



CONTRACT NO: HK/2015/01

WANCHAI DEVELOPMENT PHASE II AND CENTRAL  
WANCHAI BYPASS  
SAMPLING, FIELD MEASUREMENT AND TESTING WORK  
(STAGE 3)

ENVIRONMENTAL PERMIT NO. EP-122/2002/E

MONTHLY ENVIRONMENTAL MONITORING & AUDIT REPORT

- JUNE 2019 -

CLIENTS:

Civil Engineering and Development  
Department

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Raymond Dai  
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DATE:

11 July 2019

Ref.: AACWBIECEM00\_0\_11473L.19

11 July 2019

AECOM Asia Company Limited  
11/F, Tower 2  
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Hong Kong

By Post and Fax (2691 2649)

Attention: Mr. Conrad Ng

Dear Mr. Ng,

**Re: Wan Chai Development Phase II and Central-Wan Chai Bypass  
Monthly Environmental Monitoring and Audit Report (June 2019)  
for EP-122/2002/E**

Reference is made to the Environmental Team's submission of the captioned Monthly Environmental Monitoring and Audit (EM&A) Report for June 2019 received by e-mail on 11 July 2019 for our review and comment.

Please be informed that we have no adverse comment on the captioned submission. We write to verify the captioned submission in accordance with Condition 4.6 of the captioned Environmental Permit.

Please do not hesitate to contact the undersigned should you have any queries.

Yours faithfully,



David Yeung  
Independent Environmental Checker

c.c.	CEDD	Mr. Henry Tsang	by fax: 2301 1277
	AECOM	Mr. Francis Leong / Mr. Stephen Lai	by fax: 2691 2649
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## EXECUTIVE SUMMARY

- i. This is the Environmental Monitoring and Audit (EM&A) Monthly Report – **June 2019** specific for Environmental Permit no. EP-122/2002/E. The EM&A report is prepared by the Environmental Team (ET) employed under Contract No. HK/2015/01 – Wan Chai Development Phase II and Central Wanchai Bypass – Sampling, Field Measurement and Testing Works (Stage 3). This report presents the environmental monitoring findings and information recorded during the period of **June 2019**. The cut-off date of reporting is the last day of each reporting month.
- ii. The implementation of the Environmental Monitoring and Audit Programme for the Wan Chai Development phase II and Central-Wan Chai Bypass Project has been taken over by the Lam Geotechnics Limited (LGL) under Contract HK/2015/01 – Wan Chai Development Phase II and Central Wanchai Bypass – Sampling, Field Measurement and Testing Works (Stage 3) from 27 December 2015 in continuation of the previous Environmental Team employed under Contract HK/2011/07 – Wan Chai Development Phase II and Central Wanchai Bypass – Sampling, Field Measurement and Testing Works (Stage 2).
- iii. In the reporting month, the principal work activities of the contracts are included as follows:  
Contract no. HK/2012/08 – Wan Chai Development Phase II – Central- Wan Chai Bypass at Wan Chai West
  - Roadworks
  - Drainage
  - Seawall coping
  - Dismantling of temporary landing steps  
Contract no. HY/2010/08 – Central- Wan Chai Bypass (CWB) – Tunnel (Slip Road 8)
  - Junction modification  
Noise Monitoring
  - iv. Continuous noise monitoring was conducted at ACL3 – City Hall.
  - v. **One limit level exceedance was recorded on 26 June 2019 in the reporting period. After investigation, the exceedance was not related to Project.**
  - vi. Due to safety concern, the location of the continuous noise monitoring station at City Hall was finely adjusted to the roof of the City Hall, Low Block on 1 May 2013.  
Air Quality Monitoring
  - vii. 1-hour and 24-hour Total Suspended Particulates (TSP) monitoring were conducted on every six days basis at ACL1 – City Hall and ACL2a – Contractor HK/2012/08 Site Office.

- viii. No action or limit level exceedance was recorded at ACL1 – City Hall and ACL2a – Contractor HK/2012/08 Site Office in the reporting month.
- ix. Due to interruption of electricity, the 24hr TSP monitoring at ACL2a was rescheduled from 14 and 20 June 2019 to 15 and 21 June 2019.
- x. Due to the defective electricity supply found at monitoring station ACL1 and the advice from City Hall Building Management, the air quality monitoring station ACL1 – City Hall was finely adjusted on 28 Feb 2014 to an alternate electricity supply.
- xi. Due to the large scale renovation works at People’s Liberation Army Headquarter, a Proposal for Relocation of Air Quality Monitoring Station at People’s Liberation Army Headquarter (ACL2) was formally submitted to EPD on 4<sup>th</sup> November, 2013.
- xii. The Proposal for Relocation of Air Quality Monitoring Station at People’s Liberation Army Headquarter (ACL2) was approved by EPD on 27 November 2013.
- xiii. According to the approved proposal for relocation of Air Quality Monitoring station, the action and limit levels of ACL2a shall adopt the reference monitoring result from the baseline air monitoring report for EP/364/2009 in 22 April 2010 in which approved by EPD.
- xiv. The air quality monitoring at ACL2a – Contractor HK/2012/08 Site Office was commenced on 7 December 2013.

Water Quality Monitoring

- xv. As confirmed by WDII RSS, the dredging works, seawall modification works and other associated works undertaken at Central Reclamation Phase III by Contractor HK/2012/08 was commenced in late September 2014. According to the approved EM&A manual under EP-122/2002/E, water quality monitoring shall be implemented at the Central Reclamation Phase III works area accordingly to assess any potential water quality impact during the construction period.
- xvi. Water quality monitoring at M5B and Culvert J were conducted three days per week during reporting period starting from 26 September 2014. The action and limit level exceedance of water quality monitoring are summarized in **Table 1**.
- xvii. Total 3 action level exceedances of suspended solid and 1 limit level exceedance of suspended solid were recorded in this reporting period. After the investigation, the exceedance was concluded as non-project related.
- xviii. The water quality monitoring scheduled on 12 June 2019 at M5B and Culvert J during flood and ebb tide was temporary suspended due to restriction of access and safety concern.

**Table 1 Summary of Water Quality Monitoring Exceedances in Reporting Month**

Contract No.	Water quality monitoring station	Mid-flood				Mid-ebb			
		DO		SS		DO		SS	
		AL	LL	AL	LL	AL	LL	AL	LL
HK/2012/08	M5B <sup>2</sup>	0	0	2	0	0	0	1	1
	Culvert J <sup>1</sup>	-	-	-	-	-	-	-	-
<b>Total</b>		<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>

Remarks<sup>1</sup>: Action or limit level are not applicable to reference station Culvert J.

Remarks<sup>2</sup>: Turbidity measurement are reported as reference.

Complaints, Notifications of Summons and Successful Prosecutions

- xix. No environmental complaint was received in this reporting month.

Site Inspections and Audit

- xx. The Environmental Team (ET) conducted weekly site inspection for Contract no. HK/2012/08 and HY/2010/08 in this reporting period. The Contractors rectified major observation and recommendations made during the audit sessions. No non-conformance was identified during the site inspections.

Future Key Issues

- xxi. In the coming reporting month, the principal work activities of the contract is anticipated as follows:

Contract no. HK/2012/08 – Wan Chai Development Phase II – Central- Wan Chai Bypass at Wan Chai West

- Roadworks
- Drainage
- Seawall coping
- Dismantling of temporary landing step

Contract no. HY/2010/08 – Central- Wan Chai Bypass (CWB) – Tunnel (Slip Road 8)

- Junction modification

## 1 INTRODUCTION

### 1.1 Scope of the Report

1.1.1. Lam Geotechnics Limited (LGL) has been appointed take up the role as the Environmental Team (ET) under Contract HK/2015/01 – Wan Chai Development Phase II and Central Wan Chai Bypass – Sampling, Field Measurement and Testing works (Stage 3) to implement the Environmental Monitoring and Audit (EM&A) programme under Environmental Permit EP-122/2002/E and as stipulated in the EM&A Manual of the approved Environmental Impact Assessment (EIA) Report for Central Reclamation Phase III - Studies, Site Investigation, Design and Construction (Register No.: AEIAR-040/2001) since 27 December 2015.

1.1.2. This report documents the finding of EM&A works for Environmental Permit (EP) no. EP-122/2002/E, during the period of [June 2019](#). The cut-off date of reporting is the last day of each reporting month.

### 1.2 Structure of the Report

**Section 1**      **Introduction** – details the scope and structure of the report.

**Section 2**      **Project Background** – summarizes background and scope of the project, site description, project organization and contact details of key personnel during the reporting period.

**Section 3**      **Status of Regulatory Compliance** – summarizes the status of valid Environmental Permits / Licenses during the reporting period.

**Section 4**      **Monitoring Requirements** – summarizes all monitoring parameters, monitoring methodology and equipment, monitoring locations, monitoring frequency, criteria and respective event and action plan and monitoring programmes.

**Section 5**      **Monitoring Results** – summarizes the monitoring results obtained in the reporting period.

**Section 6**      **Compliance Audit** – summarizes the auditing of monitoring results, all exceedances environmental parameters.

**Section 7**      **Cumulative Construction Impact due to the Concurrent Projects** – summarizes the relevant cumulative construction impact due to the concurrent activities of the concurrent Projects.



**Section 8**      ***Environmental Site Audit*** – summarizes the findings of weekly site inspections undertaken within the reporting period, with a review of any relevant follow-up actions within the reporting period.

**Section 9**      ***Complaints, Notification of summons and Prosecution*** – summarizes the cumulative statistics on complaints, notification of summons and prosecution

**Section 10**     ***Conclusion***

## 2 PROJECT BACKGROUND

### 2.1 Background

2.1.1 Central Reclamation Phase III - Studies, Site Investigation, Design and Construction (hereafter called “the Project”) are Designated Project (DP) under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO). The Environmental Impact Assessment (EIA) Reports for Central Reclamation Phase III - Studies, Site Investigation, Design and Construction (Register No. AEIAR-040/2001) has been approved on 31 August 2001.

### 2.2 Scope of the Project and Site Description

2.2.1. The design and construction of Central Reclamation Phase III involves the permanent reclamation and construction and operation of a trunk road and its road tunnel that is shown at [Figure 2.1](#).

2.2.2. The key purpose of the study area encompasses the area of Victoria Harbour to the southeast of the new Outlying Islands Ferry Piers and north of Edinburgh Place and Lung Wui Road. The area extends eastward to Fenwick Pier Street and the Fleet Arcade, and includes the existing GPO, Star Ferry Piers, Queens Pier, City Hall, PLA Headquarters, Hong Kong Red Cross Headquarters building and the Tamar Site. The scope of the Central Reclamation, Phase III includes:

- Reclamation and seawalls, roads and associated services, North Island Line Protection Works and Advance Trunk Road Tunnel (ATRT) for the CWB;
- Re provisioning of Star Ferry Pier, public landing steps, wallah wallah moorings, and motor boat/launch operators' kiosks;
- External cooling water systems which consist of the cooling water pumping shells for future developments, and the re provisioning of existing cooling water pumping stations and associated pipework systems and E&M works;
- Re provisioning of existing Leisure and Cultural Services Department (LCSD)'s facilities;
- Provision of a flood relief path, stormwater culvert extensions, upgrading of hinterland stormwater drainage resulting from the reclamation, demolition of the existing waterfront structures and necessary landscaping;
- The Hong Kong Station Extended Overrun Tunnel (EOT) and associated ventilation structures entrusted for construction within the CR III works;
- Re provisioning of the Government Heliport at the Wan Chai PCWA and re provisioning of the Wan Chai PCWA at Chai Wan Basin.

2.2.3. The project also contains various Schedule 2 DPs that, under the EIAO, require Environmental Permits (EPs) to be granted by the DEP before they may be either constructed

or operated. **Table 2.1** summarises the four individual DPs under this Project. **Figure 2.1** shows the locations of these Schedule 2 DPs.

**Table 2.1 Schedule 2 Designated Projects under this Project**

Item	Designated Project	EIAO Reference
DP1	Reclamation works	Schedule 2, Part I, A.7
DP2	Road P2 and other roads which are classified as primary/district distributor roads	Schedule 2, Part I, A.1
DP3	Central-Wanchai bypass (CWB)	Schedule 2, Part I, C.1
DP4	The North Island Line (NIL) Protection Works within CR III	Schedule 2, Part I, A.7

2.2.4. Contract HK/2012/08 – Wan Chai Development Phase II – Central- Wan Chai Bypass at Wan Chai West as part of the Project works by the Civil Engineering and Development Department (CEDD) is associated with Designated Project 1(DP1) and Designated Project (DP2).

2.2.5. Contract HY/2009/18 – Central Wanchai Bypass – Central Interchange as part of the Project works by the Highways Department (HyD) is associated with Designated Project 2(DP2). As confirmed with Resident Site Staff, the construction of P1 Road of DP2 under Contract HY/2009/18 have been completed on 1 November 2017.

2.2.6. Contract HY/2010/08 – Central Wanchai Bypass – Tunnel as part of the Project works by the Highways Department (HyD) is associated with Designated Project 2 (DP2).

**2.3 Project Organization and Contact Personnel**

2.3.1 Civil Engineering and Development Department is the overall project controllers for the Central Reclamation Phase III Project. For the construction phase of the Project, Project Engineer, Contractor(s), Environmental Team and Independent Environmental Checker are appointed to manage and control environmental issues.

2.3.2 The proposed project organization and lines of communication with respect to environmental protection works are shown in **Figure 2.2**. Key personnel and contact particulars are summarized in **Table 2.2**:



**Table 2.2 Contact Details of Key Personnel**

Party	Role	Post	Name	Contact No.	Contact Fax
AECOM	Engineer's Representative for WDII	Chief Resident Engineer	Ms. Gloria Tang	2587 1778	2587 1877
	Engineer's Representative for CWB	Chief Resident Engineer	Mr. Dennis Norton	3912 3188	3912 3010
China State-Build King JV	Contractor under Contract no. HK/2012/08	Project Director	C. N. LAI	9106 5806	2877 1522
		Site Agent	Mr. George Cheung	9268 1918	
		Environmental Officer	Mr. James Ma	9130 9549	
		Environmental Supervisor	Mr. Y. L. HO	9856 5669	
China State	Contractor under Contract no. HY/2010/08	Project Director	Mr. Chris Leung	3467 4299	2566 8061
		Project Manager	Mr. Chan Ying Lun	3418 3001	
		Site Agent	Mr. Thomas Lui	3557 6452	
		Environmental Officer	Mr. Gabriel Wong	3557 6466	
Ramboll Hong Kong Limited	Independent Environmental Checker (IEC)	Independent Environmental Checker (IEC)	Mr. David Yeung	3465 2888	3465 2899
Lam Geotechnics Limited	Environmental Team (ET)	Environmental Team Leader (ETL)	Mr. Raymond Dai	2882 3939	2882 3331

2.3.3 In this reporting month, the principal work activities of the contract is included as follows:

Contract no. HK/2012/08 – Wan Chai Development Phase II – Central- Wan Chai Bypass at Wan Chai West

- Roadworks
- Drainage
- Seawall coping
- Dismantling of temporary landing steps

Contract no. HY/2010/08 – Central- Wan Chai Bypass (CWB) – Tunnel (Slip Road 8)

- Junction modification

2.3.4 In coming reporting month, the principal work activities of the contract is anticipated as follows:

Contract no. HK/2012/08 – Wan Chai Development Phase II – Central- Wan Chai Bypass at Wan Chai West

- Roadworks
- Drainage
- Seawall coping
- Dismantling of temporary landing steps

Contract no. HY/2010/08 – Central- Wan Chai Bypass (CWB) – Tunnel (Slip Road 8)

- Junction modification

### 3 STATUS OF REGULATORY COMPLIANCE

#### 3.1 Status of Environmental Licensing and Permitting under the Project

3.1.1. A summary of the current status on licences and/or permits on environmental protection pertinent to the Project is shown in **Table 3.1**.

**Table 3.1 Summary of the current status on licences and/or permits on environmental protection pertinent to the Project**

Permits and/or Licences	Reference No.	Issued Date	Status
Environmental Permit	EP-122/2002/E	24 Sep 2015	Valid

3.1.2. The current status on licences and/or permits on environmental protection pertinent for Contract no. HK/2012/08 showed in **Table 3.2**.

**Table 3.2 Cumulative Summary of Valid Licences and Permits under Contract no. HK/2012/08**

Permits and/or Licences	Reference No.	Issued Date	Valid Period/ Expiry Date	Status
Notification of Works Under APCO	355439	4 Feb 2013	N/A	Valid
Registration as a Chemical Waste Producer	5213-134-C3790-01	30 Jun 2016	N/A	Valid
Billing Account under Waste Disposal Ordinance	7016883	18 Feb 2013	N/A	Valid
Billing Account under Waste Disposal Ordinance (Dumping by Vessel)	-	-	-	-
Construction Noise Permit	GW-RS1247-18	31 Dec 2018	13 Jan 2019 to 12 Jul 2019	Valid
	GW-RS0294-19	2 Apr 2019	5 Apr 2019 to 4 Oct 2019	Valid
Water Discharge Licence	WT00018470-2014	6 Mar 2014	31 Mar 2019	Expired

3.1.3. The current status on licences and/or permits on environmental protection pertinent for Contract no. HY/2010/08 showed in **Table 3.3**.

**Table 3.3 Cumulative Summary of Valid Licences and Permits under Contract no. HY/2010/08**

Permits and/or Licences	Reference No.	Issued Date	Valid Period/ Expiry Date	Status
Notification of Works Under APCO	357176	2 Apr 2013	N/A	Valid
Registration as a Chemical Waste Producer	WPN5213-147-C1169-44	27 Mar 2013	N/A	Valid
Billing Account under Waste Disposal Ordinance	7017170	27 Mar 2013	N/A	Valid
Billing Account under Waste Disposal Ordinance (Dumping by Vessel)	7020947	22 Dec 2014	N/A	Valid
Construction Noise Permit	GW-RS0243-19	22/3/2019	25 Mar 2019 to 30 April 2019	Expired

3.1.4. Implementation status of the recommended mitigation measures during this reporting month is presented in [Appendix 3.1](#).

## 4 MONITORING REQUIREMENTS

### 4.1 Noise Monitoring

#### NOISE MONITORING STATIONS

- 4.1.1. The continuous noise monitoring station for the Project is listed and shown in **Table 4.1** and **Figure 4.1.** **Appendix 4.1** shows the established Action/Limit Levels for the monitoring works.

**Table 4.1 Continuous Noise Monitoring Stations**

District	Station	Description
Central	ACL3	City Hall

#### NOISE MONITORING PARAMETERS, FREQUENCY AND DURATION

- 4.1.2. Continuous 24-hour noise monitoring shall be carried out at the designated monitoring stations. The following is an initial guide on the regular monitoring frequency for each station on a 24 hours daily basis when noise generating activities are underway:
- One set of measurements between 0700 and 1900 hours on normal weekdays.
  - One set of measurements between 1900 and 2300 hours on normal weekdays and 0700 and 2300 hours on public holidays.
  - One set of measurements between 2300 and 0700 hours on next day on every day.
- 4.1.3. If construction works are extended to include works during the hours of 1900 – 0700 as well as public holidays and Sundays, additional weekly impact monitoring shall be carried out during respective restricted hours periods. Applicable permits under NCO shall be obtained by the Contractor.

#### MONITORING EQUIPMENT

- 4.1.4. As referred to in the Technical Memorandum <sup>TM</sup> issued under the NCO, sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. Immediately prior to and following each noise measurement the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration level from before and after the noise measurement agrees to within 1.0 dB.
- 4.1.5. Noise measurements shall not be made in fog, rain, wind with a steady speed exceeding 5 m/s or wind with gusts exceeding 10 m/s. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.

4.1.6. The sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency before deployment to the site and during each site visit. Measurements will be accepted as valid only if the calibration level from before and after the noise measurement agrees to within 1.0 dB.

**4.2 Air Quality Monitoring**

AIR QUALITY MONITORING STATIONS

4.2.1. The air quality monitoring stations for the Project are listed and shown in **Table 4.2** and **Figure 4.1**. **Appendix 4.1** shows the established Action/Limit Levels for the monitoring works.

**Table 4.2 Air Quality Monitoring Stations**

Station ID	Description
ACL1	City Hall
ACL2a	Contractor HK/2012/08 Site Office

AIR QUALITY MONITORING PARAMETERS, FREQUENCY AND DURATION

4.2.2. One-hour and 24-hour TSP levels should be measured to indicate the impacts of construction dust on air quality. The 24-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B.

4.2.3. All relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, and any other local atmospheric factors affecting or affected by site conditions, etc., shall be recorded down in detail.

4.2.4. For regular impact monitoring, the sampling frequency of at least once in every six-days, shall be strictly observed at all the monitoring stations for 24-hour TSP monitoring. For 1-hour TSP monitoring, the sampling frequency of at least three times in every six-days should be undertaken when the highest dust impact occurs.

SAMPLING PROCEDURE AND MONITORING EQUIPMENT

4.2.5. High volume samplers (HVSs) in compliance with the following specifications shall be used for carrying out the 1-hour and 24-hour TSP monitoring:

- 0.6 – 1.7 m<sup>3</sup> per minute adjustable flow range;
- Equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operation;
- Installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;

- Capable of providing a minimum exposed area of 406 cm<sup>2</sup>;
- Flow control accuracy: +/- 2.5% deviation over 24-hour sampling period;
- Equipped with a shelter to protect the filter and sampler;
- Incorporated with an electronic mass flow rate controller or other equivalent devices;
- Equipped with a flow recorder for continuous monitoring;
- Provided with a peaked roof inlet;
- Incorporated with a manometer;
- Able to hold and seal the filter paper to the sampler housing at horizontal position;
- Easily changeable filter; and
- Capable of operating continuously for a 24-hour period.

4.2.6. Initial calibration of dust monitoring equipment shall be conducted upon installation and thereafter at bi-monthly intervals. The transfer standard shall be traceable to the internationally recognized primary standard and be calibrated annually. The concern parties such as IEC shall properly document the calibration data for future reference. All the data should be converted into standard temperature and pressure condition.

#### LABORATORY MEASUREMENT / ANALYSIS

- 4.2.7. A clean laboratory with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments to handle the dust samples collected, shall be available for sample analysis, and equipment calibration and maintenance. The laboratory should be HOKLAS accredited.
- 4.2.8. Filter paper of size 8" x 10" shall be labelled before sampling. It shall be a clean filter paper with no pinholes, and shall be conditioned in a humidity-controlled chamber for over 24-hours and be pre-weighed before use for the sampling.
- 4.2.9. After sampling, the filter paper loaded with dust shall be kept in a clean and tightly sealed plastic bag. The filter paper shall then be returned to the laboratory for reconditioning in the humidity controlled chamber followed by accurate weighing by an electronic balance with readout down to 0.1 mg. The balance shall be regularly calibrated against a traceable standard.
- 4.2.10. All the collected samples shall be kept in a good condition for 6 months before disposal.
- 4.2.11. Current calibration certificates of equipment are presented in **Appendix 4.2**.

### 4.3 Water Quality Monitoring

#### WATER QUALITY MONITORING STATIONS

4.3.1 The water quality monitoring stations for the Project are listed and shown in **Table 4.3** and **Figure 4.1**. **Appendix 4.1** shows the established Action/Limit Levels for the monitoring works.

**Table 4.3 Water Quality Monitoring Stations**

Station ID	Description	Easting	Northing
<b>Cooling Water Intakes</b>			
M5B	Swire / Government Headquarters/ Tamar Development/ MTRCL and HSBC Headquarters	835169	816052
<b>Culverts (Reference Station)</b>			
Culvert J	Culvert J Outfall Location	835082	816071

#### WATER QUALITY PARAMETERS

- 4.3.2. Monitoring of dissolved oxygen (DO), turbidity and suspended solids (SS) shall be carried out at WSD flushing water intakes and cooling water intakes. DO and Turbidity are measured in-situ while SS is determined in laboratory.
- 4.3.3. In association with the water quality parameters, other relevant data shall also be measured, such as monitoring location/position, time, sampling depth, water temperature, pH, salinity, dissolved oxygen (DO) saturation, weather conditions, sea conditions, tidal stage, and any special phenomena and work underway at the construction site etc.

#### SAMPLING PROCEDURES AND MONITORING EQUIPMENT

4.3.4. The interval between two sets of monitoring should not be less than 36 hours except where there are exceedances of Action and/or Limit Levels, in which case the monitoring frequency will be increased. **Table 4.4** shows the proposed monitoring frequency and water quality parameters. Duplicate in-situ measurements and water sampling should be carried out in each sampling event. For selection of tides for in-situ measurement and water sampling, tidal range of individual flood and ebb tides should be not less than 0.5m.

**Table 4.4 Marine Water Quality Monitoring Frequency and Parameters**

Activities	Monitoring Frequency <sup>1</sup>	Parameters <sup>2</sup>
During the 4-week baseline monitoring period	Three days per week, at mid-flood and mid-ebb tides	Turbidity, Suspended Solids (SS), Dissolved Oxygen (DO), pH, Temperature, Salinity
During marine construction works	Three days per week, at mid-flood and mid-ebb tides	Turbidity, Suspended Solids (SS), Dissolved Oxygen (DO), pH, Temperature, Salinity
After completion of marine construction works	Three days per week, at mid-flood and mid-ebb tides	Turbidity, Suspended Solids (SS), Dissolved Oxygen (DO), pH, Temperature, Salinity



**Notes:**

1. For selection of tides for in-situ measurement and water sampling, tidal range of individual flood and ebb tides should be not less than 0.5m.
2. Turbidity should be measured in situ whereas SS should be determined by laboratory.

**DISSOLVED OXYGEN AND TEMPERATURE MEASURING EQUIPMENT**

- 4.3.5. The instrument should be a portable, weatherproof dissolved oxygen measuring instrument complete with cable, sensor, comprehensive operation manuals, and use a DC power source. It should be capable of measuring:
- a dissolved oxygen level in the range of 0-20 mg/l and 0-200% saturation
  - a temperature of 0-45 degree Celsius
- 4.3.6. It should have a membrane electrode with automatic temperature compensation complete with a cable. Sufficient stocks of spare electrodes and cables should be available for replacement where necessary. (e.g. YSI model 59 meter, YSI 5739 probe, YSI 5795A submersible stirrer with reel and cable or an approved similar instrument).
- 4.3.7. Should salinity compensation not be build-in in the DO equipment, in-situ salinity shall be measured to calibrate the DO equipment prior to each DO measurement.

**TURBIDITY MEASUREMENT INSTRUMENT**

- 4.3.8. The instrument should be a portable, weatherproof turbidity-measuring instrument complete with comprehensive operation manual. The equipment should use a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0-1000 NTU and be complete with a cable (e.g. Hach model 2100P or an approved similar instrument).

**SAMPLER**

- 4.3.9. A water sampler comprises a transparent PVC cylinder, with a capacity of not less than 2 litres, and can be effectively sealed with latex cups at both ends. The sampler should have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth (e.g. Kahlsico Water Sampler or an approved similar instrument).

**SAMPLE CONTAINER AND STORAGE**

- 4.3.10. Water samples for suspended solids measurement should be collected in high-density polythene bottles, packed in ice (cooled to 4°C without being frozen), and delivered to ALS Technichem (HK) Pty Ltd. as soon as possible after collection for analysis.

**WATER DEPTH DETECTOR**

- 4.3.11. A portable, battery-operated echo sounder shall be used for the determination of water depth at each designated monitoring station. This unit can either be handheld or affixed to the bottom of the workboat, if the same vessel is to be used throughout the monitoring programme.

**SALINITY**

- 4.3.12. A portable salinometer capable of measuring salinity in the range of 0-40 ppt shall be provided for measuring salinity of the water at each of monitoring location.

#### MONITORING POSITION EQUIPMENT

- 4.3.13. A hand-held or boat-fixed type digital Global Positioning System (GPS) with waypoint bearing indication or other equivalent instrument of similar accuracy shall be provided and used during monitoring to ensure the monitoring vessel is at the correct location before taking measurements.

#### CALIBRATION OF IN-SITU INSTRUMENTS

- 4.3.14. All in-situ monitoring instrument shall be checked, calibrated and certified by a laboratory accredited under HOKLAS or equivalent before use, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring. Responses of sensors and electrodes should be checked with certified standard solutions before each use. Wet bulb calibration for a DO meter shall be carried out before measurement at each monitoring location.
- 4.3.15. For the on site calibration of field equipment by the ET, the BS 127:1993, "Guide to Field and on-site test methods for the analysis of waters" should be observed.
- 4.3.16. Sufficient stocks of spare parts should be maintained for replacements when necessary. Backup monitoring equipment shall also be made available so that monitoring can proceed uninterrupted even when some equipment is under maintenance, calibration, etc.
- 4.3.17. Current calibration certificates of equipment are presented in [Appendix 4.2](#).

#### LABORATORY MEASUREMENT / ANALYSIS

- 4.3.18. Analysis of suspended solids has been carried out in a HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd. Water samples of about 1L shall be collected at the monitoring stations for carrying out the laboratory SS determination. The SS determination work shall start within 24 hours after collection of the water samples. The SS determination shall follow APHA 19ed or equivalent methods subject to the approval of IEC and EPD.

## 5 MONITORING RESULTS

5.0.1. The environmental monitoring will be implemented based on the division of works areas of each designated project managed under different contracts with separate FEP applied by individual contractors. Overall layout showing work areas of various contracts, latest status of work commencement and monitoring stations is shown in [Figure 2.1](#) and [Figure 4.1](#). The monitoring results are presented in according to the Individual Contract(s).

5.0.2. In the reporting month, the concurrent contracts are:

- Contract no. HK/2012/08 – Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai West.
- Contract no. HY/2010/08 – Central- Wan Chai Bypass (CWB) – Tunnel (Slip Road 8)

5.0.3. The environment monitoring schedules for reporting month and coming month are presented in [Appendix 5.1](#).

### 5.1 Noise Monitoring Results

5.1.1 Due to safety concerned, the location of the continuous noise monitoring station at City Hall was finely adjusted to the roof of the City Hall, Low Block on 1 May 2013.

Contract no. HK/2012/08 – Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai West

5.1.2 The proposed division of noise monitoring stations is summarized in **Table 5.1** below.

**Table 5.1 Continuous Noise Monitoring Stations for Contract no. HK/2012/08**

Location ID	District	Description
ACL3	Central	City Hall

*Remarks: Continuous noise monitoring results and graphical presentation for ACL3 during restricted hours and night time period are for information only.*

5.1.3 One limit level exceedance was recorded on 26 June 2019 in the reporting period. After investigation, no construction works was conducted by Contractor HK/2012/08 at CRIII area on 26 June 2019. Meanwhile, public events were held at area opposite to the monitoring station during the concerned period and considered as the major noise contribution. As such, the exceedance was not related to Project.

Contract no. HY/2010/08 – Central- Wan Chai Bypass (CWB) – Tunnel (Slip Road 8)

- 5.1.4 As confirmed with CWB RSS, junction modification works in Central area would be conducted by Contract HY/2010/08 starting from July 2018 and tentatively completed in September 2018. The continuous noise monitoring station ACL3 located at City Hall would tentatively associated with Contract HY/2010/08.
- 5.1.5 The proposed division of noise monitoring stations is summarized in **Table 5.2** below.

**Table 5.2 Continuous Noise Monitoring Stations for Contract no. HY/2010/08**

Location ID	District	Description
ACL3	Central	City Hall

*Remarks: Continuous noise monitoring results and graphical presentation for ACL3 during restricted hours and night time period are for information only.*

- 5.1.6 [One limit level exceedance was recorded on 26 June 2019 in the reporting period. After investigation, no construction works was conducted by HY/2010/08 at CRIII area on 26 June 2019. Meanwhile, public events were held at area opposite to the monitoring station during the concerned period and considered as the major noise contribution. As such, the exceedance was not related to Project.](#)
- 5.1.7 Continuous noise monitoring results measured in this reporting period are reviewed and summarized. Details of continuous noise monitoring results and graphical presentation can be referred to [Appendix 5.2](#).

**5.2 Air Quality Monitoring Results**

- 5.2.1 Due to the defective electricity supply found at monitoring station ACL1 and the advice from City Hall Building Management, the air quality monitoring station ACL1 – City Hall was finely adjusted on 28 Feb 2014 to an alternate electricity supply.
- 5.2.2 Due to the large scale renovation works at People’s Liberation Army Headquarter, a Proposal for Relocation of Air Quality Monitoring Station at People’s Liberation Army Headquarter (ACL2) was formally submitted to EPD on 4th November, 2013.
- 5.2.3 The Proposal for Relocation of Air Quality Monitoring Station at People’s Liberation Army Headquarter (ACL2) was approved by EPD on 27 November 2013.
- 5.2.4 According to the approved proposal for relocation of Air Quality Monitoring station, the action and limit levels of ACL2a shall adopt the reference monitoring result from the baseline air monitoring report for EP/364/2009 in 22 April 2010 in which approved by EPD.
- 5.2.5 The air quality monitoring at ACL2a – Contractor HK/2012/08 Site Office was commenced on 7 December 2013.

Contract no. HK/2012/08 – Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai West

5.2.6 The proposed division of air quality monitoring stations are summarized in **Table 5.3** below.

**Table 5.3 Air Quality Monitoring Station for Contract no. HK/2012/08**

Station	Description
ACL1	City Hall
ACL2a	Contractor HK/2012/08 Site Office

5.2.7 No action or limit level exceedance was recorded at ACL1 – City Hall and ACL2a – Contractor HK/2012/08 Site Office in the reporting month.

5.2.8 Due to interruption of electricity, the 24hr TSP monitoring at ACL2a was rescheduled from 14 and 20 June 2019 to 15 and 21 June 2019.

Contract no. HY/2010/08 – Central- Wan Chai Bypass (CWB) – Tunnel (Slip Road 8)

5.2.9 As confirmed with CWB RSS, junction modification works in Central area would be conducted by Contract HY/2010/08 starting from July 2018 and tentatively completed in September 2018. The air quality monitoring station ACL1 located at City Hall would tentatively associated with Contract HY/2010/08.

5.2.10 The proposed division of air quality monitoring stations are summarized in **Table 5.4** below.

**Table 5.4 Air Quality Monitoring Station for Contract no. HY/2010/08**

Station	Description
ACL1	City Hall

5.2.11 No action or limit level exceedance was recorded at ACL1 – City Hall in the reporting month.

5.2.12 The air quality monitoring results measured in this reporting period are reviewed and summarized. Details of air quality monitoring results and graphical presentation can be referred in [Appendix 5.3](#).

**5.3 Water Quality Monitoring Results**

Contract no. HK/2012/08 – Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai West

5.3.1 The proposed division of water quality monitoring stations are summarized in **Table 5.5** below.

**Table 5.5 Water Quality Monitoring Station for Contract no. HK/2012/08**

Station ID	Description
<b>Cooling Water Intakes</b>	
M5B	Swire / Government Headquarters/ Tamar Development/ MTRCL and HSBC Headquarters
<b>Culverts (Reference Station)</b>	
Culvert J	Culvert J Outfall Location

- 5.3.2 Water quality monitoring results measured in this reporting period are reviewed and summarized. Detail of water quality monitoring results and graphical presentation can be referred in **Table 5.6** and [Appendix 5.4](#)
- 5.3.3 Total 3 action level exceedances of suspended solids and 1 limit level exceedance of suspended solids were recorded in this reporting period.
- 5.3.4 1 limit level exceedance of suspended solids was recorded on 1 June 2019 during ebb tide in the reporting period. No marine construction activity was conducted under Contract HK/2012/08 was conducted on the monitoring date while nearby culvert discharge was observed and the location of the construction area was at downstream of monitoring station M5B during monitoring period. In view of the above, it is considered that the exceedance was not related to Project works. No exceedance was recorded in the subsequent monitoring on 1 June 2019 flood tide.
- 5.3.5 1 action level exceedance of suspended solids was recorded on 3 June 2019 during flood tide in the reporting period. No marine construction activity was conducted under Contract HK/2012/08 was conducted on the monitoring date. In view of no marine works, it is considered that the exceedance was not related to Project works. No exceedance was recorded in the subsequent monitoring on 5 June 2019 flood tide.
- 5.3.6 1 action level exceedance of suspended solids was recorded on 17 June 2019 during ebb tide in the reporting period. No marine construction activity was conducted under Contract HK/2012/08 was conducted on the monitoring date while nearby culvert discharge was observed and the location of the construction area was at downstream of monitoring station M5B during monitoring period. In view of the above, it is considered that the exceedance was not related to Project works.
- 5.3.7 1 action level exceedance of suspended solids was recorded on 17 June 2019 during flood tide in the reporting period. No marine construction activity was conducted under Contract HK/2012/08 was conducted on the monitoring date. In view of no marine works, it is considered that the exceedance was not related to Project works. No exceedance was recorded in the subsequent monitoring on 19 June 2019 flood tide.

5.3.8 The water quality monitoring scheduled on 12 June 2019 at M5B and Culvert J during flood and ebb tide was temporary suspended due to restriction of access and safety concern.

**Table 5.6 Summary of Water Quality Monitoring Exceedance in Reporting Month**

Contract No.	Water quality monitoring station	Mid-flood				Mid-ebb			
		DO		SS		DO		SS	
		AL	LL	AL	LL	AL	LL	AL	LL
HK/2012/08	M5B <sup>2</sup>	0	0	2	0	0	0	1	1
	Culvert J <sup>1</sup>	-	-	-	-	-	-	-	-
<b>Total</b>		<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>

Remarks<sup>1</sup>: Action or limit level are not applicable to reference station Culvert J.

Remarks<sup>2</sup>: Turbidity measurement are reported as reference.

#### 5.4 Waste Monitoring Results

Contract no. HK/2012/08 – Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai West

5.4.1 No inert and non-inert C&D wastes were disposed in this reporting month. Details of the waste flow table are summarized in **Table 5.7**

**Table 5.7 Details of Waste Disposal for Contract no. HK/2012/08**

Waste Type	Quantity this month	Cumulative Quantity-to-Date	Disposal / Dumping Grounds
Inert C&D materials disposed, m3	NIL	8005	TM38
	NIL	51779	TKO137
Inert C&D materials recycled, m3	NIL	NIL	NIL
Non-inert C&D materials disposed, m3	NIL	1925	SENT Landfill
Non-inert C&D materials recycled, m3	NIL	NIL	NIL
Chemical waste disposed, kg	NIL	NIL	NIL
Marine Sediment (Type 1 – Open Sea Disposal), m <sup>3</sup>	0 (Bulk volume)	0 (Bulk volume)	South of Cheung Chau
Marine Sediment (Type 2), m <sup>3</sup>	0 (Bulk volume)	0 (Bulk volume)	South of The Brothers

Contract no. HY/2010/08 – Central- Wan Chai Bypass (CWB) – Tunnel (Slip Road 8)

5.4.2 No inert and non-inert C&D wastes were disposed in this reporting month. Details of the waste flow table are summarized in **Table 5.8**

**Table 5.8 Details of Waste Disposal for Contract no. HY/2010/08**

Waste Type	Quantity this month	Cumulative Quantity-to-Date	Disposal / Dumping Grounds
Inert C&D materials disposed, m3	NIL	NIL	NIL
Inert C&D materials recycled, m3	NIL	NIL	NIL
Non-inert C&D materials disposed, m3	NIL	NIL	NIL
Non-inert C&D materials recycled, m3	NIL	NIL	NIL
Chemical waste disposed, kg	NIL	NIL	NIL



## 6 Compliance Audit

6.0.1 The Event Action Plan for construction noise, air and water quality are presented in [Appendix 6.1](#).

### 6.1 Noise Monitoring

Contract no. HK/2012/08 – Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai West

6.1.1. [No action or limit level exceedances were recorded in the reporting period.](#)

Contract Contract no. HY/2010/08 – Central- Wan Chai Bypass (CWB) – Tunnel (Slip Road 8)

6.1.2 [No action or limit level exceedances were recorded in the reporting period.](#)

### 6.2 Air Quality Monitoring

Contract no. HK/2012/08 – Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai West

6.2.1 [No action or limit level exceedance was recorded at ACL1 – City Hall and ACL2a – Contractor HK/2012/08 Site Office in the reporting month.](#)

Contract Contract no. HY/2010/08 – Central- Wan Chai Bypass (CWB) – Tunnel (Slip Road 8)

6.2.2 [No action or limit level exceedance was recorded at ACL1 – City Hall in the reporting month.](#)

### 6.3 Water Quality Monitoring

Contract no. HK/2012/08 – Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai West

6.3.1 [Total 3 action level exceedances of suspended solids and 1 limit level exceedance of suspended solids were recorded in this reporting period. After the investigation, the exceedances were concluded as non-project related.](#)

### 6.4 Review of the Reasons for and the Implications of Non-compliance

6.4.1 There was no non-compliance from the site audits in the reporting period. The observations and recommendations made in each individual site audit session were presented in Section 8.

### 6.5 Summary of action taken in the event of and follow-up on non-compliance

6.5.1 There was no particular action taken since no non-compliance was recorded from the site audits in the reporting period.

## 7 CUMULATIVE CONSTRUCTION IMPACT DUE TO THE CONCURRENT PROJECTS

- 7.0.1. This section addresses the relevant cumulative construction impact due to the concurrent activities of the current projects including the Central Reclamation Phase III (CRIII), Wan Chai Development Phase II (WDII), Central-WanChai Bypass (CWB), Island Eastern Corridor Link projects (IECL) and Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai East (CWB Tunnel).
- 7.0.2. According to the Final EM&A report of Central Reclamation Phase III (CRIII) for Contract HK 12/02, the major construction activities were completed by end of January 2014 and no construction activities were undertaken thereafter and the water quality monitoring was completed in October 2011. As such, it is considered that there were no cumulative construction impact due to the concurrent activities of the current projects with the Central Reclamation Phase III (CRIII) undertaken by contractor HK12/02 in the reporting month.
- 7.0.3. [According to the construction programme of Central-Wanchai Bypass at Wanchai West at the Central Reclamation Phase III area include roadworks, drainage, seawall coping, dismantling of temporary landing steps and junction modification were performed in June 2019 reporting period.](#) As no project related exceedance were recorded during the reporting period, cumulative construction impact due to the concurrent activities of the current projects with the Central Reclamation Phase III (CRIII) was considered as insignificant.
- 7.0.4. [According to the construction programme of Wan Chai Development Phase II, Central-Wan Chai Bypass and Island Eastern Corridor Link projects, the major construction activities under Wan Chai Development Phase II were road and drains construction and trimming work at WCR4 at Wan Chai. The major construction activities under Central-Wan Chai Bypass and Island Eastern Corridor Link Projects were ventilation building ABWF works and junction modification at Central; seabed reinstatement at Causeway Bay; road works, drainage improvement work, utility diversion works and landscape works at Victoria Park; bridge noise enclosure installation works, road works, drainage works, soft landscape works and ventilation building ABWF work at North Point area in the reporting period. In addition, other non-Wan Chai Development Phase II, Central-Wan Chai Bypass and Island Eastern Corridor Link projects were observed undertaken at Wan Chai North and North Point area.](#)
- 7.0.5. No significant air impact from construction activities was anticipated in the reporting month. Besides, no project related exceedance was recorded during the water, air and noise environmental monitoring events in the reporting month. Thus, it is evaluated that the cumulative construction impact from the concurrent projects including Central Reclamation Phase III (CRIII), Wan Chai Development Phase II (WDII), Central-WanChai Bypass (CWB), Island Eastern Corridor Link projects (IECL) was insignificant.

**8 ENVIRONMENTAL SITE AUDIT**

8.1.1 During this reporting month, four weekly site inspections were carried out on 5, 11, 18 and 25 June 2019 for Contract no. HK/2012/08. The results of inspection and outcome are summarized in **Table 8.1**.

**Table 8.1 Summary of Environmental Inspections for Contract no. HK/2012/08**

Item	Date	Observations	Action taken by Contractor	Outcome
190625_1	25-Jun-19	Sand / Mud deposited at the pedestrian walkway shall be cleaned.	The sand / mud was cleaned.	Completion as observed on 2 July 2019

8.1.2 During this reporting month, four weekly site inspections were carried out on 5, 14 21 and 26 June 2019 for Contract no. HY/2010/08. No observation was found during the reporting month.

Mitigation measures implemented to prevent muddy discharge and surface runoff

8.1.3 With a view to ensure the adequacy and effectiveness of measures to prevent the discharge of muddy water, including surface run-off, from construction works during wet season, the following mitigation measures were implemented by Contractor(s) in the reporting period::

Contract No.	Mitigation Measures implemented
HK/2012/08	<ul style="list-style-type: none"> <li>• Deployment of embankment along seawall</li> <li>• Regular cleaning the sand / silt / mud sitting along the seawall</li> <li>• Hard paved the area along seafront</li> <li>• Cover the stockpile material to avoid excessive surface runoff</li> <li>• Regular review and maintenance of the site drainage system</li> <li>• Discharge of wastewater via wastewater treatment plant if necessary</li> </ul>
HY/2010/08	<ul style="list-style-type: none"> <li>• Most of the land based construction works was completed. Contractor will regular review the muddy discharge and surface runoff concern depends on the remaining works</li> </ul>

**9 COMPLAINTS, NOTIFICATION OF SUMMONS AND PROSECUTION**

9.1.1 No environmental complaint was received in this reporting month.

9.1.2 The details of cumulative complaint log and updated summary of complaints are presented in **Appendix 9.1**

9.1.3 Cumulative statistic on complaints and successful prosecutions are summarized in **Table 9.1** and **Table 9.2** respectively.

**Table 9.1 Cumulative Statistics on Complaints**

Reporting Period	No. of Complaints
July 2013 – May 2019	5
June 2019	0
Total	5

**Table 9.2 Cumulative Statistics on Successful Prosecutions**

Environmental Parameters	Cumulative No. Brought Forward	No. of Successful Prosecutions this month (Offence Date)	Cumulative No. Project-to-Date
Air	0	0	0
Noise	0	0	0
Water	0	0	0
Waste	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 10 CONCLUSION

- 10.0.1. The EM&A programme was carried out in accordance with the EM&A Manual requirements, minor alterations to the programme proposed were made in response to changing circumstances.
- 10.0.2. The scheduled construction activities and the recommended mitigation measures for the coming month are listed in **Table 10.1**. The construction programmes of individual contracts are provided in [Appendix 10.1](#).

**Table 10.1 Summary of Key Construction Activities of Individual Contract(s) to be commenced in Coming Reporting Month**

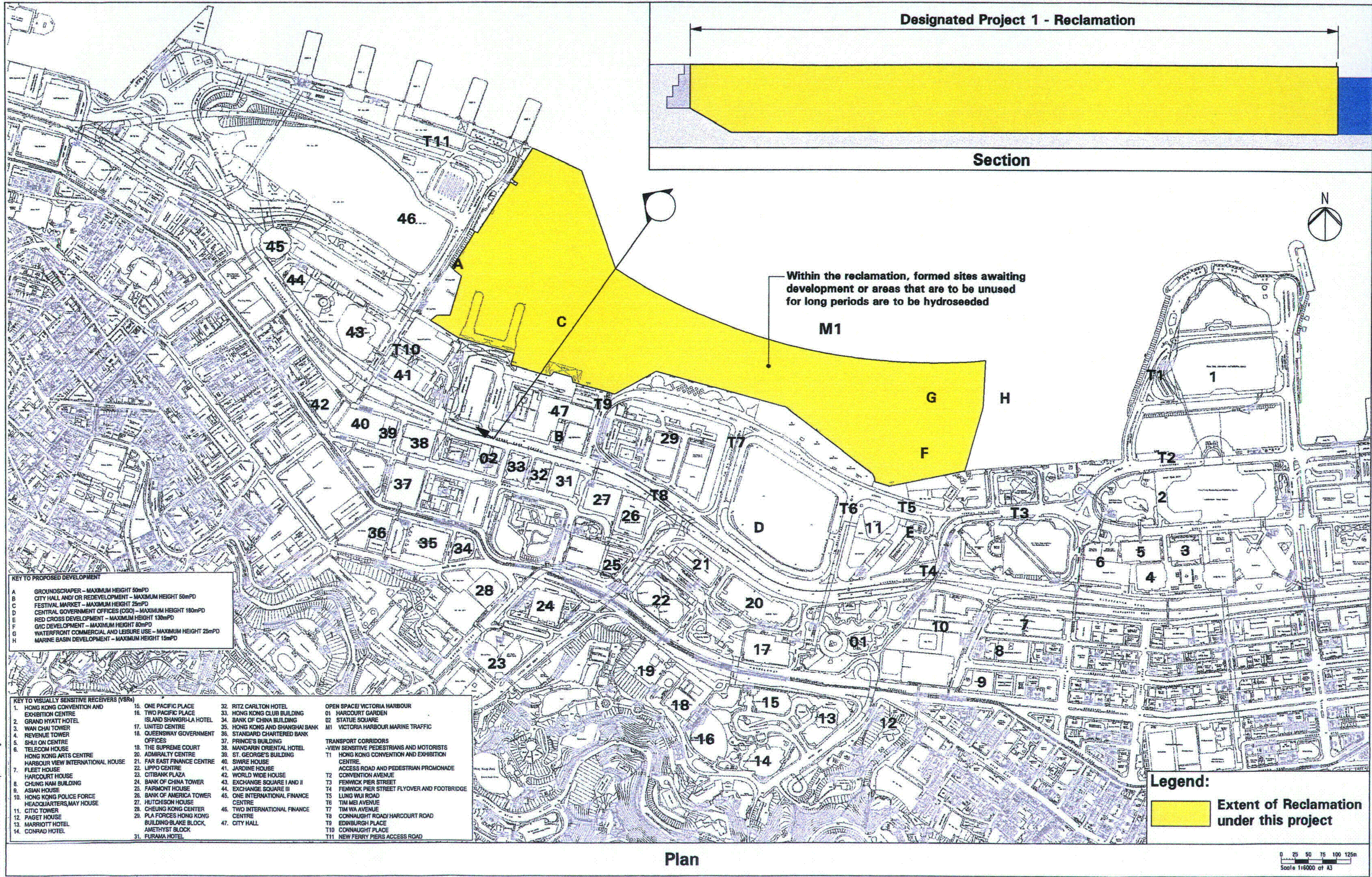
Contract No.	Key Construction Works	Recommended Mitigation Measures
HK/2012/08	<ul style="list-style-type: none"> <li>Roadworks</li> <li>Drainage</li> <li>Seawall coping</li> <li>Dismantling of temporary landing steps</li> </ul>	<ul style="list-style-type: none"> <li>Dust control during dust generating works;</li> <li>Implementation of proper noise pollution control; and</li> <li>Provision of protection to ensure no runoff out of site area or direct discharge into public drainage system.</li> </ul>
HY/2010/08	<ul style="list-style-type: none"> <li>Junction modification</li> </ul>	<ul style="list-style-type: none"> <li>Dust control during dust generating works</li> <li>Implementation of proper noise pollution control; and</li> <li>Provision of protection to ensure no runoff out of site area or direct discharge into public drainage system.</li> </ul>



***Figure 2.1***

***Project Layout***





**KEY TO PROPOSED DEVELOPMENT**

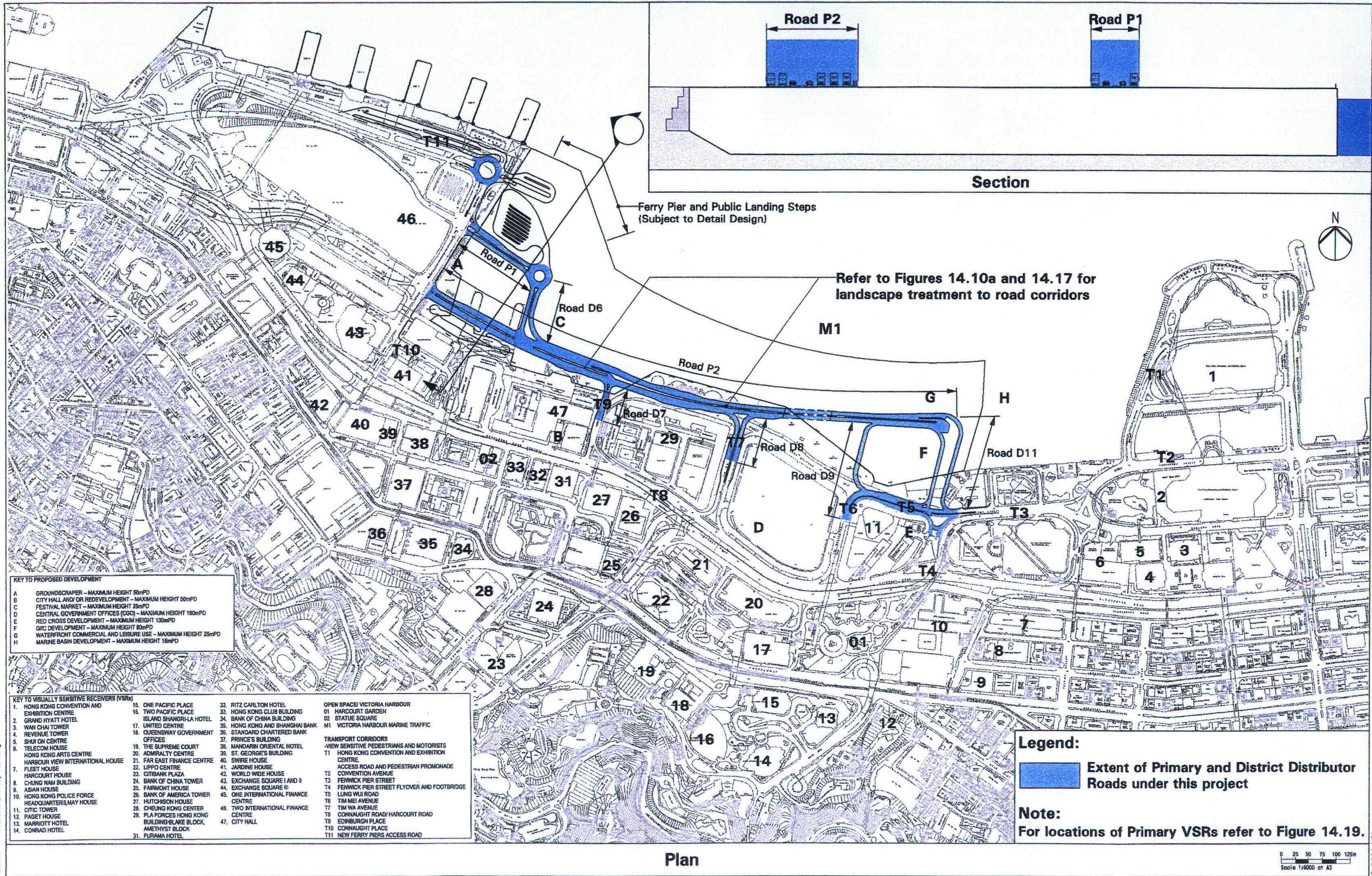
A	GROUNDSCRAPER - MAXIMUM HEIGHT 50mPD
B	CITY HALL AND/OR REDEVELOPMENT - MAXIMUM HEIGHT 50mPD
C	FESTIVAL MARKET - MAXIMUM HEIGHT 25mPD
D	CENTRAL GOVERNMENT OFFICES (CGO) - MAXIMUM HEIGHT 180mPD
E	RED CROSS DEVELOPMENT - MAXIMUM HEIGHT 130mPD
F	G/C DEVELOPMENT - MAXIMUM HEIGHT 80mPD
G	WATERFRONT COMMERCIAL AND LEISURE USE - MAXIMUM HEIGHT 25mPD
H	MARINE BASIN DEVELOPMENT - MAXIMUM HEIGHT 15mPD

**KEY TO VISUALLY SENSITIVE RECEIVERS (VSRs)**

1. HONG KONG CONVENTION AND EXHIBITION CENTRE	15. ONE PACIFIC PLACE	32. RITZ CARLTON HOTEL	OPEN SPACE/ VICTORIA HARBOUR
2. GRAND HYATT HOTEL	16. TWO PACIFIC PLACE	33. HONG KONG CLUB BUILDING	01. HARCOURT GARDEN
3. WAN CHAI TOWER	17. UNITED CENTRE	34. BANK OF CHINA BUILDING	02. STATUE SQUARE
4. REVENUE TOWER	18. QUEENSWAY GOVERNMENT OFFICES	35. HONG KONG AND SHANGHAI BANK	M1. VICTORIA HARBOUR MARINE TRAFFIC
5. SHUI ON CENTRE	19. THE SUPREME COURT	36. STANDARD CHARTERED BANK	TRANSPORT CORRIDORS
6. TELECOM HOUSE	20. ADMIRALTY CENTRE	37. PRINCE'S BUILDING	-VIEW SENSITIVE PEDESTRIANS AND MOTORISTS
7. HONG KONG ARTS CENTRE	21. FAR EAST FINANCE CENTRE	38. MANDARIN ORIENTAL HOTEL	T1. HONG KONG CONVENTION AND EXHIBITION CENTRE
8. HARBOUR VIEW INTERNATIONAL HOUSE	22. LIPPO CENTRE	39. ST. GEORGE'S BUILDING	ACCESS ROAD AND PEDESTRIAN PROMONADE
9. FLEET HOUSE	23. CITIBANK PLAZA	40. SWIRE HOUSE	T2. CONVENTION AVENUE
10. HARCOURT HOUSE	24. BANK OF CHINA TOWER	41. JARDINE HOUSE	T3. FENWICK PIER STREET
11. CHUNG NAM BUILDING	25. FAIRMONT HOUSE	42. WORLD WIDE HOUSE	T4. FENWICK PIER STREET FLYOVER AND FOOTBRIDGE
12. ASIAN HOUSE	26. BANK OF AMERICA TOWER	43. EXCHANGE SQUARE I AND II	T5. LUNG WUI ROAD
13. HONG KONG POLICE FORCE HEADQUARTERS, MAY HOUSE	27. HUTCHISON HOUSE	44. EXCHANGE SQUARE III	T6. TIM MEI AVENUE
14. CITIC TOWER	28. CHEUNG KONG CENTER	45. ONE INTERNATIONAL FINANCE CENTRE	T7. TIM WA AVENUE
15. PAGET HOUSE	29. PLA FORCES HONG KONG BUILDING-BLAKE BLOCK, AMETHYST BLOCK	46. TWO INTERNATIONAL FINANCE CENTRE	T8. CONNAUGHT ROAD/ HARCOURT ROAD
16. MARRIOTT HOTEL	30. FURAMA HOTEL	47. CITY HALL	T9. EDINBURGH PLACE
17. CONRAD HOTEL			T10. CONNAUGHT PLACE
			T11. NEW FERRY PIERS ACCESS ROAD

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Designated Project 2 - Primary and District Distributor Roads  
Layout Plan and Section

Figure 14.10





**KEY TO PROPOSED DEVELOPMENT**

A	GROUNDSCRAPER - MAXIMUM HEIGHT 50mPD
B	CITY HALL AND/OR REDEVELOPMENT - MAXIMUM HEIGHT 50mPD
C	FESTIVAL MARKET - MAXIMUM HEIGHT 25mPD
D	CENTRAL GOVERNMENT OFFICES (CGO) - MAXIMUM HEIGHT 180mPD
E	RED CROSS DEVELOPMENT - MAXIMUM HEIGHT 130mPD
F	GVC DEVELOPMENT - MAXIMUM HEIGHT 80mPD
G	WATERFRONT COMMERCIAL AND LEISURE USE - MAXIMUM HEIGHT 25mPD
H	MARINE BASIN DEVELOPMENT - MAXIMUM HEIGHT 15mPD

**KEY TO VISUALLY SENSITIVE RECEIVERS (VSRs)**

1. HONG KONG CONVENTION AND EXHIBITION CENTRE	15. ONE PACIFIC PLACE	32. RITZ CARLTON HOTEL	OPEN SPACE/ VICTORIA HARBOUR
2. GRAND HYATT HOTEL	16. TWO PACIFIC PLACE	33. HONG KONG CLUB BUILDING	01 HARCOURT GARDEN
3. WAN CHAI TOWER	17. UNITED CENTRE	34. BANK OF CHINA BUILDING	02 STATUE SQUARE
4. REVENUE TOWER	18. QUEENSWAY GOVERNMENT OFFICES	35. HONG KONG AND SHANGHAI BANK	M1 VICTORIA HARBOUR MARINE TRAFFIC
5. SHUI ON CENTRE	19. THE SUPREME COURT	36. STANDARD CHARTERED BANK	TRANSPORT CORRIDORS
6. TELECOM HOUSE	20. ADMIRALTY CENTRE	37. PRINCE'S BUILDING	-VIEW SENSITIVE PEDESTRIANS AND MOTORISTS
7. FLEET HOUSE	21. FAR EAST FINANCE CENTRE	38. MANDARIN ORIENTAL HOTEL	T1 HONG KONG CONVENTION AND EXHIBITION CENTRE
8. HARCOURT HOUSE	22. LIPPO CENTRE	39. ST. GEORGE'S BUILDING	ACCESS ROAD AND PEDESTRIAN PROMENADE CONVENTION AVENUE
9. ASIAN HOUSE	23. CITIBANK PLAZA	40. SWIRE HOUSE	T2
10. HONG KONG POLICE FORCE HEADQUARTERS, MAY HOUSE	24. BANK OF CHINA TOWER	41. JAPANESE HOUSE	T3
11. CITIC TOWER	25. FAIRMONT HOUSE	42. WORLD WIDE HOUSE	T4 FENWICK PIER STREET FLYOVER AND FOOTBRIDGE
12. PAGET HOUSE	26. BANK OF AMERICA TOWER CENTRE	43. EXCHANGE SQUARE I AND II	T5 LUNG WUI ROAD
13. MARRIOTT HOTEL	27. HUTCHISON HOUSE	44. EXCHANGE SQUARE III	T6 TIM MEI AVENUE
14. CONRAD HOTEL	28. CHEUNG KONG CENTER	45. ONE INTERNATIONAL FINANCE CENTRE	T7 TIM WA AVENUE
	29. PLA FORCES HONG KONG BUILDING-SLAKE BLOCK, AMETHYST BLOCK	46. TWO INTERNATIONAL FINANCE CENTRE	T8 CONNAUGHT ROAD/ HARCOURT ROAD
	31. PURANA HOTEL	47. CITY HALL	T9 EDINBURGH PLACE
			T10 CONNAUGHT PLACE
			T11 NEW FERRY PIERS ACCESS ROAD

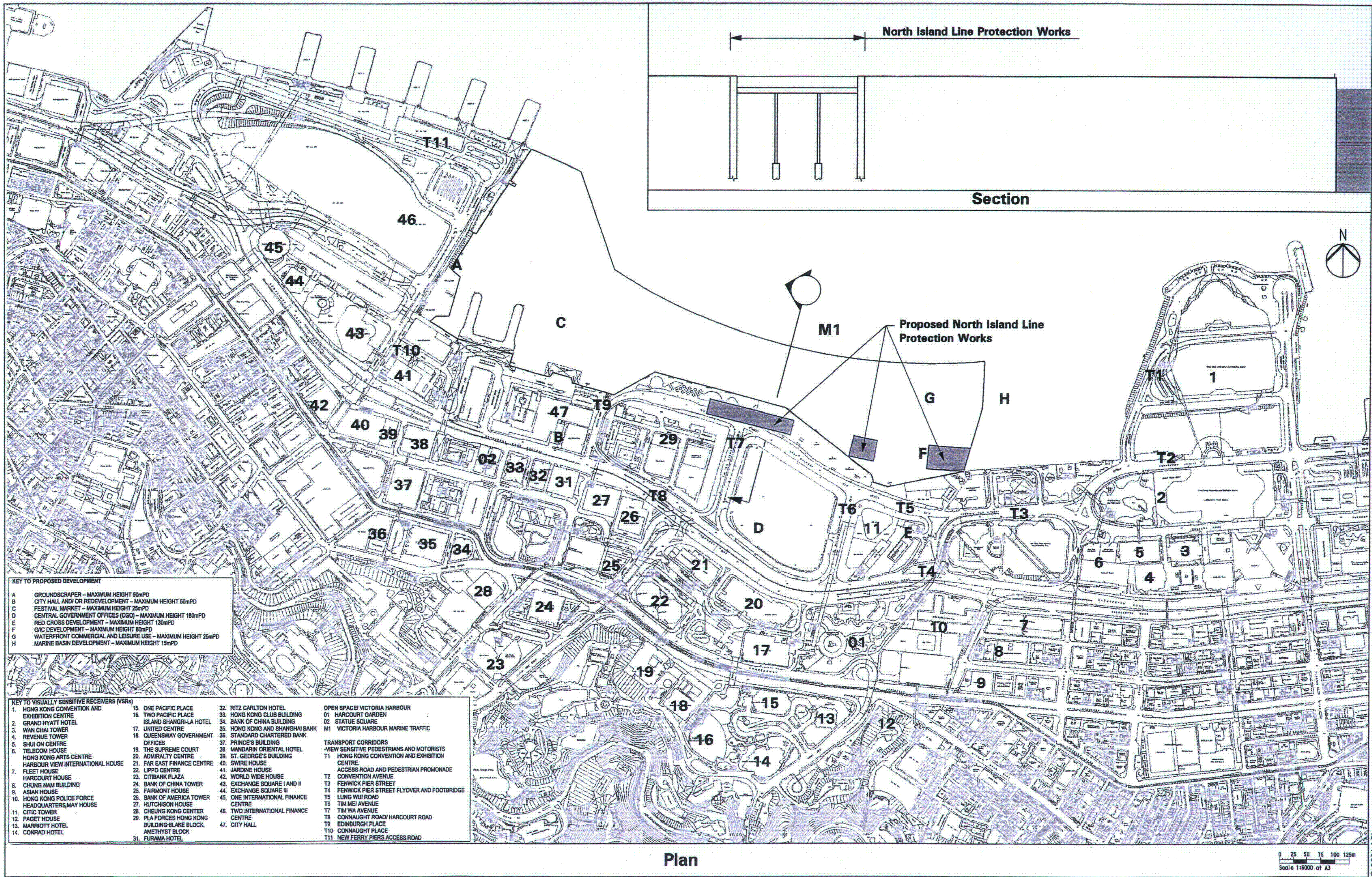
**Legend:**  
Extent of Central Wan Chai Bypass Tunnel under this project

Scale 1:6000 of A3  
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Designated Project 3 - Central Wan Chai Bypass Tunnel  
Layout Plan and Section

Figure 14.11





**KEY TO PROPOSED DEVELOPMENT**

A	GROUNDSCRAPER - MAXIMUM HEIGHT 50mPD
B	CITY HALL AND/OR REDEVELOPMENT - MAXIMUM HEIGHT 50mPD
C	FESTIVAL MARKET - MAXIMUM HEIGHT 25mPD
D	CENTRAL GOVERNMENT OFFICES (CGO) - MAXIMUM HEIGHT 180mPD
E	RED CROSS DEVELOPMENT - MAXIMUM HEIGHT 130mPD
F	GIC DEVELOPMENT - MAXIMUM HEIGHT 80mPD
G	WATERFRONT COMMERCIAL AND LEISURE USE - MAXIMUM HEIGHT 25mPD
H	MARINE BASIN DEVELOPMENT - MAXIMUM HEIGHT 15mPD

**KEY TO VISUALLY SENSITIVE RECEIVERS (VSRs)**

1. HONG KONG CONVENTION AND EXHIBITION CENTRE	15. ONE PACIFIC PLACE	32. RITZ CARLTON HOTEL	OPEN SPACE/ VICTORIA HARBOUR
2. GRAND HYATT HOTEL	16. TWO PACIFIC PLACE	33. HONG KONG CLUB BUILDING	01. HARCOURT GARDEN
3. WAN CHAI TOWER	17. ISLAND SHANGRI-LA HOTEL	34. BANK OF CHINA BUILDING	02. STATUE SQUARE
4. REVENUE TOWER	18. UNITED CENTRE	35. HONG KONG AND SHANGHAI BANK	M1 VICTORIA HARBOUR MARINE TRAFFIC
5. SHUI ON CENTRE	19. QUEENSWAY GOVERNMENT OFFICES	36. STANDARD CHARTERED BANK	TRANSPORT CORRIDORS
6. TELECOM HOUSE	20. ADMIRALTY CENTRE	37. PRINCE'S BUILDING	-VIEW SENSITIVE PEDESTRIANS AND MOTORISTS
7. HONG KONG ARTS CENTRE	21. FAR EAST FINANCE CENTRE	38. MANDARIN ORIENTAL HOTEL	T1 HONG KONG CONVENTION AND EXHIBITION CENTRE
8. HARBOUR VIEW INTERNATIONAL HOUSE	22. LIPPO CENTRE	39. ST. GEORGE'S BUILDING	T2 ACCESS ROAD AND PEDESTRIAN PROMENADE
9. FLEET HOUSE	23. CITIBANK PLAZA	40. SWIRE HOUSE	T3 CONVENTION AVENUE
10. HARCOURT HOUSE	24. BANK OF CHINA TOWER	41. JARDINE HOUSE	T4 FENWICK PIER STREET
11. CHUNG NAM BUILDING	25. FAIRMONT HOUSE	42. WORLD WIDE HOUSE	T5 FENWICK PIER STREET FLYOVER AND FOOTBRIDGE
12. ASIAN HOUSE	26. BANK OF AMERICA TOWER	43. EXCHANGE SQUARE I AND II	T6 LUNG WUI ROAD
13. HONG KONG POLICE FORCE HEADQUARTERS, MAY HOUSE	27. HUTCHISON HOUSE	44. EXCHANGE SQUARE III	T7 TIM MEI AVENUE
14. CITIC TOWER	28. CHEUNG KONG CENTER	45. ONE INTERNATIONAL FINANCE CENTRE	T8 TIM WA AVENUE
15. PAGET HOUSE	29. PLA FORCES HONG KONG BUILDING-BLAKE BLOCK	46. TWO INTERNATIONAL FINANCE CENTRE	T9 CONNAUGHT ROAD/ HARCOURT ROAD
16. MARRIOTT HOTEL	30. AMETHYST BLOCK	47. CITY HALL	T10 EDINBURGH PLACE
17. CONRAD HOTEL	31. FURAMA HOTEL		T11 CONNAUGHT PLACE
			T12 NEW FERRY PIERS ACCESS ROAD

Designated Project 4 - North Island Line Protection Works  
Layout Plan and Section

Figure 14.12

Scale 1:6000 at A3

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***Figure 2.2***

***Project Organization Chart***





***Figure 4.1***

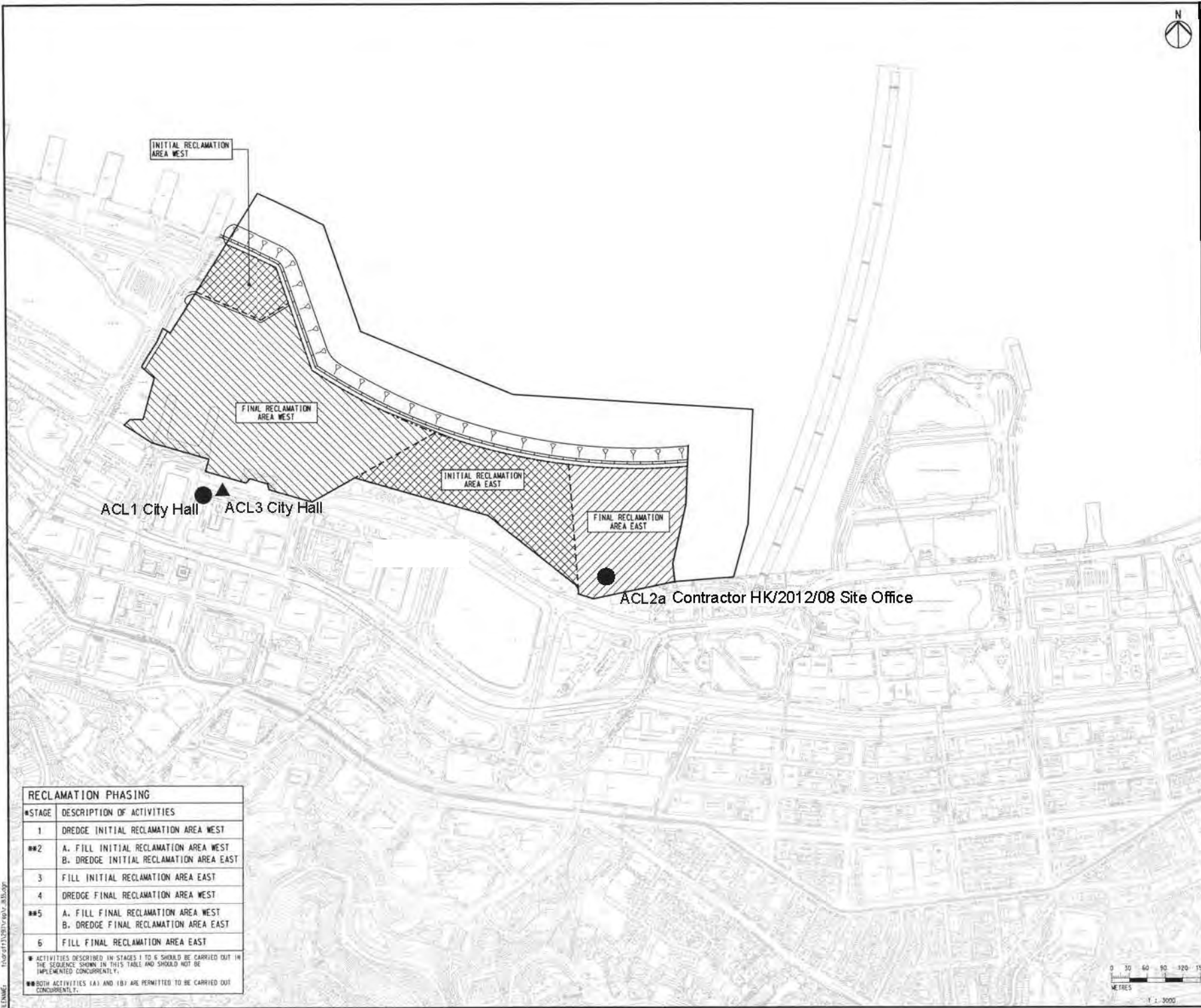
***Locations of Monitoring Stations***



DO NOT SCALE DRAWINGS, VERIFY ALL DIMENSIONS ON SITE

**LEGEND:**

- DUST MONITORING STATIONS
- ▲ NOISE MONITORING STATION



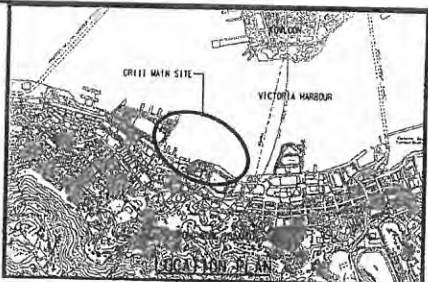
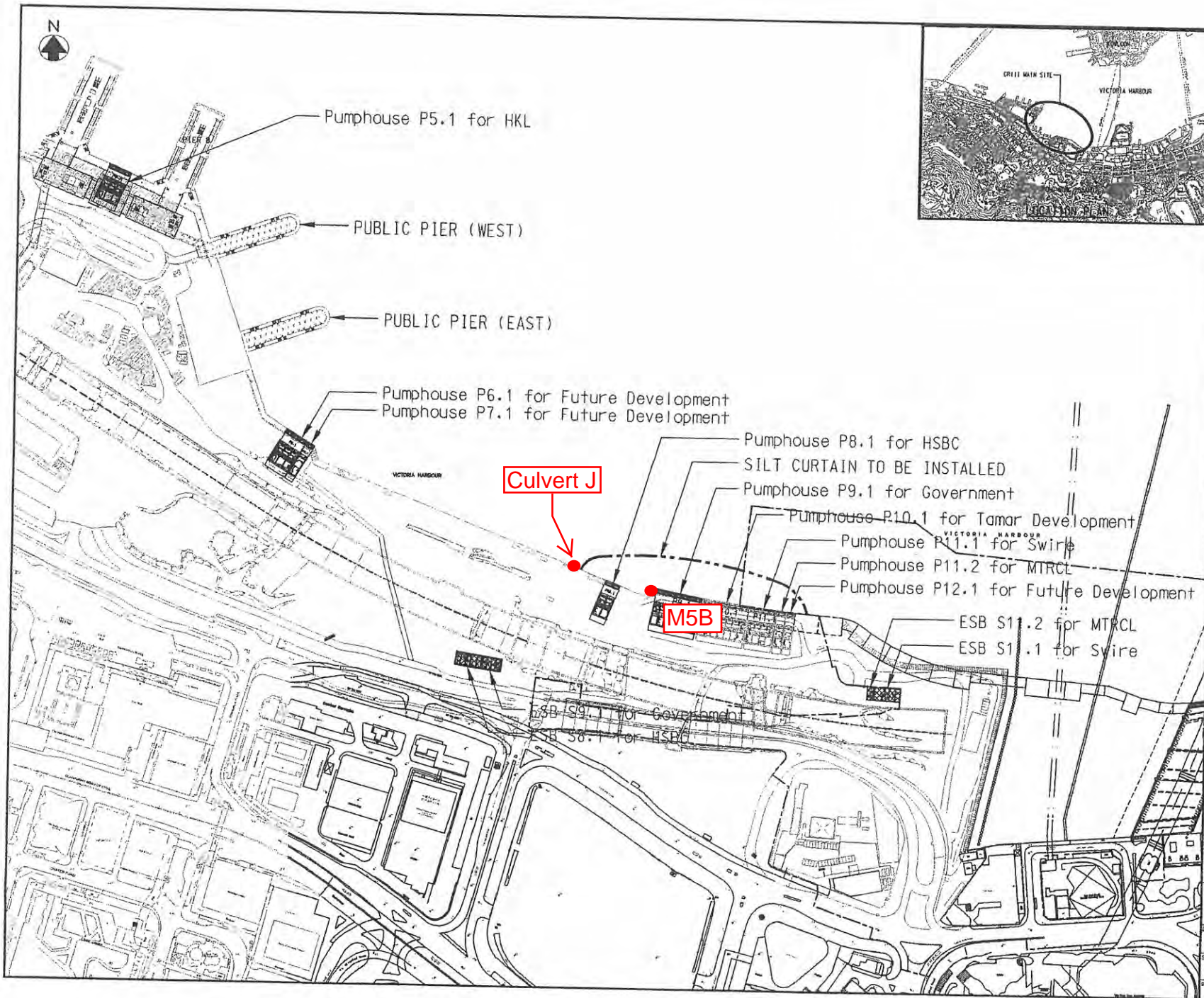
RECLAMATION PHASING	
#STAGE	DESCRIPTION OF ACTIVITIES
1	DREDGE INITIAL RECLAMATION AREA WEST
**2	A. FILL INITIAL RECLAMATION AREA WEST B. DREDGE INITIAL RECLAMATION AREA EAST
3	FILL INITIAL RECLAMATION AREA EAST
4	DREDGE FINAL RECLAMATION AREA WEST
**5	A. FILL FINAL RECLAMATION AREA WEST B. DREDGE FINAL RECLAMATION AREA EAST
6	FILL FINAL RECLAMATION AREA EAST

\* ACTIVITIES DESCRIBED IN STAGES 1 TO 6 SHOULD BE CARRIED OUT IN THE SEQUENCE SHOWN IN THIS TABLE AND SHOULD NOT BE IMPLEMENTED CONCURRENTLY.  
 \*\* BOTH ACTIVITIES (A) AND (B) ARE PERMITTED TO BE CARRIED OUT CONCURRENTLY.



Fig 4.1 Location of monitoring stations

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FILE NAME: [illegible]



NOTES :  
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.

LEGENDS :  
- - - - - SILT CURTAIN

CONTRACT NO. HK/2012/08  
WAN CHAI DEVELOPMENT PHASE II -  
CENTRAL - WAN CHAI BYPASS AT  
WAN CHAI WEST

TITLE  
PUMP HOUSES AND ESBS  
LOCATION PLAN WITH INSTALLED  
SILT CURTAIN

中國建築 - 利達聯眾  
CHINA STATE-LEADER JOINT VENTURE

PROJ. NO.  
HK\_2012\_08/CDB/S/SK/071

SCALE  
A3 1:3000  
DATE OF ISSUING THIS  
8-AUG-2013

EMBRACING ARE IN METRES  
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***Appendix 3.1***

***Environmental Mitigation Implementation Schedule***



### IMPLEMENTATION SCHEDULE OF THE PROPOSED MITIGATION MEASURES

No.	Activity	Mitigation/EIA Recommendations	Responsibility for Implementation	Location Duration completion of measures	Implementation Stage C : Construction D : Design	Permit Conditions apply to	Relevant Guidelines Legislation
1	Operational Traffic Noise*	The openings of ventilation buildings or ventilation shafts should be placed carefully and ideally should be such that they are not facing directly onto any NSR.	Various	Area Wide, Proposals at design stage for Implementation during construction	D/C	N/A	--
2	Operational Air Quality	Air intakes for commercial/G/IC buildings should be placed such that they are at locations where contours indicate AQOs are met.	ArchSD/Private sector +	CRIII During development of sites Completion of CRIII	Development of CRIII	Carry forward to design stage	6
3	Operational Water Quality	Provision of grit traps for surface drainage	TDD's Contractor	New roads and paved areas During construction End of construction	C	P, R, A, C	7
4	Operational Landscape and Visual	Operational stage landscape and visual mitigation measures should include +  <ul style="list-style-type: none"> <li>· Implementation of the Waterfront Promenade, Statue Square Corridor, Historic Corridor, Civic Corridor, Arts and Entertainment Corridor, Streetscape Network, Landscape Decks, and Supplementary Landscape Spaces;</li> <li>· provision of a legible, integrated pedestrian circulation system linking major activity nodes, reinforcing links with adjoining areas, and providing an international quality hard and soft landscape treatment;</li> <li>· provision of a grade separated pedestrian system to minimise vehicular/ pedestrian conflict;</li> <li>· provision of an integrated network of local and regional open spaces for passive and active recreation;</li> <li>· preservation of selected architectural features;</li> <li>· preservation insitu of existing significant vegetation, principally the two Banyan Trees flanking the Tamar Site;</li> <li>· new roads to incorporate suitable streetscape amenity and landscape planting to minimise visual and environmental impacts;</li> </ul>	Various	Area wide, proposals at design stage for implementation during construction	D/C	P	--



No.	Activity	Mitigation/EIA Recommendations	Responsibility for Implementation	Location Duration completion of measures	Implementation Stage C : Construction D : Design	Permit Conditions apply to	Relevant Guidelines Legislation
		<ul style="list-style-type: none"> <li>existing roads upgraded to 'marry' with the proposed landscape framework;</li> <li>Hydroseeding of reclamation if there is no immediate use of the site, periphery of the reclamation;</li> <li>Designated service corridors beneath footpaths to prevent potential impacts upon vegetation during services maintenance;</li> <li>Sensitively designed colour themes to footpath paving areas; and</li> <li>Sensitively designed seawall to enhance the recreational value of the future promenade can be included.</li> </ul>	Various	Area wide, proposals at design stage for implementation during construction	D/C	P	--
5	Construction Noise Control Requirements	Use of the following quiet mechanical equipment for construction works : <ul style="list-style-type: none"> <li>air compressor; paver; hand held breaker; breaker, excavator mounted; bulldozer; concrete lorry mixer; concrete pump; crane; dump truck; excavator/ loader; grader; lorry ; poker; road roller; vibratory roller;</li> </ul>	TDD's Contractor	Works Area During construction End of construction	C	P, R, A, C	-
		Use of noise barriers (in the form if purpose built site hoarding of 3 - 5 m height and surface density of at least 7 kgm <sup>2</sup> with cranked top) for the following works: <ul style="list-style-type: none"> <li>Hong Kong Station Extended Overrun Tunnels to north of Central Barracks.</li> <li>North Island Line Protection Works to north of Central Barracks;</li> <li>Road/Drainage Works to north of Central Barracks;</li> <li>Culvert F Piling Works to north of City Hall.</li> </ul>	TDD's Contractor	Work Sites as stated Start of activity stated End of activity stated	C	P, A	
		Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme.	TDD's Contractor	Works Area During construction End of construction	C	P,R,A,C	4
		Silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction programme.	TDD's Contractor	Works Area During construction End of construction	C	P,R,A,C	4
		Mobile plant, if any, should be sited as far away from noise sensitive facilities as possible.	TDD's Contractor	Works Area During construction End of construction	C	P,R,A,C	4



No.	Activity	Mitigation/EIA Recommendations	Responsibility for Implementation	Location Duration completion of measures	Implementation Stage C : Construction D : Design	Permit Conditions apply to	Relevant Guidelines Legislation
		<ul style="list-style-type: none"> <li>Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum.</li> </ul>	TDD's Contractor	Works Area During construction End of construction	C	P,R,A,C	4
		<ul style="list-style-type: none"> <li>Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from nearby noise sensitive facilities.</li> </ul>	TDD's Contractor	Works Area During construction End of construction	C	P,R,A,C	4
6	Construction Air Quality Control Requirements	<ul style="list-style-type: none"> <li>Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.</li> </ul>	TDD's Contractor	Works Area During construction End of construction	C	P,R,A,C	4
		<ul style="list-style-type: none"> <li>Strictly limit truck speed on site to below 10 km per hour and water spraying to keep the haul roads in wet condition.</li> </ul>	TDD's Contractor	Works Area During construction End of construction	C	P,R,A,C	6,7
		<ul style="list-style-type: none"> <li>Twice daily watering of the site with active operations when the weather and the work site are dry.</li> </ul>	TDD's Contractor	Works Area During construction End of construction	C	P,R,A,C	6,7
		<ul style="list-style-type: none"> <li>Watering during excavation and material handling.</li> </ul>	TDD's Contractor	Works Area During construction End of construction	C	P,R,A,C	6,7
		<ul style="list-style-type: none"> <li>Provision of vehicle wheel and body washing facilities at the exit points of the site, combined with cleaning of public roads where necessary.</li> </ul>	TDD's Contractor	Works Area During construction End of construction	C	P,R,A,C	6,7
		<ul style="list-style-type: none"> <li>Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.</li> </ul>	TDD's Contractor	Works Area During construction End of construction	C	P,R,A,C	6,7
		<ul style="list-style-type: none"> <li>Covers for dusty stockpiles</li> </ul>	TDD's Contractor	Works Area During construction End of construction	C	P,R,A,C	6
		<ul style="list-style-type: none"> <li>All plant shall be maintained to prevent any undue air emissions</li> </ul>	TDD's Contractor	Works Area	C	P,R,A,C	6



No.	Activity	Mitigation/EIA Recommendations	Responsibility for Implementation	Location Duration completion of measures	Implementation Stage C : Construction D : Design	Permit Conditions apply to	Relevant Guidelines Legislation
				During construction End of construction			
7	Construction Water Quality Control Requirements	<p>Specific Measures Associated with Dredging Works</p> <ul style="list-style-type: none"> <li>· the use of closed clamshell (water-tight) grab dredgers to remove seriously contaminated material such that the amount of SS and other pollutants released from the marine mud and pore water can be minimised;</li> <li>· the prohibition of stockpiling of any moderately or seriously contaminated marine sediment, and careful control of stockpiling of any uncontaminated sediment to prevent runoff, resuspension and odour nuisances; and</li> <li>· the control of dredging and bulk reclamation filling rates within acceptable limits. Based upon the construction sequence developed for this study the maximum dredging and filling rates adopted for Final Reclamation Area East were : Maximum Dredging Rate : 184 m<sup>2</sup>/hour Maximum Daily Filling Rate : 17,727 m<sup>3</sup>/day (for bulk reclamation filling)</li> </ul> <p>Maximum dredging and filling rates for other reclamation sites should take account of information contained in Table 10.14 of the EIA Report and envisaged construction sequence.</p> <ul style="list-style-type: none"> <li>· no dredging should take place under very bad weather conditions.</li> </ul>	TDD's Contractor	Whole reclamation area During reclamation works End of reclamation works	C	R	7
		<ul style="list-style-type: none"> <li>· silt curtain around dredging sites to be provided as necessary.</li> </ul> <p>Specific Measure for Marine Disposal of Dredged Materials and Marine Sand Filling Works</p> <ul style="list-style-type: none"> <li>· all vessels should be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;</li> <li>· all hopper barges and dredgers should be fitted with tight fitting seals to their bottom openings to prevent leakage of material;</li> <li>· loading of hopper barges should be controlled to prevent splashing of dredged or filling material to the surrounding water, and barges or hoppers should not be filled to a level which will cause the overflow of materials or polluted water during loading or</li> </ul>	TDD's Contractor	Whole reclamation area During reclamation works End of reclamation works	C	R	7



No.	Activity	Mitigation/EIA Recommendations	Responsibility for Implementation	Location Duration completion of measures	Implementation Stage C : Construction D : Design	Permit Conditions apply to	Relevant Guidelines Legislation
		transportation;					
		<ul style="list-style-type: none"> <li>· the works should cause no visible foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site or dumping grounds;</li> <li>· bulk filling should be carried out, where feasible, behind completed seawall to above high water mark. In general and where physically practical, filling should not be carried out without the seawall having been substantially completed for a distance of 100m – 200m ahead of filling; and</li> <li>· fill materials should comply with technical specification requirements and be taken from approved sources only. The maximum fines content of marine sand should be limited to 5% as assumed in the water quality assessments.</li> <li>· transport of contaminated mud (or filling material) to the marine disposal site (or works site) should, wherever possible, be by split barge of not less than 750 m<sup>3</sup> capacity, well maintained and capable of rapid opening and discharge at the disposal site;</li> <li>· the dredged material should be disposed in the pit by bottom dumping, at a location within the pit specified by the MFC;</li> <li>· discharge should be undertaken rapidly and the hoppers should then immediately be closed. Material adhering to the sides of the hopper should not be washed out of the hopper and the hopper should remain closed until the barge next return to the disposal site;</li> <li>· the dumping vessel is not required to station but will be guided by the site staff managing the disposal facility. The vessel crew should be familiar with such operational procedures;</li> <li>· monitoring of the barge loading to ensure that loss of material does not take place during transportation; and</li> <li>· Transport barges or vessels shall be equipped with automatic self-monitoring devices.</li> </ul>	TDD's Contractor	Whole reclamation area During reclamation works End of reclamation works	C	R	7



No.	Activity	Mitigation/EIA Recommendations	Responsibility for Implementation	Location Duration completion of measures	Implementation Stage C : Construction D : Design	Permit Conditions apply to	Relevant Guidelines Legislation
		<p>Specific Measures Associated with Dredging and Filling Works when CRIII Dredging and Filling Works are being constructed concurrently with WDII Dredging and Filling Works</p> <ul style="list-style-type: none"> <li>· deployment of silt curtains around the dredging and fill release points to contain SS within the construction site during dredging and filling;</li> <li>· deployment of silt screens at the cooling water intakes and WSD salt water intakes to further minimise the intake of SS within the sea water.</li> </ul>	TDD's Contractor	<p>Reclamation Areas as appropriate</p> <p>When CRIII and WDII - Dredging and Filling Works occur concurrently</p> <p>End of Concurrent Works</p>	C	R	-
		<p>Specific Measures Associated with Floating Debris</p> <p>The result of the floating debris simulation has shown that the intermediate layout of the proposed reclamation has potential to trap floating rubbish. Monitoring and control of the construction activities should be taken to prevent the release of construction waste and rubbish from the construction site. Collection of floating debris should be carried out at least once every day by the CRIII Contractor, and more frequently (two or three times per day) at the water body south of the Initial Reclamation Area West and near the cooling water intakes where large substances could block the screens and filter pipes of the intakes and reduce their efficiency. Debris should be collected and taken to landfill sites for disposal.</p>	TDD's Contractor	<p>Whole reclamation area</p> <p>During construction</p> <p>At end of construction</p>	C	R	-
		<p>Specific Measures for Dealing with Culvert L Outfall at Completion of CRIII Eastern Seawall</p> <p>As a mitigation measure, to avoid the accumulation of water borne pollutants within a temporary embayment to the east of CRIII, an impermeable barrier, suspended from a floating boom on the water surface and extending down to the seabed, will be erected by the CRIII Contractor on completion of the CRIII eastern seawall. The barrier will channel the stormwater discharge flows from Culvert L to the outside of the embayment. The CRIII Contractor will maintain this barrier until the WDII Contractor takes possession of this site, whereupon the WDII Contractor will takeover the maintenance of this barrier until the reclamation works in this area are carried out and the new Culvert L extension is constructed.</p>	TDD's Consultant	<p>Culvert L Outfall</p> <p>During Construction</p> <p>To handover to WDII Contractor</p>	C	R	--



No.	Activity	Mitigation/EIA Recommendations	Responsibility for Implementation	Location Duration completion of measures	Implementation Stage C : Construction D : Design	Permit Conditions apply to	Relevant Guidelines Legislation
		<p>Construction Run-off and Drainage</p> <ul style="list-style-type: none"> <li>- Control of Site Surface Runoff:</li> <li>- Surface run-off from construction sites should be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels or earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries should be provided where necessary. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.</li> <li>- Silt removal facilities, channels and manholes should be maintained.</li> <li>- Construction works should be programmed to minimise soil excavation works in rainy seasons (April to September). If excavation in soil cannot be avoided, temporarily exposed slope surfaces should be covered and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided.</li> <li>- Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage such as intercepting channels should be provided where necessary.</li> <li>- Measures should be taken to minimise the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.</li> <li>- Open stockpiles of construction materials should be covered.</li> <li>- Manholes should be adequately covered and temporarily sealed.</li> </ul>	TDD's Contractor	<p>Works Area</p> <p>During construction</p> <p>End of construction</p>	C	P,R,A,C	7
		<ul style="list-style-type: none"> <li>- Groundwater</li> <li>- Groundwater pumped out of tunnels or caverns should be discharged into storm drains after the removal of silt.</li> </ul>					



No.	Activity	Mitigation/EIA Recommendations	Responsibility for Implementation	Location Duration completion of measures	Implementation Stage C : Construction D : Design	Permit Conditions apply to	Relevant Guidelines Legislation
		<ul style="list-style-type: none"> <li>- Boring and Drilling Water</li> <li>- Water used in ground boring and drilling for site investigation or rock/soil anchoring should as far as practicable be recirculated after sedimentation. Wastewater should be discharged into storm drains via silt removal facilities.</li> <li>- Wastewater from Concrete Batching and Precast Concrete Casting</li> <li>- Wastewater generated from the washing down of mixer trucks and drum mixers and similar equipment should wherever practicable be recycled. The discharge of wastewater should be kept to a minimum.</li> <li>- To prevent pollution from wastewater overflow, the pump sump of any water recycling system should be provided with an on-line standby pump of adequate capacity and with automatic alternating devices.</li> <li>- Under normal circumstances, surplus wastewater may be discharged into foul sewers after treatment in silt removal and pH adjustment facilities (to within the pH range of 6 to 10). Disposal of wastewater into storm drains will require more elaborate treatment. Surface run-off should be segregated from the concrete mixing and casting yard area as much as possible, and diverted to the stormwater drainage system. Surface run-off contaminated by materials in a concrete mixing area or casting yard should be adequately treated before disposal into stormwater drains.</li> </ul>	TDD's Contractor	<p style="text-align: center;">Work Area</p> <p style="text-align: center;">During construction</p> <p style="text-align: center;">End of construction</p>	C	P,R,A,C	7
		<ul style="list-style-type: none"> <li>- Wheel Washing Water</li> <li>- All vehicles and plant should be cleaned before they leave the construction site. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.</li> <li>- Bentonite Slurries</li> <li>- Bentonite slurries should be reconditioned and reused wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the used slurry may be disposed of at the marine spoil site subject to obtaining a marine dumping licence from EPD (on a case-by-case basis).</li> </ul>	TDD's Contractor	<p style="text-align: center;">Work Area</p> <p style="text-align: center;">During construction</p> <p style="text-align: center;">End of construction</p>	C	P,R,A,C	7





No.	Activity	Mitigation/EIA Recommendations	Responsibility for Implementation	Location Duration completion of measures	Implementation Stage C : Construction D : Design	Permit Conditions apply to	Relevant Guidelines Legislation
		<ul style="list-style-type: none"> <li>- If the used bentonite slurry is intended to be disposed of through the public drainage system, it should be treated to the respective effluent standards applicable to foul sewers, storm drains or the receiving waters as set out in the WPCO Technical Memorandum on Effluent Standards.</li> </ul>					
		<ul style="list-style-type: none"> <li>- Wastewater from Building Construction</li> <li>- Before commencing any demolition works, all sewer and drainage connections should be sealed to prevent building debris, soil, sand etc. from entering public sewers/drains.</li> <li>- Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities should not be discharged into the stormwater drainage system. If the wastewater is to be discharged into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary.</li> </ul>					
		<ul style="list-style-type: none"> <li>-Licensing of Construction Site Discharges within Water Control Zones</li> <li>-All discharges into any drainage or sewerage systems, or inland or coastal waters, or into the ground (e.g. from septic tanks) within a Water Control Zone are controlled under the Water Pollution control Ordinance (WPCO), except the discharge of domestic sewage into foul sewers or the discharge of unpolluted water into storm drains or into the waters of Hong Kong. Construction site discharges are controlled under the WPCO.</li> <li>-Discharges controlled under the WPCO must comply with the terms and conditions of a valid WPCO licence.</li> </ul>					



No.	Activity	Mitigation/EIA Recommendations	Responsibility for Implementation	Location Duration completion of measures	Implementation Stage C : Construction D : Design	Permit Conditions apply to	Relevant Guidelines Legislation
8.	Construction Waste Control Requirements	<p>Specific Measures Associated with Marine sediments</p> <p>In accordance with the WBTC No. 3/2000, the seriously contaminated material must be dredged and transported with great care. Mitigation measures, including the use of close-grab dredgers, shall be incorporated.</p> <p>The dredged contaminated sediment must be effectively isolated from the environment upon final disposal and shall be disposed of at the East Sha Chau Contaminated Mud Pits.</p>	TDD's Contractor	Whole Reclamation Area During Reclamation Works End of Reclamation Work	C	R	7
		<p>Segregation and Disposal of Wastes</p> <ul style="list-style-type: none"> <li>· inert demolition/construction waste material when deemed suitable for reclamation or land formation should be re-used on-site;</li> <li>· non-inert demolition / construction waste material should be disposed of at landfills;</li> <li>· chemical waste as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be stored in accordance with approved methods defined in the Regulation and Code of Practice and the chemical waste disposed of at the Chemical Waste Treatment Facility located at Tsing Yi or an approved recycler;</li> <li>· general refuse should be recycled where possible or disposed of at public landfill.</li> </ul>	TDD's Contractor	Works Areas During Construction End of Construction	C	P, R, A, C	1,8, 9
		<p>Storage, Collection and Transport of Waste</p> <ul style="list-style-type: none"> <li>· wastes should be handled and stored in a manner which ensures that they are held securely without loss or leakage thereby minimising the potential for pollution. Release of these potential pollutants into marine waters during storage, handling or barge transportation should not be permitted as introduction of polluted waters is likely to have detrimental effects on water quality and water sensitive receivers;</li> <li>· only reputable waste hauliers authorised to collect the specific category of waste concerned should be employed;</li> <li>· appropriate measures should be employed to minimise windblown litter and dust during transportation by using enclosed bins, covering trucks or transporting wastes in enclosed containers;</li> <li>· the necessary waste disposal permits and registrations should be obtained from the appropriate authorities, if they are required, in accordance with the Waste Disposal</li> </ul>	TDD's Contractor	Works Areas During Construction End of Construction	C	P, R, A, C	1, 8, 9



No.	Activity	Mitigation/EIA Recommendations	Responsibility for Implementation	Location Duration completion of measures	Implementation Stage C : Construction D : Design	Permit Conditions apply to	Relevant Guidelines Legislation
		Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 354) and the Crown Land Ordinance; <ul style="list-style-type: none"> <li>· collection of general refuse should be carried out frequently, preferably daily;</li> <li>· waste should only be disposed of at licensed sites and the civil engineering contractor should develop procedures to ensure that illegal disposal of wastes does not occur;</li> <li>· waste storage areas should be well maintained and cleaned regularly;</li> <li>· records should be maintained of the quantities of wastes generated, recycled and disposed, determined by weighing each load or other method; and</li> <li>· A "trip ticket" system should be implemented, if required by Government.</li> </ul>					
9	Construction Landscape and Visual Control Requirements	Construction stage landscape and visual mitigation measures should include : <ul style="list-style-type: none"> <li>· Minimising contractors accesses and working areas as far as possible;</li> <li>· Protection and retention of existing vegetation where possible in accordance with the Hong Kong Government "A Guide to Tree Planting and Maintenance in Urban Hong Kong, Section 5" Care of Trees on Development Sites' and the Country Parks Ordinance</li> <li>· Transplanting of trees where appropriate;</li> <li>· Advance planting and visual screening;</li> <li>· Conservation of top soil;</li> <li>· Design of the temporary works areas so as to optimise eventual use as promenade and public open space; and</li> <li>· Sensitively designed site hoarding.</li> </ul>	TDD's design consultant	Area wide during design and contract preparation	D	P, R, A, C	11, 12, 13,14
10	Monitoring and Audit	To be carried out in accordance with the Schedule in the EM and A Manual	TDD*/Contractor/ RSS  TDD's design consultant	Works areas During construction End of construction and within one year of operational phase Area wide during design and contract preparation	C/O  D	P, R, A, C  P, R, A, C	1  11,12,13,14



**Relevant Guidelines Legislation**

1. Environmental Impact Assessment Ordinance Technical Memorandum (EIAO)
2. HKPSG
3. ExCo Criteria for ITR
4. Noise Control Ordinance
5. The ProPECC Note PN2/93 (Construction Noise daytime limits)
6. Air Pollution Control Ordinance (APCO)
7. Water Pollution Control Ordinance (WPCO)(Cap. 358)
8. Waste Disposal Ordinance (Cap 354)
9. Waste Disposal (Chemical Waste)(General) Regulation (Cap 354)
10. Land Ordinance (Cap 28)
11. WBTC 25/92 Allocation of Space for Urban Trees
12. WBTC 25/93 Control of Visual Impact of Slopes
13. WBTC 18/94 Management and Maintenance of both Natural Vegetation and Landscape Works
14. WBTC 24/94 and PELBTC 3/94 "Tree Preservation"
15. Antiquities and Monuments Ordinance (Cap 53)

**Permit Conditions apply to**

- P Primary and District Distributor Roads
- R Reclamation
- A North Island Line Protection Works
- C Central and Wanchai Bypass
- + These items should be excluded from any Environmental Permit conditions as these refer to future development of the area (which is not designated under the EIAO), and are not related to reclamation and dredging activities which are designated, and can hence be controlled through EP conditions.
- \* Normally undertaken by a specialist monitoring team employed directly by the proponent and audited by the Environmental Works Checker.



***Appendix 4.1***

***Action and Limit Level***



**Action and Limit Level**

***Action and Limit Level for Noise Monitoring***

Time Period	Action Level	Limit Level
07:00 - 19:00 hours on normal weekdays	When one documented complaint is received.	70 dB(A)

***Action and Limit Level for Air Quality Monitoring***

Monitoring Locations	1-hour TSP Level in $\mu\text{g}/\text{m}^3$		24-hour TSP Level in $\mu\text{g}/\text{m}^3$	
	Action Level	Limit Level	Action Level	Limit Level
<b>ACL1</b> - City Hall	460	500	163	260
<b>ACL2a</b> - Contractor HK/2012/08 Site Office	300.1	500	187.3	260

***Action and Limit Level for Water Quality Monitoring***

Parameters	Action Level	Limit Level
<b>M5B – Central Cooling Water Intake Group</b>		
SS in mg/L	12.00	17.00
DO in mg/L	4.60	3.00



***Appendix 4.2***

***Copies of Calibration Certificates***



## CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0907 02 Page 1 of 2

### Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250-L	4950	ZC0032
Serial/Equipment No.:	3006790	2827240	21213
Adaptors used:	-	-	-

### Item submitted by

Customer Name: Lam Geotechnics Limited  
 Address of Customer: -  
 Request No.: -  
 Date of receipt: 07-Sep-2018

Date of test: 10-Sep-2018

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2019	CIGISMEC
Signal generator	DS 360	33873	24-Apr-2019	CEPREI
Signal generator	DS 360	61227	23-Apr-2019	CEPREI

### Ambient conditions

Temperature: 21 ± 1 °C  
 Relative humidity: 50 ± 10 %  
 Air pressure: 1005 ± 5 hPa

### Test specifications

- The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure response of the Sound Level Meter.

### Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:

  
 Feng Junq

Date: 10-Sep-2018

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.





## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0907 02 Page 2 of 2

### 1. Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	0.8	
	Lin	Pass	1.6	
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Frequency weightings			
Time weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Peak response	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
R.M.S. accuracy	Single 100µs rectangular pulse	Pass	0.3	
	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 <sup>3</sup> at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 <sup>4</sup> at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

### 2. Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

### 3. Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by:

Date: 10-Sep-2018

Fung Chi Yip

- End -

Checked by:

Date: 10-Sep-2018

Shek Kwong Tat

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

# Calibration Certificate

Certificate Number 2018010851

**Customer:**

LAM Environmental Services Ltd

11/F Centre Point

181-185 Gloucester Road

Wanchai, , Hong Kong

**Model Number** CAL200

**Serial Number** 13098

**Test Results** Pass

**Initial Condition** Inoperable

**Description** Larson Davis CAL200 Acoustic Calibrator

**Procedure Number** D0001.8386

**Technician** Scott Montgomery

**Calibration Date** 29 Oct 2018

**Calibration Due**

**Temperature** 23 °C ± 0.3 °C

**Humidity** 34 %RH ± 3 %RH

**Static Pressure** 101.2 kPa ± 1 kPa

**Evaluation Method** The data is acquired by the insert voltage calibration method using the reference microphone's open circuit sensitivity. Data reported in dB re 20 µPa.

**Compliance Standards** Compliant to Manufacturer Specifications per D0001.8190 and the following standards:  
IEC 60942:2017 ANSI S1.40-2006

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the SI through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005. **Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.**

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

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## Standards Used

Description	Cal Date	Cal Due	Cal Standard
Agilent 34401A DMM	09/06/2018	09/06/2019	001021
Larson Davis Model 2900 Real Time Analyzer	04/10/2018	04/10/2019	001051
Microphone Calibration System	03/07/2018	03/07/2019	005446
1/2" Preamplifier	09/20/2018	09/20/2019	006506
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/07/2018	08/07/2019	006507
1/2 inch Microphone - RI - 200V	05/10/2018	05/10/2019	006510
Pressure Transducer	07/18/2018	07/18/2019	007368

Larson Davis, a division of PCB Piezotronics, Inc  
1681 West 820 North  
Provo, UT 84601, United States  
716-684-0001



**LARSON DAVIS**  
A PCB PIEZOTRONICS DIV.



## CERTIFICATE OF CALIBRATION

Certificate No.: 18CA1220 02

Page: 1 of 2

### Item tested

Description: Acoustical Calibrator (Class 1)  
Manufacturer: Larson Davis  
Type/Model No.: CAL200  
Serial/Equipment No.: 13128  
Adaptors used: -

### Item submitted by

Customer: Lam Environmental Service Ltd.  
Address of Customer: -  
Request No.: -  
Date of receipt: 20-Dec-2018

Date of test: 28-Dec-2018

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	20-Apr-2019	SCL
Preamplifier	B&K 2673	2239857	27-Apr-2019	CEPREI
Measuring amplifier	B&K 2610	2346941	08-May-2019	CEPREI
Signal generator	DS 360	33873	24-Apr-2019	CEPREI
Digital multi-meter	34401A	US36087050	23-Apr-2019	CEPREI
Audio analyzer	8903B	GB41300350	23-Apr-2019	CEPREI
Universal counter	53132A	MY40003662	24-Apr-2019	CEPREI

### Ambient conditions

Temperature:  $20 \pm 1$  °C  
Relative humidity:  $50 \pm 10$  %  
Air pressure:  $1000 \pm 5$  hPa

### Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942: 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

### Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:



Feng Junqi

Date: 29-Dec-2018

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA1220 02 Page: 2 of 2

### 1. Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	93.84	0.10

(Output level in dB re 20 µPa)

### 2. Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.006 dB**  
Estimated expanded uncertainty 0.005 dB

### 3. Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:


At 1000 Hz **Actual Frequency = 999.4 Hz**  
Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

### 4. Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz **TND = 0.4%**  
Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by:   
Date: 28-Dec-2018

Checked by:   
Date: 29-Dec-2018

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



# Certificate of Calibration

Calibration Certification Information			
Cal. Date: January 11, 2019	Rootsmeter S/N: 438320	Ta: 293	°K
Operator: Jim Tisch		Pa: 760.7	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 0005		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4090	3.2	2.00
2	3	4	1	0.9980	6.4	4.00
3	5	6	1	0.8900	7.8	5.00
4	7	8	1	0.8450	8.7	5.50
5	9	10	1	0.6990	12.6	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (y-axis)
1.0138	0.7195	1.4269	0.9958	0.7067	0.8777
1.0095	1.0115	2.0180	0.9916	0.9936	1.2412
1.0076	1.1321	2.2561	0.9897	1.1121	1.3877
1.0064	1.1910	2.3663	0.9886	1.1699	1.4555
1.0012	1.4323	2.8538	0.9834	1.4069	1.7553
<b>QSTD</b>	m=	<b>1.99861</b>	<b>QA</b>	m=	<b>1.25149</b>
	b=	<b>-0.00882</b>		b=	<b>-0.00543</b>
	r=	<b>0.99997</b>		r=	<b>0.99997</b>

Calculations			
Vstd= $\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$	Va= $\Delta Vol((Pa-\Delta P)/Pa)$		
Qstd= $Vstd/\Delta Time$	Qa= $Va/\Delta Time$		
For subsequent flow rate calculations:			
$Qstd = 1/m \left( \left( \sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)} \right) - b \right)$		$Qa = 1/m \left( \left( \sqrt{\Delta H \left( \frac{Ta}{Pa} \right)} \right) - b \right)$	

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg
Key	
ΔH: calibrator manometer reading (in H2O)	
ΔP: rootsmeter manometer reading (mm Hg)	
Ta: actual absolute temperature (°K)	
Pa: actual barometric pressure (mm Hg)	
b: intercept	
m: slope	

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30



Lam Environmental Services Limited

**Calibration Data for High Volume Sampler (TSP Sampler)**

Location : ACL1  
 Equipment no. : HVS014

Calibration Date : 16-Apr-19  
 Calibration Due Date : 16-Jun-19

**CALIBRATION OF CONTINUOUS FLOW RECORDER**

Ambient Condition			
Temperature, T <sub>a</sub>	294	Kelvin	Pressure, P <sub>a</sub>
			1013 mmHg

Orifice Transfer Standard Information					
Equipment No.	0005	Slope, m <sub>c</sub>	1.99861	Intercept, b <sub>c</sub>	-0.00882
Last Calibration Date	11-Jan-19	$\left( H \times P_a / 1013.3 \times 298 / T_a \right)^{1/2}$ $= m_c \times Q_{std} + b_c$			
Next Calibration Date	11-Jan-20				

Calibration of TSP						
Calibration Point	Manometer Reading			Q <sub>std</sub> (m <sup>3</sup> / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC (W(P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31) Y-axis
	(up)	(down)	(difference)			
1	1.3	1.3	2.6	0.8165	34	34.2254
2	2.3	2.3	4.6	1.0847	44	44.2918
3	3.5	3.5	7.0	1.3370	50	50.3315
4	4.5	4.5	9.0	1.5154	56	56.3713
5	5.6	5.6	11.2	1.6900	60	60.3978

By Linear Regression of Y on X

Slope, m = 29.7204      Intercept, b = 10.8223  
 Correlation Coefficient\* = 0.9965  
 Calibration Accepted = Yes/No\*\*

\* if Correlation Coefficient &lt; 0.990, check and recalibration again.

\*\* Delete as appropriate.

Remarks : \_\_\_\_\_  
 \_\_\_\_\_

Calibrated by : Henry Lau  
 Date : 16-Apr-19

Checked by : Dean Chan  
 Date : 16-Apr-19



Lam Environmental Services Limited

**Calibration Data for High Volume Sampler (TSP Sampler)**

Location : ACL1  
 Equipment no. : HVS014

Calibration Date : 19-Jun-19  
 Calibration Due Date : 19-Aug-19

**CALIBRATION OF CONTINUOUS FLOW RECORDER**

Ambient Condition			
Temperature, T <sub>a</sub>	303	Kelvin	Pressure, P <sub>a</sub>
			1009 mmHg

Orifice Transfer Standard Information					
Equipment No.	0005	Slope, m <sub>c</sub>	1.99861	Intercept, b <sub>c</sub>	-0.00882
Last Calibration Date	11-Jan-19	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$ $= m_c \times Q_{std} + b_c$			
Next Calibration Date	11-Jan-20				

Calibration of TSP						
Calibration Point	Manometer Reading			Q <sub>std</sub> (m <sup>3</sup> / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC (W(P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31) Y-axis
	(up)	(down)	(difference)			
1	1.4	1.4	2.8	0.8330	35	34.6363
2	2.4	2.4	4.8	1.0892	45	44.5324
3	3.5	3.5	7.0	1.3145	50	49.4804
4	4.4	4.4	8.8	1.4733	56	55.4181
5	5.2	5.2	10.4	1.6012	59	58.3869

By Linear Regression of

Slope, m = 30.5553      Intercept, b = 9.9233  
 Correlation Coefficient\* = 0.9956  
 Calibration Accepted = Yes/No\*\*

\* if Correlation Coefficient &lt; 0.990, check and recalibration again.

\*\* Delete as appropriate.

Remarks : \_\_\_\_\_

Calibrated by : Henry Lau  
 Date : 19-Jun-19

Checked by : Dean Chan  
 Date : 19-Jun-19



Lam Environmental Services Limited

**Calibration Data for High Volume Sampler (TSP Sampler)**

Location : ACL2a  
 Equipment no. : HVS011

Calibration Date : 16-Apr-19  
 Calibration Due Date : 16-Jun-19

**CALIBRATION OF CONTINUOUS FLOW RECORDER**

Ambient Condition			
Temperature, T <sub>a</sub>	294	Kelvin	Pressure, P <sub>a</sub>
			1013 mmHg

Orifice Transfer Standard Information					
Equipment No.	0005	Slope, m <sub>c</sub>	1.99861	Intercept, b <sub>c</sub>	-0.00882
Last Calibration Date	11-Jan-19	$\left( H \times P_a / 1013.3 \times 298 / T_a \right)^{1/2}$ $= m_c \times Q_{std} + b_c$			
Next Calibration Date	11-Jan-20				

Calibration of TSP						
Calibration Point	Manometer Reading			Q <sub>std</sub> (m <sup>3</sup> / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC (W(P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31) Y-axis
	(up)	(down)	(difference)			
1	1.3	1.3	2.6	0.8165	25	25.1658
2	2.2	2.2	4.4	1.0609	35	35.2321
3	3.5	3.5	7.0	1.3370	44	44.2918
4	4.7	4.7	9.4	1.5486	54	54.3581
5	5.6	5.6	11.2	1.6900	60	60.3978

By Linear Regression of Y on X

Slope, m = 39.8983      Intercept, b = -7.6042  
 Correlation Coefficient\* = 0.9983  
 Calibration Accepted = Yes/No\*\*

\* if Correlation Coefficient &lt; 0.990, check and recalibration again.

\*\* Delete as appropriate.

Remarks : \_\_\_\_\_  
 \_\_\_\_\_

Calibrated by : Henry Lau  
 Date : 16-Apr-19

Checked by : Dean Chan  
 Date : 16-Apr-19





Lam Environmental Services Limited

**Calibration Data for High Volume Sampler (TSP Sampler)**

Location : ACL2a  
 Equipment no. : HVS011

Calibration Date : 19-Jun-19  
 Calibration Due Date : 19-Aug-19

**CALIBRATION OF CONTINUOUS FLOW RECORDER**

Ambient Condition			
Temperature, T <sub>a</sub>	303	Kelvin	Pressure, P <sub>a</sub>
			1009 mmHg

Orifice Transfer Standard Information					
Equipment No.	0005	Slope, m <sub>c</sub>	1.99861	Intercept, b <sub>c</sub>	-0.00882
Last Calibration Date	11-Jan-19	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$ $= m_c \times Q_{std} + b_c$			
Next Calibration Date	11-Jan-20				

Calibration of TSP						
Calibration Point	Manometer Reading			Q <sub>std</sub> (m <sup>3</sup> / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC (W(P <sub>a</sub> /1013.3x298/T <sub>a</sub> ) <sup>1/2</sup> /35.31) Y-axis
	(up)	(down)	(difference)			
1	1.4	1.4	2.8	0.8330	26	25.7298
2	2.3	2.3	4.6	1.0664	35	34.6363
3	3.4	3.4	6.8	1.2956	45	44.5324
4	4.6	4.6	9.2	1.5063	53	52.4492
5	5.5	5.5	11.0	1.6466	58	57.3973

By Linear Regression of Y on X

Slope, m = 39.3340      Intercept, b = -6.9882  
 Correlation Coefficient\* = 0.9995  
 Calibration Accepted = Yes/No\*\*

\* if Correlation Coefficient &lt; 0.990, check and recalibration again.

\*\* Delete as appropriate.

Remarks : \_\_\_\_\_  
 \_\_\_\_\_

Calibrated by : Henry Lau  
 Date : 19-Jun-19

Checked by : Dean Chan  
 Date : 19-Jun-19



REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

Information supplied by customer:

CONTACT: MR. CHAN KA CHUN                      JOB REFERENCE NO.: 22777053-C18V5302  
CLIENT: LAM ENVIRONMENTAL SERVICES LTD  
DATE RECEIVED: 18/03/2019  
DATE OF ISSUE: 27/03/2019  
ADDRESS: 11/F, CENTRE POINT, 181-185, GLOUCESTER ROAD,  
WANCHAI, HONG KONG  
PROJECT: ---

METHOD OF PERFORMANCE CHECK/ CALIBRATION:

Ref: APHA22nd ed 2130B

**COMMENTS**

It is certified that the item under performance check/calibration has been calibrated/checked by corresponding calibrated equipment in the laboratory.


Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of FT Laboratories Ltd will be followed.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1807063
Equipment No.:	---
Date of Calibration:	22/03/2019

Remarks:

This is the Final Report. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Certified By:

  
HO Lai Sze  
Senior Chemist

Issue Date:

27/03/2019



REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

WORK ORDER: 22777053-C18V5302  
DATE OF ISSUE: 27/03/2019  
CLIENT: LAM ENVIRONMENTAL SERVICES LTD

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1807063
Equipment No.:	---
Date of Calibration:	22/03/2019
Date of next Calibration:	21/06/2019
Lab ID:	H190085-02

Parameters:

Turbidity

Method Ref: APHA 22<sup>nd</sup> ed. 2130B

Expected Reading (NTU)	Display Reading (NTU)	Tolerance
0	0.00	---
4	4.00	0.0%
10	9.92	-0.8%
40	39.54	-1.2%
100	99.08	-0.9%
400	404	1.1%
1000	922	-7.8%
	Tolerance Limit ( $\pm$ )	10%

Remark: "Displayed Reading" presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.





REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

WORK ORDER: 22787053-C18V5201  
DATE OF ISSUE: 27/03/2019  
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1807073
Equipment No.:	---
Date of Calibration:	22/03/2019
Date of next Calibration:	21/06/2019
Lab ID:	H190084-01

Parameters:

Turbidity

Method Ref: APHA 22<sup>nd</sup> ed. 2130B

Expected Reading (NTU)	Display Reading (NTU)	Tolerance
0	0.00	---
4	4.13	3.3%
10	10.04	0.4%
40	40.33	0.8%
100	98.47	-1.5%
400	396	-1.0%
1000	906	-9.4%
	Tolerance Limit ( $\pm$ )	10%

Remark: "Displayed Reading" presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.



REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

Information supplied by customer:

CONTACT: MR. CHAN KA CHUN                      JOB REFERENCE NO.: 22777053-E29V4502  
CLIENT: LAM GEOTECHNICS LIMITED  
DATE RECEIVED: 29/05/2019  
DATE OF ISSUE: 18/06/2019  
ADDRESS: 11/F, CENTRE POINT, 181-185, GLOUCESTER ROAD,  
            WANCHAI, HONG KONG  
PROJECT: ---

METHOD OF PERFORMANCE CHECK/ CALIBRATION:

Ref: APHA22nd ed 2130B

COMMENTS

It is certified that the item under performance check/calibration has been calibrated/checked by corresponding calibrated equipment in the laboratory.

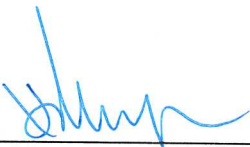
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of FT Laboratories Ltd will be followed.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1807077
Equipment No.:	---
Date of Calibration:	01/06/2019

Remarks:

This is the Final Report. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Certified By:

  
\_\_\_\_\_  
HO Lai Sze  
Senior Chemist

Issue Date:

18/06/2019

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Form No.: HG022-002 Rev 0 20190101

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REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

WORK ORDER: 22777053-E29V4502  
DATE OF ISSUE: 18/06/2019  
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1807077
Equipment No.:	---
Date of Calibration:	01/06/2019
Date of next Calibration:	31/08/2019
Lab ID:	H190165-02

Parameters:

Turbidity

Method Ref: APHA 22<sup>nd</sup> ed. 2130B

Expected Reading (NTU)	Display Reading (NTU)	Tolerance
0	0.00	---
4	4.32	8.0%
10	9.99	-0.1%
40	43.32	8.3%
100	100.30	0.3%
400	435	8.6%
1000	1002	0.2%
	Tolerance Limit ( $\pm$ )	10%

Remark: "Displayed Reading" presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.



## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

<b>CONTACT:</b>	CHAN KA CHUN	<b>WORK ORDER:</b>	HK1912921
<b>CLIENT:</b>	LAM ENVIRONMENTAL SERVICES LTD		
<b>ADDRESS:</b>	11/ F CENTRE POINT, 181- 185 GLOUCESTER ROAD, WANCHAI, HONG KONG	<b>SUB- BATCH:</b>	0
		<b>LABORATORY:</b>	HONG KONG
		<b>DATE RECEIVED:</b>	27- Mar- 2019
		<b>DATE OF ISSUE:</b>	02- Apr- 2019

### COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Dissolved Oxygen, pH Value, Salinity and Temperature
Equipment Type:	Multifunctional Meter
Brand Name:	YSI
Model No.:	Professional Plus
Serial No.:	14M100277
Equipment No.:	--
Date of Calibration:	02 April, 2019

### NOTES

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr Chan Siu Ming, Vico  
Manager - Inorganic

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# REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION



**WORK ORDER:** HK1912921  
**SUB- BATCH:** 0  
**DATE OF ISSUE:** 02- Apr- 2019  
**CLIENT:** LAM ENVIRONMENTAL SERVICES LTD

**Equipment Type:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** Professional Plus  
**Serial No.:** 14M100277  
**Equipment No.:** --  
**Date of Calibration:** 02 April, 2019

**Date of Next Calibration:** 02 July, 2019

**PARAMETERS:**

**Dissolved Oxygen** Method Ref: APHA (21st edition), 4500- O: G

Expected Reading (mg/ L)	Displayed Reading (mg/ L)	Tolerance (mg/ L)
2.85	2.66	- 0.19
5.99	5.79	- 0.20
8.54	8.57	+ 0.03
	Tolerance Limit (mg/ L)	± 0.20

**pH Value**

Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)
4.0	3.82	- 0.18
7.0	6.83	- 0.17
10.0	9.87	- 0.13
	Tolerance Limit (pH unit)	± 0.20

**Salinity**

Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	9.95	- 0.5
20	20.10	+ 0.5
30	30.03	+ 0.1
	Tolerance Limit (%)	± 10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico  
Manager - Inorganic

# REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION



**WORK ORDER:** HK1912921  
**SUB- BATCH:** 0  
**DATE OF ISSUE:** 02- Apr- 2019  
**CLIENT:** LAM ENVIRONMENTAL SERVICES LTD

Equipment Type: Multifunctional Meter  
Brand Name: YSI  
Model No.: Professional Plus  
Serial No.: 14M100277  
Equipment No.: --  
Date of Calibration: 02 April, 2019

Date of Next Calibration: 02 July, 2019

## PARAMETERS:

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
9.0	8.2	- 0.8
23.0	22.6	- 0.4
40.0	39.3	- 0.7
	Tolerance Limit (°C)	± 2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico  
Manager - Inorganic



## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

<b>CONTACT:</b>	CHAN KA CHUN	<b>WORK ORDER:</b>	HK1914664
<b>CLIENT:</b>	LAM ENVIRONMENTAL SERVICES LTD		
<b>ADDRESS:</b>	11/F CENTRE POINT, 181-185 GLOUCESTER ROAD, WANCHAI, HONG KONG	<b>SUB- BATCH:</b>	0
		<b>LABORATORY:</b>	HONG KONG
		<b>DATE RECEIVED:</b>	04-Apr-2019
		<b>DATE OF ISSUE:</b>	11-Apr-2019

### COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Dissolved Oxygen, pH Value, Salinity and Temperature
Equipment Type:	Multifunctional Meter
Brand Name:	YSI
Model No.:	Professional Plus
Serial No.:	14K100322
Equipment No.:	--
Date of Calibration:	10 April, 2019

### NOTES

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Ms. Lin Wai Yu  
Assistant Manager - Inorganic

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# REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION



**WORK ORDER:** HK1914664  
**SUB- BATCH:** 0  
**DATE OF ISSUE:** 11-Apr-2019  
**CLIENT:** LAM ENVIRONMENTAL SERVICES LTD

Equipment Type: Multifunctional Meter  
 Brand Name: YSI  
 Model No.: Professional Plus  
 Serial No.: 14K100322  
 Equipment No.: --  
 Date of Calibration: 10 April, 2019                      Date of Next Calibration: 10 July, 2019

**PARAMETERS:**

**Dissolved Oxygen**    Method Ref: APHA (21st edition), 4500- O: G

Expected Reading (mg/ L)	Displayed Reading (mg/ L)	Tolerance (mg/ L)
8.20	8.30	+0.10
6.04	5.98	-0.06
2.63	2.54	-0.09
	Tolerance Limit (mg/L)	±0.20

**pH Value**                      Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)
4.0	3.87	-0.13
7.0	6.90	-0.10
10.0	9.84	-0.16
	Tolerance Limit (pH unit)	±0.20

**Salinity**                      Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	10.07	+0.7
20	20.20	+1.0
30	30.87	+2.9
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu  
 Assistant Manager - Inorganic

# REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION



**WORK ORDER:** HK1914664  
**SUB- BATCH:** 0  
**DATE OF ISSUE:** 11-Apr-2019  
**CLIENT:** LAM ENVIRONMENTAL SERVICES LTD

Equipment Type: Multifunctional Meter  
Brand Name: YSI  
Model No.: Professional Plus  
Serial No.: 14K100322  
Equipment No.: --  
Date of Calibration: 10 April, 2019                      Date of Next Calibration: 10 July, 2019

**PARAMETERS:**

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
9.5	10.4	+0.9
22.0	22.3	+0.3
40.0	39.7	-0.3
	Tolerance Limit (°C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu  
Assistant Manager - Inorganic



## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

<b>CONTACT:</b>	CHAN KA CHUN	<b>WORK ORDER:</b>	HK1916521
<b>CLIENT:</b>	LAM ENVIRONMENTAL SERVICES LTD		
<b>ADDRESS:</b>	11/F CENTRE POINT, 181-185 GLOUCESTER ROAD, WANCHAI, HONG KONG	<b>SUB- BATCH:</b>	0
		<b>LABORATORY:</b>	HONG KONG
		<b>DATE RECEIVED:</b>	17-Apr-2019
		<b>DATE OF ISSUE:</b>	25-Apr-2019

### COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principle as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Dissolved Oxygen, pH Value, Salinity and Temperature
Equipment Type:	Multifunctional Meter
Brand Name:	YSI
Model No.:	Professional Plus
Serial No.:	17F100236
Equipment No.:	--
Date of Calibration:	24-Apr-2019

### NOTES

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Ms. Lin Wai Yu  
Assistant Manager - Inorganic

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# REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION



**WORK ORDER:** HK1916521  
**SUB- BATCH:** 0  
**DATE OF ISSUE:** 25-Apr-2019  
**CLIENT:** LAM ENVIRONMENTAL SERVICES LTD

**Equipment Type:** Multifunctional Meter  
**Brand Name:** YSI  
**Model No.:** Professional Plus  
**Serial No.:** 17F100236  
**Equipment No.:** --  
**Date of Calibration:** 24-Apr-2019                      **Date of Next Calibration:** 24-Jul-2019

**PARAMETERS:**

**Dissolved Oxygen**    **Method Ref: APHA (21st edition), 4500- O: G**

Expected Reading (mg/ L)	Displayed Reading (mg/ L)	Tolerance (mg/ L)
8.15	8.07	-0.08
5.90	6.05	+0.15
2.64	2.69	+0.05
	Tolerance Limit (mg/L)	±0.20

**pH Value**                      **Method Ref: APHA (21st edition), 4500H:B**

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)
4.0	4.00	+0.00
7.0	7.20	+0.20
10.0	10.05	+0.05
	Tolerance Limit (pH unit)	±0.20

**Salinity**                      **Method Ref: APHA (21st edition), 2520B**

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	9.86	-1.4
20	19.53	-2.3
30	29.81	-0.6
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu  
 Assistant Manager - Inorganic

# REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION



**WORK ORDER:** HK1916521  
**SUB- BATCH:** 0  
**DATE OF ISSUE:** 25-Apr-2019  
**CLIENT:** LAM ENVIRONMENTAL SERVICES LTD

Equipment Type: Multifunctional Meter  
Brand Name: YSI  
Model No.: Professional Plus  
Serial No.: 17F100236  
Equipment No.: --  
Date of Calibration: 24-Apr-2019 Date of Next Calibration: 24-Jul-2019

**PARAMETERS:**

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
9.5	9.7	+0.2
22.0	22.1	+0.1
38.5	38.2	-0.3
	Tolerance Limit (°C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu  
Assistant Manager - Inorganic





***Appendix 5.1***

***Monitoring Schedules for Reporting Month and Coming Reporting Month***

Contract No. HK/2015/01  
**Wan Chai Development Phase II and Central-Wan Chai Bypass  
 Sampling, Field Measurement and Testing Works (Stage 3)  
 Environmental Monitoring Schedule  
 June 2019**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						01-Jun       Mid-Ebb 11:11 Mid-Flood 17:30
02-Jun	03-Jun	04-Jun	05-Jun	06-Jun	07-Jun	08-Jun
	24hr TSP   Mid-Ebb 12:19 Mid-Flood 19:01	1hr TSP	Mid-Flood 07:19 Mid-Ebb 14:28			24hr TSP   Mid-Flood 08:53 Mid-Ebb 16:15
09-Jun	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun
	1hr TSP   Mid-Flood 11:20 Mid-Ebb 18:27		Mid-Ebb 08:33 Mid-Flood 14:25		24hr TSP (ACL1)  Mid-Ebb 10:19 Mid-Flood 16:43	24hr TSP (ACL2a)  1hr TSP
16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun
	Mid-Ebb 12:22 Mid-Flood 19:26		Mid-Flood 06:41 Mid-Ebb 13:40	24hr TSP (ACL1)	24hr TSP (ACL2a)  1hr TSP  Mid-Ebb 14:55 Mid-Flood 22:23	
23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun
	Mid-Flood 09:45 Mid-Ebb 16:44		24hr TSP   Mid-Ebb 18:40	1hr TSP   Mid-Flood 02:06	Mid-Ebb 09:25	Mid-Flood 03:06

Contract No. HK/2015/01  
Wan Chai Development Phase II and Central-Wan Chai Bypass  
Sampling, Field Measurement and Testing Works (Stage 3)  
Tentative Environmental Monitoring Schedule  
July 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30-Jun	01-Jul	02-Jul	03-Jul	04-Jul	05-Jul	06-Jul
		24hr TSP	1hr TSP			
		Mid-Ebb 11:58 Mid-Flood 18:56		Mid-Ebb 13:31 Mid-Flood 20:34		Mid-Flood 08:08 Mid-Ebb 15:10
07-Jul	08-Jul	09-Jul	10-Jul	11-Jul	12-Jul	13-Jul
	24hr TSP	1hr TSP				24hr TSP
	Mid-Flood 10:05 Mid-Ebb 16:57		Mid-Flood 12:45 Mid-Ebb 19:05		Mid-Ebb 09:13 Mid-Flood 15:42	
14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul
	1hr TSP				24hr TSP	1hr TSP
	Mid-Ebb 11:32 Mid-Flood 18:43		Mid-Ebb 12:46 Mid-Flood 20:01		Mid-Ebb 13:56 Mid-Flood 21:10	
21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul
				24hr TSP	1hr TSP	
	Mid-Flood 08:50 Mid-Ebb 15:30		Mid-Ebb 16:41	Mid-Flood 00:04		Mid-Flood 01:18 Mid-Ebb 08:31
28-Jul	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug
			24hr TSP	1hr TSP		
	Mid-Ebb 10:10 Mid-Flood 17:16		Mid-Ebb 11:41 Mid-Flood 18:50		Mid-Ebb 13:18 Mid-Flood 20:14	



***Appendix 5.2***

***Continuous Noise Monitoring Results and Graphical Presentations***













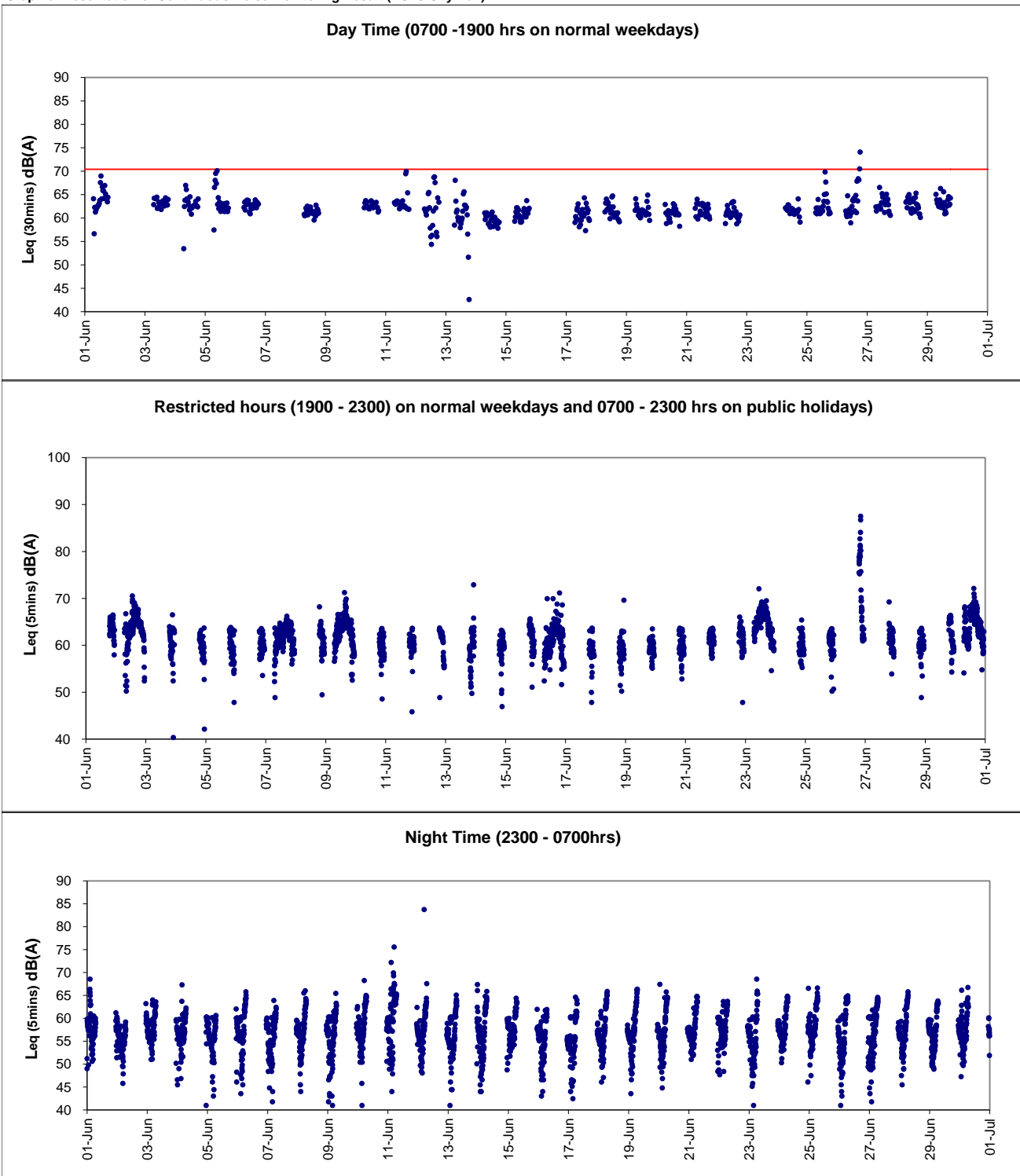








Graphic Presentation of Continuous Noise Monitoring Result (ACL3-City Hall)



After the investigation, no construction works was conducted by Contractor HK/2012/08 and HY/2010/08 at CRIII area on 26 June 2019. Meanwhile, public events were held at area opposite to the monitoring station during the concerned period and considered as the major noise contribution. As such, the exceedance was considered as non-project related.



***Appendix 5.3***

***Air Quality Monitoring Results and Graphical Presentations***



Location: ACL1 - City Hall

Report on 24-hour TSP monitoring

Action Level ( $\mu\text{g}/\text{m}^3$ ) - 163

Limit Level ( $\mu\text{g}/\text{m}^3$ ) - 260

Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, $\text{m}^3/\text{min}$			Total Volume, $\text{m}^3$	TSP Level, $\mu\text{g}/\text{m}^3$
				Initial	Final	Initial	Final		Initial, $Q_{si}$	Final, $Q_{sf}$	Average		
03-Jun-19	08:00	Rainy	ACL1_24hr_141144	2.6547	2.6823	5630.87	5654.87	24.00	0.98	0.98	0.98	1417	19.5
08-Jun-19	08:00	Cloudy	ACL1_24hr_000038	2.7171	2.7436	5657.87	5681.87	24.00	0.98	0.98	0.98	1409	18.8
14-Jun-19	08:00	Rainy	ACL1_24hr_000355	2.6644	2.7330	5684.87	5708.87	24.00	0.98	0.98	0.98	1411	48.6
20-Jun-19	08:00	Cloudy	ACL1_24hr_000276	2.7120	2.7359	5711.87	5735.87	24.00	0.86	0.86	0.86	1236	19.3
26-Jun-19	08:00	Cloudy	ACL1_24hr_000628	2.7086	2.7666	5738.87	5762.87	24.00	0.98	0.97	0.98	1408	41.2

Report on 1-hour TSP monitoring

Action Level ( $\mu\text{g}/\text{m}^3$ ) - 460

Limit Level ( $\mu\text{g}/\text{m}^3$ ) - 500

Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, $\text{m}^3/\text{min}$			Total Volume, $\text{m}^3$	TSP Level, $\mu\text{g}/\text{m}^3$
				Initial	Final	Initial	Final		Initial, $Q_{si}$	Final, $Q_{sf}$	Average		
04-Jun-19	08:55	Rainy	ACL1_1hr_1_141139	2.6588	2.6588	5654.87	5655.87	1.00	0.98	0.98	0.98	59	<0.1
04-Jun-19	10:45	Rainy	ACL1_1hr_2_141113	2.6789	2.6792	5655.87	5656.87	1.00	0.98	0.98	0.98	59	5.1
04-Jun-19	13:00	Rainy	ACL1_1hr_3_141129	2.6440	2.6440	5656.87	5657.87	1.00	0.98	0.98	0.98	59	<0.1
10-Jun-19	08:15	Cloudy	ACL1_1hr_1_000211	2.6764	2.6786	5681.87	5682.87	1.00	0.85	0.85	0.85	51	43.2
10-Jun-19	10:58	Cloudy	ACL1_1hr_2_000216	2.6886	2.6914	5682.87	5683.87	1.00	0.98	0.98	0.98	59	47.7
10-Jun-19	13:00	Cloudy	ACL1_1hr_3_000372	2.6860	2.6867	5683.87	5684.87	1.00	0.85	0.85	0.85	51	13.7
15-Jun-19	09:20	Cloudy	ACL1_1hr_1_000268	2.6909	2.6924	5708.87	5709.87	1.00	0.85	0.85	0.85	51	29.3
15-Jun-19	10:25	Cloudy	ACL1_1hr_2_000271	2.7150	2.7177	5709.87	5710.87	1.00	0.98	0.98	0.98	59	45.9
15-Jun-19	13:00	Cloudy	ACL1_1hr_3_000274	2.6778	2.6801	5710.87	5711.87	1.00	0.85	0.85	0.85	51	45.0
21-Jun-19	09:15	Cloudy	ACL1_1hr_1_000320	2.6928	2.6950	5735.87	5736.87	1.00	0.85	0.85	0.85	51	42.9
21-Jun-19	10:17	Cloudy	ACL1_1hr_2_000308	2.7072	2.7103	5736.87	5737.87	1.00	0.85	0.85	0.85	51	60.4
21-Jun-19	13:00	Cloudy	ACL1_1hr_3_000311	2.7037	2.7088	5737.87	5738.87	1.00	0.85	0.85	0.85	51	99.4
27-Jun-19	09:02	Rainy	ACL1_1hr_1_000102	2.6889	2.6912	5762.87	5763.87	1.00	0.85	0.85	0.85	51	45.1
27-Jun-19	10:05	Rainy	ACL1_1hr_2_000108	2.6819	2.6823	5763.87	5764.87	1.00	0.85	0.85	0.85	51	7.8
27-Jun-19	13:00	Rainy	ACL1_1hr_3_000111	2.6918	2.6925	5764.87	5765.87	1.00	0.85	0.85	0.85	51	13.7





Location: ACL2a - Contractor HK/2012/08 Site office

Report on 24-hour TSP monitoring  
Action Level ( $\mu\text{g}/\text{m}^3$ ) - 187.3  
Limit Level ( $\mu\text{g}/\text{m}^3$ ) - 260

Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, $\text{m}^3/\text{min}$			Total Volume, $\text{m}^3$	TSP Level, $\mu\text{g}/\text{m}^3$
				Initial	Final	Initial	Final		Initial, $Q_{si}$	Final, $Q_{sf}$	Average		
03-Jun-19	08:00	Rainy	ACL2a_24hr_141141	2.6588	2.6880	10854.39	10878.39	24.00	1.10	1.10	1.10	1583	18.4
08-Jun-19	08:00	Cloudy	ACL2a_24hr_000359	2.6741	2.6984	10881.39	10905.39	24.00	1.10	1.09	1.10	1577	15.4
15-Jun-19	11:50	Rainy	ACL2a_24hr_000204	2.7042	2.7553	10911.39	10935.39	24.00	1.10	1.10	1.10	1580	32.3
21-Jun-19	10:13	Cloudy	ACL2a_24hr_000695	2.7173	2.7205	10943.78	10967.78	24.00	1.09	1.09	1.09	1575	2.0
26-Jun-19	08:00	Cloudy	ACL2a_24hr_000627	2.6966	2.7172	10970.78	10994.78	24.00	1.10	1.09	1.09	1574	13.1

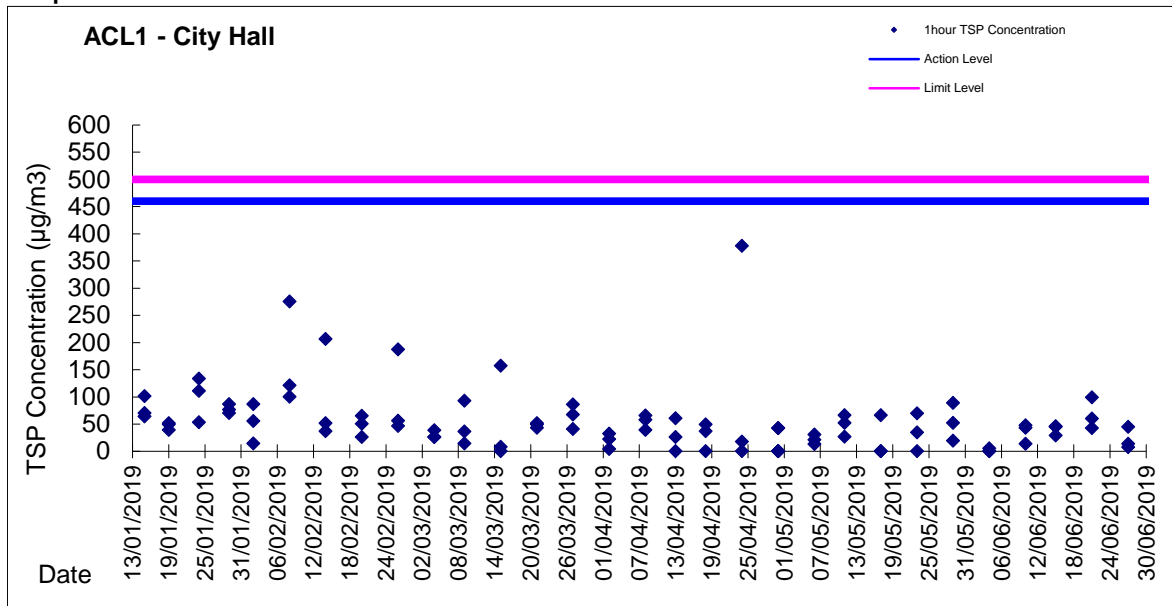
Remarks: Due to interruption of electricity, the 24hr TSP was rescheduled from 14, 20 June 2019 to 15, 21 June 2019.

Report on 1-hour TSP monitoring  
Action Level ( $\mu\text{g}/\text{m}^3$ ) - 300.1  
Limit Level ( $\mu\text{g}/\text{m}^3$ ) - 500

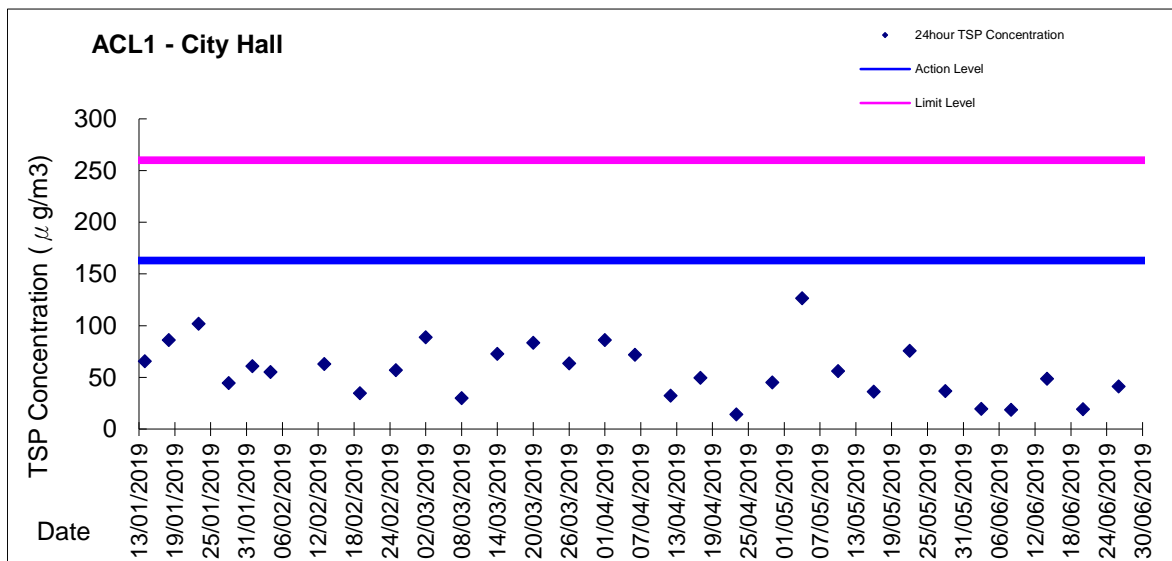
Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, $\text{m}^3/\text{min}$			Total Volume, $\text{m}^3$	TSP Level, $\mu\text{g}/\text{m}^3$
				Initial	Final	Initial	Final		Initial, $Q_{si}$	Final, $Q_{sf}$	Average		
04-Jun-19	09:35	Rainy	ACL2a_1hr_1_141137	2.6460	2.6460	10878.39	10879.39	1.00	1.10	1.10	1.10	66	<0.1
04-Jun-19	13:00	Rainy	ACL2a_1hr_2_141114	2.6593	2.6593	10879.39	10880.39	1.00	1.10	1.10	1.10	66	<0.1
04-Jun-19	14:05	Rainy	ACL2a_1hr_3_141126	2.6606	2.6606	10880.39	10881.39	1.00	1.10	1.10	1.10	66	<0.1
10-Jun-19	09:30	Cloudy	ACL2a_1hr_1_000219	2.7213	2.7271	10905.39	10906.39	1.00	1.09	1.09	1.09	66	88.3
10-Jun-19	13:00	Cloudy	ACL2a_1hr_2_000368	2.6607	2.6637	10906.39	10907.39	1.00	1.09	1.09	1.09	66	45.7
10-Jun-19	16:00	Cloudy	ACL2a_1hr_3_000379	2.6953	2.7034	10907.39	10908.39	1.00	1.09	1.09	1.09	66	123.3
15-Jun-19	08:00	Cloudy	ACL2a_1hr_1_000265	2.6872	2.6912	10908.39	10909.39	1.00	1.10	1.10	1.10	66	60.8
15-Jun-19	09:45	Cloudy	ACL2a_1hr_2_000280	2.7036	2.7059	10909.39	10910.39	1.00	1.10	1.10	1.10	66	35.0
15-Jun-19	10:48	Cloudy	ACL2a_1hr_3_000283	2.6774	2.6805	10910.39	10911.39	1.00	1.10	1.10	1.10	66	47.1
24-Jun-19	13:00	Cloudy	ACL2a_1hr_1_000601	2.7289	2.7325	10967.78	10968.78	1.00	1.10	1.10	1.10	66	54.7
24-Jun-19	14:05	Cloudy	ACL2a_1hr_2_000696	2.7079	2.7089	10968.78	10969.78	1.00	1.10	1.10	1.10	66	15.2
24-Jun-19	15:14	Cloudy	ACL2a_1hr_3_000630	2.7126	2.7139	10969.78	10970.78	1.00	1.10	1.10	1.10	66	19.8
27-Jun-19	08:10	Rainy	ACL2a_1hr_1_000693	2.6919	2.6946	10994.78	10995.78	1.00	1.09	1.09	1.09	65	41.3
27-Jun-19	09:40	Rainy	ACL2a_1hr_2_000692	2.7037	2.7055	10995.78	10996.78	1.00	1.09	1.09	1.09	65	27.5
27-Jun-19	10:43	Rainy	ACL2a_1hr_3_000653	2.7215	2.7253	10996.78	10997.78	1.00	1.09	1.09	1.09	65	58.1



Graphic Presentation of 1 hour TSP Result

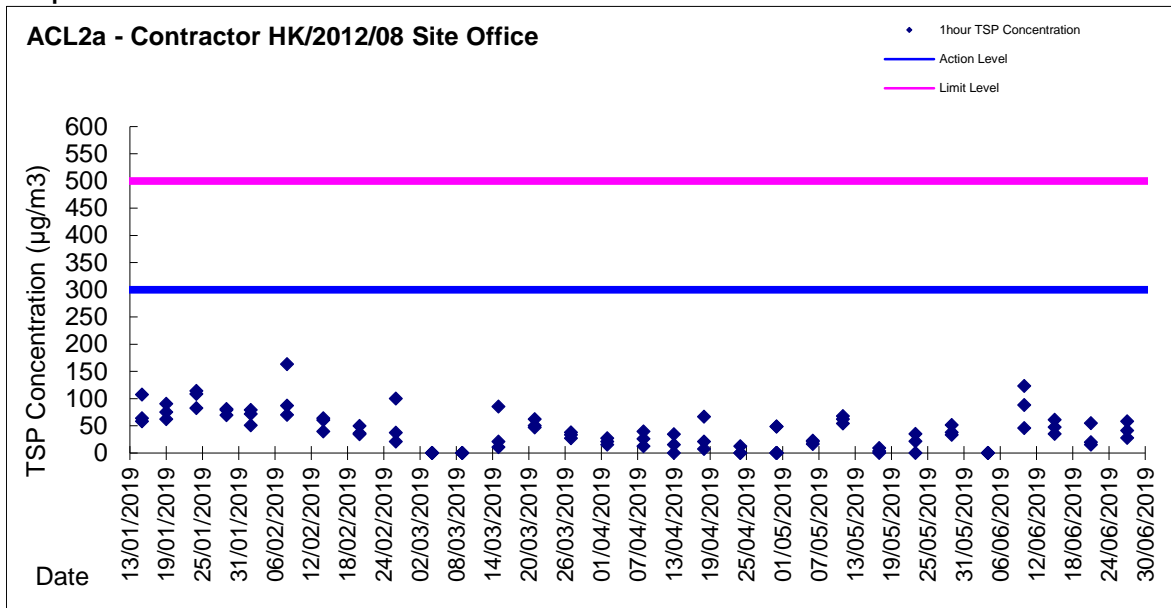


Graphic Presentation of 24 hour TSP Result

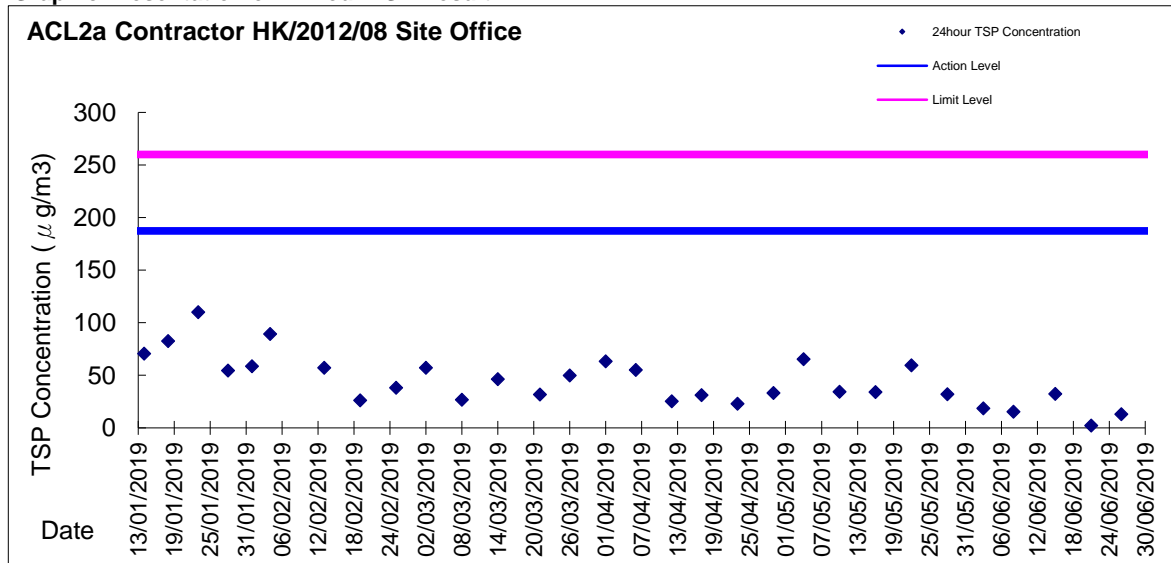




Graphic Presentation of 1 hour TSP Result



Graphic Presentation of 24 hour TSP Result





***Appendix 5.4***

***Water Quality Monitoring Results and Graphical Presentations***



**Water Monitoring Result at M5B - Central Cooling Water Intake Group  
Mid-Flood Tide**

Date	Time	Weather Condition	Sampling Depth		Water Temperature			pH			Salinity			DO Saturation		DO		Turbidity		Suspended Solids				
					°C			-			ppt			%		mg/L		NTU		mg/L				
			m	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	
01/06/2019	18:05	Fine	Middle	4.0	26.60	26.60	26.70	7.38	7.38	7.39	30.35	30.35	30.35	92.9	92.9	93.4	6.27	6.27	6.30	4.96	4.97	4.94	5	4.50
	18:07		Middle	4.0	26.80	26.80		7.39	7.39		30.34	30.34		93.8	94.0		6.33	6.34		4.91	4.92		4	
03/06/2019	18:35	Cloudy	Middle	3.0	28.30	28.30	28.30	7.89	7.89	7.89	29.52	29.52	29.52	88.6	89.3	87.8	5.67	5.72	5.66	4.18	4.25	4.15	16	<u>16.00</u>
	18:36		Middle	3.0	28.30	28.30		7.89	7.89		29.52	29.52		86.7	86.5		5.63	5.61		4.10	4.07		16	
05/06/2019	004:30	Cloudy	Middle	3.5	26.70	26.70	26.70	7.95	7.95	7.95	29.03	29.03	29.03	76.8	76.9	78.1	5.28	5.30	5.34	3.65	3.55	3.55	<2	<2
	04:31		Middle	3.5	26.70	26.70		7.95	7.95		29.03	29.03		79.7	79.0		5.42	5.37		3.52	3.48		<2	
08/06/2019	07:40	Fine	Middle	4.0	27.10	27.10	27.15	7.08	7.08	7.09	29.24	29.24	29.24	94.4	94.0	93.8	6.26	6.23	6.21	3.53	3.46	3.48	5	5.50
	07:42		Middle	4.0	27.20	27.20		7.09	7.09		29.23	29.23		93.1	93.5		6.17	6.19		3.48	3.46		6	
10/06/2019	10:50	Cloudy	Middle	4.0	28.50	28.50	28.55	7.33	7.33	7.35	27.14	27.14	27.14	96.9	96.7	96.3	6.46	6.44	6.41	3.53	3.54	3.54	4	3.50
	10:52		Middle	4.0	28.60	28.60		7.36	7.36		27.14	27.14		95.6	95.9		6.36	6.38		3.52	3.56		3	
12/06/2019	-	-	Middle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-		Middle	-	-	-		-	-		-	-		-	-		-	-		-	-		-	
14/06/2019	17:15	Fine	Middle	4.0	28.40	28.40	28.45	7.32	7.32	7.33	27.99	27.99	27.99	88.8	89.4	89.9	5.91	5.94	5.98	2.71	2.72	2.74	6	5.00
	17:17		Middle	4.0	28.50	28.50		7.33	7.33		27.99	27.99		90.7	90.7		6.03	6.03		2.71	2.80		4	
17/06/2019	20:26	Cloudy	Middle	3.5	26.80	26.80	26.80	8.11	8.11	8.11	31.15	31.15	31.15	82.8	85.1	83.5	5.29	5.44	5.35	9.84	9.27	9.66	16	<u>16.50</u>
	20:27		Middle	3.5	26.80	26.80		8.11	8.11		31.15	31.15		84.3	81.7		5.43	5.22		9.91	9.61		17	
19/06/2019	05:15	Cloudy	Middle	3.0	27.10	27.10	27.10	8.05	8.05	8.05	28.92	28.92	28.92	85.1	83.9	84.2	5.76	5.67	5.70	7.12	7.30	7.04	8	8.50
	05:16		Middle	3.0	27.10	27.10		8.05	8.05		28.92	28.92		83.4	84.5		5.65	5.72		6.83	6.91		9	
21/06/2019	16:05	Cloudy	Middle	3.0	29.10	29.10	29.10	8.13	8.13	8.13	26.63	26.63	26.63	93.3	96.4	94.1	6.19	6.39	6.24	7.23	7.54	7.48	5	4.50
	19:06		Middle	3.0	29.10	29.10		8.13	8.13		26.63	26.63		94.0	92.5		6.26	6.13		7.71	7.44		4	
24/06/2019	09:10	Cloudy	Middle	4.0	28.70	28.70	28.75	7.53	7.53	7.56	24.55	24.50	24.53	89.2	89.5	89.6	6.02	6.04	6.05	5.13	5.13	5.14	<2	2.00
	09:12		Middle	4.0	28.80	28.80		7.58	7.58		24.54	24.54		89.9	89.9		6.06	6.06		5.15	5.14		2	
27/06/2019	00:30	Cloudy	Middle	3.0	27.20	27.20	27.20	8.07	8.07	8.07	27.19	27.19	27.19	76.1	76.4	75.5	5.12	5.14	5.08	2.07	1.88	1.82	3	3.00
	00:31		Middle	3.0	27.20	27.20		8.07	8.07		27.19	27.19		75.7	73.8		5.09	4.96		1.73	1.61		3	
29/06/2019	05:07	Cloudy	Middle	3.5	28.10	28.10	28.10	7.89	7.89	7.89	27.40	27.40	27.40	84.4	85.3	84.5	5.66	5.72	5.66	2.23	2.34	2.34	<2	<2
	05:08		Middle	3.5	28.10	28.10		7.89	7.89		27.40	27.40		84.6	83.6		5.67	5.60		2.44	2.36		<2	

Remarks:  
Single underline denotes exceedance over Action Level.  
Double underline denotes exceedance over Limit Level.



**Water Monitoring Result at Culvert J - Reference Station  
Mid-Flood Tide**

Date	Time	Weather Condition	Sampling Depth		Water Temperature		pH		Salinity		DO Saturation		DO		Turbidity		Suspended Solids							
			m		°C		-		ppt		%		mg/L		NTU		mg/L							
					Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average						
01/06/2019	18:00	Fine	Middle	3.5	27.20	27.20	27.25	7.32	7.32	7.33	30.30	30.30	30.30	86.6	86.1	85.8	5.79	5.76	5.74	3.44	3.36	3.41	4	4.00
	18:02		Middle	3.5	27.30	27.30		7.34	7.34		30.30	30.30		85.3	85.3		5.70	5.70		3.42	3.43		4	
03/06/2019	18:43	Cloudy	Middle	2.5	28.10	28.10	28.10	7.93	7.93	7.93	28.51	28.51	28.51	91.2	92.4	90.4	5.88	5.96	5.83	6.24	6.08	6.18	12	11.50
	18:44		Middle	2.5	28.10	28.10		7.93	7.93		28.51	28.51		88.8	89.1		5.73	5.75		6.21	6.17		11	
05/06/2019	04:38	Cloudy	Middle	3.0	26.60	26.60	26.60	8.04	8.04	8.04	22.96	22.96	22.96	84.1	88.6	85.9	5.91	6.22	6.04	4.91	4.88	4.91	2	2.50
	04:39		Middle	3.0	26.60	26.60		8.04	8.04		22.96	22.96		85.2	85.6		6.01	6.03		4.93	4.90		3	
08/06/2019	07:35	Fine	Middle	3.5	26.60	26.60	26.70	7.04	7.04	7.05	28.42	28.42	28.42	91.9	91.0	90.4	6.07	6.00	5.96	5.19	5.19	5.20	4	4.50
	07:37		Middle	3.5	26.80	26.80		7.06	7.06		28.41	28.41		89.3	89.3		5.89	5.88		5.20	5.22		5	
10/06/2019	10:45	Cloudy	Middle	3.5	29.30	29.30	29.40	7.33	7.33	7.34	25.01	25.01	25.01	97.0	97.0	96.7	6.45	6.44	6.42	4.02	4.06	4.06	3	3.50
	10:47		Middle	3.5	29.50	29.50		7.34	7.34		25.01	25.01		96.4	96.5		6.40	6.40		4.07	4.08		4	
12/06/2019	-	-	Middle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-		Middle	-	-	-		-	-		-	-		-	-		-	-		-	-		-	
14/06/2019	17:10	Fine	Middle	3.5	28.50	28.50	28.50	7.39	7.39	7.39	22.07	22.07	22.07	89.9	90.1	89.6	6.17	6.18	6.15	9.89	9.89	9.89	13	12.50
	17:12		Middle	3.5	28.50	28.50		7.39	7.39		22.07	22.07		89.0	89.4		6.10	6.13		9.89	9.89		12	
17/06/2019	20:31	Cloudy	Middle	3.0	26.90	26.90	26.90	8.15	8.15	8.15	26.08	26.08	26.08	76.9	79.5	78.0	5.05	5.22	5.12	8.88	8.78	8.60	18	19.00
	20:32		Middle	3.0	26.90	26.90		8.15	8.15		26.08	26.08		79.0	76.7		5.18	5.03		8.45	8.27		20	
19/06/2019	05:25	Cloudy	Middle	2.5	27.00	27.00	27.00	8.10	8.10	8.10	26.29	26.29	26.29	84.3	81.5	83.6	5.79	5.60	5.74	7.94	7.53	7.72	11	10.50
	05:26		Middle	2.5	27.00	27.00		8.10	8.10		26.29	26.29		82.2	86.4		5.65	5.93		7.63	7.77		10	
21/06/2019	19:11	Cloudy	Middle	2.5	29.00	29.00	29.00	8.24	8.24	8.24	25.11	25.11	25.11	87.8	88.3	88.4	5.88	5.97	5.93	7.20	7.39	7.18	13	13.00
	19:12		Middle	2.5	29.00	29.00		8.24	8.24		25.11	25.11		89.5	87.8		5.99	5.87		7.11	7.03		13	
24/06/2019	09:00	Cloudy	Middle	3.5	28.80	28.80	28.85	7.47	7.47	7.45	21.85	21.85	21.84	84.7	84.5	84.4	5.78	5.77	5.76	5.56	5.51	5.52	3	3.00
	09:02		Middle	3.5	28.90	28.90		7.40	7.46		21.83	21.83		84.2	84.2		5.75	5.75		5.50	5.50		3	
27/06/2019	00:38	Cloudy	Middle	2.5	28.00	28.00	27.95	8.12	8.12	8.12	23.83	23.83	23.83	75.1	74.3	75.1	5.15	5.10	5.15	2.62	2.31	2.32	4	3.50
	00:39		Middle	2.5	27.90	27.90		8.12	8.12		23.83	23.83		76.5	74.6		5.25	5.11		2.15	2.20		3	
29/06/2019	05:15	Cloudy	Middle	3.0	28.10	28.10	28.10	8.01	8.00	8.00	21.69	21.69	21.69	81.1	80.0	81.0	5.62	5.54	5.61	2.16	1.93	1.98	<2	<2
	05:16		Middle	3.0	28.10	28.10		8.00	8.00		21.69	21.69		80.7	82.2		5.59	5.69		1.84	1.99		<2	

Remarks:  
Single underline denotes exceedance over Action Level.  
Double underline denotes exceedance over Limit Level.



**Water Monitoring Result at M5B - Central Colling Water Intake Group  
Mid-Ebb Tide**

Date	Time	Weather Condition	Sampling Depth		Water Temperature		pH			Salinity		DO Saturation		DO		Turbidity		Suspended Solids						
					°C		-			ppt		%		mg/L		NTU		mg/L						
					Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average				
01/06/2019	10:20	Cloudy	Middle	4.0	26.50	26.50	26.55	7.25	7.25	7.26	30.61	30.61	30.61	94.3	94.3	94.2	6.37	6.37	6.36	9.98	9.92	9.94	25	<u>25.00</u>
	10:22		Middle	4.0	26.60	26.60		7.26	7.26		30.61	30.61		94.2	94.1		6.35	6.35		9.93	9.94		25	
03/06/2019	11:25	Cloudy	Middle	4.0	27.10	27.10	27.15	7.35	7.35	7.36	28.91	28.91	28.91	87.4	87.2	87.1	5.91	5.89	5.87	5.63	5.61	5.59	6	6.50
	11:27		Middle	4.0	27.20	27.20		7.36	7.36		28.91	28.91		87.0	86.9		5.83	5.83		5.58	5.55		7	
05/06/2019	15:20	Fine	Middle	3.5	28.00	28.00	28.05	7.15	7.15	7.16	28.73	28.73	28.73	91.1	90.6	90.7	6.08	6.04	6.04	4.47	4.47	4.46	<2	<2
	15:22		Middle	3.5	28.10	28.10		7.17	7.17		28.73	28.73		90.5	90.6		6.02	6.03		4.46	4.44		<2	
08/06/2019	17:55	Cloudy	Middle	3.5	28.40	28.40	28.55	7.36	7.36	7.37	27.95	27.95	27.96	95.7	95.9	94.6	6.35	6.36	6.31	2.39	2.40	2.40	5	4.50
	17:37		Middle	3.5	28.70	28.70		7.37	7.37		27.96	27.96		93.3	93.4		6.25	6.26		2.40	2.40		4	
10/06/2019	17:10	Cloudy	Middle	4.0	28.60	28.60	28.65	7.26	7.26	7.26	25.52	25.52	25.52	99.0	98.6	98.6	6.65	6.62	6.63	3.29	3.30	3.31	3	3.00
	17:12		Middle	4.0	28.70	28.70		7.26	7.26		25.52	25.52		98.5	98.4		6.64	6.61		3.31	3.32		3	
12/06/2019	-	-	Middle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-		Middle	-	-	-		-	-		-	-		-	-		-	-		-	-		-	
14/06/2019	09:55	Fine	Middle	3.5	28.20	28.20	28.25	7.22	7.22	7.23	28.20	28.20	28.20	88.6	88.5	88.4	5.90	5.89	5.88	2.39	2.38	2.35	5	4.50
	09:57		Middle	3.5	28.30	28.30		7.24	7.24		28.20	28.20		88.2	88.1		5.87	5.86		2.28	2.33		4	
17/06/2019	11:45	Cloudy	Middle	4.0	26.90	26.90	26.90	7.20	7.20	7.20	30.45	30.45	30.45	91.6	91.9	91.7	6.17	6.18	6.17	5.04	5.04	5.04	16	<u>16.00</u>
	11:47		Middle	4.0	26.90	26.90		7.20	7.20		30.45	30.45		91.7	91.7		6.17	6.17		5.05	5.04		16	
19/06/2019	14:05	Cloudy	Middle	3.5	29.40	29.40	29.45	7.29	7.29	7.30	28.68	28.68	28.68	94.1	93.5	94.0	6.13	6.05	6.11	3.28	3.29	3.28	7	7.50
	14:07		Middle	3.5	29.50	29.50		7.30	7.30		28.68	28.68		94.1	94.4		6.12	6.15		3.29	3.26		8	
21/06/2019	11:35	Fine	Middle	4.0	29.50	29.50	29.55	7.85	7.85	7.84	27.76	27.76	27.76	83.0	83.3	82.3	5.43	5.45	5.38	5.98	5.99	5.98	5	4.50
	11:37		Middle	4.0	29.60	29.60		7.82	7.82		27.76	27.76		81.3	81.4		5.31	5.32		5.96	5.97		4	
24/06/2019	15:10	Fine	Middle	3.5	28.90	28.90	28.90	7.45	7.45	7.46	31.60	31.60	31.61	95.2	95.2	95.1	6.69	6.69	6.69	4.89	4.78	4.80	2	2.00
	15:12		Middle	3.5	28.90	28.90		7.47	7.47		31.61	31.61		94.9	95.2		6.67	6.69		4.77	4.76		<2	
26/06/2019	19:00	Cloudy	Middle	3.0	28.10	28.10	28.10	8.02	8.02	8.02	27.19	27.19	27.19	73.4	76.3	74.6	4.93	5.13	5.01	1.41	1.38	1.33	5	5.00
	19:01		Middle	3.0	28.10	28.10		8.02	8.02		27.19	27.19		75.1	73.4		5.04	4.93		1.28	1.26		5	
29/06/2019	09:55	Fine	Middle	4.0	29.70	29.70	29.50	7.58	7.58	7.57	24.87	24.87	24.89	93.4	93.5	93.0	6.22	6.24	6.19	1.92	1.86	1.89	<2	<2
	09:57		Middle	4.0	29.30	29.30		7.56	7.56		24.91	24.91		92.6	92.3		6.17	6.14		1.88	1.88		<2	

Remarks:  
Single underline denotes exceedance over Action Level.  
Double underline denotes exceedance over Limit Level.



**Water Monitoring Result at Culvert J - Reference Station  
Mid-Ebb Tide**

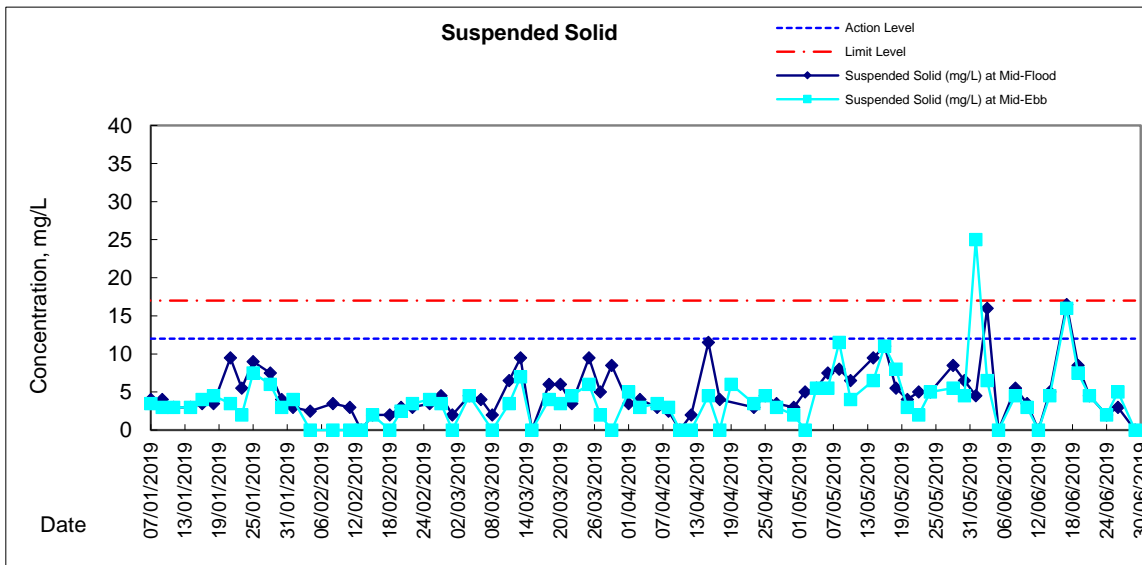
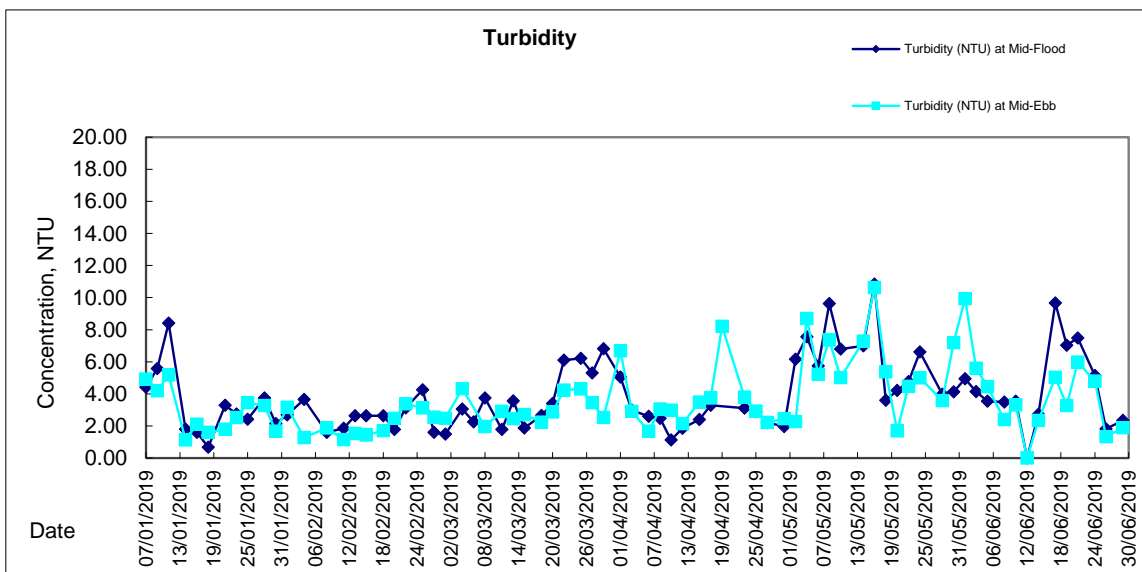
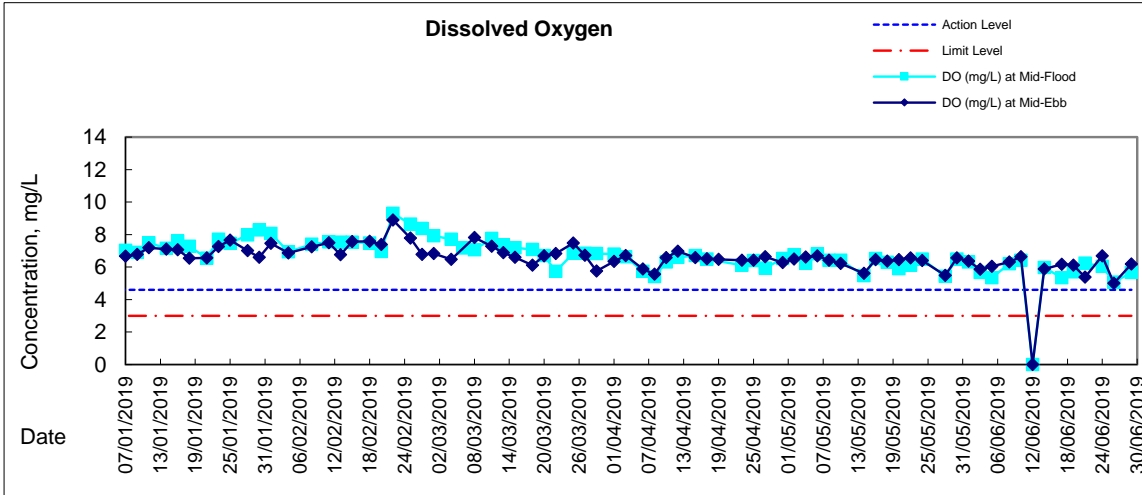
Date	Time	Weather Condition	Sampling Depth		Water Temperature		pH			Salinity		DO Saturation		DO		Turbidity		Suspended Solids						
					°C		-			ppt		%		mg/L		NTU		mg/L						
					Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average				
01/06/2019	10:15	Cloudy	Middle	4	26.90	26.90	27.05	7.17	7.17	7.18	30.05	30.05	30.04	89.4	89.3	88.9	6.01	6.00	5.97	5.47	5.38	5.41	8	8.00
	10:17		Middle	4	27.20	27.20		7.18	7.18		30.03	30.03		88.5	88.4		5.94	5.93		5.39	5.41		8	
03/06/2019	11:20	Cloudy	Middle	4	27.20	27.20	27.25	7.27	7.27	7.25	27.07	27.07	27.07	83.0	83.0	82.8	5.66	5.66	5.65	5.68	5.64	5.65	8	7.50
	11:22		Middle	4	27.30	27.30		7.23	7.23		27.07	27.07		83.1	82.0		5.67	5.59		5.64	5.63		7	
05/06/2019	15:15	Fine	Middle	4	28.70	28.70	28.80	7.09	7.09	7.11	26.11	26.11	26.12	87.3	87.0	86.6	5.83	5.81	5.78	4.79	4.84	4.81	3	2.50
	15:17		Middle	4	28.90	28.90		7.12	7.12		26.12	26.12		86.4	85.7		5.76	5.71		4.81	4.79		2	
08/06/2019	17:30	Cloudy	Middle	4	29.10	29.10	29.25	7.26	7.26	7.29	28.07	28.07	28.07	94.2	94.2	93.7	6.17	6.17	6.13	2.44	2.41	2.41	7	7.00
	17:32		Middle	4	29.40	29.40		7.32	7.32		28.06	28.06		93.6	92.6		6.12	6.07		2.39	2.39		7	
10/06/2019	17:05	Cloudy	Middle	4	28.80	28.80	28.85	7.07	7.07	7.08	24.09	24.09	24.09	100.0	99.6	99.4	6.76	6.72	6.71	3.71	3.66	4.41	4	4.50
	17:07		Middle	4	28.90	28.90		7.08	7.08		24.09	24.09		99.5	98.4		6.72	6.64		3.62	6.64		5	
12/06/2019	-	-	Middle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-		Middle	-	-	-		-	-		-	-		-	-		-	-		-	-		-	
14/06/2019	09:50	Fine	Middle	4	28.90	28.90	28.95	7.17	7.17	7.19	26.42	26.42	26.42	90.6	89.6	89.6	6.02	5.95	5.95	5.86	5.78	5.78	7	7.00
	09:52		Middle	4	29.00	29.00		7.20	7.20		26.42	26.42		88.6	89.4		5.89	5.93		5.77	5.80		7	
17/06/2019	11:40	Cloudy	Middle	4	27.10	27.10	27.10	7.12	7.12	7.10	29.34	29.34	29.34	94.4	93.7	93.6	6.37	6.32	6.31	6.98	6.99	7.01	12	13.50
	11:42		Middle	4	27.10	27.10		7.08	7.08		29.34	29.34		93.3	93.0		6.29	6.27		7.04	7.02		15	
19/06/2019	14:00	Cloudy	Middle	4	29.60	29.60	29.60	7.23	7.23	7.24	28.77	28.77	28.78	91.5	90.6	90.8	5.91	5.85	5.86	4.17	4.16	4.17	10	10.50
	14:02		Middle	4	29.60	29.60		7.25	7.25		28.78	28.78		90.5	90.6		5.84	5.84		4.17	4.17		11	
21/06/2019	11:30	Fine	Middle	4	29.50	29.50	29.40	7.79	7.79	7.78	27.56	27.56	27.57	80.0	80.1	80.2	5.26	5.27	5.27	5.08	5.12	5.11	8	7.50
	11:32		Middle	4	29.30	29.30		7.77	7.77		27.57	27.57		80.1	80.6		5.26	5.27		5.11	5.13		7	
24/06/2019	15:05	Fine	Middle	4	28.70	28.70	28.75	7.35	7.35	7.37	31.76	31.76	31.76	95.9	95.4	94.3	6.65	6.62	6.54	4.19	4.20	4.21	3	3.00
	15:07		Middle	4	28.80	28.80		7.39	7.39		31.76	31.76		92.4	93.5		6.41	6.48		4.21	4.22		3	
26/06/2019	19:15	Cloudy	Middle	3	28.00	28.00	28.00	8.10	8.10	8.10	23.60	23.60	23.60	71.8	73.7	74.1	4.93	5.05	5.08	2.17	2.36	2.23	5	4.50
	19:16		Middle	3	28.00	28.00		8.10	8.10		23.60	23.60		75.6	75.2		5.19	5.16		2.23	2.15		4	
29/06/2019	09:50	Fine	Middle	4	29.70	29.70	29.80	7.45	7.45	7.48	20.32	20.32	20.33	92.2	92.7	91.9	6.25	6.28	6.24	20.16	20.16	20.16	12	11.50
	09:52		Middle	4	29.90	29.90		7.50	7.50		20.33	20.33		91.0	91.6		6.17	6.26		20.15	20.15		11	

Remarks:  
Single underline denotes exceedance over Action Level.  
Double underline denotes exceedance over Limit Level.



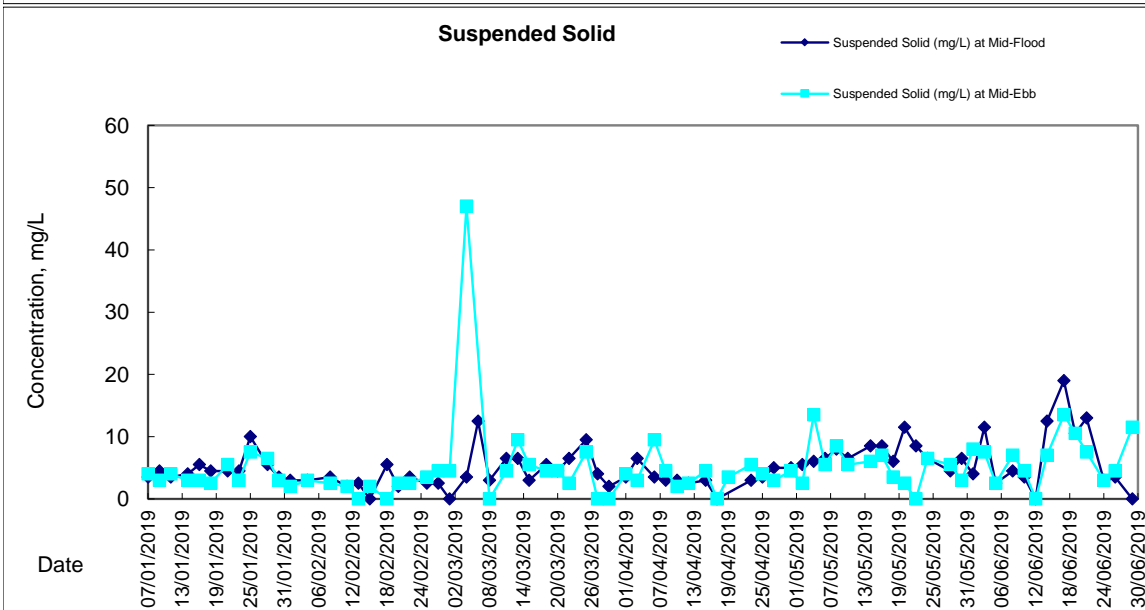
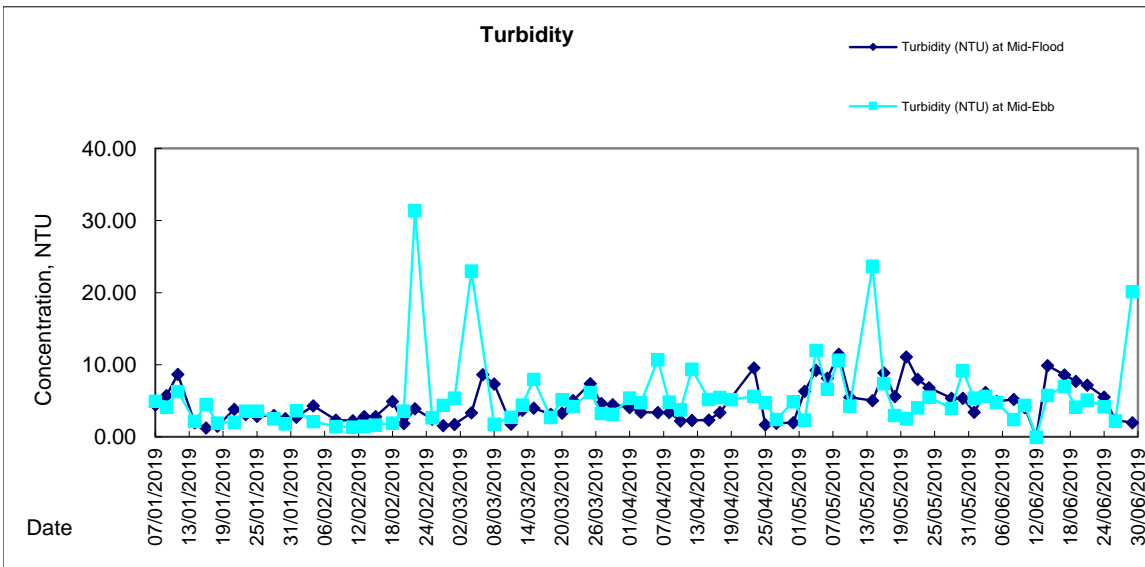
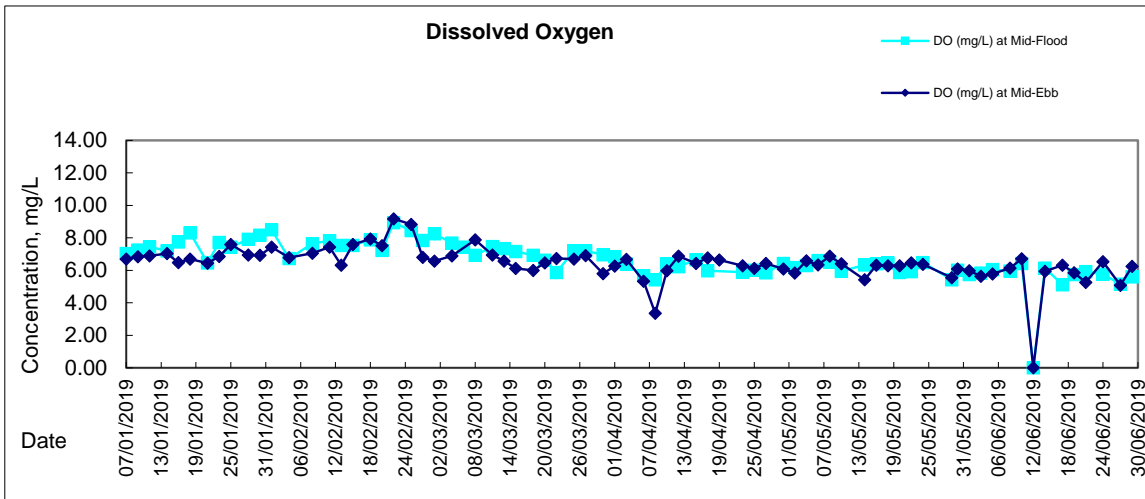


### Graphic Presentation of Water Quality Result of M5B - Central Cooling Water Intake Groups





# Graphic Presentation of Water Quality Result of Culvert J - Reference Station





***Appendix 6.1***

***Event Action Plans***

Central Reclamation Phase III : Environmental Monitoring and Audit - Event and Action Plan for Air and Noise Quality

Event and Action Plan for Air Quality				
Event	Action			
	ET Leader	IC(E)	ER	Contractor
Action Level - Exceedance for one sample	<ol style="list-style-type: none"> <li>Identify source</li> <li>Inform IC(E) and ER</li> <li>Repeat measurement to confirm finding</li> <li>Increase monitoring frequency to daily</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET</li> <li>Check Contractor's working method</li> </ol>	<ol style="list-style-type: none"> <li>Notify Contractor</li> </ol>	<ol style="list-style-type: none"> <li>Rectify any unacceptable practice</li> <li>Amend working methods if appropriate</li> </ol>
Action Level - Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>Identify source</li> <li>Inform IC(E) and ER</li> <li>Repeat measurement to confirm finding</li> <li>Increase monitoring frequency to daily</li> <li>Discuss with IC(E) and Contractor on remedial actions</li> <li>If exceedance continues, arrange meeting with IC(E) and ER</li> <li>If exceedance stops cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET</li> <li>Check Contractor's working method</li> <li>Discuss with ET and Contractor on possible remedial measures</li> <li>Advise the ER on the effectiveness of the proposed remedial measures</li> <li>Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing</li> <li>Notify Contractor</li> <li>Ensure remedial measures properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>Submit proposals for remedial actions to IC(E) within 3 working days of notification</li> <li>Implement the agreed proposals</li> <li>Amend proposal if appropriate</li> </ol>
Limit Level - Exceedance for one sample	<ol style="list-style-type: none"> <li>Identify source</li> <li>Inform ER and EPD</li> <li>Repeat measurement to confirm findings</li> <li>Increase monitoring frequency to daily</li> <li>Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET</li> <li>Check Contractor's working method</li> <li>Discuss with ET and Contractor on possible remedial measures</li> <li>Advise the ER on the effectiveness of the proposed remedial measures</li> <li>Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing</li> <li>Notify Contractor</li> <li>Ensure remedial measures properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>Take immediate action to avoid further exceedance</li> <li>Submit proposal for remedial actions to IC(E) within 3 working days of notification</li> <li>Implement the agreed measures</li> </ol>
Limit Level - Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>Notify IC(E), ER, Contractor and EPD</li> <li>Identify source</li> <li>Repeat measurements to confirm findings</li> <li>Increase monitoring frequency to daily</li> <li>Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented</li> <li>Arrange meeting with IC(E) and ER to discuss the remedial actions to be taken</li> <li>Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results</li> <li>If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>Discuss amongst ER, ET, and Contractor on the potential remedial actions</li> <li>Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly</li> <li>Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing</li> <li>Notify Contractor</li> <li>In consultation with the IC(E), agree with the Contractor on the remedial measures to be implemented</li> <li>Ensure remedial measures properly implemented</li> <li>If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated</li> </ol>	<ol style="list-style-type: none"> <li>Take immediate action to avoid further exceedance</li> <li>Submit proposals for remedial actions to IC(E) within 3 working days of notification</li> <li>Implement the agreed proposals</li> <li>Resubmit proposals if problem still not under control</li> <li>Stop the relevant portion of works as determined by the ER until the exceedance is abated</li> </ol>

Central Reclamation Phase III : Environmental Monitoring and Audit - Event and Action Plan for Air and Noise Quality

Event and Action Plan for Noise Quality				
Event	Action			
	ET Leader	IC(E)	ER	Contractor
Action Level is reached	<ol style="list-style-type: none"> <li>1. Notify IC(E) and Contractor</li> <li>2. Carry out investigation</li> <li>3. Report the results of the investigation to the IC(E) and Contractor</li> <li>4. Discuss with the Contractor and formulate remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET and Contractor on the potential remedial actions</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly</li> <li>3. Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing</li> <li>2. Notify Contractor</li> <li>3. Require Contractor to propose remedial measures for the analyzed noise problem</li> <li>4. Ensure remedial measures are properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposal to IC(E)</li> <li>2. Implement noise mitigation proposals</li> </ol>
Limit Level is reached	<ol style="list-style-type: none"> <li>1. Notify IC(E), ER, EPD and Contractor</li> <li>2. Identify source</li> <li>3. Repeat measurement to confirm findings</li> <li>4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented</li> <li>5. Inform IC(E), ER and EPD the causes &amp; actions taken for the exceedances</li> <li>6. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results</li> <li>7. If exceedance stops cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET and Contractor on the potential remedial actions</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly</li> <li>3. Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing</li> <li>2. Notify Contractor</li> <li>3. Require Contractor to propose remedial measures for the analyzed noise problem</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion or work until the exceedance is abated</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance</li> <li>2. Submit proposals for remedial actions to IC(E) within 3 working days of notification</li> <li>3. Implement the agreed proposals</li> <li>4. Resubmit proposals if problem still not under control</li> <li>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated</li> </ol>



Central Reclamation Phase III: Environmental Monitoring and Audit - Event and Action Plan for Water Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action level being exceeded by one sampling day	Repeat in-situ measurement to confirm findings; Identify source(s) of impact; Inform IEC and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC and Contractor; (The above actions should be taken within 1 working day after the exceedance is identified) Repeat measurement on next day of exceedance.	Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	Discuss with IEC on the proposed mitigation measures; Make agreement on the mitigation measures to be implemented. (The above actions should be taken within 1 working day after the exceedance is identified)	Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IEC and propose mitigation measures to IEC and ER; Implement the agreed mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)
Action level being exceeded by more than one consecutive sampling days	Identify source(s) of impact; Inform IEC and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC and Contractor; Ensure mitigation measures are implemented; Prepare to increase the monitoring frequency to daily; (The above actions should be taken within 1 working day after the exceedance is identified) Repeat measurement on next working day of exceedance.	Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	Discuss with IEC on the proposed mitigation measures; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; Implement the agreed mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)



Central Reclamation Phase III: Environmental Monitoring and Audit - Event and Action Plan for Water Quality

Event	Action			
	ET	IEC	ER	Contractor
Limit level being exceeded by one sampling day	Repeat in-situ measurement to confirm findings; Identify source(s) of impact; Inform IEC, contractor and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit level. (The above actions should be taken within 1 working day after the exceedance is identified)	Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	Inform the Engineer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET , IEC and ER and propose mitigation measures to IEC and ER within 3 working days; Implement the agreed mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)
Limit level being exceeded by more than one consecutive sampling days	Identify source(s) of impact; Inform IEC, contractor and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days. (The above actions should be taken within 1 working day after the exceedance is identified)	Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. (The above actions should be taken within 1 working day after the exceedance is identified)	Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures; Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit level. (The above actions should be taken within 1 working day after the exceedance is identified)	Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET , IEC and ER and propose mitigation measures to IEC and ER within 3working days; Implement the agreed mitigation measures; As directed by the Engineer, to slow down or to stop all or part of the marine work or construction activities. (The above actions should be taken within 1 working day after the exceedance is identified)





***Appendix 6.2***

***Summary for Notification of Exceedance***





Ref no.	Date	Tidal	Location	Parameters	Measured	Action	Limit Level	Follow-up action
X_19CR001	1-Jun-19	Mid-ebb	M5B	DO(mg/L)	6.30	4.60	3.00	<b>Possible reason:</b> Changes of water quality in the vicinity of water quality monitoring station possibly in relate to nearby culvert discharge.  <b>Action taken/ to be taken:</b> Immediate repeated in-site measurement had conducted to confirm the exceedance. Checking with the contractor works and review previous monitoring data.  <b>Remarks/ Other Obs:</b> No marine construction activity was conducted under Contract HK/2012/08 was conducted on the monitoring date while nearby culvert discharge was observed and the location of the construction area was at downstream of monitoring station M5B during monitoring period. In view of the above, it is considered that the exceedance was not related to Project works. No exceedance was recorded in the subsequent monitoring on 1 June 2019 flood tide.
				SS(mg/L)	25.00	12.00	17.00	
X_19CR002	3-Jun-19	Mid-flood	M5B	DO(mg/L)	5.66	4.60	3.00	<b>Possible reason:</b> Changes of water quality in the vicinity of water quality monitoring station.  <b>Action taken/ to be taken:</b> Immediate repeated in-site measurement had conducted to confirm the exceedance. Checking with the contractor works and review previous monitoring data.  <b>Remarks/ Other Obs:</b> No marine construction activity was conducted under Contract HK/2012/08 was conducted on the monitoring date. In view of no marine works, it is considered that the exceedance was not related to Project works. No exceedance was recorded in the subsequent monitoring on 5 June 2019 flood tide.
				SS(mg/L)	16.00	12.00	17.00	
X_19CR003	17-Jun-19	Mid-ebb	M5B	DO(mg/L)	6.17	4.60	3.00	<b>Possible reason:</b> Changes of water quality in the vicinity of water quality monitoring station possibly in relate to nearby culvert discharge.  <b>Action taken/ to be taken:</b> Immediate repeated in-site measurement had conducted to confirm the exceedance. Checking with the contractor works and review previous monitoring data.  <b>Remarks/ Other Obs:</b> No marine construction activity was conducted under Contract HK/2012/08 was conducted on the monitoring date while nearby culvert discharge was observed and the location of the construction area was at downstream of monitoring station M5B during monitoring period. In view of the above, it is considered that the exceedance was not related to Project works.
				SS(mg/L)	16.00	12.00	17.00	
X_19CR003	17-Jun-19	Mid-flood	M5B	DO(mg/L)	5.35	4.60	3.00	<b>Possible reason:</b> Changes of water quality in the vicinity of water quality monitoring station.  <b>Action taken/ to be taken:</b> Immediate repeated in-site measurement had conducted to confirm the exceedance. Checking with the contractor works and review previous monitoring data.  <b>Remarks/ Other Obs:</b> No marine construction activity was conducted under Contract HK/2012/08 was conducted on the monitoring date. In view of no marine works, it is considered that the exceedance was not related to Project works. No exceedance was recorded in the subsequent monitoring on 19 June 2019 flood tide.
				SS(mg/L)	16.50	12.00	17.00	



***Appendix 9.1***

***Complaint Log***



### Environmental Complaints Log

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
150211	21/1/2015	EPD complaint (EPD Ref.: H04/RS/000171 6-15) received by ET on 11 February 2015	Construction site opposite to CITIC Tower	Construction dust was emitted from a construction site opposite to CITIC Tower	<p>According to the relevant site records, trench grabbing for D-wall construction and socket H-pile construction were conducted at the concerned location on 21 January 2015. Dust screen for socket H-pile construction, maintenance of site haul road in wet condition and water spraying at vehicle entrance/exit points of HK/2012/08 Contractor site office and Portion I were implemented by the Contractor of HK/2012/08 near the concerned location on 21 January 2015.</p> <p>In addition, no environmental deficiency related to dust mitigation was identified at the concerned location during weekly environmental inspections conducted on 27 Jan, 3 and 10 Feb 2015 and dust mitigation measures including water spraying for dusty haul road and provision of wheel washing were in place and no dust related impact from the construction works at the concerned location was observed.</p> <p>Meanwhile, the Air Quality Health Index (AQHI) recorded by EPD across Western District and Eastern District on 21 January 2015 was ranged from 4 to 10+ indicating a severely high concentration of ambient air pollutants.</p> <p>Based on reviewing relevant impact monitoring data, elevated TSP were recorded at monitoring stations across Central to Wan Chai West area despite a non-Project related exceedance was recorded at nearby monitoring station ACL2a (Contractor HK/2012/08 Site Office) on 21 January 2015 and was considered to be contributed by ambient air pollutant.</p> <p>The site condition under Contract HK/2012/08 at the concerned location was considered to be generally satisfactory and no non-conformity related to cumulative air quality impact was observed at the concerned location.</p> <p>Nevertheless, in view of the public concern, the contractor was reminded to enhance the dust mitigation measures implemented to minimize potential nuisance to nearby public.</p>	Closed



Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
150703	3/7/2015	EPD complaint (EPD Ref.: H05/RS/000162 15-15) received by ET on 03 July 2015	West of HKCEC outside Lung King Street	Dark smoke was observed from a derrick barge in yellow color for reclamation work at location to the west of HKCEC outside Lung King Street	<p>According to the relevant site records under Contract HK/2012/08, one derrick barge (Chang Sheng 306) in yellow color was conducting material transfer at a near shore location opposite to Fleet Arcade on 30 June 2015 around noon-time under HK/2012/08 and the concerned derrick barge was towed away for maintenance on the same date.</p> <p>Follow-up inspection was conducted during weekly environmental inspection on 7 July 2015, no dark smoke was observed from the concerned derrick barge (Chang Sheng 306). Nevertheless, the Contractor was reminded to conduct regular checking on the condition of the all derrick barges deployed on site to ensure only well maintained equipment are used to avoid potential dark smoke emission affecting nearby public.</p> <p>Based on the review on relevant record and follow up site inspection, the condition of the concerned derrick barge was considered generally in order and no dark smoke was observed. In view of the public concern, the Contractor was reminded to conduct regular checking on the condition of derrick barges deployed on site to ensure only well maintained equipment are used on site to avoid potential dark smoke emission affecting nearby public.</p>	Closed



Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
150917	17/9/2015	A public complaint regarding water quality referred by EPD was received by ET on 17 September 2015	Central and Wan Chai Reclamation coastline (between LUNG WUI ROAD to LUNG WO ROAD, Central & Wan Chai, Hong Kong)	Silt from Central and Wan Chai Reclamation was spotted along the coastline (between LUNG WUI ROAD to LUNG WO ROAD, Central & Wan Chai, Hong Kong)	<p>Based on the site records confirmed by RSS, removal of seawall blocks by derrick barge was undertaken by Contract HK/2012/08 at Central Reclamation Phase III works area while mitigation measures including provision of silt curtain implemented by the Contractor of HK/2012/08 during the seawall block removal works. According to relevant record, muddy dispersion at HKCEC2W (area opposite to Lung King Street) was observed by the Environmental Team on 14 September 2015 afternoon. The muddy patch was observed dispersing outside the outer layer silt curtain deployed by the Contractor of HK/2012/08 towards the Central Reclamation Phase III area while the outer layer silt curtain was observed partially opened.</p> <p>In view of the above observations, the Contractor was advised to rectify any environmental deficiencies such that adequate protection such as silt curtain shall be provided for exposed soil slope to mitigate for potential runoff related water quality impact to the surrounding waters; outer layer silt curtain deployed shall be entirely closed during works to safeguard the surrounding water quality. Any opening for marine vessel shall be closed promptly after passage and localized silt curtain deployed on site shall be properly maintained to avoid any gap or opening to effectively safeguard the nearby waters.</p>	Closed



Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
160804	4/8/2016	A public complaint referred by EPD was received by ET on 04 August 2016 (Case Ref.: H05/RS/0001 9364-16).	Temporary Barging Facility outside Lung Wo Road	Muddy water discharge was found at the temporary barging facility outside Lung Wo Road on 03 August 2016.	Based on the site records confirmed by RSS, the concerned temporary barging facility outside Lung Wo Road was maintained and operated by non- WDII Project and no construction activity was conducted by the Contractor of HK/2012/08 at the location around the concerned temporary barging facility on 03 August 2016.  Nevertheless, in view of the public concern, the Contractor of HK/2012/08 was reminded to maintain the bunding along site boundary for protection against potential surface runoff and maintain proper site drainage collection of construction effluent to avoid any potential water quality concern.	Closed.



Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
180625	5/6/2018	A public complaint referred by EPD was received by ET on 25 June 2018 (Case Ref.: H05/RS/0000 15459-18).	Site outside Lung Wo Road	Muddy water discharge was found at the site outside Lung Wo Road on 5 June 2018 afternoon.	<p>Based on the site records confirmed by RSS, installation of metal formwork at seawall was carried out on 5 June 2018 afternoon and mitigation measure including placing rock fill material on slope surface was implemented at the concerned location to reduce surface runoff.</p> <p>Follow up site inspection was conducted by the Environmental Team on 26 June 2018, no muddy water discharge or surface runoff related water quality impact was observed at construction area under HK/2012/08 near the concerned area</p> <p>Nevertheless, in view of the public concern, the Contractor of HK/2012/08 was reminded to provide addition tarpaulin covering to the slope surface along the seawall around the concerned location to reduce the potential surface runoff and maintain regular checking on the embankment condition to ensure no gap / void to avoid potential seepage / surface runoff to nearby water.</p>	Closed.



***Appendix 10.1***

***Construction Programme of Individual Contracts***



**CEDD Contract No. HK/2012/08  
Wan Chai Development Phase II  
Central - Wan Chai Bypass at Wan Chai West**

Activity ID	Activity Name	Remaining Dur	Early Start	Early Finish	Activity % Complete	2018												2019								
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>HK/2012/08 Revised Works Programme Rev.12.0(DD 20 November 2017)</b>																										
<b>Key Dates and Milestone Dates</b>																										
<b>Sections of Works Completion (Included Not Granted EOT Entitlement of The Contractor)</b>																										
KD10840	Completion of Section IIIA	0		08-Sep-18*	0%																					
KD10860	Completion of Section IV	0		30-Aug-18*	0%																					
KD10880	Completion of Section V	0		26-Sep-18*	0%																					
KD11010	Completion of Section VII	0		14-Sep-18*	0%																					
KD11020	Completion of Section VIII	0		21-Sep-18*	0%																					
KD11040	Completion of Section IX	0		21-Sep-19*	0%																					
KD11060	Completion of Section X	0		21-Sep-18*	0%																					
<b>Planned Sections of Works Completion</b>																										
KD10080	Planned Section IIIA Completion - Road A2,A4, A5	0		08-Sep-18	0%																					
KD10100	Planned Section IV Completion - Slip Road 3	0		30-Aug-18	0%																					
KD10140	Planned Section V Completion - Remaining At-Grade Road	0		26-Sep-18	0%																					
KD10280	Planned Section VII Completion - Remainder Works	0		14-Sep-18	0%																					
KD10300	Planned Section VIII Completion - Landscape Softwork	0		21-Sep-18	0%																					
KD10320	Planned Section IX Completion - Establishment Works	0		21-Sep-19	0%																					
KD10340	Planned Section X Completion - Tree Protection & Preservation	0		21-Sep-18	0%																					
<b>Dredging and Reclamation</b>																										
<b>Marine Work Construction</b>																										
<b>Zone CRIII</b>																										
<b>Seawall Construction - Zone CRIII</b>																										
<b>Zone CRIII Seawall- 2nd Stage</b>																										
<b>Seawall 2 &amp; 12</b>																										
MAR21371	Zone CRIII - seawall 2 & 12 - Backfilling remaining portion (type A, geotextile and filter)	0	19-Jan-18 A	27-Jan-18 A	100%	■																				
<b>Zone D</b>																										
<b>Seawall Construction - Zone D</b>																										
<b>Seawall 10 &amp; 11</b>																										
MAR20630	Zone D - Seawall 10 & 11: Install remaining seawall block	14	20-Feb-18*	05-Mar-18	0%		■																			
MAR20650	Zone D - Seawall 10 & 11: Backfill Type A	7	06-Mar-18	12-Mar-18	0%			■																		
MAR20670	Zone D - Seawall 10 & 11: Lay geotextile and filter	7	13-Mar-18	19-Mar-18	0%			■																		
<b>Works for Section Completion</b>																										
<b>Construction</b>																										
<b>Section III A - Road A2, A4 &amp; A5</b>																										
<b>Roadwork &amp; Utilities - Section 1 (L1806 - L1801)</b>																										

Data Date: 20-Feb-18

- ◆ Current Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Remaining Level of Effort

**Updated Works Programme Rev.12  
(Ref. to Rev.12 as of 20 February 2018)**

Date	Revision	Checked	Approved
20-Feb-18	12		

























Contract No. HY/2010/08  
Three Months Rolling Program

Activity Name	Start	Finish	2019		
			April	May	June
Junction Modification Works	1/4/2019	30/6/2019			