium (Cd)	0.2	USEPA 6020	1	USEPA 6020
	Lead (Pb)	1	USEPA 6020	1	USEPA 6020
	Copper (Cu)	1	USEPA 6020	1	USEPA 6020
	Tin (Sn)	0.5	USEPA 6020	1	USEPA 6020
	Chromium (Cr)	1	USEPA 6020	1	USEPA 6020
	Nickel (Ni)	1	USEPA 6020	1	USEPA 6020
	Zinc (Zn)	20	USEPA 6020	50	USEPA 6020
	Cobalt (Co)	0.5	USEPA 6020	1	USEPA 6020
	Arsenic (As)	1	USEPA 6020	10	USEPA 6020
	Molybdenum	1	USEPA 6020	1	USEPA 6020
	Barium (Ba)	0.5	USEPA 6020	1	USEPA 6020
	Mercury (Hg)	0.05	USEPA 6020	0.5	USEPA 6020

Remarks:

a) The full list of 6 Polycyclic Aromatic Hydrocarbons (PAHs) are tabulated below:

1) Naphthalene	2) Phenanthrene	3) Anthracene
4) Fluoranthene	5) Benzo(a)pyrene	6) Pyrene

b) The full list of 3 phenols are tabulated below:

1) Phenol	2) 2-methylphenol	3) 3/4-methylphenol
-----------	-------------------	---------------------

c) The full list of 18 chlorinated hydrocarbons (of halogenated aliphatics) are tabulated below:

1) 1,1-Dichloroethene	2) trans-1,2-Dichloroethene	3) 1,1-Dichloroethane
4) cis-1,2-Dichloroethene	5) 1,1,1-Trichloroethane	6) 1,1-Dichloropropylene
7) Carbon tetrachloride	8) 1,2-Dichloroethane	9) Trichloroethene
10) Dibromomethane	11) 1,1,2-Trichloroethane	12) 1,3-Dichloropropane
13) Tetrachloroethene	14) 1,1,1,2-Tetrachloroethane	15) 1,1,2,2-Tetrachloroethane
16) 1,2,3-Trichloropropane	17) 1,2-Dibromo-3-chloropropane	18) Hexachlorobutadiene

- 4.10.2 For sampling and laboratory analyses, chain of custody procedure shall be included as QC/QA procedure.
- 4.10.3 All laboratory analyses for soil and groundwater samples will be conducted by a Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory and relevant supporting document of the laboratory to be employed for this Study should be given in the future CAR or CAR/RAP.
- 4.10.4 Extra soil samples shall be stored at 0-4°C and tested for Toxicity Characteristics Leaching Procedure (TCLP) before submission of Remediation Action Plan (RAP) if excavation and

landfill disposal is identified as the last resort.

- 4.10.5 If contamination is found and landfill disposal is an option, three impacted soil samples shall be conducted for TCLP test to determine whether they comply with the criteria for landfill disposal in accordance with the *Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards, and Car Repair/Dismantling Workshops* published by the EPD.
- 4.10.6 The criteria are set primarily in terms of Toxicity Characteristic Leaching Procedure (TCLP) limits shown in **Table 4.3**.

Table 4.3 Laboratory Testing Requirements for TCLP Analysis

Parameter	Test Methods*	Detection limit (mg/L)
TCLP Leachate Preparation allowed by analysis for:		
Antimony (Sb)	USEPA 1311 and 6020A	2
Arsenic (As)		2
Barium (Ba)		2
Beryllium (Be)		1
Cadmium (Cd)		1
Chromium (Cr)		1
Copper (Cu)		2
Lead (Pb)		3
Nickel (Ni)		1.5
Selenium (Se)		0.1
Silver (Ag)		2
Thallium (Tl)		0.08
Tin (Sn)		2.5
Vanadium (V)		4
Zinc (Zn)		10
Mercury (Hg)		0.02

* equivalent internationally recognized standard methods could also be used.

5 INTERPRETATION OF RESULTS

- 5.1.1 The results of the laboratory analyses shall be interpreted in accordance with the guidance documents referred in EPD's Practice Note ProPECC PN 3/94 *Contaminated Land Assessment and Remediation and Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards, and Car Repairing/Dismantling Workshops*.
- 5.1.2 The ProPECC PN3/94 was used in setting the soil contamination criteria. The Practice Note makes reference to criteria developed in the Netherlands (Dutch 'ABC' Levels), which are most comprehensive and widely used for contaminated site assessment. The preliminary screening approach adopted in land contamination study was based on the Dutch Criteria which consists of 3 levels of guidelines, namely A, B, and C. The simplified explanation of the ABC levels is as follows:
- 'A' level implies unpolluted;
 - 'B' level implies potential pollution present that requires further investigation or remediation; and
 - 'C' level implies pollution which requires remediation.
- 5.1.3 The Dutch criteria are very stringent as they are developed based on a 'good for all uses' philosophy. The EPD generally requires remediation for soil contamination above the Dutch B level. In other words, the Dutch B level is the cleanup target for remediation of soil. Relevant soil and groundwater Dutch 'ABC' levels for this land contamination study are presented in **Table 5.1**.

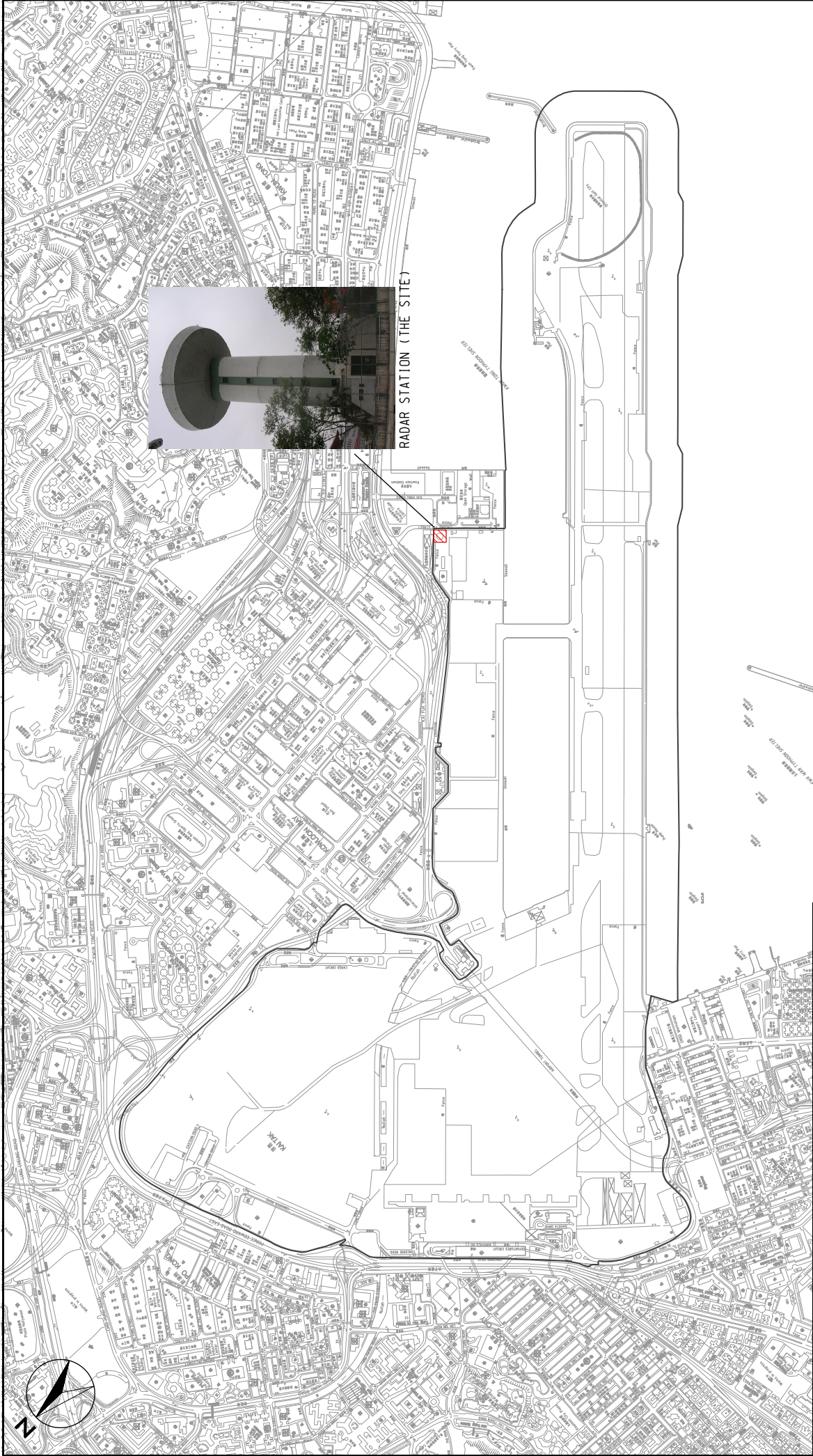
Table 5.1 Dutch ABC Values for Soil and Groundwater Contamination

Parameter	Soil (mg/kg)			Groundwater(µg/L)		
	Dutch A	Dutch B	Dutch C	Dutch A	Dutch B	Dutch C
Total Petroleum Hydrocarbons (TPH) (as mineral oil)	100	1000	5000	20	200	600
BTEX						
Benzene	0.01	0.5	5	0.2	1	5
Toluene	0.05	3	30	0.5	15	50
Ethylbenzene	0.05	5	50	0.5	20	60
Xylenes	0.05	5	50	0.5	20	60
Polyaromatic Hydrocarbons (PAHs)						
Naphthalene	0.1	5	50	0.2	7	30
Phenanthrene	0.1	10	100	0.1	2	10
Anthracene	0.1	10	100	0.1	2	10
Fluoranthene	0.1	10	100	0.02	1	5
Benzo(a)pyrene	0.05	1	10	0.01	0.2	1
Pyrene	0.1	10	100	0.02	1	5
Phenols	0.02	1	10	0.5	15	50
Chlorinated Hydrocarbons-Aliphatics (for individual)	0.1	5	50	1	10	50
Heavy Metals						
Cadmium (Cd)	1	5	20	1	2.5	10
Lead (Pb)	50	150	600	20	50	200
Copper (Cu)	50	100	500	20	50	200


Parameter	Soil (mg/kg)			Groundwater(µg/L)		
	Dutch A	Dutch B	Dutch C	Dutch A	Dutch B	Dutch C
Tin (Sn)	20	50	300	10	30	150
Chromium (Cr)	100	250	800	20	50	200
Nickel (Ni)	50	100	500	20	50	200
Zinc (Zn)	200	500	3000	50	200	800
Cobalt (Co)	20	50	300	20	50	200
Arsenic (As)	20	30	50	10	30	100
Molybdenum (Mo)	10	40	200	5	20	100
Barium (Ba)	200	400	2000	50	100	500
Mercury (Hg)	0.5	2	10	0.2	0.5	2

- 5.1.4 The Dutch 'ABC' criteria were established based on the assumption that groundwater is used as potable water. However, it is not so appropriate to be applied directly in Hong Kong where groundwater is not generally for potable use. Hence, the Dutch B levels would be only for screening out the chemicals-of-concern (COCs) for risk assessment and are not for assessing groundwater contamination in Hong Kong. A risk-based assessment would be carried out for contaminants with the concentration exceeding the Dutch B level to evaluate the risks posed to the sensitive receptors.
- 5.1.5 The risk-based assessment that has been adopted in USEPA takes into account concentrations of individual contaminants in groundwater, the anticipated most sensitive human receptor and the potential exposure pathways. For a worst-case scenario, the largest contaminant concentrations in the groundwater samples would be taken as the source concentration for the risk calculation.
- 5.1.6 Exceedance of the risk-based criteria would be qualified in two tiers. Firstly, the Total Pathway Hazard Index that is the sum of contaminant hazard quotients exceeds one (i.e. USEPA recommended hazard index). Secondly the largest contaminant concentration exceeds the corresponding Risk Based Screening Level (RBSL) that is derived from the recognized oral reference dose. For carcinogens, the first is the Total Carcinogenic Risk that is the sum of contaminant carcinogenic risk exceeds 1×10^{-6} (i.e. USEPA lifetime cancer risk level). The second is the largest carcinogenic contaminant concentration exceeds the corresponding RBSL that is derived from the recognized carcinogenic oral slope factor. It should be noted that risk assessment could only be undertaken for those chemicals that have a recognized oral slope factor or oral reference dose.

Drawings



LEGEND

 STUDY AREA OF THIS CAP

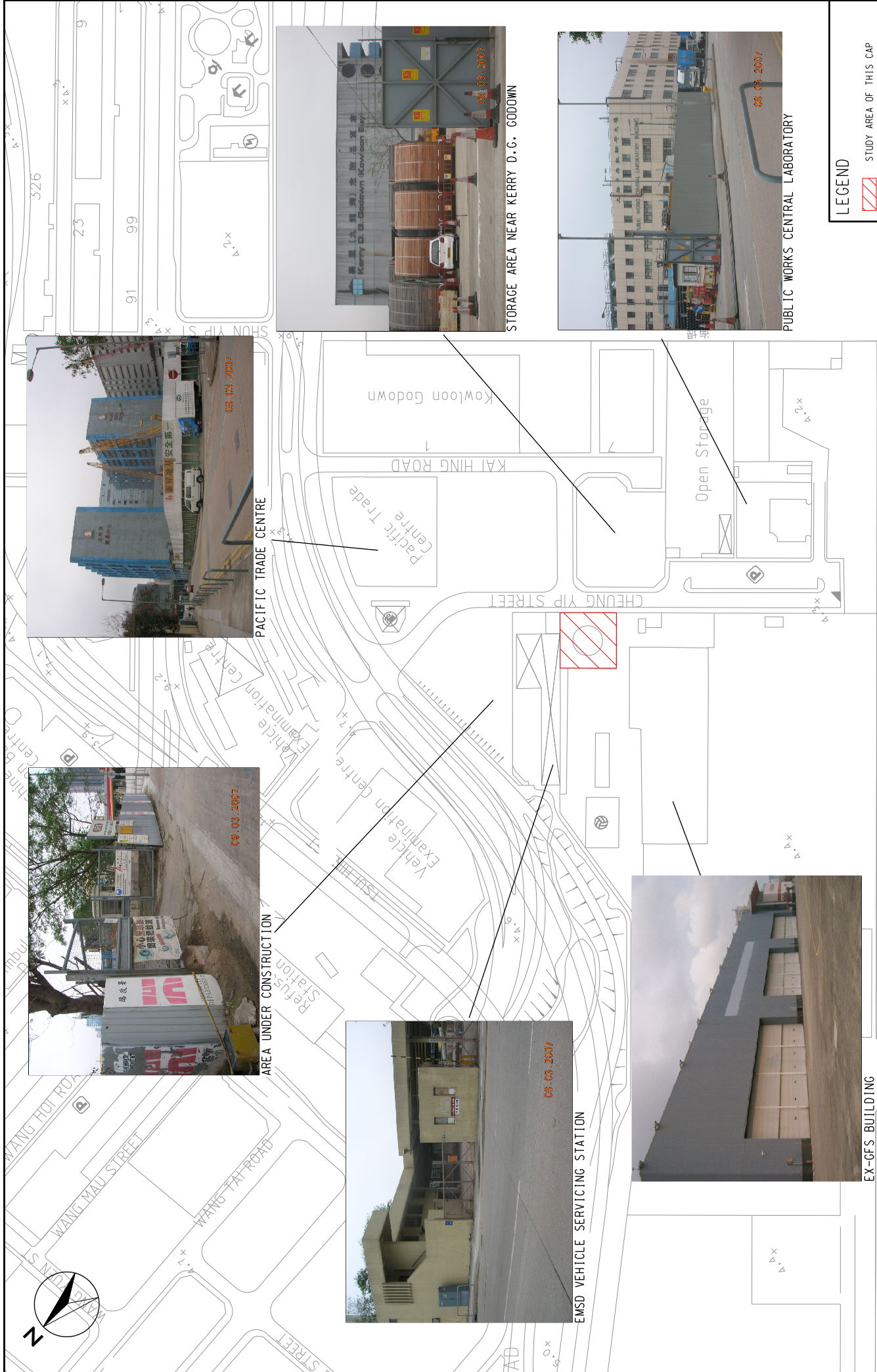
PLAN OF HONG KONG INTERNATIONAL AIRPORT
(PLAN NO. KM 1965g DATED 1.11.1994)
(LANDS DEPT. LETTER REF: (20) IN LND KEPD/103/13(11))

MAUNSELL | **AECOM**
Maunsell Consultants Asia Ltd

AGREEMENT NO. CE 35/2006 (CE)
KAI TAK DEVELOPMENT ENGINEERING STUDY CUM DESIGN AND
CONSTRUCTION OF ADVANCE WORKS—INVESTIGATION, DESIGN AND CONSTRUCTION

SITE LOCATION PLAN

SCALE	A3 1:12000	DATE	JAN 08
CHECK	ELYC	DRAWN	POHM
JOB No.	60022503	DRAWING No.	1.1
REV			—



EMSD VEHICLE SERVICING STATION

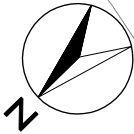
STORAGE AREA NEAR KERRY D.G. GODOWN

EX-GFS BUILDING



STUDY AREA OF THIS CAP

MAUNSELL AECOM Maunsell Consultants Asia Ltd	AGREEMENT NO. CE 35/2006 (CE) KAI TAK DEVELOPMENT ENGINEERING STUDY CUM DESIGN AND CONSTRUCTION OF ADVANCE WORKS-INVESTIGATION, DESIGN AND CONSTRUCTION SURROUNDING ENVIRONMENT OF RADAR STATION			
	SCALE	A3 1:2500	DATE	JAN 08
	CHECK	ELYC	DRAWN	POHM
	JOB No.	60022503	DRAWING No.	3.1
			REV	-



RADAR STATION LAYOUT DESCRIPTION	
①	UNDERGROUND FUEL TANK
②	STANDBY GENERATOR ROOM
③	FUEL TANK ROOM
④	CO2 ROOM
⑤	PUMP ROOM
⑥	TRANSFORMER ROOM
⑦	SWITCH ROOM
⑧	LOBBY



EMERGENCY ELECTRICITY GENERATOR LOCATED AT THE STANDBY GENERATOR ROOM



CONTAINERS STORAGE AREA INSIDE THE STANDBY GENERATOR ROOM



DAILY FUEL TANK INSIDE THE FUEL TANK ROOM



TRANSFORMER ROOM



SI LOCATION FOR B-07



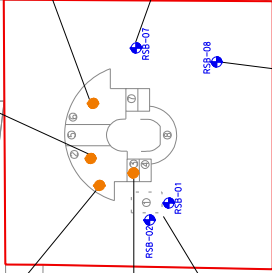
SI LOCATION FOR B-08



UNDERGROUND FUEL TANK NEAR TO THE STANDBY GENERATOR ROOM

CHEUNG YIP STREET

KAI HING ROAD

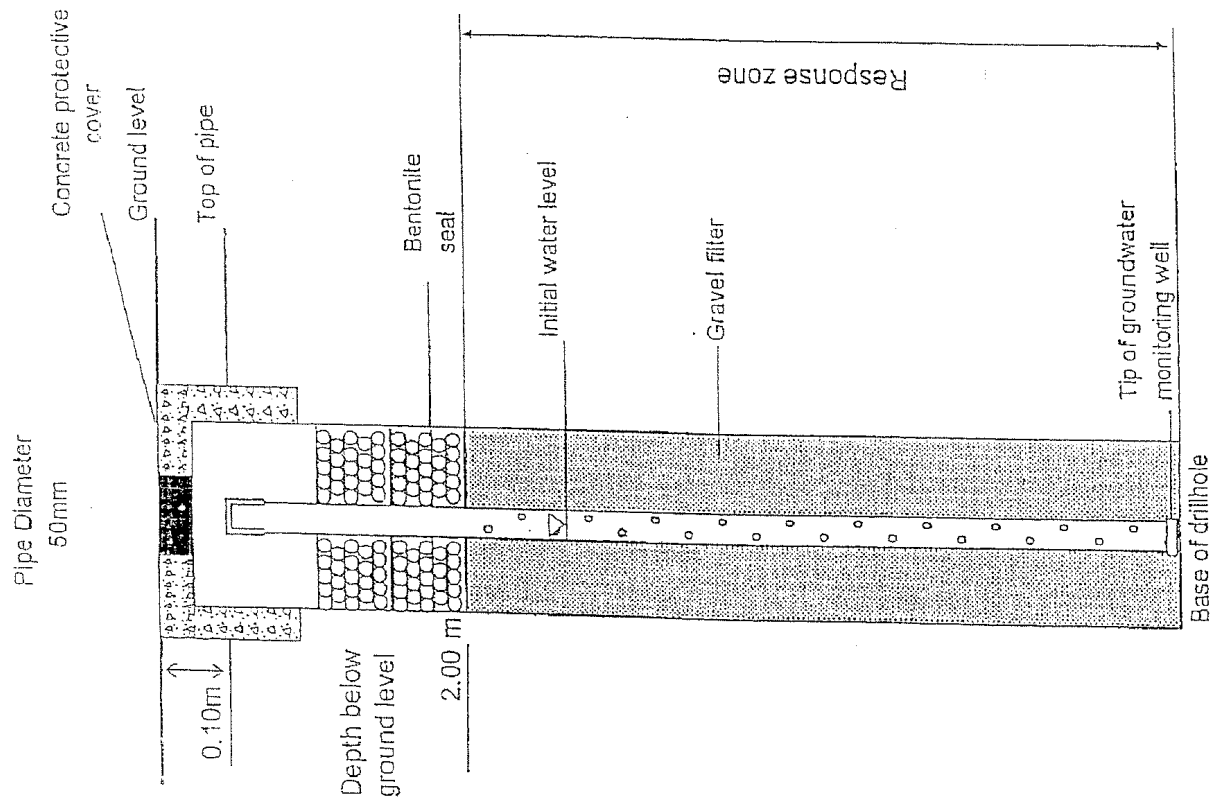


LEGEND

- STUDY AREA OF THIS CAP
- POTENTIAL LAND CONTAMINATION HOTSPOT STILL BE IN OPERATION DURING SITE INVESTIGATION
- PROPOSED S.I. LOCATION

NOTE: GROUNDWATER MONITORING/SAMPLING WELL SHOULD BE CONSTRUCTED IF GROUNDWATER IS ENCOUNTERED DURING EXCAVATION

SCALE	N.T.S	DATE	JAN 08
CHECK	ELYC	DRAWN	POHM
JOB NO.	60022503	DRAWING NO.	3.2
REV			-

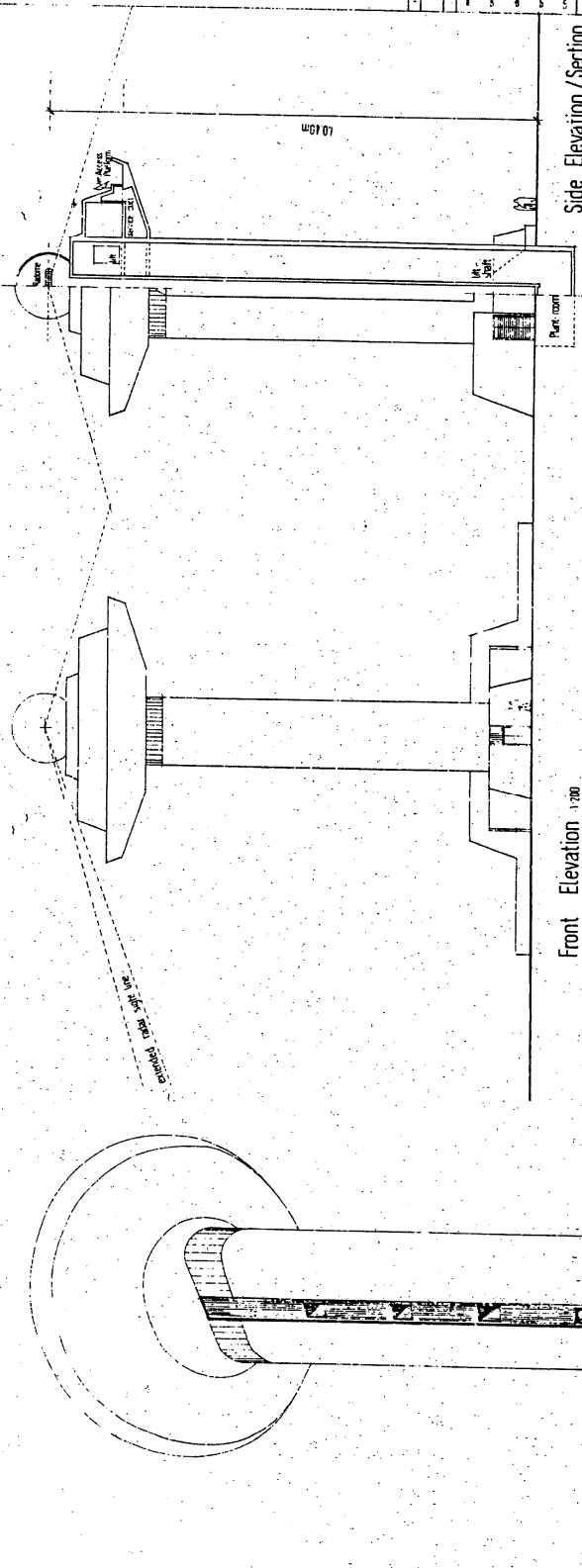


MAUNSELL <small>Environmental Investigations Asia Ltd</small>	AGREEMENT NO. CE 35/2006 (CE) KAL TAK DEVELOPMENT ENGINEERING STUDY CDM DESIGN AND CONSTRUCTION OF ADVANCE WORKS-INVESTIGATION, DESIGN AND CONSTRUCTION		SCALE CHECK JOB No.	N.T.S ELYC 60022503	DATE DRAWN DRAWING No.	JAN 08 POHM 4.1	REV -
	TYPICAL GROUNDWATER SAMPLING WELL DESIGN						
	V:\FE-ES-UM2\BON\FE15\2006\CE35\DRAWING\MAUNSELL\TYPICAL GROUNDWATER SAMPLING WELL DESIGN.dwg						

Appendices

Appendix A
(Site Layout Plans)

NOTES

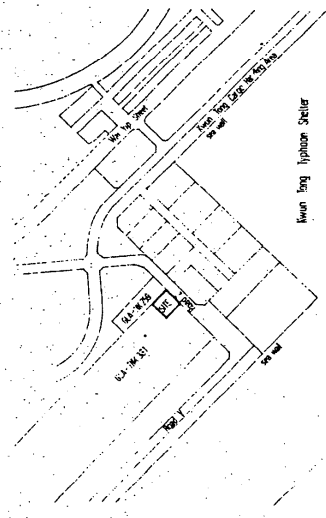


Side Elevation / Section
1:200

Front Elevation
1:200

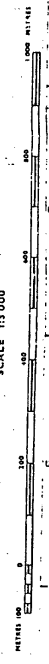
metres
SCALE 1:200
0 2 4 6 8 10 12 14 16 18 20 metres

Perspective View



Location Plan Scale 1:500

SCALE 1:5000



DATE	REVISION	BY	CHKD
Jan 83	Rev. 1	Jan 83	
Jan 83	Rev. 2	Jan 83	

PROJECT NO. 322/A 12/7/79
SHEET NO. 38A
TOWER FOR AIRFIELD
SURFACE DETECTION
EQUIPMENT (A S D E)
KAI TAK AIRPORT

PERSPECTIVE VIEW AND
ELEVATIONS

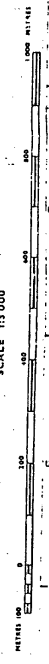
PROJECT NO. A/122561
AS SHOWN

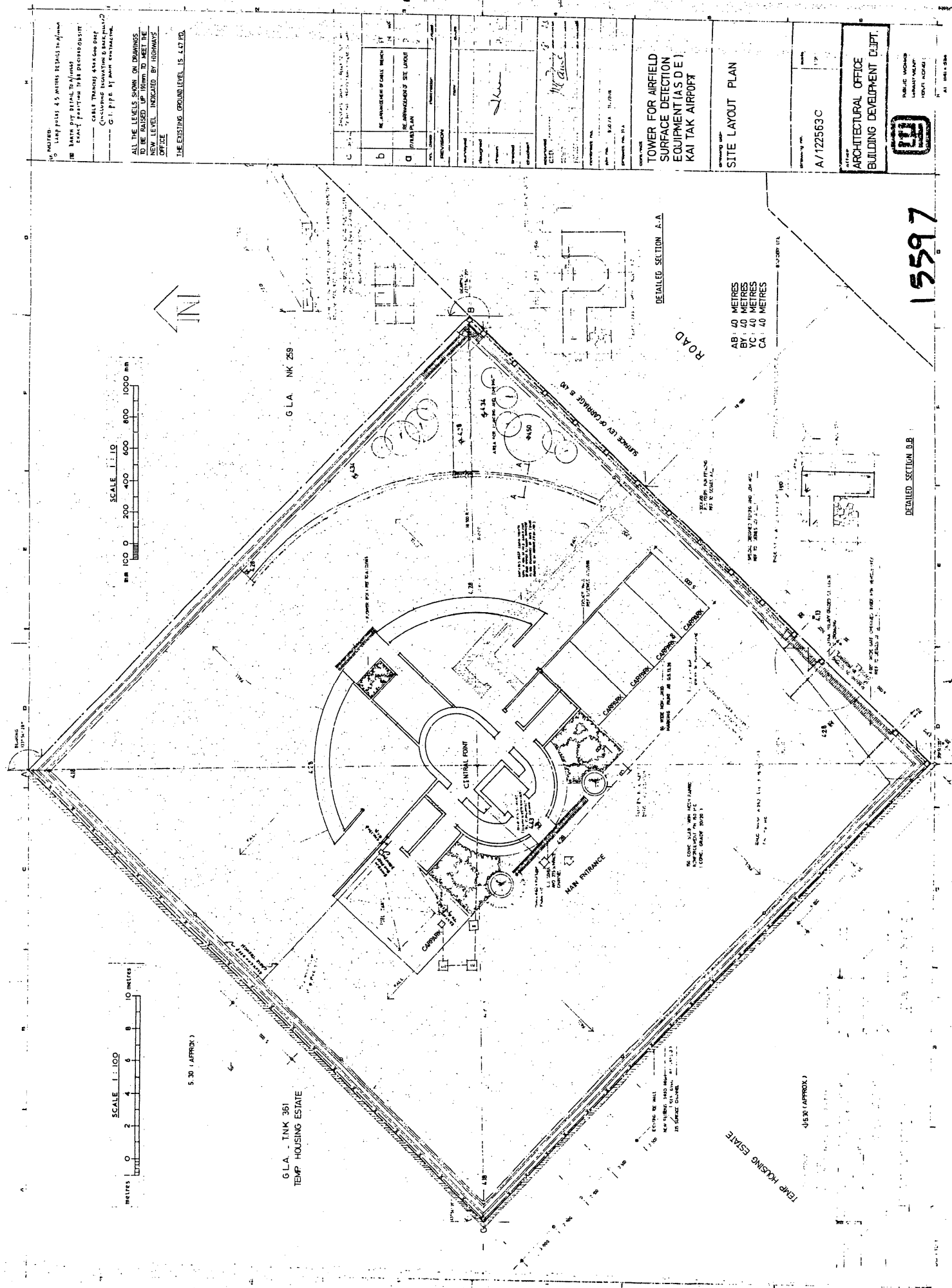
Office
Architectural Office
BUILDING DEVELOPMENT DEPT.



15595

SCALE 1:5000





SCALE 1:10
0 200 400 600 800 1000 m

SCALE 1:100
0 2 4 6 8 10 metres

5.30 (APPROX.)

GLA - TANK 361
TEMP HOUSING ESTATE

DETAILED SECTION A-A

DETAILED SECTION B-B

TEMP HOUSING ESTATE

AB: 40 METRES
BY: 40 METRES
FC: 40 METRES
CA: 40 METRES

ROAD

GLA - NK 259

ALL THE LEVELS SHOWN ON DRAWINGS
TO BE RAISED UP 10mm TO MEET THE
NEW LEVEL INDICATED BY HIGHWAYS
OFFICE

THE EXISTING GROUND LEVEL IS 4.42 PD.

NOTES:
1. ALL PIPES 4.5 METRE DEPTHS TO BE
BANK PUT BEHIND TO ADJUST
EARTH PARTITION TO BE DISCONTINUED
2. CABLE TRACING 4.5 METRE DEPT
3. CLOSING EXISTING & NEW PIPES
4. G.I. PIPE AT JUNE CONTRACT

NO.	REVISION	DATE	BY	CHKD.
1	REVISION			
2	REVISION			
3	REVISION			
4	REVISION			
5	REVISION			
6	REVISION			
7	REVISION			
8	REVISION			
9	REVISION			
10	REVISION			

TOWER FOR AIRFIELD
SURFACE DETECTION
EQUIPMENT (A.S.D.E.)
KAI TAK AIRPORT

SITE LAYOUT PLAN

A/122563C

ARCHITECTURAL OFFICE
BUILDING DEVELOPMENT DEPT.



15597

THE EXISTING GROUND LEVEL IS 4.47 F.M.

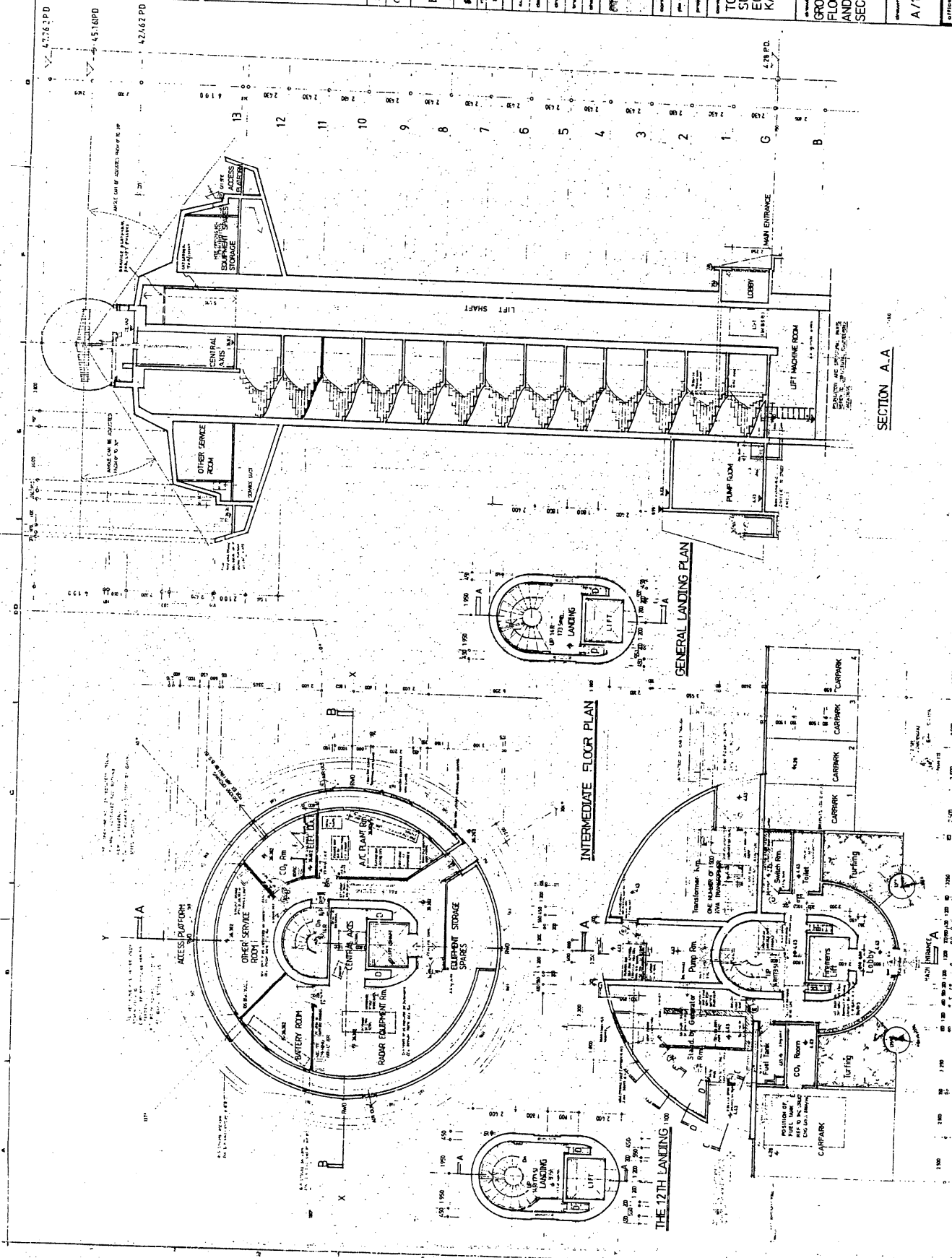
[illegible]

GROUND FLOOR PLAN, INTERMEDIATE
FLOOR PLAN, THE 12 TH LANDING
AND GENERAL LANDING,
SECTION A-A

A/122564 D

ARCHITECTURAL OFFICE
BUILDING DEVELOPMENT [

152518



7 No. EDIT SIGN TO BE REQUIRED

GROUND FLOOR PLAN

SCALE 1 : 100

Appendix B
(Letter from Environmental Protection Department)



郵遞及傳真至 2691 2649

19 March 2007

Maunsell Consultants Asia Limited
 8/F Grand Central Plaza, Tower 2,
 138 Shatin Rural Committee Road,
 Sha Tin,
 New Territories.
 (Attention: Mr Peter CHEEK)

Dear Sir,

Agreement No. CE 35/2006(CE)
 Kai Tak Development Engineering Study
 cum Design and Construction of Advance Works-
 Investigation, Design and Construction

Request for Information about Chemical Waste Producer
and Chemical Spillage Accident

Maunsell Consultants Asia Ltd.	
19 MAR 2007	254
60022408/	
ML	Sign Off
HYN	
FKY	
ATK	
TKST / NWHF	
IWLH / PHC	
MEMO - Peter Lee	

I refer to your letter dated 7 March 2007 regarding the captioned.

As requested, I provide the following information abstracted from our records:-

(i) registered chemical waste producers within the study area:

Date Registered	Name of Registered Chemical Waste Producers	Major Chemical Waste Types	Location where Waste is Produced
18 March 1993	Electrical and Mechanical Services Department, Kowloon Bay Vehicle Servicing Station	Mineral oil, flammable liquid, solvent, paint, oily sludge, acidic electrolyte and heavy metal compound	3 Cheung Yip Street, Kowloon Bay
2 November 1999	Helicopters Hong Kong Ltd	Spent lubricating oil and contaminated fuel oil	1 Cheung Yip Street, Kowloon Bay
11 June 2003	Customs & Excise Department	Spent lubricating oil, diesel oil and non-halogenated solvent	1 Cheung Yip Street, Kowloon Bay
23 January 2006	Strong Base Environmental Services and Engineering Co. Ltd.	活性炭(曾過濾柴油)	1 Cheung Yip Street, Kowloon Bay

(ii) reported accidents of spillage/leakage of chemicals within the study area: Nil.

Maunsell Environmental Management Consultants Ltd.			
Received 21 MAR 2007			
File No. IC/FIC			
TS MKO	AYK JLAM	TJC TYUT	Sign Off
Env. Consultant			
Others			
Copied To			

Yours faithfully,

(C.P. Wai)

Environmental Protection Officer
 Regional Office (East)
 for Director of Environmental Protection



再造紙
 RECYCLED PAPER

Appendix C
(Questionnaires Returned from Marine Department)

海 事 處
香港統一碼頭道38號
海港政府大樓

香港郵政總局信箱4155號



MARINE DEPARTMENT
HARBOUR BUILDING
38 PIER ROAD
HONG KONG
G.P.O. BOX 4155
HONG KONG
TELEX NO. 64553
ANSWERBACK MARHQ HX

網站 WEB SITE : <http://www.mardep.gov.hk>

YOUR REF.: PMC:NWHF:cthy:60022408/02-4-0135

本處編號 OUR REF.: (18) in PA/S 909/2/41 (136)

電話號碼 TEL. NO.: 28524350

傳真號碼 FAX NO.: 25811765

Maunsell Consultants Asia Ltd.
(Attn - Mr. Peter Cheek)

Dear Mr. Cheek,

Maunsell Consultants	
22408/02-4-0135	
Received 21 MAR 2007	
Reg. No. 265	
File No. 60022408/02	
PSYB	IS
CSL	LIE
ENVL	MCP
ENVL	SHRS
ENVL	THN
Project Reg. TKST / NWHF / Sync	
Others IWLH / PMC	
Copied to M. K. Chan - Peter Lee / Matthew Ko	
Date 20.3.07 → Land D. by e-mail	

20 March 2007

By Fax - 26912649
(Total - 3 pages)

Agreement No. CE 35/2006 (CE)
Kai Tak Development Engineering Study cum Design and Construction of Advance Works
Request Site Inspection at Radar Station

Thank you for your above referenced letter requesting for a site inspection of the ASDE radar and, attached with it a questionnaire on 'possible land contamination'.

Please find enclosed the completed questionnaire for your consideration. Our inspector Mr. KH Law, will wait for your staff at 1100 hrs as per your request, at the entrance of the ASDE radar site on 23.March 2007. Please let me have the name list of your visiting team for record purpose. Mr. Law can be contacted through pager number: 71103382 call 6798.

Yours faithfully,

(M. K. Chan)
Senior Marine Officer/Planning & Development
For Director of Marine

C.C.

PM/K, CEDD

(Attn - Mr. Walter Leung)

Fax : 23694980

Internal
SEE/E&S

同心協力，促進卓越海事服務
We are One in Promoting Excellence in Marine Services

Questionnaire on Possible Land Contamination

Name of Company: *Maine Department, HKSARG*

Site Address *Kai Tak Radar Station, Cheung Yip Street, Kowloon Bay.*

Date: *20-03-2007*

Please provide the following information as fully as possible

1	What is your company's main current activities/ operations in the above address?	<i>Vessel Traffic Services for eastern Victoria Harbour</i>
2	Area of your site?	<i>About 1,600 m²</i>
3	Length of operation?	<i>Since July 1988 upon handed over to me from CAD.</i>
4	Do you know the type of land use before you took over the site? (If yes, please give details.)	<i>Airfield Surface Detection of ex-Kai Tak Airport by CAD</i>
5	Have you ever received any notices of violation of environmental regulations or public complaints? (If yes, please give details.)	<i>No record</i>
6	Do you have regular check for any spillage and monitoring of chemicals handled? (If yes please give details.)	<i>Yes, the work is entrusted to EMSD</i>
7	Did any tank/truck spillage or leakage happen in your site? Do you have any internal records about the type, duration and quantities? (If yes, please give details.)	<i>No record</i>
8	Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please give details.)	<i>An underground diesel tank supplying fuel to the emergency power generator</i>
9	Do you have any underground storage tank? (If yes, please give details.)	<i>- ditto -</i>
10	Do you have any records of major renovation of your site or rearrangement of underground utilities, pipework/ underground tanks? (If yes, please give details.)	<i>No record</i>

Please indicate whether the following materials have been used, stored or generated on the site and indicate the method of disposal.

Item	Materials	Possible Source	Yes/No	Method of Disposal (historical & current), if applicable (see Note below)
1	Fuels	Petroleum storage, LPG storage	Y	(ii)
2	Lubricating oils, hydraulic fluids	Spillage, maintenance and dismantling of equipment, scrapped tanks and pipeworks, vehicle, vehicle maintenance	Y	(iii)
3	Cleansing solvents	Engine room and equipment maintenance	N	
4	Used chemical solutions	Engine coolant, battery fluid	Y	(iii)
5	Acids	Treating steel plate to remove millscale	N	
6	Asbestos	Application and removal of engine room insulation	N	
7	Transformer oil (PCB)	Scrapped electrical equipment	N	
8	Anti-corrosive paints, thinner	Application of anti-corrosive coatings	N	
9	Coal, ash, oily tank and bilge sludge	Boiler room/engine room maintenance, tank cleaning	N	
10	Finely divided metal wastes	Grinding and milling operations, especially welding joints	N	
11	Electrical wiring	Electrical installation, maintenance, scrapped electrical equipment	Y	(i)
12	Low-level radioactive waste	Scrapped instruments	N	
13	Wood preservatives	Timber treatment	N	
14	Polyurethane foam	Hull manufacture /maintenance	N	

Note: methods of disposal include:

- i) collection by a municipal solid waste collector;
- ii) collection by a licensed chemical waste collector;
- iii) disposal to foul sewer in liquid form;
- iv) disposal to storm drain in liquid form;
- v) burial at pits within the site

Appendix D
(Record of Interview)

Location: Radar Station

Date: 23 March 2007

Time: 10:00am

Interviewer: Maunsell Staff

Interviewee: Representative from Marine Department

Interviewer: Is there any underground fuel tank in the Radar Station Site?

Interviewee: Yes. There is an underground fuel tank for diesel. It has been operated for more than 10 years. The fuel tank is connected to the power generator located at the standby generator room. It would be used during emergency. There is a regular check every month to ensure there is no leakage and spillage.

Interviewer: What is the capacity of the fuel tank?

Interviewee: It's around 5,000L

Interviewer: As we can see, there are several drums and plastic containers at the entrance of the standby generator room. Would you tell us what are they used for?

Interviewee: The drums and plastic containers are used for storing Omala Oil. Actually, these drums and containers are emptied. They will be collected by a registered chemical waste collector every six months. For oil after use, they have been stored inside the standby generator room

Interviewer: We have found an electricity generator in the standby generator room. What is this used for?

Interviewee: This is used for supplying electricity during emergency.

Interviewer: As we can see, there is a tank in the service tank room. Would you give us more information on this tank?

Interviewee: This tank is known as the daily tank. It is used for storing diesel fuel and has a capacity of around 200L

Interviewer: We have found a pump room at the north eastern part of the Site. What is this used for?

Interviewee: Actually, this room was used for water pumping only.

Location: Radar Station

Date: 16 April 2007

Time: 4:00pm

Interviewer: Maunsell Staff

Interviewee: Representative from China Light and Power Limited

Interviewer: Would you tell me something about these machines right in the transformer room?

Interviewee: These machines are high voltage equipment and transformer.

Interviewer: How about this containment?

Interviewee: This is the power supply for the high voltage equipment and it is made up of battery cells.

Interviewer: Is there any chemicals inside the transformer?

Interviewee: There has been insulating oils inside the transformer and the quality of the oil would be checked annually on site.

Appendix E

(Photo-documentation of Site Inspection)



Photo 1: Underground Fuel Tank Area



Photo 2: Standby Generator Room



Photo 3: Container Storage Area inside the Standby Generator Room



Photo 4: Electricity Generator inside the Standby Generator Room



Photo 5: Drip Trays Located Underneath of the Electricity Generator



Photo 6: Daily Tank inside the Service Tank Room



Photo 7: Water Pumping Facility inside Pump Room



Photo 8: Transformer Room

Appendix F
***(Questionnaires Returned
From China Light and Power Limited)***

Questionnaire on Possible Land Contamination

Name of Company: CLP Power (Hong Kong) Limited

Site Address: Radar station at Kowloon Bay

Date: 4th April 2007

Please provide the following information as fully as possible

1	What is your company's main current activities/ operations in the above address?	electricity distribution business
2	Area of your site?	Transformer room of the Radar station
3	Length of operation?	22 Years
4	Do you know the type of land use before you took over the site? (If yes, please give details.)	Yes, the transformer room is provided by customer
5	Have you ever received any notices of violation of environmental regulations or public complaints? (If yes, please give details.)	No
6	Do you have regular check for any spillage and monitoring of chemicals handled? (If yes please give details.)	Yes, half yearly substation inspection and cleaning
7	Did any tank/truck spillage or leakage happen in your site? Do you have any internal records about the type, duration and quantities? (If yes, please give details.)	No,
8	Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please give details.)	No
9	Do you have any underground storage tank? (If yes, please give details.)	No
10	Do you have any records of major renovation of your site or rearrangement of underground utilities, pipework/ underground tanks? (If yes, please give details.)	No

Please indicate whether the following materials have been used, stored or generated on the site and indicate the method of disposal.

Item	Materials	Possible Source	Yes/No	Method of Disposal (historical & current), if applicable (see <i>Note</i> below)
1	Fuels	Petroleum storage, LPG storage	No	
2	Lubricating oils, hydraulic fluids	Spillage, maintenance and dismantling of equipment, scrapped tanks and pipeworks, vehicle, vehicle maintenance	No	
3	Cleansing solvents	Engine room and equipment maintenance	No	
4	Used chemical solutions	Engine coolant, battery fluid	Yes	Return to CLPP Workshop for disposal
5	Acids	Treating steel plate to remove millscale	No	
6	Asbestos	Application and removal of engine room insulation	No	
7	Transformer oil (PCB)	Scrapped electrical equipment	No	
8	Anti-corrosive paints, thinner	Application of anti-corrosive coatings	No	
9	Coal, ash, oily tank and bilge sludge	Boiler room/engine room maintenance, tank cleaning	No	
10	Finely divided metal wastes	Grinding and milling operations, especially welding joints	No	
11	Electrical wiring	Electrical installation, maintenance, scrapped electrical equipment	Yes	Return to CLPP workshop
12	Low-level radioactive waste	Scrapped instruments	No	
13	Wood preservatives	Timber treatment	No	
14	Polyurethane foam	Hull manufacture /maintenance	No	

Note: methods of disposal include:

- i) collection by a municipal solid waste collector;
- ii) collection by a licensed chemical waste collector;
- iii) disposal to foul sewer in liquid form;
- iv) disposal to storm drain in liquid form;
- v) burial at pits within the site

Appendix G
(Responses to Comments)

**Agreement No. CE 35/2006(CE)
Kai Tak Development Engineering Study
cum Design and Construction of Advance Works
– Investigation, Design and Construction**

**Revised Contamination Assessment Plan (CAP) and
Contamination Assessment Report (CAR) for the Radar Station**

Responses to Comments

Comments Received

Date Received

1. Environmental Protection Department, DEP

21 May 2008

Agreement No. CE 35/2006(CE)
Kai Tak Development Engineering Study
cum Design and Construction of Advance Works
– Investigation, Design and Construction

Revised Contamination Assessment Plan (CAP) and
Contamination Assessment Report (CAR) for the Radar Station

Responses to Comments

<u>No.</u>	<u>Comments</u>	<u>Responses</u>
1.	<p>Environmental Protection Department, Ag. Senior EPO, memo ref. () in Ax (13) to EP2/K19/S3/10 Pt. 3 dated 13 July 2007</p> <p>I refer to your MUR confirming that you have instructed MCAL to prepare and submit, on behalf of CEDD, assessment methodologies and key assessment assumptions, etc. as required in the EIA study briefs for the captioned study for our agreement.</p> <p>2. In this connection, we have received MCAL's letter ref. IWLH:ALSD:qc:60022408/08.2-1477 dated 30.4.2008 seeking our agreement to the revised CAP (Rev.3) and CAR (Rev.1) for the captioned under Section 3.4.10.4 and 3.4.10.5 of the EIA Study Brief No. ESB-152/2006.</p> <p>3. For avoidance of doubt, I have extracted the relevant requirements of the concerned EIA study brief clause as follows:</p> <p style="text-align: center;"><u>EIA Study Brief No. ESB-152/2006</u></p> <p>S.3.4.10.4 - :<i>"During the course of the EIA study, the Applicant shall submit a contamination assessment plan (CAP) to the Director for agreement prior to conducting the contamination impact assessment of the relevant land or site(s) suspected to contain land contaminant(s) that shall require remediation. The CAP shall include proposals with details on representative sampling and analysis required to determine the nature and the extent of the contamination of the relevant land or site(s)."</i></p> <p>S.3.4.10.5 - :<i>"Based on the CAP agreed with Director, the Applicant shall conduct a land contamination impact assessment. If land contamination is confirmed, a remediation action plan (RAP) shall be prepared to formulate necessary</i></p>	

<u>No.</u>	<u>Comments</u>	<u>Responses</u>
	<p><i>remedial measures."</i></p> <p>4. As we have already pointed out previously, S3.4.10.5 does not require any submission of the CAR/RAP for your agreement. The CAR/RAP should form part of the EIA Report for approval submission under the EIAO. It is not legitimate for us to provide any form of partial agreement(s) of CAR/RAP in advance of the EIA Report approval.</p> <p>5. Please note that our comments below on the revised CAP are only provided for partial fulfilment of specific requirements for agreement stipulated in the above mentioned EIA study brief S3.4.10.4 and for radar station area only and shall not pre-empt our future decisions to the EIA report approval process for the Kai Tak Development EIA and any future related EIA studies within the Kai Tak Development EIA study area under the EIA Ordinance. Moreover, our views below shall not absolve your responsibility to fulfil requirements in other statutory legislation, including the Waste Disposal Ordinance.</p> <p>6. Subject to the above caveats, we agree that the revised CAP (Rev.3) identified in paragraph 2 above, with incorporation of the amendments below, has partially fulfilled the specific requirement for the Radar Station area stipulated in Section 3.4.10.4 of the EIA Study Brief No. ESB-152/2006 mentioned in paragraph 3 above::</p> <p>(i) In the response to comments item (7)(b)(iii)], the Consultant is of the opinion that "Since the ground of remaining areas were generally well paved with concrete and thus the contamination problem within the building area, if any, were considered to be surmountable.". Please add this opinion in Section 3.6.1 of the CAP.</p> <p>7. Please incorporate the above amendments and provide two copies of the amended CAP for our record</p>	<p>Comment noted. a new section, Section 3.6.2 has been added according to the comment.</p>

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Revised Contamination Assessment Plan (CAP) and
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Responses to Comments

Comments Received

Date Received

1. Environmental Protection Department, DEP

26 Feb 2008

Agreement No. CE 35/2006(CE)
Kai Tak Development Engineering Study
cum Design and Construction of Advance Works
– Investigation, Design and Construction

Revised Contamination Assessment Plan (CAP) and
Contamination Assessment Report (CAR) for the Radar Station

Responses to Comments

<u>No.</u>	<u>Comments</u>	<u>Responses</u>
1.	<p>Environmental Protection Department, Ag. Senior EPO, memo ref. () in Ax (13) to EP2/K19/S3/10 Pt. 3 dated 13 July 2007</p> <p>I refer to your MUR confirming that you have instructed MCAL to prepare and submit, on behalf of CEDD, assessment methodologies and key assessment assumptions, etc. as required in the EIA study briefs for the captioned study for our agreement.</p> <p>2. In this connection, we have received MCAL's letter ref. IWLH:MPLL:cassk:60022408/08.2-1115 dated 11.2.2008 seeking our agreement to the revised CAP and CAR for the captioned under Section 3.4.10.4 and 3.4.10.5 of the EIA Study Brief No. ESB-152/2006.</p> <p>3. For avoidance of doubt, I have extracted the relevant requirements of the concerned EIA study brief clause as follows:</p> <p><u>EIA Study Brief No. ESB-152/2006</u></p> <p>S.3.4.10.4 - :<i>"During the course of the EIA study, the Applicant shall submit a contamination assessment plan (CAP) to the Director for agreement prior to conducting the contamination impact assessment of the relevant land or site(s) suspected to contain land contaminant(s) that shall require remediation. The CAP shall include proposals with details on representative sampling and analysis required to determine the nature and the extent of the contamination of the relevant land or site(s)."</i></p> <p>S.3.4.10.5 - :<i>"Based on the CAP agreed with Director, the Applicant shall conduct a land contamination impact assessment. If land contamination is confirmed, a remediation action plan (RAP) shall be prepared to formulate necessary remedial measures."</i></p>	

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No.	Comments	Responses
	<p>4. Please note above that the S.3.4.10.5 does not require any submission of the CAR/RAP for our agreement. The CAR/RAP should form part of the EIA Report for approval submission under the EIAO. It is not legitimate for us to provide any form of partial agreement(s) of CAR/RAP in advance of the EIA Report approval.</p> <p>5. Regarding the revised CAP submission, according to our record, we agreed on 3.8.2007 your earlier CAP submission for the radar station area. However, we were informed on 7.10.2007 that only limited investigation could be carried out at some of the proposed sampling locations due to site constraints and this would not tally with the same plan for site investigation as stipulated in the agreed CAP. You are now seeking our agreement on the revised CAP for the radar station area.</p> <p>6. Please note that our comments below on the revised CAP are only provided for the partial fulfilment of the specific requirements for agreement stipulated in the above-mentioned EIA study brief S.3.4.10.4 and for the radar station area only and shall not pre-empt our future decisions to the EIA report approval process for the Kai Tak Development EIA and any future related EIA studies within the Kai Tak Development EIA study area under the EIA Ordinance. Moreover, our views below shall not absolve your responsibility to fulfil requirements in other statutory legislation, including the Waste Disposal Ordinance.</p> <p>7. Subject to the above caveats, we have the following comments, provided on an advisory basis, on your Consultant's submission:</p> <p>(a) Section 1.2.3 – the project proponent's intention to apply directly for Environmental Permit is irrelevant to the objectives of this CAP and shall be deleted.</p> <p>(b) Section 3.6 – (i) Please review available information for the remaining areas and provide the findings accordingly (para. 4(ii) of my memo ref. (16) in Ax(13) to EP2/K19/S3/10 Pt.4 dated 17 October 2007 refers)</p>	<p>Comment noted. Section 1.2.3 was deleted.</p> <p>Please note that available information on geology and hydrogeology, aerial photos and relevant information acquired from government department for Radar Station (including the remaining areas within the building area) has been reviewed and the findings were provided in Section 3.2-3.4.</p>

<u>No.</u>	<u>Comments</u>	<u>Responses</u>
	<p>(ii) Please provide an initial contamination evaluation of the remaining areas and possible remediation methods (para. 4(ii) of my memo ref. (16) in Ax(13) to EP2/K19/S3/10 Pt.4 dated 17 October 2007 refers)</p> <p>(iii) Please evaluate and confirm whether the contamination problem at these remaining areas would be surmountable and provide the findings accordingly (para. 4(ii) of my memo ref. (16) in Ax(13) to EP2/K19/S3/10 Pt.4 dated 17 October 2007 refers)</p> <p>(c) Section 4.1.3 – The revised CAP is for the whole radar station area, please provide supplementary sampling plan and tentative programme for the remaining areas (para. 4(ii) of my memo ref. (16) in Ax(13) to EP2/K19/S3/10 Pt.4 dated 17 October 2007 refers).</p> <p>8. In views of the comments in para. 5 above, the CAP is yet to be revised and resubmitted for our agreement.</p> <p>9. Lastly, we note that the submitted CAR has presented your Consultant's land contamination assessment findings at the outdoor area of the Radar Station only and has recommended that land contamination assessment for the area inside the building of the Radar Station be carried out upon the cessation of operation and prior to the development of the Study Area. In other words, the land contamination assessment for the whole Radar Station area cannot be completed until then. In this connection, without pre-empting our future decision under the EIAO, in case if the land contamination assessment results cannot be available and incorporated into the EIA Report and the land contamination level at the subject site and the required decontamination works are still subject great uncertainty, the project proponent's intention to apply directly for Environmental Permit for decommissioning of the the Radar Station based on the approved EIA Report seems very remote.</p>	<p>Please note that an initial land contamination evaluation to identify any contamination hotspots within Radar Station (including the remaining areas) has been conducted on 23 March 2007 and 16 April 2007. Details of the evaluation have been provided in Section 3.5.7-3.5.15.</p> <p>Based on the initial land contamination evaluation, the remaining areas of Radar Station with potential contamination concerns include standby generator room, fuel tank room and transformer room.</p> <p>Since the ground of these areas were generally well paved with concrete and the results of site investigation indicated no exceedances in Dutch B/C levels among all soil samples collected at the surrounding of the Radar Station, the contamination problem within the building area, if any, were considered to be surmountable</p> <p>A supplementary sampling plan of site investigations for the remaining areas of Radar Station has been prepared and attached as Appendix B in the CAR for Radar Station. This supplementary contamination assessment should be carried out upon the cessation of the operations and prior to the redevelopment of the Radar Station.</p> <p>Noted. The revised CAP will be resubmitted.</p> <p>The uncertainty in decontamination work is considered limited and surmountable due to the following reasons: (1) the remaining inaccessible sampling locations are located inside the building. They are much protected by the solid concrete floor. (2) The scale of the contamination as reviewed by the activities and the size of the hotspot would be small.</p>

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Kai Tak Development Engineering Study
cum Design and Construction of Advance Works
– Investigation, Design and Construction

Contamination Assessment Plan (CAP) for the Radar Station

Responses to Comments

Comments Received

Date Received

1. Environmental Protection Department, Ag. Senior EPO

13 July 2007

Agreement No. CE 35/2006(CE)
Kai Tak Development Engineering Study
cum Design and Construction of Advance Works
– Investigation, Design and Construction

Contamination Assessment Plan (CAP) for the Radar Station

Responses to Comments

<u>No.</u>	<u>Comments</u>	<u>Responses</u>
1.	<p>Environmental Protection Department, Ag. Senior EPO, memo ref. () in Ax (13) to EP2/K19/S3/10 Pt. 3 dated 13 July 2007</p> <p>I refer to your MUR confirming that you have instructed MCAL to prepare and submit, on behalf of CEDD, assessment methodologies and key assessment assumptions, etc. as required in the EIA study briefs for the captioned study for our agreement.</p> <p>2. In this connection, we have received MCAL's letter ref. PMC:NWHF:tkk:60022408/09.5-0424 dated 22.6.2007 seeking our agreement to the captioned CAP under Section 3.4.1.4 of the EIA Study Brief No. ESB-152/2006.</p> <p>3. For avoidance of doubt, I have reproduced the relevant requirements of the concerned EIA study brief clause as follows:</p> <p style="text-align: center;"><u>EIA Study Brief No. ESB-152/2006</u></p> <p>S.3.4.10.4 - :<i>"During the course of the EIA study, the Applicant shall submit a contamination assessment plan (CAP) to the Director for agreement prior to conducting the contamination impact assessment of the relevant land or site(s) suspected to contain land contaminant(s) that shall require remediation. The CAP shall include proposals with details on representative sampling and analysis required to determine the nature and the extent of the contamination of the relevant land or site(s)."</i></p> <p>4. In addition, you should also be aware that Section 3.4.10.2 of the EIA Study Brief No. ESB-152/2006 clearly defines that "Assessment Area for land contamination impact shall include all areas within the boundary of the former Kai Tak International Airport as described in section 3.2.1 (of the brief)." The Subject CAP submission is only for the radar station area and you are reminded that CAPs for other areas within</p>	

No.	Comments	Responses
	<p>the Assessment Area shall be submitted in due course for our agreement prior to conducting the contamination impact assessment of the relevant land or site(s) suspected to contain land contaminant(s) that shall require remediation in accordance with Section 3.4.10.4 of the EIA Study Brief No. ESB-152/2006.</p> <p>5. Please note that our comments below on the CAP are only provided for the partial fulfilment of the specific requirements for agreement stipulated in the above-mentioned EIA study brief clause and for the radar station area only and shall not pre-empt our future decisions to the EIA report approval process for the Kai Tak Development EIA and any future related EIA studies within the Kai Tak Development EIA study area under the EIA Ordinance. Moreover, our views below shall not absolve your responsibility to fulfil requirements in other statutory legislation, including the Waste Disposal Ordinance.</p> <p>6. Subject to the above caveats, we have the following comments, provided on an advisory basis, on your Consultant's submission:</p> <p>(a) Section 3.1 – (i) Please provide drawing(s) showing the layout (in particular the internal layout) and typical cross section of the Radar Station. (ii) Please provide information (including a drawing and/or photographs) regarding the sensitive receptors in the general vicinity of the subject Site.</p> <p>(b) Section 3.3.2 – According to the records provided by EPD (Appendix A refers), the subject Site was registered as a chemical producer since 1993. Please clarify and amend the text accordingly.</p> <p>(c) Section 3.5 – Please provide drawing(s) showing the location and layout of the underground fuel tank, standby generator room, service tank room, pump room, transformer room, etc.</p>	<p>Comment noted. The general layout plans of the Radar Station have been provided in Appendix A of the revised CAP. As stated in Section 3.1.1, surrounding environment of the Radar Station is mainly industrial and commercial landuses. A drawing showing the general vicinity of the Radar Station has been provided as Drawing 3.1 in the revised CAP.</p> <p>Please note that there had not been any registered chemical waste producer within the Radar Station according to the information provided from EPD as attached in Appendix B in the revised CAP. The chemical producer registered since 1993 should be the Electrical and Mechanical Services Department, Kowloon Bay Vehicle Servicing Station, instead of the Radar Station.</p> <p>Comment noted. The location and the general layout of the underground fuel tank, standby generator room, service tank room, pump room, transformer room and other associated facilities of the Radar Station have now been provided in Appendix A in the revised CAP.</p>

<u>No.</u>	<u>Comments</u>	<u>Responses</u>
	<p>of the subject Site.</p> <p>(d) Section 3.5.7 – Should the last sentence be read as “Therefore, no borehole is proposed in this open area near the entrance of the standby generator room”? Please amend the text as necessary.</p> <p>(e) Section 4.10.5 – It should be noted that landfill disposal should only be considered as the last resort.</p> <p>(f) Drawing 3.1 – (i) For the sake of completeness, please also provide photographs showing the details and existing condition of the area around the proposed boreholes B-06, B-07 and B-08. (ii) Please insert a note to indicate that all proposed boreholes will also serve as groundwater monitoring/sampling wells (Section 4.6.2 refers).</p> <p>7. In views of the comments in para. 5 above, the CAP is yet to be revised and resubmitted for our agreement.</p>	<p>Comment noted and the last sentence of Section 3.5.7 has been revised as “Therefore, no borehole is proposed in the area near the entrance of the standby generator room”.</p> <p>As stated in Section 4.10.4, landfill disposal should only be considered as the last resort.</p> <p>Comment noted and the photographs taken near the proposed boreholes B-06, B-07 and B-08 have been added to Drawing 3.2 of the revised CAP. It should be noted that no photograph was allowed to be taken inside the transformer room (i.e. borehole B-06) as informed by CLP.</p> <p>A note indicating that groundwater monitoring/sampling wells should be constructed if groundwater is encountered during excavation has also been appended in Drawing 3.2.</p>