



Lam Geotechnics Limited

Contract No. HK/2011/07  
Wan Chai Development Phase II and Central Wan Chai Bypass  
- Sampling, Field Measurement and Testing Works (Stage 2)  
Monthly EM&A Report (July 2014)

**CONTRACT NO: HK/2011/07**

**WANCHAI DEVELOPMENT PHASE II AND CENTRAL  
WANCHAI BYPASS  
SAMPLING, FIELD MEASUREMENT AND TESTING WORK  
(STAGE 2)**

**ENVIRONMENTAL PERMIT NO. EP-122/2002/D**

**MONTHLY ENVIRONMENTAL MONITORING & AUDIT REPORT**

**- JULY 2014 -**

**CLIENTS:**

Civil Engineering and Development  
Department

**PREPARED BY:**

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**CERTIFIED BY:**

Raymond Dai  
Environmental Team Leader

**DATE:**

11 August 2014

Ref.: AACWBIECEM00\_0\_5544L.14

11 August 2014

AECOM Asia Company Limited  
11/F, Tower 2  
Grand Central Plaza  
138 Shatin Rural Committee Road  
Shatin, New Territories  
Hong Kong

By Post and Fax (2691 2649)

Attention: Mr. Conrad Ng

Dear Sir,

**Re: Wan Chai Development Phase II and Central-Wan Chai Bypass  
Monthly Environmental Monitoring and Audit Report (July 2014) for EP-122/2002/D**

Reference is made to the Environmental Team's submission of the captioned Monthly Environmental Monitoring and Audit (EM&A) Report for July 2014 received by e-mail on 11 August 2014.

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 in the captioned Environmental Permit.

Thank you very much for your kind attention and please do not hesitate to contact the undersigned should you have any queries.

Yours sincerely,



David Yeung  
Independent Environmental Checker

c.c.	CEDD	Mr. Jackson Cheung	by fax: 2577 5040
	AECOM	Mr. Francis Leong / Mr. Stephen Lai	by fax: 2691 2649
	Lam	Mr. Raymond Dai	by fax: 2882 3331

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## EXECUTIVE SUMMARY

- i. This is the Environmental Monitoring and Audit (EM&A) Monthly Report – [July 2014](#) specific for Environmental Permit no. EP-122/2002/D. The EM&A report is prepared by the Environmental Team (ET) employed under Contract No. HK/2011/07 – Wan Chai Development Phase II and Central Wanchai Bypass – Sampling, Field Measurement and Testing Works (Stage 2). This report presents the environmental monitoring findings and information recorded during the period of [July 2014](#). The cut-off date of reporting is the last day of each reporting month.
  
- ii. In the reporting month, the principal work activities of the contract are included as follows:  
Contract no. HK/2012/08 – Wan Chai Development Phase II – Central- Wan Chai Bypass at Wan Chai West
  - [Diaphragm wall construction works](#)
  - [Pipe pile wall construction](#)

### Noise Monitoring

- iii. Continuous noise monitoring was conducted at ACL3 – City Hall.
- iv. Limit level exceedances were recorded on 22 July 2014 during daytime in the reporting month.  
[After the investigation, the exceedances were concluded as not project related.](#)
- v. 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

- vi. Due to electricity supply, the 24hr TSP monitoring at monitoring station ACL1 was rescheduled from 28 July 2014 to 29 July 2014.
- 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. Due to the defective electricity supply found at monitoring station ACL1 and the advice from City Hall Building Management, the air monitoring station ACL1 – City Hall was finely adjusted on 28 Feb 2014 to an alternate electricity supply.
- ix. 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.
- x. Air Quality Monitoring at ACL2 was temporarily suspended during the period from 14<sup>th</sup> November, 2013 to 3<sup>rd</sup> December, 2013.
- xi. The Proposal for Relocation of Air Quality Monitoring Station at People's Liberation Army Headquarter (ACL2) was approved by EPD on 27 November 2013.



- xii. 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.
- xiii. The air quality monitoring at ACL2a – Contractor HK/2012/08 Site Office was commenced on 7 December 2013.
- xiv. No exceedances were recorded in the reporting month.

Complaints, Notifications of Summons and Successful Prosecutions

- xv. There was no environmental complaint received in this reporting month.

Site Inspections and Audit

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

Future Key Issues

- xvii. 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

- Diaphragm wall construction works
- Pipe pile wall construction



## 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 Environmental Permit no. EP-122/2002/D to implement the Environmental Monitoring and Audit (EM&A) programme 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 1 May 2013.
- 1.1.2. This report documents the finding of EM&A works for Environmental Permit (EP) no. EP-122/2002/D, during the period of [July 2014](#). 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**      ***Site Inspection*** – 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;
- Reprovisioning 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 reprovisioning of existing cooling water pumping stations and associated pipework systems and E&M works;
- Reprovisioning 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 CRIII works;
- Reprovisioning of the Government Heliport at the Wan Chai PCWA and reprovisioning 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	Central-Wanchai Bypass (CWB)	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	Reclamation works	Schedule 2, Part I, C.1
DP4	The North Island Line (NIL) Protection Works within CRIII	Schedule 2, Part I, A.7

2.2.4. The designated project work I (DP1) was awarded to China State-Leader Joint Venture HK/2012/08 as part of the Project works by the Civil Engineering and Development Department (CEDD). The construction work under Contract no. HK/2012/08 was commenced on 27 May 2013.

### 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	Principal Resident Engineer	Mr. Frankie Fan	2587 1778	2587 1877
	Engineer's Representative for CWB	Principal Resident Engineer	Mr. Peter Poon	3922 3388	3912 3010
China State-Leader JV	Contractor under Contract no. HK/2012/08	Project Director	Mr. Andrew Tse	9137 1811	2877 1522
		Project Manager	Mr. Victor Wu	9193 8871	

Party	Role	Post	Name	Contact No.	Contact Fax
		Deputy Project Manager	Mr. Eddie Chung	9189 8118	
		Site Agent	Mr. Paul Lui	9095 7922	
		Environmental Officer	Mr. James Ma	9130 9549	
		Environmental Supervisor	Mr. Y. L. HO	9856 5669	
ENVIRON 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

- Diaphragm wall construction works
- Pipe pile wall construction

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

- Diaphragm wall construction works
- Pipe pile wall construction

### **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/D	1 Sep 2009	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	8 Mar 2013	N/A	Valid
Billing Account under Waste Disposal Ordinance	7016883	18 Feb 2013	18 Jul 2017	Valid
Billing Account under Waste Disposal Ordinance (Dumping by Vessel)	-	-	-	-
Construction Noise Permit	GW-RS0257-14	26 Mar 2014	28 Mar 2014 to 25 Sep 2014	Valid
Water Discharge Licence	WT00018470-2014	6 Mar 2014	31 Mar 2019	Valid

- 3.1.3. 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.**



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

- 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.
- 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 Limit level exceedances were recorded on 22 July 2014 during daytime in the reporting month. After checking with Contractor, no major noisy construction activity was conducted on 22 July 2014. In addition, thunderstorm warning for the concern location and amber rainstorm warning were hoisting during the recorded period. As such, the exceedances were considered to be contributed by the adverse weather condition and not related to Project.
- 5.1.4 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 The proposed division of air quality monitoring stations are summarized in [Table 5.2](#) below.

**Table 5.2 Air Quality Monitoring Station for Contract no. HK/2012/08**

Station	Description

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

- 5.2.2 Due to electricity supply, the 24hr TSP monitoring at monitoring station ACL1 was rescheduled from 28 July 2014 to 29 July 2014
- 5.2.3 Due to the defective electricity supply found at monitoring station ACL1 and the advice from City Hall Building Management, the air monitoring station ACL1 – City Hall was finely adjusted on 28 Feb 2014 to an alternate electricity supply.
- 5.2.4 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.
- 5.2.5 Air Quality Monitoring at ACL2 was temporarily suspended during the period from 14th November, 2013 to 3rd December, 2013.
- 5.2.6 The Proposal for Relocation of Air Quality Monitoring Station at People's Liberation Army Headquarter (ACL2) was approved by EPD on 27 November 2013.
- 5.2.7 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.
- 5.2.8 The air quality monitoring at ACL2a – Contractor HK/2012/08 Site Office was commenced on 7 December 2013.
- 5.2.9 No action or limit level exceedance was recorded at ACL1 – City Hall and ACL2a – Contractor HK/2012/08 Site Office in the reporting month.
- 5.2.10 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 Waste Monitoring Results

5.3.1 Inert and non-inert C&D wastes were disposed in this reporting month. Details of the waste flow table are summarized in **Table 5.3**.

**Table 5.3 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, m <sup>3</sup>	0 1484	396 4144	TM38 TKO137
Inert C&D materials recycled, m <sup>3</sup>	NIL	NIL	NIL
Non-inert C&D materials disposed, m <sup>3</sup>	45	305	SENT Landfill
Non-inert C&D materials recycled, m <sup>3</sup>	NIL	NIL	NIL
Chemical waste disposed, kg	NIL	NIL	NIL



## 6 Compliance Audit

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

### 6.1 Noise Monitoring

6.1.1. Limit level exceedances were recorded on 22 July 2014 during daytime in this reporting month. After the investigation, the exceedances were concluded as non-project related.

### 6.2 Air Quality Monitoring

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

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

6.3.1. 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.

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

6.4.1. 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 Wan Chai Development Phase II, Central-Wan Chai Bypass and Island Eastern Corridor Link projects, the major construction activity under Wan Chai Development Phase II were marine works at HKCEC areas, tunnel works at Wan Chai East and filling works at Wan Chai West. The major construction activities under Central-Wan Chai Bypass and Island Eastern Corridor Link Projects were backfilling works at TS4 and TPCWAE. Bridge construction and tunnel works at Central Interchange, ELS, segment launching works and tunnel works at North Point area. The major environmental impact was water quality impact at Causeway Bay and Wan Chai. Marine-based construction activities were filling works at WanChai West and removal of temporary reclamation at TS4, TS2 and EX-PCWA at Wan Chai East in the reporting month.
- 7.0.4. No significant air impact from construction activities was anticipated in the reporting month. Besides, no project-related exceedances were recorded during the 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

- 8.0.1. Five site inspections for Contract no. HK/2012/08 were carried out on 2, 8, 14, 22 and 30 July 2014 in the reporting month. 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
140708_01	8-July-14	Oil cans should be placed on drip tray.	Drip trap was provided for oil cans	Completion as observed on 14 July 2014



## 9 COMPLAINTS, NOTIFICATION OF SUMMONS AND PROSECUTION

- 9.0.1. No environmental complaint was received in the reporting period.
- 9.0.2. The details of cumulative complaint log and updated summary of complaints are presented in **Appendix 9.1**
- 9.0.3. 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
June 2013 – June 2014	0
July 2014	0
Total	0

**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>



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
Contract No. HK/2011/07

Wanchai Development Phase II and Central Wanchai Bypass  
Sampling, Field Measurement and Testing Work (Stage 2)

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
***Figure 2.1***

***Project Layout***



**Designated Project 1 - Reclamation**  
**Layout Plan and Section**

**Figure 14.9**



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

**Figure 14.10**





Figure 14.11



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

**Figure 14.12**

***Figure 2.2***

***Project Organization Chart***

## Project Organization Chart

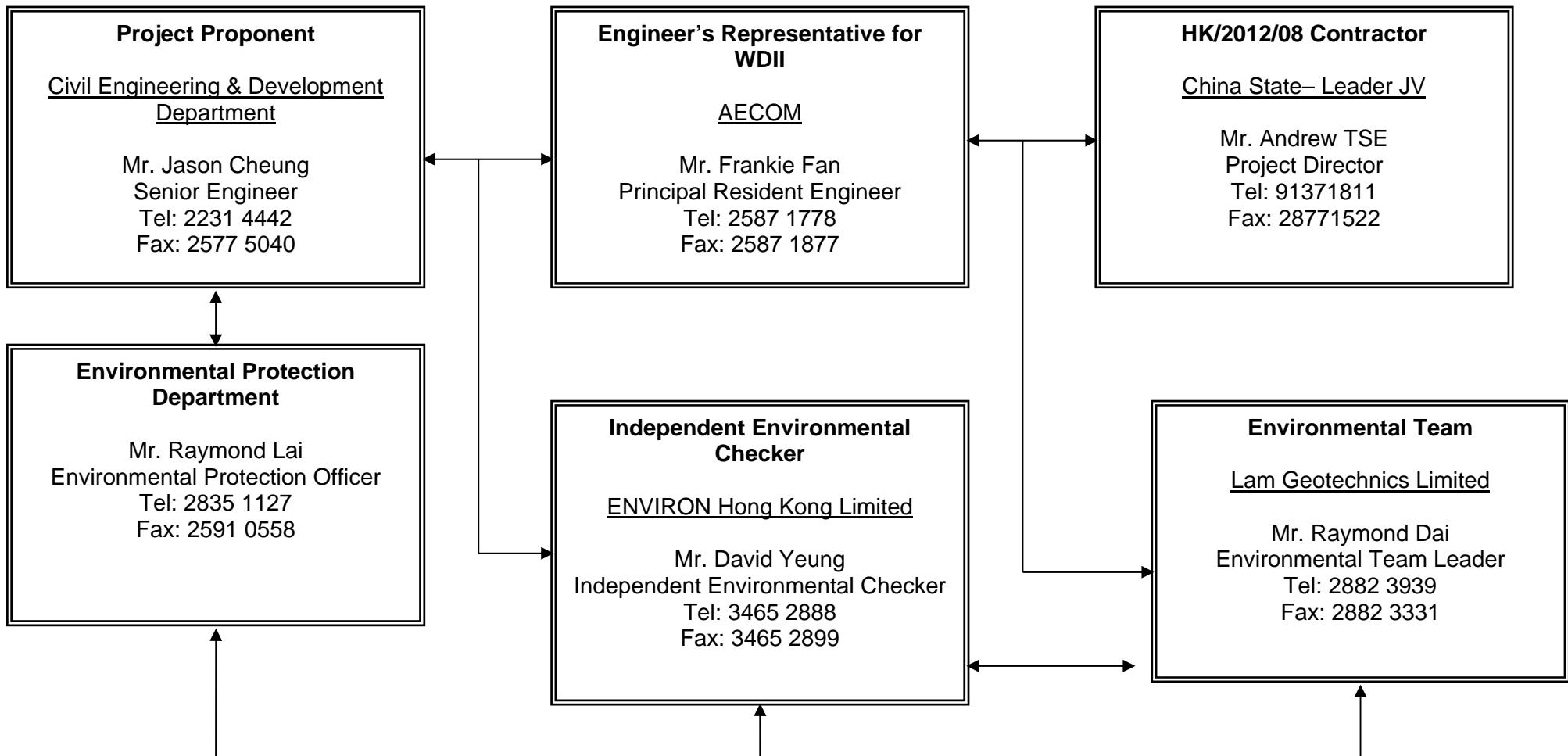


Figure 2.2

***Figure 4.1***

***Locations of Monitoring Stations***



## LEGEND:

DUST MONITORING STATION

NOISE MONITORING STATION

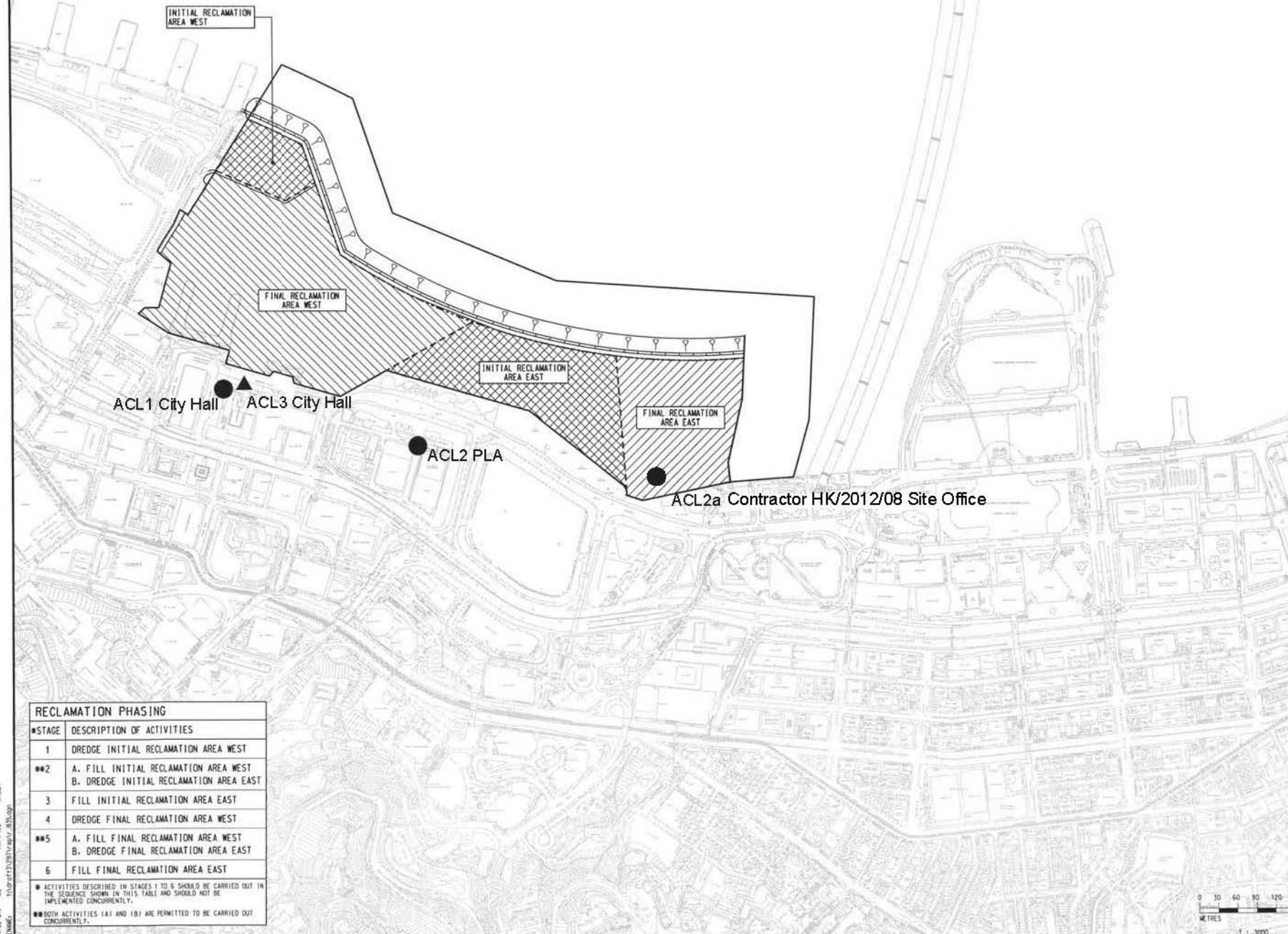


Fig 4.1 Location of monitoring stations



Lam Geotechnics Limited

Contract No. HK/2011/07

Wanchai Development Phase II and Central Wanchai Bypass  
Sampling, Field Measurement and Testing Work (Stage 2)

### **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	<p>Operational stage landscape and visual mitigation measures should include +</p> <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 : -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;	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 shoud 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> <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> <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	4
		<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 :           <ul style="list-style-type: none"> <li>Maximum Dredging Rate : 184 m<sup>2</sup>/hour</li> <li>Maximum Daily Filling Rate : 17,727 m<sup>3</sup>/day</li> <li>(for bulk reclamation filling)</li> </ul>           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.         </li> <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 Maine 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>		<p>Whole reclamation area</p> <p>During construction</p> <p>At end of construction</p>			
		<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 take over 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	Works Area During construction End of construction	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	Work Area During construction End of construction	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	Work Area During construction End of construction	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	<p>Whole Reclamation Area</p> <p>During Reclamation Works</p> <p>End of Reclamation Work</p>	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>					
		<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	<p>Works Areas</p> <p>During Construction</p> <p>End of Construction</p>	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
		<p>Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 354) and the Crown Land Ordinance;</p> <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	<p>Construction stage landscape and visual mitigation measures should include :</p> <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	<p>Area wide during design and contract preparation</p>	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	<p>TDD*/Contractor/ RSS</p> <p>TDD's design consultant</p>	<p>Works areas During construction End of construction and within one year of operational phase Area wide during design and contract preparation</p>	<p>C/O</p> <p>D</p>	<p>P, R, A, C</p> <p>P, R, A, C</p>	<p>1</p> <p>11,12,13,14</p>

**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 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



Lam Geotechnics Limited

Contract No. HK/2011/07

Wanchai Development Phase II and Central Wanchai Bypass  
Sampling, Field Measurement and Testing Work (Stage 2)

## ***Appendix 4.2***

### ***Copies of Calibration Certificates***



TISCH ENVIRONMENTAL, INC.  
 145 SOUTH MIAMI AVE.  
 VILLAGE OF CLEVES, OH 45002  
 513.467.9000  
 877.263.7610 TOLL FREE  
 513.467.9009 FAX  
 WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT  
 ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Jul 15, 2013 Rootsmeter S/N 0438320 Ta (K) - 300  
 Operator Tisch Orifice I.D. - 0005 Pa (mm) - 759.46

PLATE OR Run #	VOLUME START (m <sup>3</sup> )	VOLUME STOP (m <sup>3</sup> )	DIFF VOLUME (m <sup>3</sup> )	DIFF TIME (min)	METER	ORIFICE
					DIFF Hg (mm)	DIFF H <sub>2</sub> O (in.)
1	NA	NA	1.00	1.3910	3.2	2.00
2	NA	NA	1.00	0.9830	6.4	4.00
3	NA	NA	1.00	0.8800	7.9	5.00
4	NA	NA	1.00	0.8380	8.8	5.50
5	NA	NA	1.00	0.6930	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9884	0.7106	1.4090	0.9958	0.7159	0.8888
0.9843	1.0013	1.9926	0.9916	1.0087	1.2570
0.9822	1.1161	2.2278	0.9895	1.1244	1.4054
0.9811	1.1708	2.3365	0.9884	1.1795	1.4740
0.9760	1.4084	2.8180	0.9832	1.4188	1.7777

Qstd slope (m) = 2.01968  
 intercept (b) = -0.02746  
 coefficient (r) = 0.99999

y axis = SQRT[H<sub>2</sub>O(Pa/760)(298/Ta)]

Qa slope (m) = 1.26469  
 intercept (b) = -0.01732  
 coefficient (r) = 0.99999

y axis = SQRT[H<sub>2</sub>O(Ta/Pa)]

CALCULATIONS

$$\begin{aligned} V_{std} &= \text{Diff. Vol} [(Pa - \text{Diff. Hg}) / 760] (298 / Ta) \\ Q_{std} &= V_{std} / \text{Time} \end{aligned}$$

$$\begin{aligned} Va &= \text{Diff Vol} [(Pa - \text{Diff Hg}) / Pa] \\ Qa &= Va / \text{Time} \end{aligned}$$

For subsequent flow rate calculations:

$$\begin{aligned} Q_{std} &= 1/m \{ [\text{SQRT}(H_2O(Pa/760)(298/Ta))] - b \} \\ Qa &= 1/m \{ [\text{SQRT } H_2O(Ta/Pa)] - b \} \end{aligned}$$



Lam Geotechnics Limited

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

Location :	ACL1	Calibration Date :	21-Jun-14
Equipment no. :	EL222	Calibration Due Date :	21-Aug-14

### CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, $T_a$	301	Kelvin	Pressure, $P_a$	1003	mmHg
Orifice Transfer Standard Information					
Equipment No.	EL086	Slope, $m_c$	2.01968	Intercept, $b_c$	-0.02746
Last Calibration Date	15-Jul-13	$( H \times P_a / 1013.3 \times 298 / T_a )^{1/2}$			
Next Calibration Date	15-Jul-14	$= m_c \times Q_{std} + b_c$			
Calibration of TSP					
Calibration Point	Manometer Reading			$Q_{std}$	Continuous Flow Recorder, $W$
	H (inches of water) (up)      (down)      (difference)			( $m^3 / min.$ ) <b>X-axis</b>	(CFM) <b>Y-axis</b>
1	5.8	5.8	11.6	1.6830	56
2	4.4	4.4	8.8	1.4676	48
3	3.7	3.7	7.4	1.3469	43
4	2.2	2.2	4.4	1.0417	34
5	1.5	1.5	3.0	0.8626	26
By Linear Regression of Y on X					
Slope, $m$	=	35.2472	Intercept, $b$	=	-4.1457
Correlation Coefficient*	=	0.9981			
Calibration Accepted	=	Yes/No**			

\* if Correlation Coefficient < 0.990, check and recalibration again.

\*\* Delete as appropriate.

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

\_\_\_\_\_

Calibrated by	:	Felix Li	Checked by	:	Pauline Wong
Date	:	21-Jun-14	Date	:	21-Jun-14



Lam Geotechnics Limited

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

<b>Location</b>	:	ACL2a	<b>Calibration Date</b>	:	3-Jun-14
<b>Equipment no.</b>	:	EL111	<b>Calibration Due Date</b>	:	3-Aug-14

### CALIBRATION OF CONTINUOUS FLOW RECORDER

<b>Ambient Condition</b>						
Temperature, $T_a$	303	Kelvin	Pressure, $P_a$	1004	mmHg	
<b>Orifice Transfer Standard Information</b>						
Equipment No.	EL086	Slope, $m_c$	2.01968	Intercept, $b_c$	-0.02746	
Last Calibration Date	15-Jul-13	$( H \times P_a / 1013.3 \times 298 / T_a )^{1/2}$				
Next Calibration Date	15-Jul-14	$= m_c \times Q_{std} + b_c$				
<b>Calibration of TSP</b>						
Calibration Point	Manometer Reading H (inches of water) (up)      (down)      (difference)			$Q_{std}$ ( $m^3 / min.$ )	Continuous Flow Recorder, W (CFM)	
X-axis				Y-axis	$IC$ $(W(P_a/1013.3x298/T_a)^{1/2}/35.31)$	
1	6.2	6.2	12.4	1.7347	61	60.2164
2	5.1	5.1	10.2	1.5746	53	52.3191
3	4.2	4.2	8.4	1.4302	46	45.4091
4	2.6	2.6	5.2	1.1282	33	32.5761
5	1.6	1.6	3.2	0.8879	23	22.7045
By Linear Regression of Y on X						
Slope, $m$	=	44.0592	Intercept, $b$	=	16.8841	
Correlation Coefficient*	=	0.9993				
Calibration Accepted	=	Yes/No**				

\* if Correlation Coefficient < 0.990, check and recalibration again.

\*\* Delete as appropriate.

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

<b>Calibrated by</b>	:	Henry	<b>Checked by</b>	:	Derek Lo
<b>Date</b>	:	3-Jun-14	<b>Date</b>	:	3-Jun-14

# Certificate of Calibration and Conformance

Certificate Number 2014-185089

Instrument Model LXT1, Serial Number 0003737, was calibrated on 20 Jan 2014. The instrument meets factory specifications per Procedure D0001.8306, ANSI S1.4-1983 (R 2006) Type 1, S1.43-1997, S1.25-1991; S1.11-2004; IEC 61672-2002, 60651-2001, 60804-2000, 61260-2001, 61252-2002.

**New Instrument**

**Date Calibrated:** 20 Jan 2014

**Calibration due:**

## Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Stanford Research Systems	DS360	61889	12 Months	30 Jan 2014	61889-013013

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

## Calibration Environmental Conditions

Temperature: 22 ° Centigrade

Relative Humidity: 22 %

## Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

Tested with PRMLXT1L-028019

Signed: Ron Harris  
Technician: Ron Harris

Page 1 of 1

# ~ Certificate of Calibration and Compliance ~

Microphone Model: 377B02

Serial Number: 140872

Manufacturer: PCB

## Calibration Environmental Conditions

Environmental test conditions as printed on microphone calibration chart.

## Reference Equipment

Manufacturer	Model #	Serial #	PCB Control #	Cal Date	Due Date
Hewlett Packard	34401A	MY41045214	LD-001	3/6/13	3/6/14
Brüel & Kjaer	4192	2493415	LD028	1/16/13	1/16/14
Newport	BTH-W/N	8410668	CA1187	not required	not required
Larson Davis	PRM915	124	CA-1024	12/6/12	12/6/13
Larson Davis	PRM902	4943	CA1162	10/21/13	10/21/14
Larson Davis	2559LF	3216	CA-883	not required	not required
Larson Davis	ADP005	1	LD-017	not required	not required
Larson Davis	PRM916	127	CA924	4/15/13	4/15/14
Larson Davis	CAL250	5025	CA1277	7/25/13	7/25/14
Larson Davis	2201	140	CA-1409	3/22/13	3/21/14
Larson Davis	2900	1079	CA-521A	6/4/13	6/4/14
Larson Davis	PRA951-4	234	CA1154	9/17/13	9/17/14
0	0	0	0	not required	not required
0	0	0	0	not required	not required

Frequency sweep performed with B&K UA0033 electrostatic actuator.

## Condition of Unit

As Found: N/A

As Left: New unit in tolerance

## Notes

1. Calibration of reference microphone is traceable through PTB.
2. This certificate shall not be reproduced, except in full, without written approval from PCB Piezotronics, Inc.
3. Calibration is performed in compliance with ISO 9001, ISO 10012-1, ANSI/NCSL Z540.3 and ISO 17025.
4. See Manufacturer's Specification Sheet for a detailed listing of performance specifications.
5. Open circuit sensitivity is measured using the insertion voltage method following procedure AT603-5.
6. Measurement uncertainty (95% confidence level with coverage factor of 2) for sensitivity is +/-0.20 dB.
7. Unit calibrated per ACS-20.

Technician: Lenard Lukasik

Date: November 25, 2013



CALIBRATION CERT #1862.01

**PCB PIEZOTRONICS™**  
VIBRATION DIVISION

3425 Walden Avenue, Depew, New York, 14043

TEL: 888-684-0013 FAX: 716-685-3886 wwwpcb.com

ID: CAL60-3468230871.248

# ~ Calibration Report ~

Microphone Model: 377B02

Serial Number: 140872

Description: 1/2" Free-Field Microphone

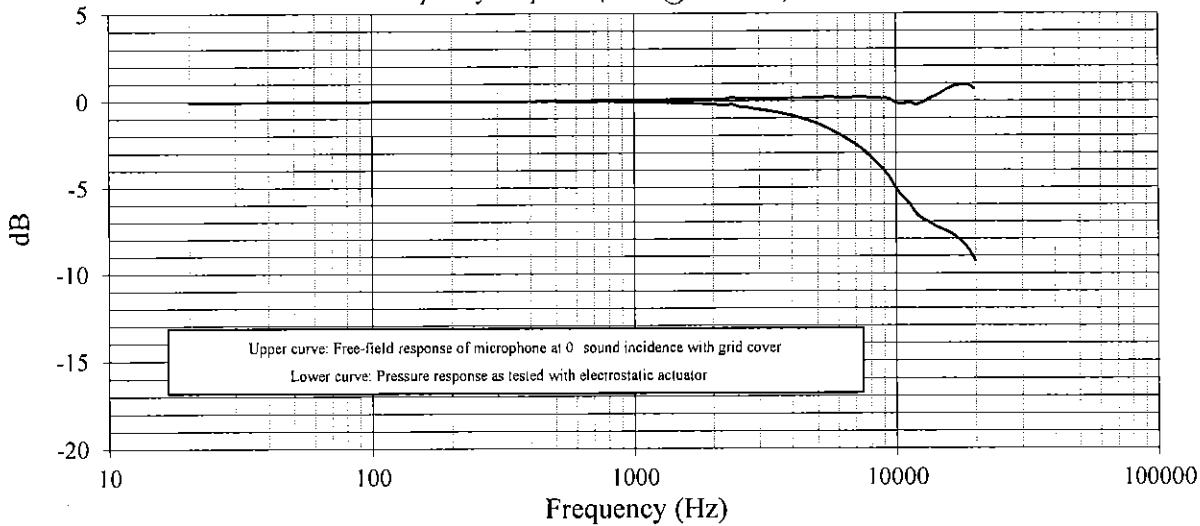
## Calibration Data

Open Circuit Sensitivity @ 251.2 Hz: 50.64 mV/Pa  
-25.91 dB re 1V/Pa

Polarization Voltage, External: 0 V  
Capacitance: 10.7 pF

Temperature: 69 °F (21°C)      Ambient Pressure: 1001 mbar      Relative Humidity: 28 %

*Frequency Response (0 dB @ 251.2 Hz)*



Freq (Hz)	Lower (dB)	Upper (dB)	Freq (Hz)	Lower (dB)	Upper (dB)	Freq (Hz)	Lower (dB)	Upper (dB)	Freq (Hz)	Lower (dB)	Upper (dB)
20.0	-0.06	-0.06	1584.9	-0.12	0.09	6683.4	-2.32	0.20	-	-	-
25.1	-0.06	-0.06	1678.8	-0.14	0.09	7079.5	-2.56	0.22	-	-	-
31.6	-0.05	-0.05	1778.3	-0.15	0.10	7498.9	-2.85	0.22	-	-	-
39.8	-0.03	-0.03	1883.7	-0.18	0.10	7943.3	-3.22	0.17	-	-	-
50.1	-0.02	-0.02	1995.3	-0.20	0.11	8414.0	-3.57	0.16	-	-	-
63.1	-0.02	-0.02	2113.5	-0.22	0.12	8912.5	-3.96	0.15	-	-	-
79.4	-0.01	-0.01	2238.7	-0.25	0.12	9440.6	-4.41	0.11	-	-	-
100.0	-0.01	-0.01	2371.4	-0.20	0.21	10000.0	-5.07	-0.12	-	-	-
125.9	0.00	0.00	2511.9	-0.32	0.14	10592.5	-5.57	-0.17	-	-	-
158.5	0.00	0.00	2660.7	-0.34	0.17	11220.2	-5.96	-0.10	-	-	-
199.5	0.00	0.00	2818.4	-0.43	0.13	11885.0	-6.54	-0.22	-	-	-
251.2	0.00	0.00	2985.4	-0.47	0.15	12589.3	-6.86	-0.09	-	-	-
316.2	0.00	0.01	3162.3	-0.53	0.15	13335.2	-7.06	0.13	-	-	-
398.1	0.00	0.00	3349.7	-0.60	0.14	14125.4	-7.30	0.29	-	-	-
501.2	-0.01	0.03	3548.1	-0.67	0.15	14962.4	-7.46	0.51	-	-	-
631.0	-0.01	0.03	3758.4	-0.75	0.15	15848.9	-7.63	0.72	-	-	-
794.3	-0.02	0.07	3981.1	-0.84	0.16	16788.0	-7.86	0.86	-	-	-
1000.0	-0.05	0.07	4217.0	-0.94	0.17	17782.8	-8.19	0.92	-	-	-
1059.3	-0.05	0.08	4466.8	-1.06	0.17	18836.5	-8.61	0.90	-	-	-
1122.0	-0.06	0.08	4731.5	-1.18	0.19	19952.6	-9.28	0.65	-	-	-
1188.5	-0.07	0.08	5011.9	-1.32	0.21	-	-	-	-	-	-
1258.9	-0.08	0.08	5308.8	-1.49	0.21	-	-	-	-	-	-
1333.5	-0.09	0.09	5623.4	-1.66	0.22	-	-	-	-	-	-
1412.5	-0.10	0.09	5956.6	-1.87	0.20	-	-	-	-	-	-
1496.2	-0.11	0.09	6309.6	-2.08	0.21	-	-	-	-	-	-

Technician: Lenard Lukasik      Date: November 25, 2013



CALIBRATION CERT #1862.01

**PCB PIEZOTRONICS™**  
VIBRATION DIVISION

3425 Walden Avenue, Depew, New York, 14043

TEL: 888-684-0013    FAX: 716-685-3886    [wwwpcb.com](http://wwwpcb.com)

ID: CAL60-0468230871.246



綜合試驗有限公司  
SOILS & MATERIALS ENGINEERING CO., LTD.

G/F., 9/F., 12/F., 13/F. & 20/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.  
香港黃竹坑道37號利達中心地下, 9樓, 12樓, 13樓及20樓  
E-mail: smec@cigismec.com Website: www.cigismec.com

Tel : (852) 2873 6860  
Fax : (852) 2555 7533



## CERTIFICATE OF CALIBRATION

Certificate No.: 14CA0529 01-02

Page: 1 of 2

### Item tested

Description: Acoustical Calibrator (Class 1)  
Manufacturer: Rion Co., Ltd.  
Type/Model No.: NC-73  
Serial/Equipment No.: 10465798  
Adaptors used: -

### Item submitted by

Customer: Lam Geotechnics Limited  
Address of Customer: -  
Request No.: -  
Date of receipt: 29-May-2014

Date of test: 30-May-2014

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	13-May-2015	SCL
Preamplifier	B&K 2673	2239857	10-Apr-2015	CEPREI
Measuring amplifier	B&K 2610	2346941	08-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI
Digital multi-meter	34401A	US36087050	17-Dec-2014	CEPREI
Audio analyzer	8903B	GB41300350	07-Apr-2015	CEPREI
Universal counter	53132A	MY40003662	11-Apr-2015	CEPREI

### Ambient conditions

Temperature: 22 ± 1 °C  
Relative humidity: 60 ± 10 %  
Air pressure: 1000 ± 10 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

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

Approved Signatory:

Huang Jian Min/Feng Jun Qi

Date: 30-May-2014

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.



綜合試驗有限公司  
SOILS & MATERIALS ENGINEERING CO., LTD.

G/F, 9/F, 12/F, 13/F & 20/F, Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.  
香港黃竹坑道37號利達中心地下、9樓、12樓、13樓及20樓  
E-mail: smec@cigismec.com Website: www.cigismec.com

Tel : (852) 2873 6860  
Fax : (852) 2555 7533



## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 14CA0529 01-02

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	(Output level in dB re 20 $\mu$ Pa) Estimated Expanded Uncertainty dB
1000	94.00	94.57	0.10

### 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 = 0.001 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 = 965.6 Hz

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

### 4. Total Noise and Distortion

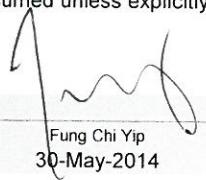
For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz TND = 0.9 %

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:



- End -

Checked by:



Lam Tze Wai

Date: 30-May-2014

Date: 30-May-2014

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.



### ***Appendix 5.1***

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

**Contract No. HK/2011/07**  
**Wan Chai Development Phase II and Central-Wan Chai Bypass**  
**Sampling, Field Measurement and Testing Works (Stage 2)**

**Environmental Monitoring Schedule**  
**July 2014**

			1-Jul	2-Jul		3-Jul	4-Jul	5-Jul
6-Jul		7-Jul	8-Jul	9-Jul		10-Jul	11-Jul	12-Jul
13-Jul		14-Jul	15-Jul	16-Jul		17-Jul	18-Jul	19-Jul
20-Jul		21-Jul	22-Jul	23-Jul		24-Jul	25-Jul	26-Jul
27-Jul		28-Jul	29-Jul	30-Jul		31-Jul		

24hr TSP  
1hr TSP

24hr TSP  
1hr TSP

24hr TSP  
1hr TSP

24hr TSP (ACL1)  
1hr TSP

Contract No. HK/2011/07  
 Wan Chai Development Phase II and Central-Wan Chai Bypass  
 Sampling, Field Measurement and Testing Works (Stage 2)

**Tentative Environmental Monitoring Schedule**  
**August 2014**

						1-Aug	2-Aug
						24hr TSP	
3-Aug	4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	
				24hr TSP		1hr TSP	
10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	
			24hr TSP		1hr TSP		
17-Aug	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	
		24hr TSP		1hr TSP			
24-Aug	25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	
		24hr TSP	1hr TSP				
31-Aug							



Lam Geotechnics Limited

Contract No. HK/2011/07

Wanchai Development Phase II and Central Wanchai Bypass  
Sampling, Field Measurement and Testing Work (Stage 2)

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### ***Appendix 5.2***

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













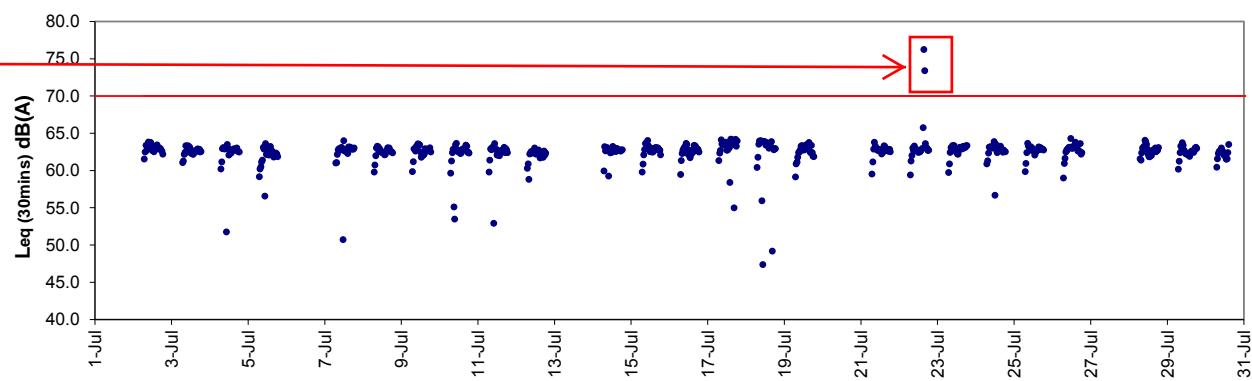




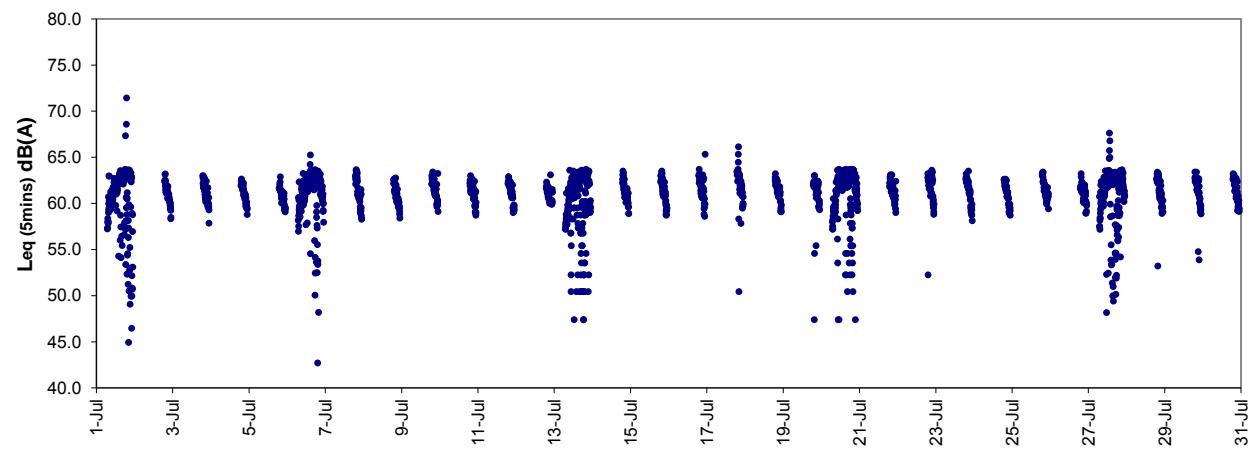


## Graphic Presentation of Continuous Noise Monitoring Result (ACL3-City Hall)

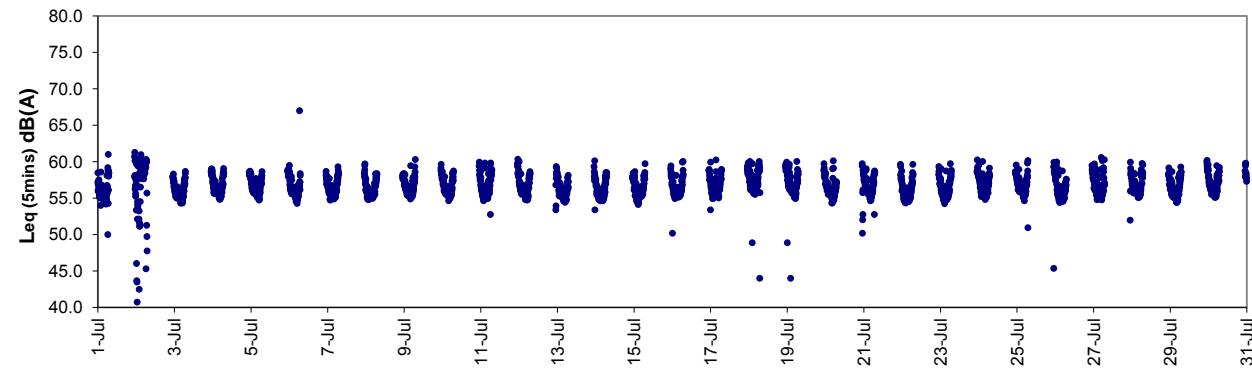
## Day Time (0700 -1900 hrs on normal weekdays)



## Restricted hours (1900 - 2300) on normal weekdays and 0700 - 2300 hrs on public holidays



## Night Time (2300 - 0700hrs)



After checking with contractor HK/2012/08, no major noisy construction activity was conducted at the concerned location during the recorded period and the exceedances were considered to be contributed by the adverse weather condition during the hoisting period of amber rainstorm Warning Signal and thunder warning signal. As such the exceedances were considered to be not related to Project.

### **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		
4-Jul-14	8:00	Fine	009196	2.8592	2.9183	2955.17	2979.17	24.00	1.27	1.27	1.27	1834	32
10-Jul-14	8:00	Rainy	009179	2.8551	2.9065	2982.17	3006.17	24.00	1.28	1.28	1.28	1838	28
16-Jul-14	8:00	Rainy	009166	2.8609	2.9272	3009.17	3033.17	24.00	1.28	1.25	1.26	1820	36
22-Jul-14	8:00	Rainy	009164	2.8814	3.0660	3036.17	3060.17	24.00	1.28	1.27	1.27	1834	101
29-Jul-14	12:00	Fine	009434	2.8509	2.9390	3066.17	3090.17	24.00	1.28	1.28	1.28	1837	48

\* Due to interruption of electricity supply, the 24hr TSP was rescheduled from 28 July 2014 to 29 July 2014 respectively.

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		
5-Jul-14	8:41	Rainy	009207	2.8526	2.8553	2979.17	2980.17	1.00	1.27	1.27	1.27	76	35
5-Jul-14	10:00	Rainy	009210	2.8483	2.8496	2980.17	2981.17	1.00	1.27	1.27	1.27	76	17
5-Jul-14	11:10	Rainy	009176	2.8435	2.8515	2981.17	2982.17	1.00	1.27	1.27	1.27	76	105
11-Jul-14	8:46	Rainy	009279	2.8394	2.8440	3006.17	3007.17	1.00	1.28	1.28	1.28	77	60
11-Jul-14	10:20	Rainy	009280	2.8330	2.8373	3007.17	3008.17	1.00	1.28	1.28	1.28	77	56
11-Jul-14	13:00	Rainy	009281	2.8461	2.8520	3008.17	3009.17	1.00	1.28	1.28	1.28	77	77
17-Jul-14	9:02	Rainy	009220	2.8339	2.8384	3033.17	3034.17	1.00	1.28	1.28	1.28	77	59
17-Jul-14	10:05	Rainy	009221	2.8502	2.8540	3034.17	3035.17	1.00	1.28	1.28	1.28	77	50
17-Jul-14	13:00	Rainy	009222	2.8511	2.8524	3035.17	3036.17	1.00	1.28	1.28	1.28	77	17
23-Jul-14	8:43	Fine	009441	2.8626	2.8695	3060.17	3061.17	1.00	1.27	1.27	1.27	76	90
23-Jul-14	9:48	Fine	009442	2.8558	2.8638	3061.17	3062.17	1.00	1.27	1.27	1.27	76	105
23-Jul-14	10:53	Fine	009443	2.8518	2.8603	3062.17	3063.17	1.00	1.27	1.27	1.27	76	111
29-Jul-14	8:36	Fine	009161	2.8495	2.8586	3063.17	3064.17	1.00	1.28	1.28	1.28	77	119
29-Jul-14	9:44	Fine	009162	2.8408	2.8502	3064.17	3065.17	1.00	1.28	1.28	1.28	77	123
29-Jul-14	10:52	Fine	009163	2.8474	2.8562	3065.17	3066.17	1.00	1.28	1.28	1.28	77	115



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

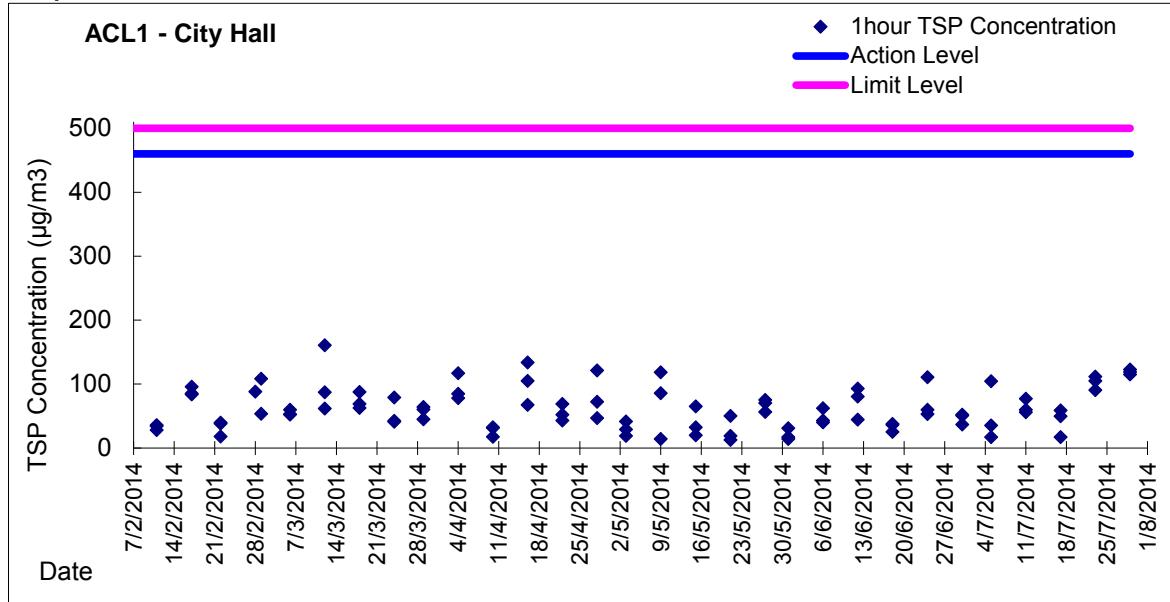
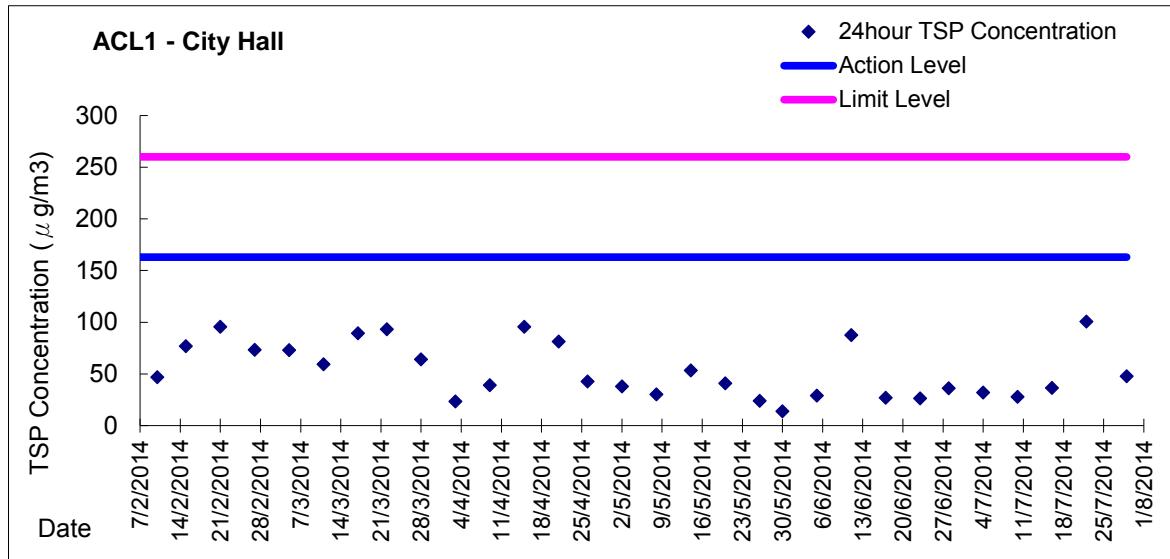
Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, $\text{m}^3/\text{min}$			Total Volume, $\text{m}^3$	TSP Level, $\mu\text{g}/\text{m}^3$
				Initial	Final	Initial	Final		Initial, $Q_{si}$	Final, $Q_{sf}$	Average		
4-Jul-14	8:00	Fine	009142	2.8556	2.9246	2087.84	2111.84	24.00	1.05	1.05	1.05	1513	46
10-Jul-14	8:00	Rainy	009284	2.8383	2.8998	2114.84	2138.84	24.00	1.10	1.10	1.10	1581	39
16-Jul-14	8:00	Rainy	009265	2.8500	2.9813	2141.84	2165.84	24.00	1.08	1.08	1.08	1550	85
22-Jul-14	8:00	Rainy	009124	2.8677	3.0183	2168.84	2192.84	24.00	1.10	1.09	1.10	1578	95
28-Jul-14	8:00	Fine	009406	2.8605	2.9991	2195.85	2219.85	24.00	1.05	1.05	1.05	1516	91

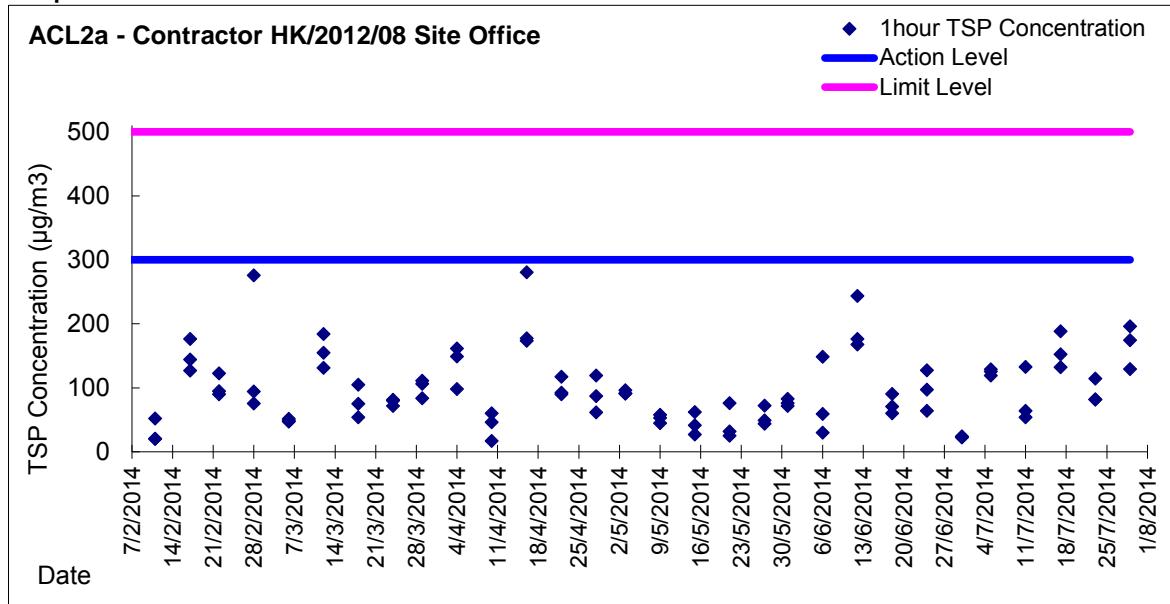
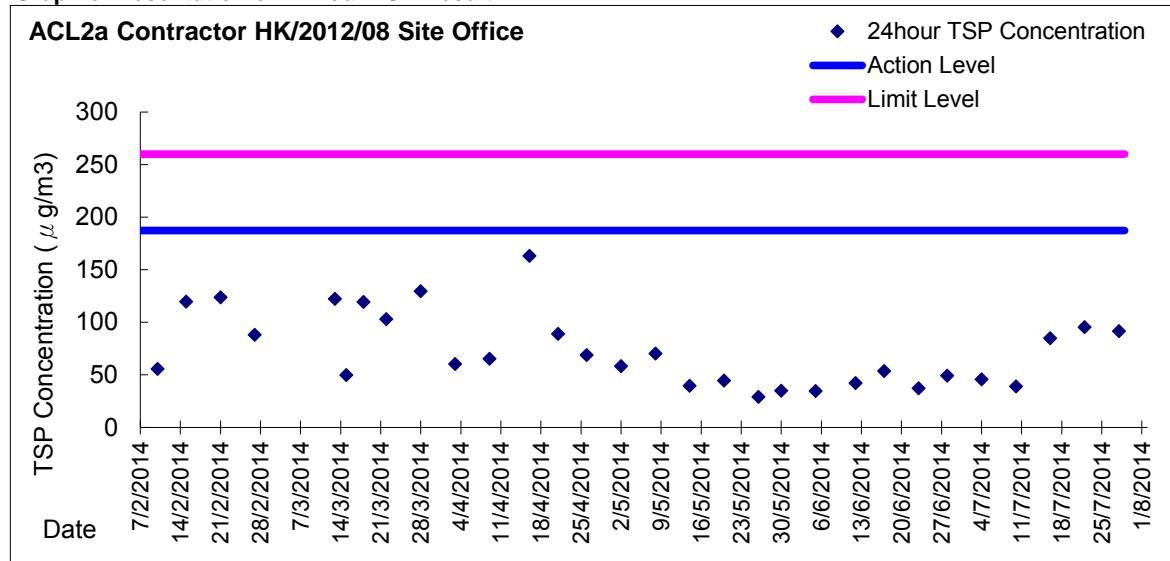
Report on 1-hour TSP monitoring

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		
5-Jul-14	8:44	Rainy	009172	2.8481	2.8562	2111.84	2112.84	1.00	1.05	1.05	1.05	63	128
5-Jul-14	9:48	Rainy	009173	2.8505	2.8584	2112.84	2113.84	1.00	1.05	1.05	1.05	63	125
5-Jul-14	10:52	Rainy	009174	2.8656	2.8731	2113.84	2114.84	1.00	1.05	1.05	1.05	63	119
11-Jul-14	9:19	Rainy	009181	2.8466	2.8548	2138.84	2139.84	1.00	1.03	1.03	1.03	62	133
11-Jul-14	10:45	Rainy	009184	2.8471	2.8505	2139.84	2140.84	1.00	1.05	1.05	1.05	63	54
11-Jul-14	13:00	Rainy	009187	2.8477	2.8519	2140.84	2141.84	1.00	1.10	1.10	1.10	66	64
17-Jul-14	9:35	Rainy	009115	2.8611	2.8735	2165.84	2166.84	1.00	1.10	1.10	1.10	66	188
17-Jul-14	10:40	Rainy	009118	2.8538	2.8630	2166.84	2167.84	1.00	1.01	1.01	1.01	60	152
17-Jul-14	13:00	Rainy	009121	2.8483	2.8570	2167.84	2168.84	1.00	1.10	1.10	1.10	66	132
23-Jul-14	9:35	Fine	009373	2.8556	2.8605	2192.84	2193.84	1.00	1.00	1.00	1.00	60	81
23-Jul-14	10:40	Fine	009377	2.8422	2.8497	2193.84	2194.84	1.00	1.09	1.09	1.09	66	114
23-Jul-14	13:00	Fine	009379	2.8711	2.8760	2194.84	2195.84	1.00	1.00	1.00	1.00	60	81
29-Jul-14	13:00	Fine	009347	2.8572	2.8682	2219.85	2220.85	1.00	1.05	1.05	1.05	63	174
29-Jul-14	14:09	Fine	009350	2.8507	2.8585	2220.85	2221.85	1.00	1.01	1.01	1.01	60	129
29-Jul-14	15:17	Fine	009353	2.8625	2.8754	2221.85	2222.85	1.00	1.10	1.10	1.10	66	196

**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 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	1. Identify source 2. Inform IC(E) and ER 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily	1. Check monitoring data submitted by ET 2. Check Contractor's working method	1. Notify Contractor	1. Rectify any unacceptable practice 2. Amend working methods if appropriate
Action Level - Exceedance for two or more consecutive samples	1. Identify source 2. Inform IC(E) and ER 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily 5. Discuss with IC(E) and Contractor on remedial actions 6. If exceedance continues, arrange meeting with IC(E) and ER 7. If exceedance stops cease additional monitoring	1. Check monitoring data submitted by ET 2. Check Contractor's working method 3. Discuss with ET and Contractor on possible remedial measures 4. Advise the ER on the effectiveness of the proposed remedial measures 5. Supervise the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Ensure remedial measures properly implemented	1. Submit proposals for remedial actions to IC(E) within 3 working days of notification 2. Implement the agreed proposals 3. Amend proposal if appropriate
Limit Level - Exceedance for one sample	1. Identify source 2. Inform ER and EPD 3. Repeat measurement to confirm findings 4. Increase monitoring frequency to daily 5. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results	1. Check monitoring data submitted by ET 2. Check Contractor's working method 3. Discuss with ET and Contractor on possible remedial measures 4. Advise the ER on the effectiveness of the proposed remedial measures 5. Supervise the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Ensure remedial measures properly implemented	1. Take immediate action to avoid further exceedance 2. Submit proposal for remedial actions to IC(E) within 3 working days of notification 3. Implement the agreed measures
Limit Level - Exceedance for two or more consecutive samples	1. Notify IC(E), ER, Contractor and EPD 2. Identify source 3. Repeat measurements to confirm findings 4. Increase monitoring frequency to daily 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented 6. Arrange meeting with IC(E) and ER to discuss the remedial actions to be taken 7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results 8. If exceedance stops, cease additional monitoring	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly 3. Supervise the implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. In consultation with the IC(E), agree with the Contractor on the remedial measures to be implemented 4. Ensure remedial measures properly implemented 5. 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	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

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	<ul 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> </ul>	<ul 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> </ul>	<ul 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> </ul>	<ul style="list-style-type: none"> <li>1. Submit noise mitigation proposal to IC(E)</li> <li>2. Implement noise mitigation proposals</li> </ul>
Limit Level is reached	<ul 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> </ul>	<ul 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> </ul>	<ul 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> </ul>	<ul 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> </ul>



## ***Appendix 6.2***

### ***Summary for Notification of Exceedance***



Lam Geotechnics Limited

Contract No. HK/2011/07  
Wanchai Development Phase II and Central Wanchai Bypass  
Sampling, Field Measurement and Testing Work (Stage 2)  
Summary for Notification of Exceedance

Ref no.	Date	Tidal	Location	Parameters (Unit)	Measured	Action Level	Limit Level	Follow-up action
--	--	--	--	--	--	--	--	--



Lam Geotechnics Limited

Contract No. HK/2011/07

Wanchai Development Phase II and Central Wanchai Bypass  
Sampling, Field Measurement and Testing Work (Stage 2)

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### ***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
--	--	--	--	--	--	--



Lam Geotechnics Limited

Contract No. HK/2011/07

Wanchai Development Phase II and Central Wanchai Bypass  
Sampling, Field Measurement and Testing Work (Stage 2)

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### ***Appendix 10.1***

#### ***Construction Programme of Individual Contracts***

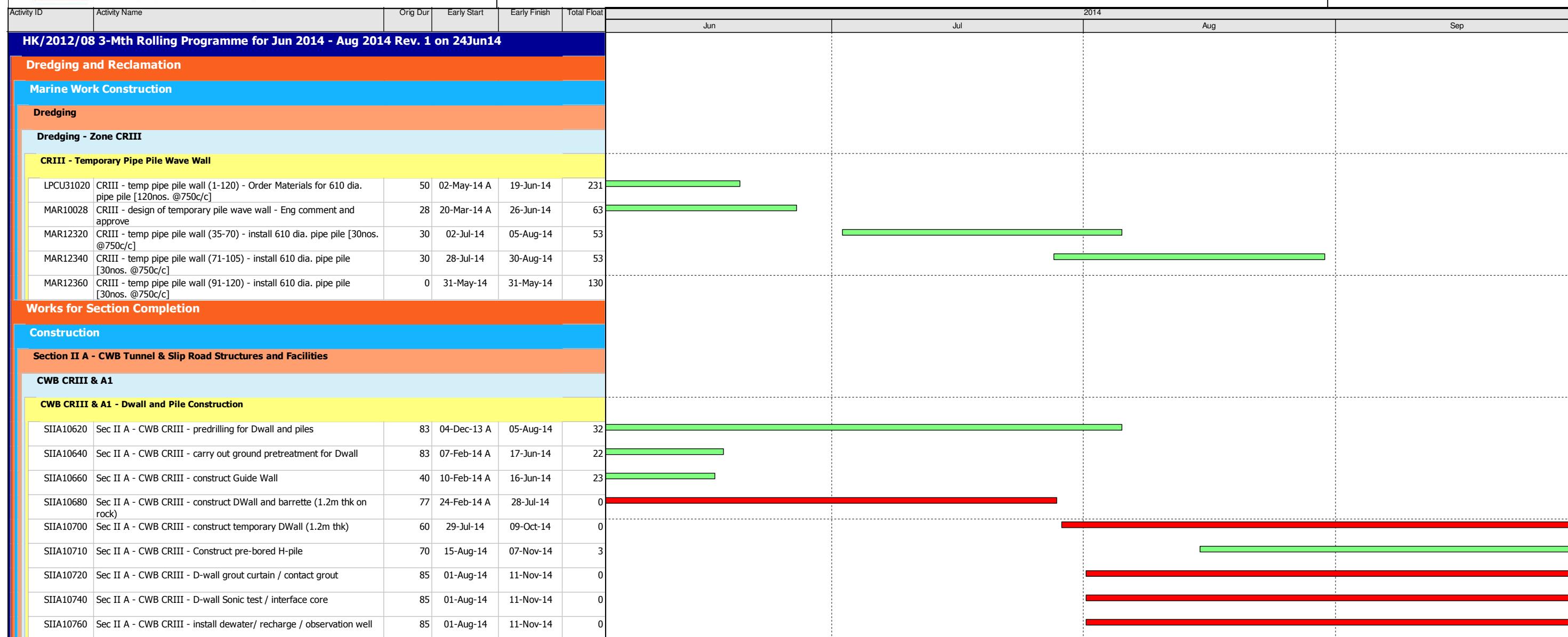


**LEADER**  
利達

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

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

Page : 1 / 1



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

**3 - Months Rolling Programme (June 2014 to August 2014)  
For Zone CRIII Works**

Data Date:  
31-May-14

Date	Revision	Checked	Approved
31-May-14			

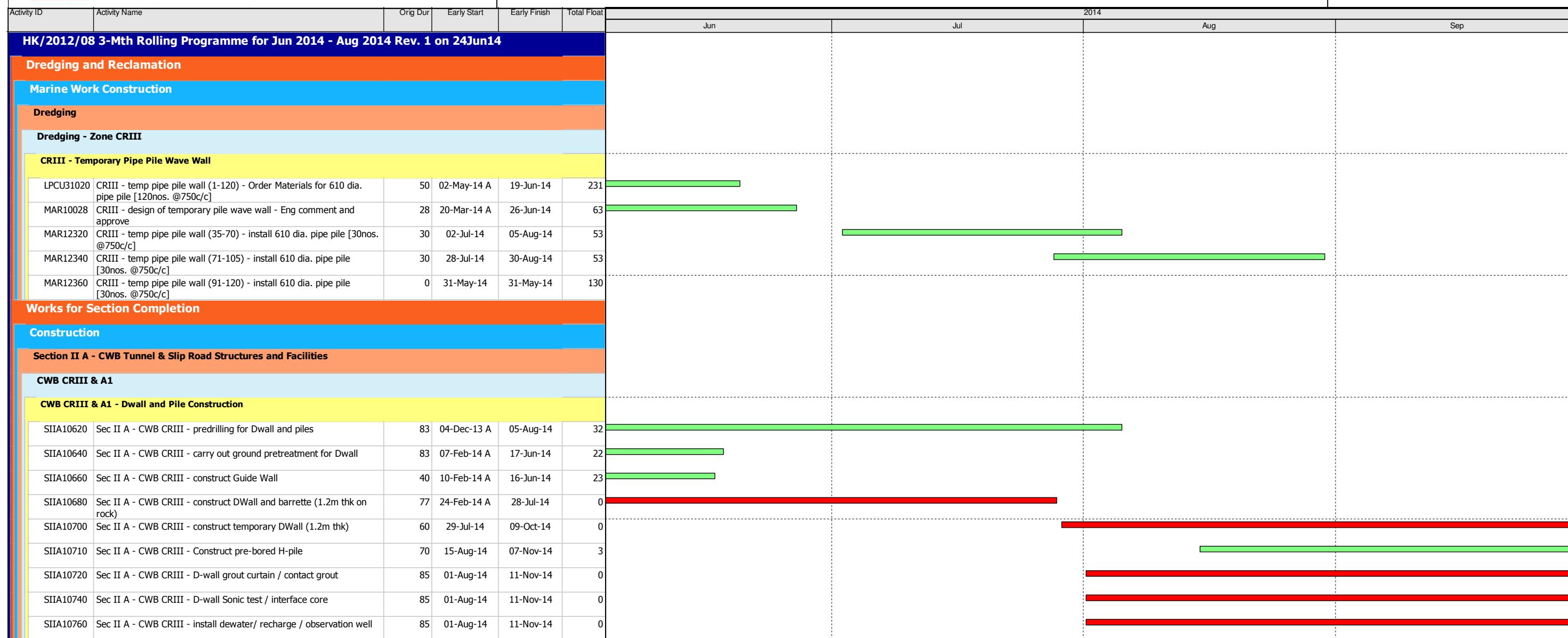


LEADER

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

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

Page : 1 / 1



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

**3 - Months Rolling Programme (June 2014 to August 2014)  
For Zone CRIII Works**

Data Date:  
31-May-14

Date	Revision	Checked	Approved
31-May-14			



## 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>• Diaphragm wall construction works</li><li>• Pipe pile wall construction</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>