MTR Corporation Limited

Shatin to Central Link
Hung Hom to Admiralty Section

Contamination Assessment Plan

(Nov 2012)

Verified by: Tom Chapman

Position: Independent Environmental Checker

Date: 6/11/12

MTR Corporation Limited

Shatin to Central Link
Hung Hom to Admiralty Section

Contamination Assessment Plan

(Nov 2012)

Certified by: Richard Kwan

Position: Environmental Team Leader

Date: 9 November 2012

AECOM

MTR Corporation Limited

Consultancy Agreement No. C11033B

Shatin to Central Link – Hung Hom to Admiralty Section [SCL (HUH-ADM)]

Contamination Assessment Plan

November 2012

	Name	Signature
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Reviewed & Approved:	Josh Lam	

Version:	B	Date: 2 November 2012

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1 INTRODUCTION

1.1 Background

1.1.1 Shatin to Central Link – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (the Project), is approximately 6km long which extends from the existing East Rail Line across the harbour to Exhibition Station (EXH) and Admiralty Station (ADM).

1.1.2 The EIA Report for SCL (HUH-ADM) (Register No.: AEIAR-166/2012) was approved with conditions on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) was granted on 22 March 2012 (EP No: EP-436/2012) for the construction and operation of the SCL (HUH-ADM).

1.1.3 During the time of the SCL (HUH-ADM) EIA study, the proposed site investigation (SI) works were divided into two stages as outlined in the approved Contamination Assessment Plan in SCL (HUH-ADM) EIA Report (CAP/EIA). Stage 1 SI works had been conducted for all accessible sites. Due to land use and site constraints, SI was not conducted for the potentially contaminated site at the southeast corner of Wan Chai Swimming Pool (aboveground diesel storage tanks at Wan Chai Swimming Pool) under Stage 1. The investigation for the aboveground diesel tanks at Wan Chai Swimming Pool would be conducted in Stage 2 after decommissioning of existing buildings and access has been granted.

1.1.4 Pursuant to EP Condition 2.24, extent and level of land contamination at the existing aboveground diesel tanks for Wan Chai Swimming Pool as shown in **Figure C11033B/C/SCL/ACM/M57/002** shall be determined and necessary remedial measures shall be formulated. A Contamination Assessment Plan (CAP) shall be proposed with details of representative sampling and analysis required to determine the nature and extent of contamination. A Contamination Assessment Report (CAR) shall be submitted to document the findings of the land contamination investigation works. If land contamination is confirmed, a Remedial Action Plan (RAP) shall be submitted to formulate necessary remedial measures. No demolition of the existing aboveground diesel tank for Wan Chai Swimming Pool should be carried out before the CAR/RAP is approved.

1.2 Objectives

1.2.1 This CAP is prepared for submission to EPD for approval as per EP Condition 2.24. This CAP provides details of representative sampling and analysis required to determine the nature and extent of contamination at the aboveground diesel tanks for Wan Chai Swimming Pool.

2 FINDINGS OF PREVIOUS LAND CONTAMINATION ASSESSMENT AND CURRENT SITE CONDITION

2.1.1 According to the approved CAP/EIA, the potential land contaminative activities identified at southeast corner of Wan Chai Swimming Pool (Area 2-15) are summarized in **Table 2.1**. The sampling requirements in the CAP/EIA is extracted and provided in **Appendix A**. It was proposed that soil/groundwater samples from Area 2-15 should be analysed for Lead, Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX), Polyaromatic Hydrocarbons (PAHs) and Total Petroleum Hydrocarbon (TPH).

Table 2.1 Potential Contaminative Land uses within Area 2-15

Potential Contaminative Area	Potential Contamination Impact
Aboveground diesel storage tanks	Possible spillage/leakage of diesel during product handling

2.1.2 One borehole WCH-1 was proposed in CAP/EIA at Area 2-15, as shown in **Figure C11033B/C/SCL/ACM/M57/003**. Soil samples were proposed to collect at depth 0.5m, 1.5m, 3.0m, 6.0m and further with 3.0m interval to the bottom of excavation or upon encountering bedrock, whichever would be shallower if there would be excavation works greater than 6.0m. It was also proposed to collect groundwater sample if encountered.

2.1.3 The land use of the site remains the same as that in the CAP/EIA. As such, no change in the subsurface condition of the site is expected. The sampling and analysis requirements proposed in the CAP/EIA are considered still valid.

3 SAMPLING PLAN FOR SITE INVESTIGATION

3.1 Sampling Locations

3.1.1 A site inspection was conducted on 26 October 2012. Two 10,000 litre capacity aboveground fuel oil tanks provide a diesel fuel supply to a boiler room located 20m north of the tanks. The tanks were erected in 1984. Each tank is supported on a concrete plinth situated within an uncovered oil tight concrete bund of about 2m high. The concrete bund floor is graded to direct rain water to a grated sump which discharges via a buried drain pipe and valve pit and an oil interceptor prior to discharge to an offsite drain. All pipelines within the bund are elevated to about 300mm from ground surface. The concrete surfaces of the floor and wall within the bund are intact and absent of cracks or oil stains. Site staff reported that there have been no leakage incidents and as such regular cleaning of the oil-interceptor has not been required since operations commenced. The pipelines connecting the boiler room and tanks are underground and are noted to be in a trench within the boiler room. The trench is intact and absent of crack or oil stain. Photographs are shown in **Appendix B** for reference. Oil Tank Plan and Detail Drawing are shown in **Appendix C**.

3.1.2 For the aboveground diesel tanks and pipelines in the boiling room/tank bund, oil leakage is not suspected based on observation of site conditions, operational practice and supplied engineering details. As per EP Condition 2.24, demolition of the existing Wan Chai Swimming Pool aboveground diesel tank should not be carried out before the CAR/RAP is approved. In order to maintain undisruptive service to the user of Wanchai Swimming Pool, reprovisioning work of the Swimming Pool in Area 2-15 has to commence before decommissioning the existing swimming pool.

3.1.3 Sinking borehole WCH-1 at the originally proposed location (within the aboveground diesel tank containment) is not feasible because it will affect the operation of the oil tanks, which serves the existing swimming pool, therefore it is proposed to relocate borehole WCH-1 several meters north-west to a new location WCH-1S. This revised location is proposed close to the point where the supply pipeline turns from aboveground to underground and is more likely location to intercept contamination that may have resulted from leaking engineering (if any). With anticipated groundwater flow to the north and towards Victoria Harbour, the location of proposed borehole WCH-1S is also designed to intercept any contamination down gradient of the fuel tanks under the anticipated groundwater flow. Sampling details are summarized in **Table 3.1**. The sampling locations are shown in **Figure C11033B/C/SCL/ACM/M57/003**.

Table 3.1 Sampling Locations

Sampling ID	Co-ordinates		Deviation from proposed location in CAP/EIA (m)
	Easting	Northing	
Proposed Sampling ID and Coordinate in approved CAP/EIA			
WCH-1	836278.78	815799.64	NA
Proposed Sampling ID and Coordinate in this CAP			
WCH-1S	836274.37	815803.04	5.6

3.2 Sampling Parameters

3.2.1 Since there is no change of land use and contamination source, the selection of chemical of concerns remains the same as CAP/EIA. Soil samples will be analyzed for Lead, BTEX, PAHs and TPH while groundwater samples will be analyzed for BTEX, PAHs and TPH.

3.3 Soil Sampling Method and Depth of Sampling

3.3.1 All soil boring / excavation and sampling should be supervised by a land contamination specialist.

3.3.2 Borehole should be advanced by means of dry rotary drilling method, i.e. without the use of flushing medium as far as applicable. For safety reasons, an inspection pit should be excavated down to 1.5m below ground to inspect for underground utilities at the proposed borehole location. If necessary, other forms (e.g. ground penetration radar, metal detection) of utilities checking should be performed to ensure clearance of underground structures. Disturbed soil samples should be collected at the depth of 0.5 m below ground surface (bgs), and 1.5 m bgs if inspection pit was excavated.

3.3.3 If there is no excavation works or excavation works not more than 6 m at Area 2-15, soil boring should be undertaken to a depth of 6.0 m bgs. If excavation deeper than 6 m is planned, drilling should be undertaken to the specified depth or upon encountering bedrock or 2 m under groundwater table, whichever is shallower.

3.3.4 Soil boring using drill rigs should then be performed for depth from 1.5 m to the maximum boring depth. Undisturbed soil samples shall be collected by sampler (e.g. U100/U76) made of stainless steel or other materials considered appropriate at 3 m and 6 m bgs and at 3 m intervals for deeper excavations. Where there are suspected signs of contamination, extra samples should be taken for laboratory analysis. If there are any spatial and/ or headroom constraints for the proposed borehole(s), trial pit(s) should be considered as an alternative to collecting the soil samples.

3.3.5 At each sampling depth, sufficient quantity of soil sample (as specified by the laboratory) should be taken. Sample containers should be laboratory cleaned, sealable, water-tight, made of suitable material to prevent cross contamination, reaction or adsorption of contaminants with the container surface. Container requirements are shown at **Table 3.2**. All soil samples should be uniquely labelled and documented on a Chain of Custody form. Backup samples should be retained and stored at 0 - 4 ºC in laboratory.

Table 3.2 Soil Sample Container Requirements

Test Parameter	Container Type (Preservation)
All testing	250 g glass soil jar with Teflon lined lid (without preservative)

* Sample size shall be specified by the laboratory

3.4 Strata Logging

3.4.1 Strata logging for borehole should be undertaken during the course of drilling/ digging by a qualified geologist. The log should include the general stratigraphical 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.

3.5 Free Product and Groundwater Level Measurement

3.5.1 The thickness of any free product and groundwater 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.

3.6 Groundwater Sampling

3.6.1 It is proposed to collect groundwater samples if groundwater is encountered at the sampling locations. If groundwater is encountered at the borehole, a groundwater well should be installed into the borehole if it is feasible upon considerations of engineering constraints. A typical design of the groundwater sampling well is shown in **Figure C11033B/C/SCL/ACM/M57/004**, however installation of the well should take into account of local conditions.

3.6.2 The well should first be developed by removing approximately five well volumes of groundwater to remove silt and drilling fluid residue (if present) from the well. The well should then be allowed to stand for 24 hours to permit groundwater conditions to equilibrate. Groundwater levels and thickness of free product layer, if present, should be measured at each well before groundwater samples are taken.

3.6.3 Prior to groundwater sampling, the monitoring well 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.

3.6.4 After purging, one groundwater sample should first be collected using a decontaminated stainless steel or Teflon bailer and placed into a decontaminated container with the following water quality parameters recorded using a water quality meter; temperature, pH, total dissolved solids, dissolved oxygen, and Redox potential.

3.6.5 One groundwater sample should then be collected using a decontaminated stainless steel or 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.

3.6.6 Trial pits are to be considered as an alternative for sampling due to any constraints such as overhead access. Groundwater samples should also be collected at all trial pits if it is encountered during excavation. Groundwater from trial pits should be collected using a decontaminated bucket. Water quality parameters should also be recorded where the volume of water is great enough (priority should be placed on collecting a groundwater sampling for laboratory analysis).

3.6.7 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 4ºC until delivered to the analytical laboratory.

3.7 Sample Size and Decontamination Procedures

3.7.1 All equipment in contact with the ground or groundwater should be thoroughly decontaminated between each excavation, drilling and sampling event to minimize the potential for cross contamination. The equipment (including trial 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.

3.7.2 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.

3.7.3 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 analyzed for BTEX and TPH.

3.7.4 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 ºC but never frozen. Samples should be delivered to laboratory within 24 hours of the samples being collected and analyzed within the respective retention period for the requested analysis but should not more than 10 days. Container requirements are shown at **Table 3.3**.

Table 3.3 Groundwater Sample Container Requirements

Test Parameter	Container Type (Preservation)
BTEX, TPH C6-C8	100mL Amber vials (with hydrochloric acid)
PAHs and TPH C9-C16, C17-C35	1L Amber glass bottle (without preservative)

* Sample size shall be specified by the laboratory

3.8 QA/QC Procedures

3.8.1 QA/QC samples should be collected with reference to the following frequency criteria where appropriate during the SI Chain of Custody protocol should be adopted.

- 1 duplicate per 20 samples for the full suite analysis;
- 1 equipment blank per 20 samples for the full suite analysis;
- 1 field blank per 20 samples for the full suite analysis; and
- 1 trip blank per trip for the analysis of volatile parameters (BTEX and TPH C6-C8).

3.9 Laboratory Analysis

3.9.1 Laboratory analysis is proposed in order to screen the presence of potential contaminants that are of concern at the area. **Table 3.2** summarises the parameters, the minimum requirement of the reporting limits and reference methods for the laboratory analysis of soil and groundwater samples.

Table 3.4 Parameters, Reporting Limits and Reference Methods for Laboratory Analysis

Parameter	Soil		Groundwater	
	Reporting Limit (mg/kg)	Reference Method	Reporting Limit (µg/L)	Reference Method
BTEX				
Benzene	0.5	USEPA 8260	5	USEPA 8260
Toluene	0.5		5	
Ethylbenzene	0.5		5	
Total Xylenes	1.5		15	
TPH				
TPH (C6-C8)	5	USEPA 8015	20	USEPA 8015
TPH (C9-C16)	200		500	
TPH (C17-C35)	500		500	
Metal				
Lead	1	USEPA 6020	N/A	N/A
PAHs				

Parameter	Soil		Groundwater	
	Reporting Limit (mg/kg)	Reference Method	Reporting Limit (µg/L)	Reference Method
Acenaphthene	0.5	USEPA8260B	2	USEPA8260B
Acenaphthylene	0.5		2	
Anthracene	0.5		2	
Benzo(a)anthracene	0.5		N/A	
Benzo(a)pyrene	0.5		N/A	
Benzo(b)fluoranthene	0.5		1	
Benzo(g,h,i)perylene	0.5		N/A	
Benzo(k)fluoranthene	0.5		N/A	
Chrysene	0.5		1	
Dibenzo(a,h)anthracene	0.5		N/A	
Fluoranthene	0.5		2	
Fluorene	0.5		2	
Indeno(1,2,3-cd)pyrene	0.5		N/A	
Naphthalene	0.5		2	
Phenanthrene	0.5		2	
Pyrene	0.5		2	

* N/A: Not available

3.9.2 For sampling and laboratory analysis, Chain of Custody procedure should be included as QA/QC procedure.

3.9.3 All laboratory analysis for soil and groundwater samples should be conducted by a Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory. All laboratory test methods should be accredited by the HOKLAS or one of its Mutual Recognition Arrangement partners as stated in **Table 3.4** or as agreed by EPD. It should be noted that alternative methods or similar reporting limits may be used subject to the laboratory availability and capability. The relevant supporting document of the laboratory to be employed for this study should be given in the CAR/RAP.

3.9.4 Extra soil samples shall be stored at 0-4 ºC and tested for Toxicity Characteristics Leaching Procedure (TCLP) before submission of RAP for consideration of excavation and landfill disposal. The criteria are set primarily in terms of TCLP limits shown in **Table 3.5**.

Table 3.5 Laboratory Testing Requirements for TCLP Analysis

Parameter	Reference Method*	Reporting Limit (mg/L)	Landfill Disposal Criteria TCLP Limit (mg/L)
Antimony	USEPA1311, USEPA6020 & USEPA 7112	0.1	150
Arsenic		0.1	50
Barium		0.1	1000
Beryllium		0.1	10
Cadmium		0.02	10
Chromium		0.1	50
Copper		0.1	250
Lead		0.1	50
Nickel		0.1	250
Selenium		0.1	1
Silver		0.1	50
Thallium		0.1	50
Tin		0.1	250

Parameter	Reference Method*	Reporting Limit (mg/L)	Landfill Disposal Criteria TCLP Limit (mg/L)
Vanadium		0.1	250
Zinc		0.1	250
Mercury		0.01	1

* Equivalent internationally recognized standard methods could also be used.

3.10 Health and Safety

3.10.1 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.

3.10.2 Extreme care should be exercised when toxic gases or other hazardous materials are encountered. Any abnormal conditions found shall be reported immediately to the Site supervisor.

3.10.3 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, in addition to normal Personal Protective Equipment such as Safety helmet, reflective vest and protective boots.

4 INTERPRETATION OF LABORATORY RESULTS

4.1.1 The laboratory results will be interpreted with reference to the *Guidance Note for Contaminated Land Assessment and Remediation, Practice Guide for Investigation and Remediation of Contaminated Land* and *Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management*. Soil and groundwater samples collected for this study will be referenced to those Risk-based Remediation Goals (RBRGs) presented in Table 2.1 and Table 2.2 as stipulated in the *Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management*.

4.1.2 The RBRGs are developed based on a risk assessment approach to suit the local environmental conditions and community needs in Hong Kong. Decisions on contaminated soil and groundwater remediation are based on the nature and extent of the potential risks that are posed to human receptors as a result of exposure to chemicals in the soil and/or groundwater. RBRGs are developed for four different land use scenarios reflecting the typical physical settings in Hong Kong under which people could be exposed to contaminated soil and groundwater. A description of each land use scenario is as follows:

- Urban residential – Sites located in an urban area where main activities involve habitation by individuals. The typical physical setting is a high rise residential building situated in a housing estate that has amenity facilities such as landscaped yards and children's playgrounds. The receptors are residents who stay indoors most of the time except for a short period each day, during which they are outdoors and have the chance of being in direct contact with soil at landscaping or play areas within the estate.

- Rural residential – Sites located in a rural area where the main activities involve habitation by individuals. These sites typically have village-type houses or low rise residential blocks surrounded by open space. The receptors are rural residents who stay at home and spend some time each day outdoors on activities such as gardening or light sports. The degree of contact with the soil under the rural setting is more than that under the urban setting both in terms of the intensity and frequency of contact.

- Industrial – Any site where activities involve manufacturing, chemical or petrochemical processing, storage of raw materials, transport operations, energy production or transmission, etc. Receptors include those at sites where part of the operation is carried out directly on land and the workers are more likely to be exposed to soil than those working in multi-storey factory buildings.

- Public parks – Receptors include individuals and families who frequent parks and play areas where there is contact with soil present in lawns, walkways, gardens and play areas. Parks are considered to be predominantly hard covered with limited areas of predominantly landscaped soil. Furthermore, public parks are not considered to have buildings present on them.

4.1.3 In addition to the RBRGs, screening criteria (soil saturation limits, C_{sat}, developed for Non-aqueous Phase Liquid [NAPL] in soil and water solubility limits for NAPL in groundwater) for the more mobile organic chemicals must be considered to determine whether a site requires further action.

4.1.4 Since this Project involves the construction of a new railway, the area is considered to be occupied for industrial purpose in the future and therefore RBRGs for Industrial Land Use will be adopted as the assessment criteria for this land contamination assessment. Relevant soil and groundwater RBRGs for this land contamination study including the Soil Saturation and Solubility Limits are presented in **Table 4.1**.

Table 4.1 Relevant RBRGs for Soil and Groundwater

Parameter	Soil (mg/kg)		Groundwater (mg/L)	
	RBRGs for Industrial	Soil Saturation Limits (Csat)	RBRGs for Industrial	Solubility Limits
BTEX				
Benzene	9.21	336	54	1,750
Toluene	10,000*	235	10,000*	526
Ethylbenzene	8,240	138	10,000*	169
Total Xylenes	1,230	150	1,570	175
TPH				
TPH (C6-C8)	10,000*	1,000	1,150	5.23
TPH (C9-C16)	10,000*	3,000	9,980	2.8
TPH (C17-C35)	10,000*	5,000	178	2.8
Metals				
Lead	2,290	N/A	N/A	N/A
PAHs				
Acenaphthene	10000*	60.2	10000*	4.24
Acenaphthylene	10000*	19.8	10000*	3.93
Anthracene	10000*	2.56	10000*	0.0434
Benzo(a)anthracene	91.8	N/A	N/A	N/A
Benzo(a)pyrene	9.18	N/A	N/A	N/A
Benzo(b)fluoranthene	17.8	N/A	7.53	0.0015
Benzo(g,h,i)perylene	10000*	N/A	N/A	N/A
Benzo(k)fluoranthene	918	N/A	N/A	N/A
Chrysene	1140	N/A	812	0.0016
Dibenzo(a,h)anthracene	9.18	N/A	N/A	N/A
Fluoranthene	10000*	N/A	10000*	0.206
Fluorene	10000*	54.7	10000*	1.98
Indeno(1,2,3-cd)pyrene	91.8	N/A	N/A	N/A
Naphthalene	453	125	862	31
Phenanthrene	10000*	28	10000*	1
Pyrene	10000*	N/A	10000*	0.135

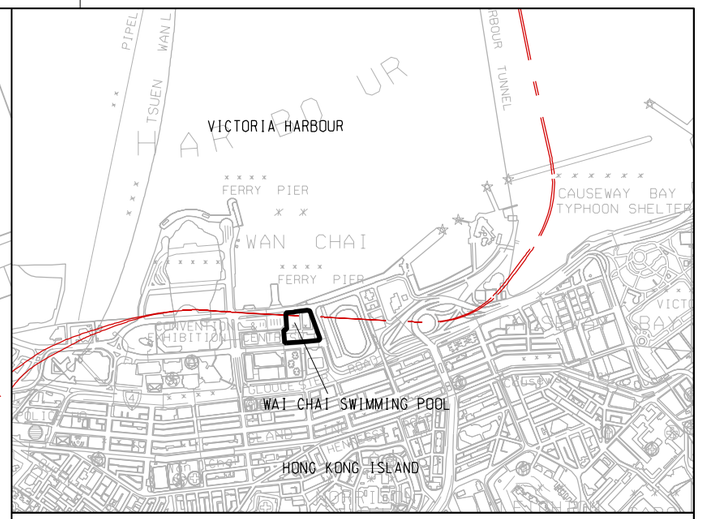
Note:
N\A - Not Available
* indicates a “ceiling limit’ concentration.

5 REPORTING

5.1.1 After completion of the site investigation, a CAR which documents the findings of the SI works and assessment on the nature and extent of land contamination shall be submitted to EPD endorsement no later than one month after the completion of SI works.

5.1.2 If land contamination is confirmed within this area, a RAP which formulates remedial measures should be submitted to EPD for endorsement. The contaminated site should be cleaned up according to the approved RAP and a Remediation Report (RR) to demonstrating completion of remedial actions should be prepared and submitted to EPD for endorsement prior to the commencement of construction works at the existing above-ground diesel tanks.

FIGURE



KEY PLAN

Harbour Road Sports Centre

Wanchai Swimming Pool

HARBOUR ROAD

TONNOCHY ROAD

EW

0 5 10 15 20 25

METRES

1 : 500

LEGEND :

- PROPOSED ALIGNMENT
- BOUNDARY OF ABOVEGROUND DIESEL STORAGE TANKS
- BOUNDARY OF AREA 2-15

PLOT DRV: $PLTDRV$
MODELNAME: $MODEL$
FILENAME: $FILE$

PRINTED BY: $USER$ $DATE$ $TIME$

REV	DESCRIPTION	BY	DATE	APPROVED
REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	RCCP
DESIGNED	RCCP
CHECKED	RCCP
APPROVED	PDA
DATE	6/SEP/2012

MTR

SHATIN TO CENTRAL LINK

ORIGINATOR

AECOM

CADD REF. C11033B_C_SCL_ACM_M57_002.dgn

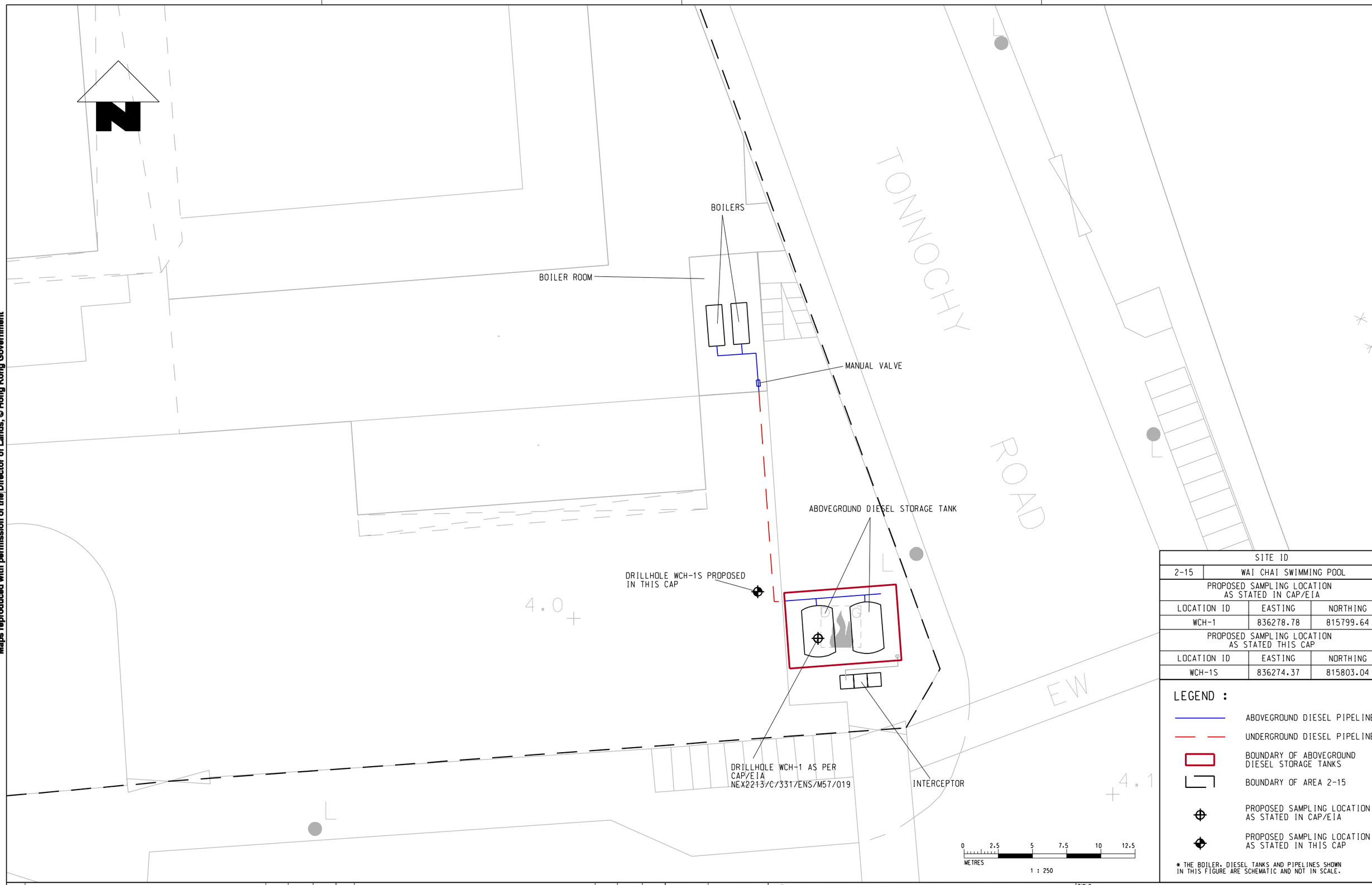
TITLE

C11033B
SCL (HUH-ADM)
CONTAMINATION ASSESSMENT PLAN
SITE LOCATION PLAN

SCALE 1 : 500 (A3)

FIGURE NO. C11033B/C/SCL/ACM/M57/002

REV. B



SITE ID	
2-15	WAI CHAI SWIMMING POOL

PROPOSED SAMPLING LOCATION AS STATED IN CAP/EIA		
LOCATION ID	EASTING	NORTHING
WCH-1	836278.78	815799.64

PROPOSED SAMPLING LOCATION AS STATED THIS CAP		
LOCATION ID	EASTING	NORTHING
WCH-1S	836274.37	815803.04

LEGEND :

- ABOVEGROUND DIESEL PIPELINE
- UNDERGROUND DIESEL PIPELINE
- BOUNDARY OF ABOVEGROUND DIESEL STORAGE TANKS
- BOUNDARY OF AREA 2-15
- PROPOSED SAMPLING LOCATION AS STATED IN CAP/EIA
- PROPOSED SAMPLING LOCATION AS STATED IN THIS CAP

* THE BOILER, DIESEL TANKS AND PIPELINES SHOWN IN THIS FIGURE ARE SCHEMATIC AND NOT IN SCALE.

PLOT DRV: $PLTDRV$
MODELNAME: $MODEL$
FILENAME: $FILE$
PRINTED BY: $USER$ $DATE$ $TIME$

REV	DESCRIPTION	BY	DATE	APPROVED
REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	
DESIGNED	RCCP
CHECKED	RCCP
APPROVED	PDA
DATE	26/OCT/2012

MTR

SHATIN TO CENTRAL LINK

ORIGINATOR

AECOM

CADD REF. C11033B_C_SCL_ACM_M57_003.dgn

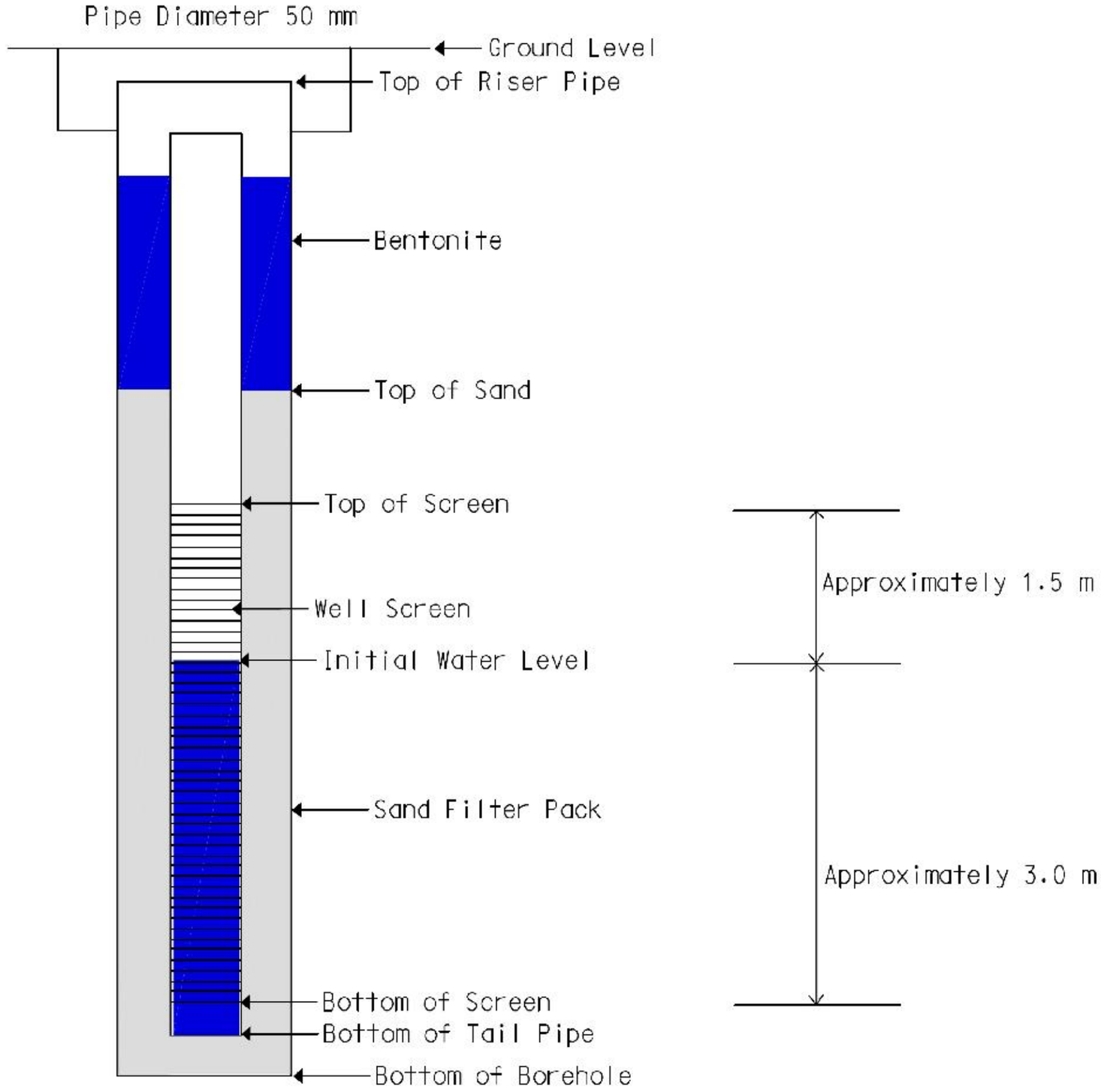
TITLE

C11033B
SCL (HUH-ADM)
CONTAMINATION ASSESSMENT PLAN
PROPOSED SAMPLING LOCATION

SCALE 1 : 250 (A3)

FIGURE NO. C11033B/C/SCL/ACM/M57/003

REV. B



REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	RCCP
DESIGNED	RCCP
CHECKED	RCCP
APPROVED	PDA
DATE	6/SEP/2012

MTR

SHATIN TO CENTRAL LINK

ORIGINATOR

AECOM

CADD REF. C11033B_C_SCL_ACM_M57_003.dgn

TITLE
C11033B
SCL (HUH-ADM)
CONTAMINATION ASSESSMENT PLAN
TYPICAL DESIGN OF GROUNDWATER SAMPLING WELL

SCALE NOT TO SCALE | FIGURE NO. C11033B/C/SCL/ACM/M57/004 | REV. A

PLOT DRV: $PLTDRVL$
MODELNAME: $MODEL$
FILENAME: $FILE$
PRINTED BY: $USER$ $DATE$ $TIME$

APPENDIX A

SAMPLING AND TESTING REQUIREMENT PROPOSED IN THE APPROVED CAP/EIA

Land Ref. No.	Site ID	Historical Land Use	Current Land Use*	Site Appraisal Results	Further Site Investigation Necessary?	Justification and Hotspots Identified	Figure Reference
WS. 123	2-14	Sea, reclaimed area, open storage	Wan Chai Sports Ground and Hong Kong Electric Co. Ltd. (HEC) Wan Chai Station Building	• This area covers a section of Wan Chai Sports Ground and the HEC Station Building	No	No adverse contaminated land impacts are identified based on site appraisal. TBM will be adopted for tunnel construction in this area; no surface excavation is expected	NEX2213/C/331 /ENS/M57/007 & NEX2213/C/331/ ENS/M57/018
WA. 110	2-07	Sea, reclaimed area, low-rise concrete building, vacant area	Harbour Rd. Garden	• Recreational garden covered by plants, with a lake onsite	No	No adverse contaminated land impacts are identified based on site appraisal.	NEX2213/C/331 /ENS/M57/008 & NEX2213/C/331/ ENS/M57/019
WS. 125	2-15	Sea, reclaimed area, open storage	Sports facilities (Harbour Road Sports Centre, WCSP) and associated facilities (e.g. substation, filtration plant room)	• Two aboveground diesel storage tanks (approx. 4,500 L each) connected (suspected through underground pipelines) to the boiler were at the intersection of Tonnochy Road and Harbour Road southeast of WCSP • The Hongkong Electric Company Ltd. (HEC) Wan Chai Recreation Centre Stage 2 Substation was observed east of the WCSP. According to HEC, this substation has been in operation for more than 20 years; it has no chemical storage and does not use PCB onsite. The reconditioning of the non-PCB transformer oil is performed once every4 years in an oil treatment plant offsite, according to the HEC personnel. • A filtration plant room was observed south of the WCSP • Several store rooms for chemicals for disinfection in the swimming pool, including NaOCL Tank Room, Common Salt Room, Brine Tank Room, Soda/Alum Store and HCL Tank Room, were found south of the WCSP	Yes (for the aboveground diesel tanks of WCSP only)	• <u>Aboveground diesel tanks:</u> possible leakage/ spillage of diesel during handling • Approximate area for this potentially contaminating land use: 10 m^2	NEX2213/C/331 /ENS/M57/008 & NEX2213/C/331/ ENS/M57/019

Table 5.2 Sampling and Testing Plan of SI Works for Sites upon Decommissioning

Site ID	Potential Hotspot Identified	Sampling Location/ Sampling ID	Sampling Method	Sample Matrix		Parameters to Be Tested	Figure Reference
Area 2							
2-15	Aboveground diesel tanks in WCSP Approx. area of 10 m^2	One sampling location at the tank for preliminary investigation WCH-1	Borehole	Soil	Soil samples at depths of 0.5, 1.5, 3.0 and 6.0 m; further with 3.0 m intervals to the bottom of excavation or upon encountering bedrock, whichever is shallower if there is excavation works greater than 6.0 m Since this site is within the hoarding area where excavation/ ground works are expected, visual inspection should be conducted to detect any abnormal colour, smell or other characteristics of the soil during demolition and excavation	Lead, BTEX, PAHs, TPH	NEX2213/C/331/ENS/M57/019
				GW	One GW sample per location if encountered.	BTEX, PAHs, TPH	

Notes:
1. GW = Groundwater; bgs = below ground surface.
2. VOCs = The whole list of COCs listed under VOCs in Appendix IV of Guidance Note 1; SVOCs = The whole list of COCs listed under SVOCs in Appendix IV of Guidance Note 1.
3. BTEX = *Benzene*, *Toluene*, *Ethylbenzene* and *Xylene*.
4. PAHs = The whole of COCs listed under group of SVOCs in the RBRGs Table except *bis-(2-Ethylhexyl)phthalate*, *Hexachlorobenzene* and *Phenol.* Since RBRGs value of *Benzo(a)anthracene Benzo(a)pyrene*, *Benzo(g,h,i)perylene Benzo(k)fluoranthene Dibenzo(a,h)anthracene and Indeno(1,2,3-cd)pyrene* were not available for groundwater, the captioned chemicals parameters would not be tested in groundwater sample.
5. Heavy Metals - The whole list of COCs listed under Metals in Appendix IV of Guidance Note 1.
6. Since the RBRGs value of *Benzo(a)anthracene Benzo(a)pyrene, Benzo(g,h,i)perylene Benzo(k)fluoranthene bis-(2-Ethylhexyl)phthalate Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene* and *Phenol* were not available for groundwater, the captioned chemicals parameters would not be tested in the groundwater sample.
7. 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 bgs subject to site conditions

APPENDIX B

PHOTOGRAPHIC LOG

Photographic log

Client Name:	Site Location:	Project No.
MTRC	Wan Chai Swimming Pool	60273419

Photo No.	Date:
1	26 Oct, 2012

Direction Photo Taken:

Northeast

Description:

Overview of the site.

Approximate alignment of underground pipeline is also drawn.

Approximate alignment of underground pipeline

Photo No.	Date:
2	26 Oct, 2012

Direction Photo Taken:

North

Description:

Overview of Aboveground Diesel Tanks

A 2-m high bund encloses the tanks for containment. The only drain in the bund is at the southeast corner which further connected to an interceptor and then to public sewage.

The product pipeline within the bund is aboveground.

Photo No. 3	Date: 26 Oct, 2012

Direction Photo Taken:

West

Description:

The tanks and pipeline in the bund are elevated. No sign of leakage was observed. The concrete surface and wall of the bund is intact and with no oil stain.

Photo No. 4	Date: 26 Oct, 2012

Direction Photo Taken:

West

Description:

Two boilers in the boiler room are shown in the photo.

The product delivery pipeline is shown. The pipeline is placed at a trench which as act as a secondary containment. No sign of leakage was observed in the trench and concrete surface.

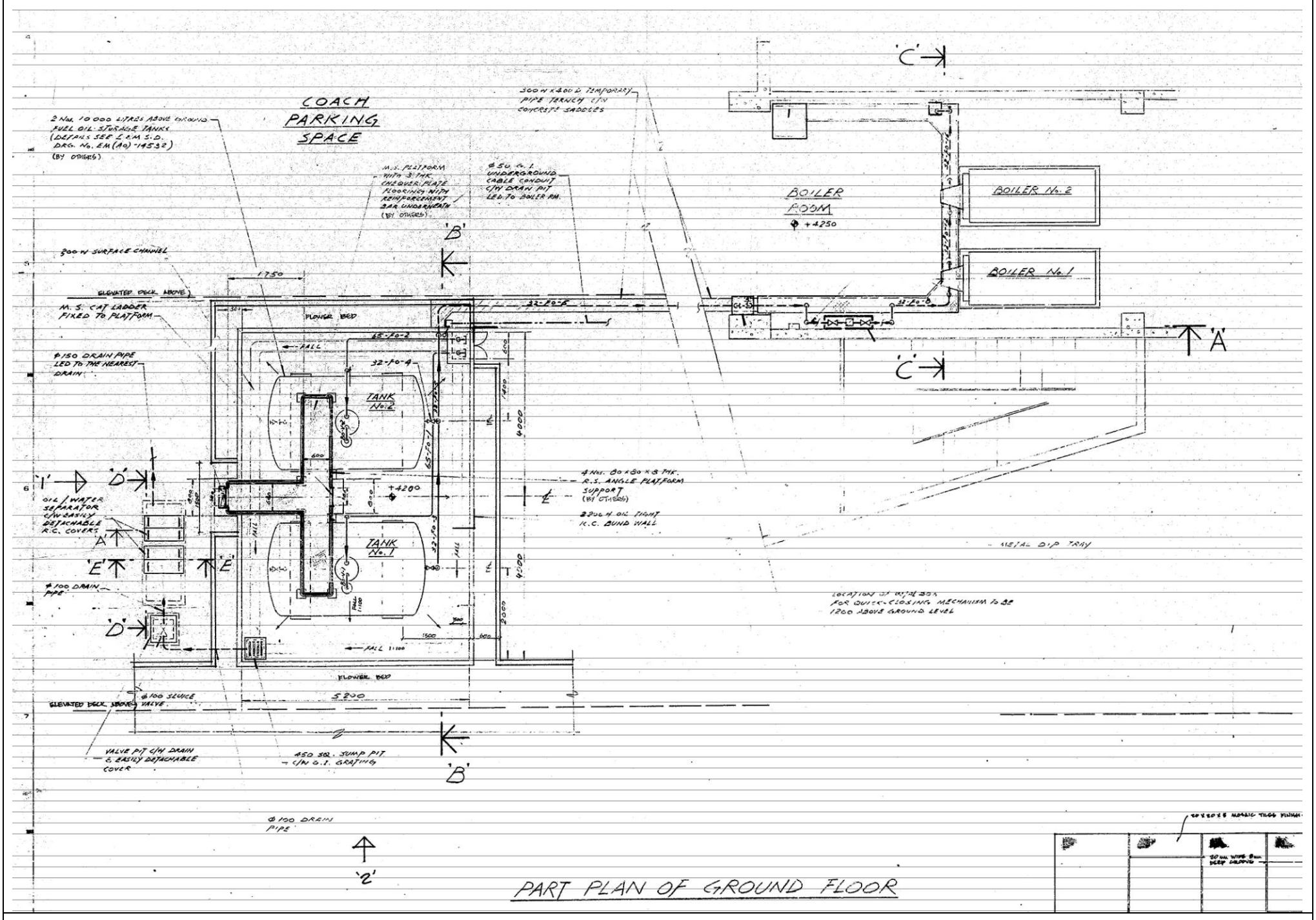
Photo No. 5	Date: 26 Oct, 2012
Direction Photo Taken: East	
Description: Feed in location of the pipeline to the boiler room. The pipeline is placed in trench from here to the boiler.	

Photo No. 6	Date: 26 Oct, 2012
Direction Photo Taken: East	
Description: Pipeline Trench	

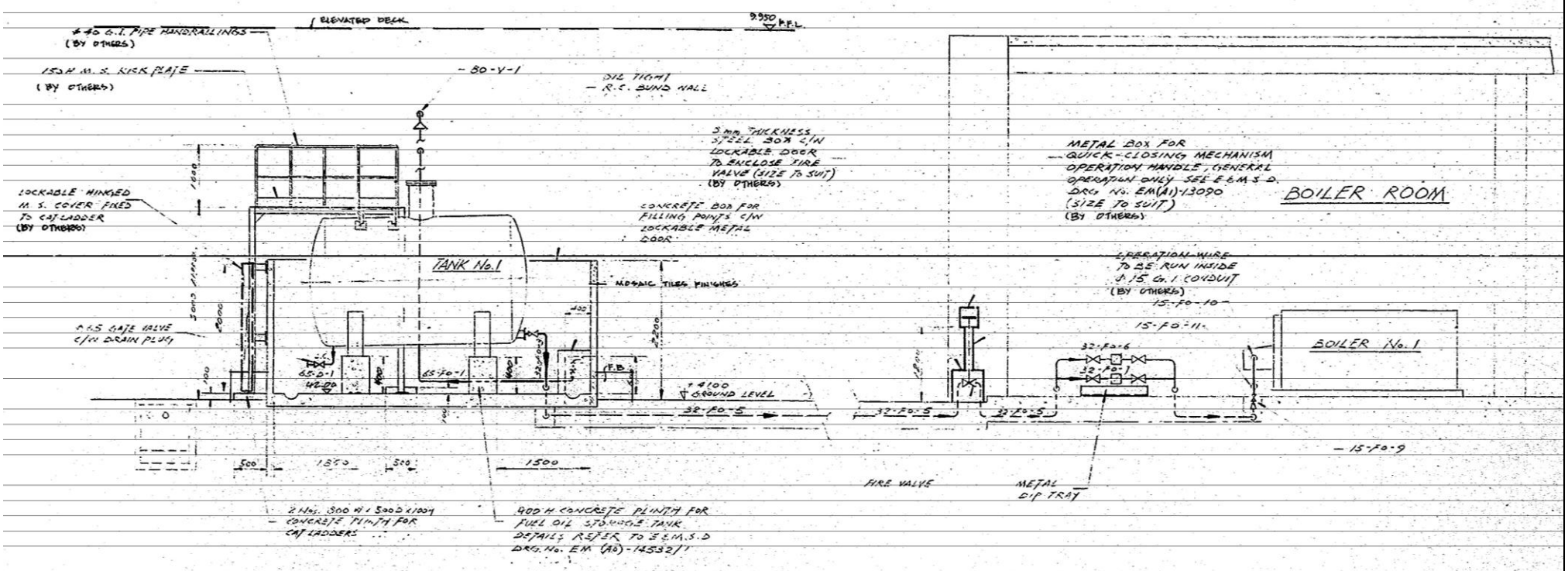
APPENDIX C

OIL TANK PLAN AND DETAIL DRAWING

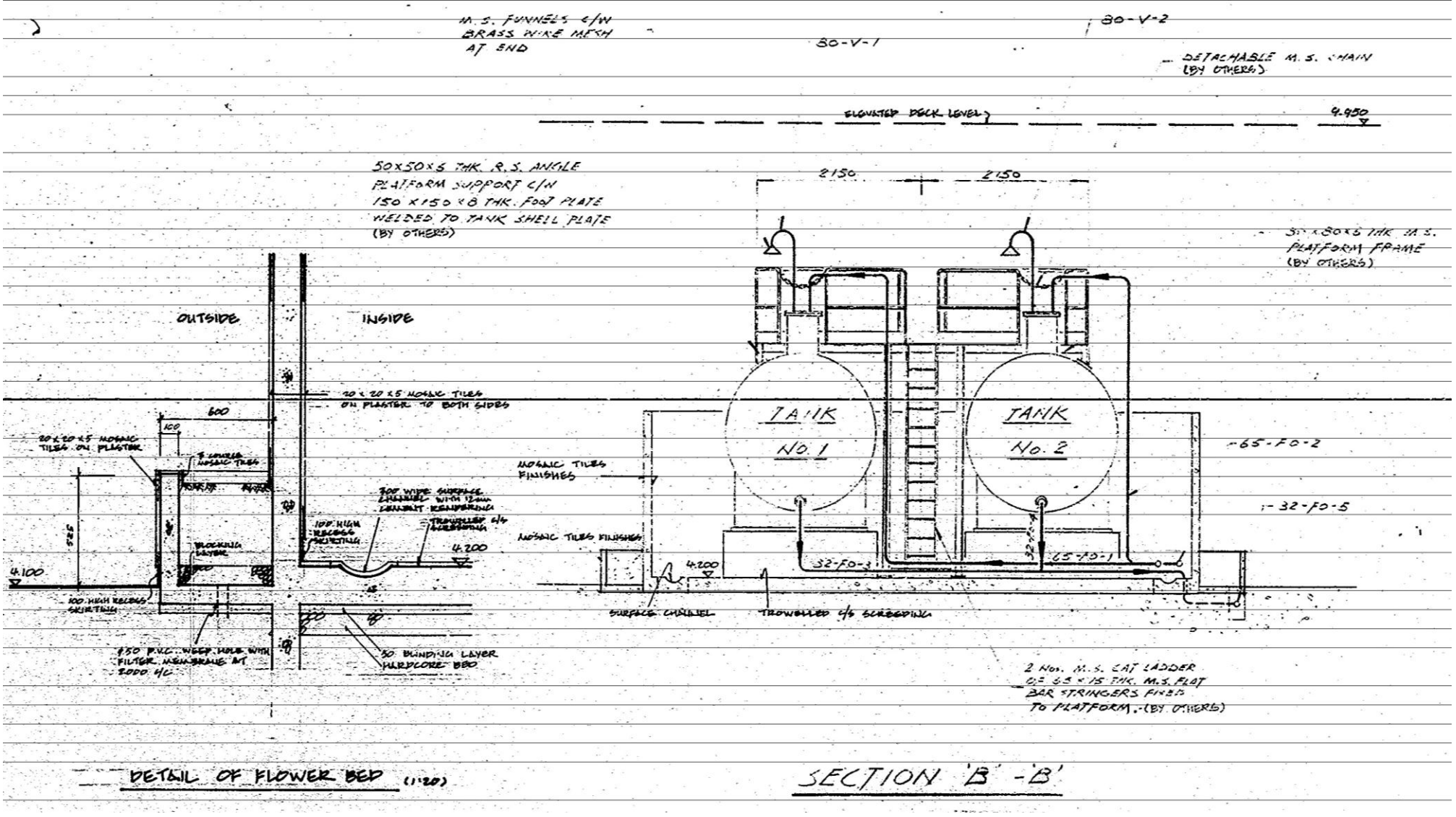
Oil Tank Plan and Detail Drawing



PART PLAN OF GROUND FLOOR



SECTION 'A' - 'A'


M.S. FUNNELS C/W BRASS WIRE MESH AT END
30-V-1
30-V-2
DETACHABLE M.S. CHAIN (BY OTHERS)
ELEVATED DECK LEVEL
4.950
50x50x6 THK. R.S. ANGLE PLATFORM SUPPORT C/W 150 x 150 x 8 THK. FOOT PLATE WELDED TO TANK SHELL PLATE (BY OTHERS)
2150
2150
50 x 50 x 6 THK. M.S. PLATFORM FRAME (BY OTHERS)
OUTSIDE
INSIDE
20 x 20 x 5 MOSAIC TILES ON PLASTER TO BOTH SIDES
600
100
20 x 20 x 5 MOSAIC TILES ON PLASTER
5 LAYERS MOSAIC TILES
525
BLOCKWORK LAYERS
4.100
100 HIGH RENDERED SKIRTING
100 HIGH RENDERED PROTECTION
TROWELLED 1/4 SCREEDING
4.200
150 P.V.C. WEEP HOLE WITH FILTER MESH GRADE 'M' 2000 H/C
50 BLINDING LAYER HURDLCRETE BED
DETAIL OF FLOWER BED (1:20)
TANK NO. 1
TANK No. 2
MOSAIC TILES FINISHES
MOSAIC TILES FINISHES
-65-FO-2
-32-FO-5
32-FO-3
65-FO-1
4.200
SURFACE CHANNEL
TROWELLED 1/4 SCREEDING
2 Nos. M.S. CAT LADDER C/W 65 x 15 THK. M.S. FLAT BAR STRINGERS FIXED TO PLATFORM. (BY OTHERS)
SECTION 'B'-'B'