CONTRACT NO: HK/2015/01

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

ENVIRONMENTAL PERMIT NO. EP-376/2009, FURTHER ENVIRONMENTAL PERMITS NO. FEP-01/376/2009 AND FEP-02/376/2009

MONTHLY ENVIRONMENTAL MONITORING & AUDIT REPORT

- AUGUST 2017 -

CLIENTS:

Civil Engineering and Development Department

PREPARED BY:

Lam Geotechnics Limited

11/F Centre Point
181-185 Gloucester Road,
Wanchai, H.K.

Telephone: (852) 2882-3939
Facsimile: (852) 2882-3331
E-mail: info@lamenviro.com
Website: http://www.lamenviro.com

CERTIFIED BY:

Raymond Dai
Environmental Team Leader

DATE:

13 September 2017

RAMBOLL ENVIRON

Ref.: AACWBIECEM00_0_9739L.17

13 September 2017

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 Mr. Ng,

Re: Contract No. HK/2015/01
Wan Chai Development Phase II - Central-Wan Chai Bypass
Sampling, Field Measurement and Testing Works (Stage 3)

Monthly Environmental Monitoring and Audit Report (August 2017) for EP-376/2009, FEP-01/376/2009 and FEP-02/376/2009

Reference is made to the Environmental Team's submission of the captioned Monthly Environmental Monitoring and Audit (EM&A) Report for August 2017 received by e-mail on 13 September 2017 for our review and comment.

Please be informed that we have no adverse comment on the captioned submission. We write to verify the captioned submission in accordance with Condition 3.4 in the captioned Environmental Permit.

Thank you very much for your 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	Attn: Mr. L K Tsang	by fax: 2577 5040
	Lam	Attn: Mr. Raymond Dai	by fax: 2882 3331
	AECOM	Attn: Mr. Francis Leong/ Stephen Lai	by fax: 2691 2649

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Ramboll Environ Hong Kong Limited 英環香港有限公司
21/F, BEA Harbour View Centre, 56 Gloucester Road, Wan Chai, Hong Kong Tel: 852.3465 2888 Fax: 852.3465 2899
www.Ramboll-Environ.com

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i. This is the Environmental Monitoring and Audit (EM&A) Monthly Report – August 2017 specific for Environmental Permit no. EP-376/2009 and Further Environmental Permits no. FEP-01/376/2009 and FEP-02/376/2009. The EM&A report is prepared by the Environmental Team (ET) employed under Contract No. HK/2015/01 – Wan Chai Development Phase II and Central Wanchai Bypass – Sampling, Field Measurement and Testing Works (Stage 3). This report presents the environmental monitoring findings and information recorded during the period of 27th July 2017 to 26th August 2017. The cut-off date of reporting is at 26th 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

- Drainage

Noise Monitoring

iii. Noise monitoring was conducted at M1a – Harbour Road Sports Centre.

iv. With respect to the shift in major construction site portions at Wan Chai North, the noise monitoring station M1a – Harbour Road Sports Centre was finely adjusted from East of Harbour Road Sports Centre to West of Harbour Road Sports Centre on 21 June 2016.

v. With respect to the demolition of Ex-Harbour Road Sports Centre, the respective noise monitoring station M1a – Harbour Road Sports Centre were finely adjusted on 16 and 25 May 2017 and thereafter to the Footbridge for Harbour Road Sports for noise monitoring.

vi. One limit level exceedances were recorded on 04 August 2017 in this reporting month. After the investigation, the exceedances were concluded as non-project related under Contract no. HK/2012/08.

Air Quality Monitoring

vii. 1-hour and 24-hour Total Suspended Particulates (TSP) monitoring were conducted on every six days basis at CMA5b – Pedestrian Plaza and CMA6a – Contractor HK/2012/08 Site Office.

viii. Due to electricity interruption, the TSP monitoring in the reporting month are rescheduled as follow:
24hr TSP monitoring at CMA5b was rescheduled from 26 Aug 2017 to 29 Aug 2017.
1hr TSP monitoring at CMA5b was rescheduled from 28 Aug 2017 to 29 Aug 2017.

ix. One limit level exceedance of 1hr TSP monitoring was recorded at CMA5b – Pedestrian Plaza on 29 August 2017 in this reporting month. The exceedances recorded was concluded as non-Project related.

Complaints, Notifications of Summons and Successful Prosecutions

x. No environmental complaint was received in this reporting month.

Site Inspections and Audit

xi. 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

xii. 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

- Drainage

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-376/2009 and Further Environmental Permits no. FEP-01/376/2009 and FEP-02/376/2009 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 Wan Chai Development Phase II and Central-Wan Chai Bypass (Register No.: AEIAR-458/2008).

This report documents the finding of EM&A works for Environmental Permit (EP) no. EP-376/2009 and Further Environmental Permits no. FEP-01/376/2009 and FEP-02/376/2009, during the period of 27th July 2017 to 26th August 2017. The cut-off date of reporting is the 26th of each reporting month.

1.2 Structure of the Report

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

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

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

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

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

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

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

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

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

Section 10 ***Conclusion***

2 PROJECT BACKGROUND

2.1 Background

2.1.1 Wan Chai Development phase II and Central-Wan Chai Bypass (hereafter called "the Project") are Designated Project (DP) under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO). The Environmental Impact Assessment (EIA) Report for Wan Chai Development phase II and Central-Wan Chai Bypass (Register No.: AEIAR-125/2008) has been approved on 11 December 2008.

2.2 Scope of the Project and Site Description

2.2.1. The design and construction of Wan Chai Development Phase II and Central Wanchai Bypass involves the construction and operation of primary and district distributor roads that is shown at ***Figure 2.1***.

2.2.2. The key purpose of the study area encompasses the Wan Chai harbourfront area. The area starts at the boundary of Central Reclamation Phase III (CRIII) at the west and connects to the existing Hung Hing Road at the east. The scope of the project includes:

- A dual 2-lane primary distributor road, Road P2, approximately 0.6km in length; and
- Other new primary and district distributor roads connecting to the slip roads of the Central-Wan Chai Bypass with a total length of approximately 0.7km.

2.2.3. The project also contains various Schedule 2 DP 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 DP under this Project. ***Figure 2.1*** shows the locations of these Schedule 2 DP.

Table 2.1 Schedule 2 Designated Project under this Project

Item	Designated Project	EIAO Reference
DP2	Road P2 and other roads which are classified as primary/district distributor roads	Schedule 2, Part I, A.1

2.2.4. The designated project work II (DP2) was awarded to China State-Leader Joint Venture HK/2012/08 (Contract Title: Wan Chai Development Phase II Central – Wan Chai Bypass at Wan Chai West) as part of the Project works by the Civil Engineering and Development Department (CEDD). The construction work under Contract no. HK/2012/08 was commenced on 13 May 2015.

2.3 Project Organization and Contact Personnel

2.3.1 Civil Engineering and Development Department and Highway Department are the overall project controllers for the Wan Chai Development Phase II and Central-Wan Chai Bypass

respectively. 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-Build King Joint Venture	Contractor under Contract no. HK/2012/08	Project Director	C. N. LAI	9106 5806	2877 1522
		Site Agent	Mr. Keith Tse	9037 1839	
		Environmental Officer	Mr. James Ma	9130 9549	
Ramboll 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

- Drainage

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

- Drainage

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-376/2009	13 Nov 2009	Valid
Further Environmental Permit	FEP-01/376/2009	31 Mar 2015	Valid
Further Environmental Permit	FEP-02/376/2009	1 Aug 2016	Valid

3.1.2. The current status on licences and/or permits on environmental protection pertinent for contract no. HK/2012/08 under FEP-02/376/2009 showed in ***Table 3.2.*** and ***Table 3.3***

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
Further Environmental Permit	FEP-01/376/2009	31 Mar 2015	N/A	Valid
	FEP-02/376/2009	1 Aug 2016	N/A	Valid
Notification of Works Under APCO	355439	4 Feb 2013	N/A	Valid
Registration as a Chemical Waste Producer	5213-134-C3790-01	30 Jun 2016	N/A	Valid
Billing Account under Waste Disposal Ordinance	7016883	18 Feb 2013	N/A	Valid
Water Discharge Licence	WT00018470-2014	6 Mar 2014	31 Mar 2019	Valid

Permits and/or Licences	Reference No.	Issued Date	Valid Period/ Expiry Date	Status
Construction Noise Permit	GW-RS1332-16	29 Dec 2016	13 Jan 2017 to 12 Jul 2017	Valid
	GW-RS0385-17	27 Apr 2017	5 May 2017 to 4 Nov 2017	Valid

Table 3.3 Summary of submission status under FEP-01/376/2009 Condition

EP Condition	Submission	Date of Submission
Condition 2.9	Noise Management Plan (Rev. 2)	Generally in order as commented by EPD on 27 Oct 2015
Condition 2.10	Landscape Plan (Rev. 0)	Generally in order as commented by EPD on 5 Aug 2015

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 STATION

4.1.1. The 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 Noise Monitoring Station

District	Station	Description
Wan Chai	M1a	Footbridge for Ex-Harbour Road Sports Centre

NOISE MONITORING PARAMETERS, FREQUENCY AND DURATION

4.1.2. The construction noise level shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq\ (30\ minutes)}$ shall be used as the monitoring parameter for the time period between 0700 and 1900 hours on normal weekdays. For all other time periods, $L_{eq\ (5\ minutes)}$ shall be employed for comparison with the Noise Control Ordinance (NCO) criteria. Supplementary information for data auditing, statistical results such as L10 and L90 shall also be obtained for reference.

4.1.3. Noise monitoring shall be carried out at all the designated monitoring stations. The monitoring frequency shall depend on the scale of the construction activities. The following is an initial guide on the regular monitoring frequency for each station on a weekly basis when noise generating activities are underway:

- One set of measurements between 0700 and 1900 hours on normal weekdays.

MONITORING EQUIPMENT

4.1.4. As referred to in the Technical Memorandum ™ 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.

4.2 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
CMA5b	Pedestrian Plaza
CMA6a	WDII PRE 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^3 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 cm2;
- 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 the designated project managed under the contract with 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 The proposed division of noise monitoring station is summarized in ***Table 5.1*** below.

Table 5.1 Noise Monitoring Station for Contract no. HK/2012/08

Location ID	District	Description
M1a	Wan Chai	Footbridge for Ex-Harbour Road Sports Centre

5.1.2 One limit level exceedances were recorded on 04 August 2017 in this reporting month.

5.1.3 No construction work under EP-376/2009 was conducted by Contract HK/2012/08 around the concerned location on 04 August 2017 during the time of measurement while breaking works next to the monitoring station under Contract HK/2009/02 was observed as the major noise contribution during monitoring. As such, the exceedance was considered as non-Project related under Contract HK/2012/08.

5.1.4 The noise monitoring results measured in this reporting period are reviewed and summarized. Details of the 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
CMA5b	Pedestrian Plaza
CMA6a	WDII PRE Site Office

5.2.2 One 1hr TSP limit level exceedance was recorded at CMA5b – Pedestrian Plaza on 29 August 2017 in the reporting month.

5.2.3 After checking with the Contractor of HK/2012/08, no construction works under EP-376/2009 was undertaken around the monitoring location on the monitoring date and no particular observation regarding air quality impact was observed during sampling while gardening and sweeping works conducted directly at the monitoring station by Pedestrian Plaza management office could potentially contribute to the elevated particulates level in the vicinity of the monitoring equipment. Hence, the exceedance is considered as not related to the Project.

5.2.4 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 No Inert and non-inert C&D wastes 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, m3	NIL	NIL	NIL
Inert C&D materials recycled, m3	NIL	NIL	NIL
Non-inert C&D materials disposed, m3	NIL	NIL	NIL
Non-inert C&D materials recycled, m3	NIL	NIL	NIL
Chemical waste disposed, kg	NIL	NIL	NIL

6 COMPLIANCE AUDIT

6.0.1. The Event Action Plan for construction noise and air quality are presented in ***Appendix 6.1***.

6.1 Noise Monitoring

6.1.1 One limit level exceedances were recorded on 04 August 2017 in this reporting month.

6.1.2 No construction work under EP-376/2009 was conducted by Contract HK/2012/08 around the concerned location on 04 August 2017 during the time of measurement while breaking works next to the monitoring station under Contract HK/2009/02 was observed as the major noise contribution during monitoring. As such, the exceedance was considered as non-Project related under Contract HK/2012/08.

6.2 Air Quality Monitoring

6.1.1. One 1hr TSP limit level exceedance was recorded at CMA5b – Pedestrian Plaza on 29 August 2017 in the reporting month.

6.1.2. After checking with the Contractor of HK/2012/08, no construction works under EP-376/2009 was undertaken around the monitoring location on the monitoring date and no particular observation regarding air quality impact was observed during sampling while gardening and sweeping works conducted directly at the monitoring station by Pedestrian Plaza management office could potentially contribute to the elevated particulates level in the vicinity of the monitoring equipment. Hence, the exceedance is considered as not related to the Project.

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. According to the Condition 3.4 of the EP-376/2009, this section addresses the relevant cumulative construction impact due to the concurrent activities of the current projects including the Central Reclamation Phase III (CRIII), Wan Chai Development Phase II (WDII), Central-WanChai Bypass (CWB), Island Eastern Corridor Link projects (IECL) and Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai East (CWB Tunnel).

7.0.2. According to the Final EM&A report of Central Reclamation Phase III (CRIII) for Contract HK 12/02, the major construction activities were completed by end of January 2014 and no construction activities were undertaken thereafter and the water quality monitoring was completed in October 2011. As such, it is considered that there were no cumulative construction impact due to the concurrent activities of the current projects with the Central Reclamation Phase III (CRIII) undertaken by contractor HK12/02 in the reporting month.

7.0.3. According to the construction programme of Central-Wanchai Bypass at Wanchai West at the Central Reclamation Phase III area include road and drain works, backfilling works and reinstatement of Culvert and Cooling mains reinstatement of planter at P1 road were performed in August 2017 reporting month. As no project related exceedance were recorded during the reporting period, cumulative construction impact due to the concurrent activities of the current projects with the Central Reclamation Phase III (CRIII) was considered as insignificant.

7.0.4. According to the construction programme of Wan Chai Development Phase II, Central-Wan Chai Bypass and Island Eastern Corridor Link projects, the major construction activities under Wan Chai Development Phase II were road and drains construction, tunnel construction and backfilling works at Wan Chai West and Wan Chai East. The major construction activities under Central-Wan Chai Bypass and Island Eastern Corridor Link Projects were drainage works and ventilation building construction at Central; temporary reclamation removal works at Causeway Bay, road works and side wall construction at Victoria Park; bridge construction, piling works, foundation works and building construction at North Point area in the reporting month. In addition, other non-Wan Chai Development Phase II, Central-Wan Chai Bypass and Island Eastern Corridor Link projects was observed undertaken at Wan Chai North and North Point area.

7.0.5. No significant air impact from construction activities was anticipated in the reporting month. Besides, no project related exceedance was recorded during the water, air and noise environmental monitoring events in the reporting month. Thus, it is evaluated that the cumulative construction impact from the concurrent projects including Central Reclamation Phase III (CRIII), Wan Chai Development Phase II (WDII), Central-WanChai Bypass (CWB), Island Eastern Corridor Link projects (IECL) was insignificant.

8 ENVIRONMENTAL SITE AUDIT

8.0.1. Four site inspections for Contract no. HK/2012/08 were carried out on 1, 8, 15 and 24 August 2017 in this reporting period. 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
170808_01	8-Aug-17	Breaker shall be covered with acoustic material while operating	Breaker was covered with acoustic material on site	Completion as observed on 15 August 2017
170815_01	15-Aug-17	Water spraying shall be implement on site works area for dust suppression	Water spraying was implemented on concerned works area	Completion as observed on 24 August 2017
170824_01	24-Aug-17	Drip tray shall be provided for oil containers on site	Oil containers were removed at the concerned area.	Completion as observed on 29 August 2017
170824_02	24-Aug-17	Wheel washing shall be strengthen at Slip Road 1 to avoid muddy trail on public road	Wheel washing facilities was observed in order and no muddy trail was observed on public road	Completion as observed on 29 August 2017
170824_03	24-Aug-17	Coverage of manhole at Slip Road 1 shall be reinstated and maintained properly	Manhole was covered at Slip Road 1	Completion as observed on 29 August 2017

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
Commencement works (May 2015) to last reporting month	0
August 2017	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
Total	**0**	**0**	**0**

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.

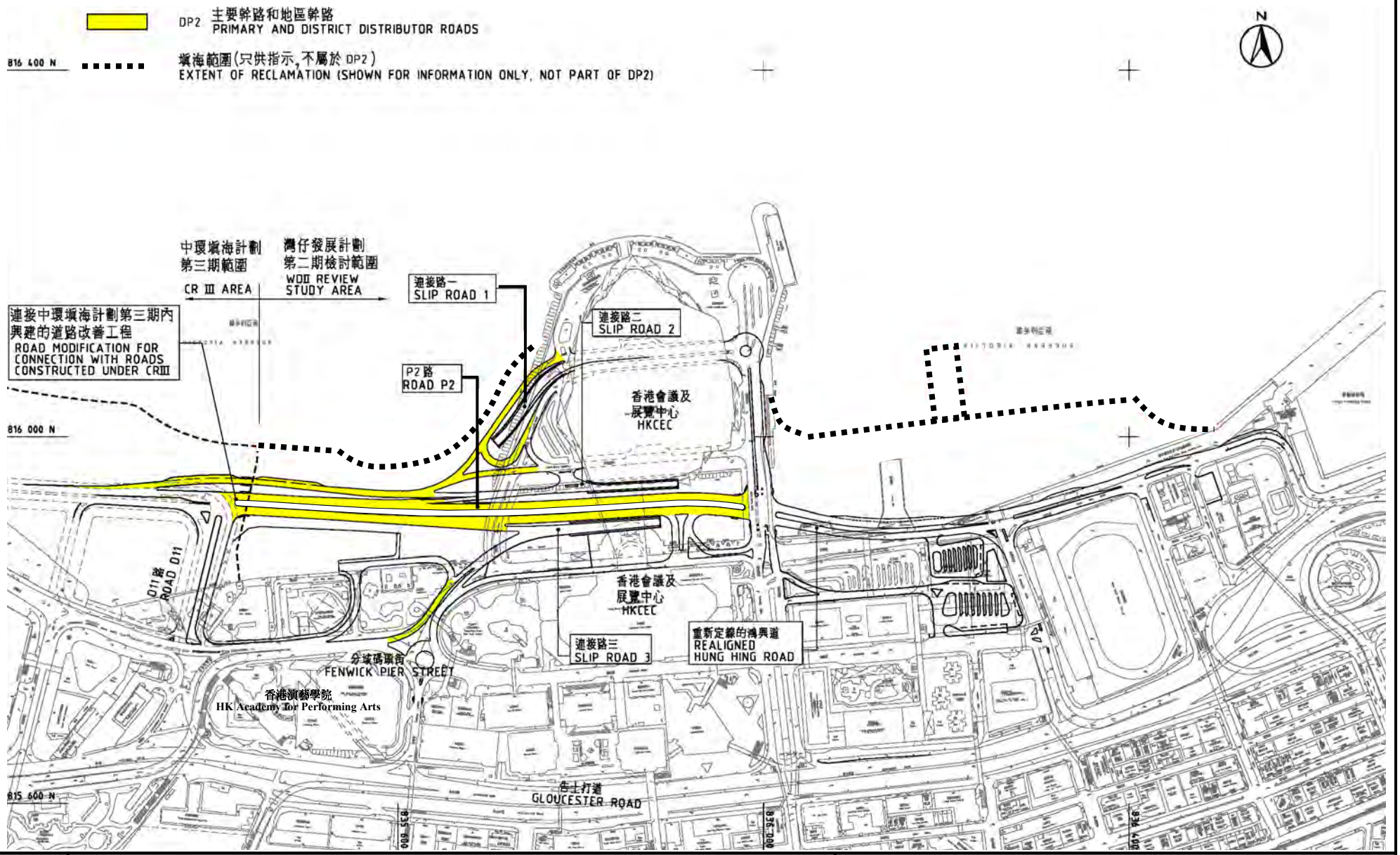
10.0.2. The scheduled construction activities and the recommended mitigation measures for the coming month are listed in ***Table 10.1***. The construction programmes of individual contracts are provided in ***Appendix 10.1***.

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	• Drainage	• Dust control during dust generating works; • Implementation of proper noise pollution control; and • Provision of protection to ensure no runoff out of site area or direct discharge into public drainage system

Figure 2.1

Project Layout



Project Title : Road P2 and other roads which are classified as primary/district distributor roads (referred to as "DP2" in the WDII&CWB EIA Report)
工程項目名稱 : P2 路及其他分類爲主要幹路或地區幹路的道路(WDII&CWB 環評報告內稱"DP2")
Environmental Permit No. : EP-376/2009
環境許可證編號 : EP-376/2009

Figure 1: Location of the Project
圖 1: 工程項目位置圖

(This figure was prepared based on Figure 1.2b of the WDII&CWB EIA report (Register No.: AEIAR-125/2008))
(本圖是根據 WDII&CWB 環評報告(登記冊編號 AEIAR-125/2008)圖 1.2b 編制)

Figure 2.2

Project Organization Chart

Project Organization Chart

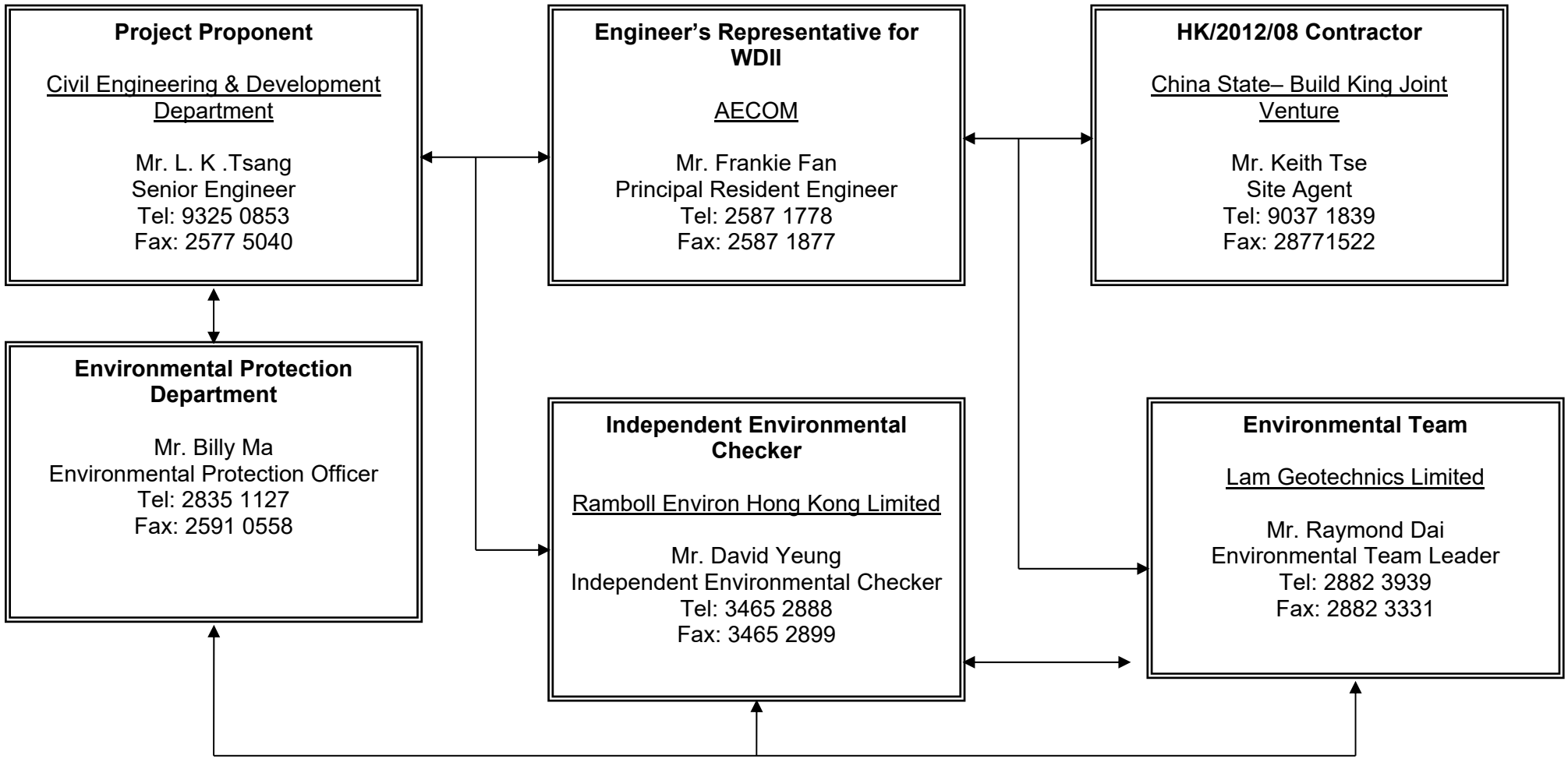
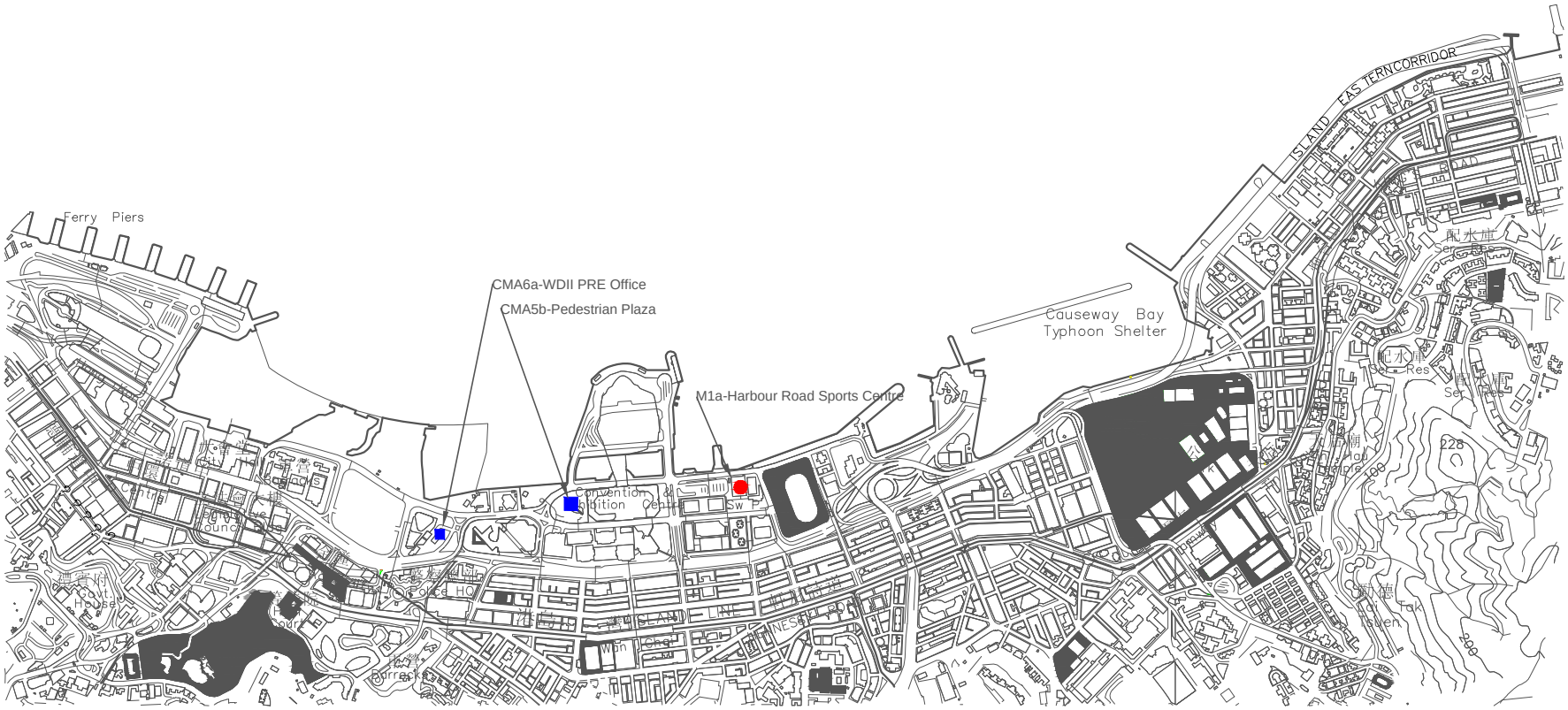


Figure 4.1

Locations of Monitoring Stations



LOCATIONS OF AIR QUALITY AND NOISE MONITORING STATIONS

Appendix 3.1

Environmental Mitigation Implementation Schedule

Appendix A

Table A13.1 Implementation Schedule for Air Quality Control
Table A13.2 Implementation Schedule for Noise Control
Table A13.3 Implementation Schedule for Water Quality Control
Table A13.4 Implementation Schedule for Waste Management
Table A13.7 Implementation Schedule for Landscape and Visual

IMPLEMENTATION SCHEDULE OF THE PROPOSED MITIGATION MEASURES

Table A13.1 Implementation Schedule for Air Quality Control

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation stage				Relevant Legislation and Guidelines
				Des	C	O	Dec	
Construction Phase								
For the Whole Project								
S3.6.5	Four times a day watering of the work site with active operations.	Work site / during construction	Contractor		√			EIAO-TM
S3.8.1	Implementation of dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation. The following mitigation measures, good site practices and a comprehensive dust monitoring and audit programme are recommended to minimise cumulative dust impacts. ▪ Strictly limit the truck speed on site to below 10 km per hour and water spraying to keep the haul roads in wet condition; ▪ Watering during excavation and material handling; ▪ Provision of vehicle wheel and body washing facilities at the exit points of the site, combined with cleaning of public roads where necessary; and ▪ Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.	Work site / during construction	Contractor		√			

▪ Des - Design, C - Construction, O – Operation, and Dec – Decommissioning

Table A13.2 Implementation Schedule for Noise Control

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation stage				Relevant Legislation and Guidelines
				Des	C	O	Dec	
Construction Phase								
For the Whole Project								
S4.9.4	Good Site Practice: ▪ Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program. ▪ Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program. ▪ Mobile plant, if any, shall be sited as far away from NSRs as possible. ▪ Machines and plant (such as trucks) that may be in intermittent use shall be shut down between works periods or shall be throttled down to a minimum. ▪ Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. ▪ Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from onsite construction activities.	Work site / during construction	Contractor		√			EIAO-TM, NCO
For DP2 – WDII Major Roads (Road P2)								
S4.8.3 – S4.8.4	Use of quiet powered mechanical equipment, movable noise barrier and temporary noise barrier for the following tasks: ▪ Temporary road diversion ▪ Resurfacing ▪ At-grade roadwork	Work site / during construction	Contractor		√			EIAO-TM, NCO

- Des - Design, C - Construction, O – Operation, and Dec – Decommissioning

Table A13.3 Implementation Schedule for Water Quality Control

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation stage				Relevant Legislation and Guidelines
				Des	C	O	Dec	
Construction Phase								
For the Whole Project								
S5.8	*Construction Runoff and Drainage* ▪ use of sediment traps, wheel washing facilities for vehicles leaving the site, and adequate maintenance of drainage systems to prevent flooding and overflow; ▪ Permanent drainage channels shall incorporate sediment basins or traps and baffles to enhance deposition rates. The design of efficient silt removal facilities shall be based on the guidelines in Appendix A1 of ProPECC PN 1/94; ▪ a sediment tank constructed from pre-formed individual cells of approximately 6 - 8 m3 capacity can be used for settling ground water prior to disposal; ▪ Oil interceptors shall be provided in the drainage system for the tunnels and regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor shall have a bypass to prevent flushing during periods of heavy rain; precautions and actions to be taken when a rainstorm is imminent or forecast, and during or after rainstorms. Particular attention shall be paid to the control of any silty surface runoff during storm events; ▪ On-site drainage system shall be installed prior to the commencement of other construction activities. Sediment traps shall be	Work site / during construction	Contractor		√			ProPECC PN 1/94; WPCO (TM-DSS)

	installed in order to minimise the sediment loading of the effluent prior to discharge; ▪ All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge shall be adequately designed for the controlled release of storm flows. All sediment control measures shall be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rain storms. ▪ The temporarily diverted drainage shall be reinstated to its original condition when the construction work is finished or the temporary diversion is no longer required. ▪ All fuel tanks and store areas shall be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity. ▪ Minimum distances of 100 m shall be maintained between the storm water discharges and the existing or planned WSD flushing water intakes during construction phase.							
S5.8	*Sewage from Construction Work Force* Construction work force sewage discharges on site shall be connected to the existing trunk sewer or sewage treatment facilities. The construction sewage shall be handled by portable chemical toilets prior to the commission of the on-site sewer system. Appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the large number of construction workers over the construction site. The Contractor shall also be responsible for waste disposal and maintenance practices.	Work site / during construction	Contractor		√			ProPECC PN 1/94; WPCO (TM-DSS)

S5.8	*Floating Debris and Refuse* Collection and removal of floating refuse shall be performed at regular intervals on a daily basis. The contractor shall be responsible for keeping the water within the site boundary and the neighbouring water free from rubbish.	Work site and adjacent water / During the construction period.	Contractor		√			WPCO
S5.8	*Storm Water Discharges* Minimum distances of 100 m shall be maintained between the existing or planned stormwater discharges and the existing or planned WSD flushing water intakes.	Work site and adjacent water / During the design and construction period.	Contractor	√	√			WPCO

- Des - Design, C - Construction, O – Operation, and Dec – Decommissioning

Table A13.4 Implementation Schedule for Waste Management

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation stage				Relevant Legislation and Guidelines
				Des	C	O	Dec	
Construction Phase								
For the Whole Project								
S6.7.7	*Good Site Practices* Recommendations for good site practices during the construction activities include: ▪ nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; ▪ training of site personnel in proper waste management and chemical waste handling procedures; ▪ provision of sufficient waste disposal points and regular collection for disposal; ▪ appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; ▪ regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and ▪ a recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites).	Work site / During planning and design stage, and construction stage	Contractor		√			
S.6.7.8	*Waste Reduction Measures* Recommendations to achieve waste reduction include: • Sort C&D waste from demolition of the existing waterfront structures to recover	Work site / During planning and design stage, and construction stage	Contractor	√	√			

	recyclable portions such as metals. • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal. • Encourage collection of aluminium cans, PET bottles and paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force. • Any unused chemicals or those with remaining functional capacity shall be recycled. • Use of reusable non-timber formwork, such as in casting the tunnel box sections, to reduce the amount of C&D material. • Proper storage and site practices to minimise the potential for damage or contamination of construction materials. • Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.							
S6.7.10	*General Refuse* General refuse shall be stored in enclosed bins or compaction units separate from C&D material. A licensed waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D material. A collection area shall be provided where wastes can be stored and loaded prior to removal from site. An enclosed and covered area is recommended to reduce the occurrence of 'wind blow' light material.	Work site / During the construction period	Contractor		√			Public Health and Municipal Services Ordinance (Cap. 132)

S6.7.11	*Chemical Wastes* After use, chemical wastes (for example, cleaning fluids, solvents, lubrication oil and fuel) shall be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Spent chemicals shall be collected by a licensed collector for disposal at the CWTF or other licensed facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	Work site / During the construction period	Contractor		√			Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes
S6.7.12 – S6.7.13	*Construction and Demolition Material* C&D material shall be sorted on-site into inert C&D material (that is, public fill) and C&D waste. All the suitable inert C&D material shall be broken down to 250 mm in size for reuse as public fill in the WDII reclamation. C&D waste, such as wood, glass, plastic, steel and other metals shall be reused or recycled and, as a last resort, disposed of to landfill. A suitable area shall be designated to facilitate the sorting process and a temporary stockpiling area will be required for the separated materials. In order to monitor the disposal of public fill and C&D waste at public fill reception facilities and landfills, respectively, and to control fly tipping, a trip-ticket system shall be included as one of the contractual requirements and implemented by the Environmental Team undertaking the environmental monitoring and audit work. An Independent Environment Checker shall be responsible for auditing the results of the system.	Work site / During the construction period	Contractor and Independent Environmental Checker		√			DEVB TCW No.6/2010; ETWB TCW No. 33/2002; ETWB TCW No. 19/2005
S6.7.14	*Bentonite Slurry* The disposal of residual used bentonite slurry shall follow the good practice guidelines stated	Work site / During the construction period	Contractor		√			ProPECC PN 1/94

	in ProPECC PN 1/94 "Construction Site Drainage" and listed as follows: ▪ If the disposal of a certain residual quantity cannot be avoided, the used slurry may be disposed of at the marine spoil grounds subject to obtaining a marine dumping licence from EPD on a case-by-case basis. ▪ If the used bentonite slurry is intended to be disposed of through the public drainage system, it shall be treated to the respective effluent standards applicable to foul sewers, storm drains or the receiving waters as set out in the Technical Memorandum of Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters. ▪ If the used bentonite slurry is intended to be disposed to public fill reception facilities, it will be mixed with dry soil on site before disposal.							

- Des - Design, C - Construction, O – Operation, and Dec – Decommissioning

Table A13.7 Implementation Schedule for Landscape and Visual

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation stage				Relevant Legislation and Guidelines
				Des	C	O	Dec	
Construction Phase								
For the Whole Project								
Table 10.5	CM1 Topsoil, where identified, shall be stripped and stored for re-use in the construction of the soft landscape works, where practical.	Work site / During Construction Phase	Contractor	√	√			EIAO TM
Table 10.5	CM2 Existing trees to be retained on site shall be carefully protected during construction.	Work site / During Construction Phase	Contractor	√	√			EIAO TM
Table 10.5	CM3 Trees unavoidably affected by the works shall be transplanted where practical.	Work site / During Construction Phase	Contractor	√	√			EIAO TM
Table 10.5	CM4 Compensatory tree planting shall be provided to compensate for felled trees.	Work site / During Construction Phase	Contractor	√	√			EIAO TM
Table 10.5	CM5 Control of night-time lighting.	Work site / During Construction Phase	Contractor		√			EIAO TM
Table 10.5	CM6 Erection of decorative screen hoarding compatible with the surrounding setting.	Work site / During Construction Phase	Contractor		√			EIAO TM
For DP2 – WDII Major Roads (Road P2)								
Table 10.5	CM1 Topsoil, where identified, shall be stripped and stored for re-use in the construction of the soft landscape works, where practical.	Work site / During Construction Phase	Contractor	√	√			EIAO TM
Table 10.5	CM2 Existing trees to be retained on site shall be carefully protected during construction.	Work site / During Construction Phase	Contractor	√	√			EIAO TM
Table 10.5	CM3 Trees unavoidably affected by the works shall be transplanted where practical.	Work site / During Construction Phase	Contractor	√	√			EIAO TM
Table 10.5	CM4 Compensatory tree planting shall be provided to compensate for felled trees.	Work site / During Construction Phase	Contractor	√	√			EIAO TM
Table 10.5	CM5 Control of night-time lighting.	Work site / During Construction Phase	Contractor		√			EIAO TM
Table 10.5	CM6 Erection of decorative screen hoarding compatible with the surrounding setting.	Work site / During Construction Phase	Contractor		√			EIAO TM

Operation Phase								
For DP2 – WDII Major Roads (Road P2)								
Table 10.6, Figure 10.5.1-10.5.5	OM1 Aesthetic design of buildings and road-related structures, including viaducts, vent buildings, subways, footbridges and noise barriers and enclosure.	Work site / During Design Stage and Operation Phases	CEDD/HyD		√	√		ETWB TCW 2/2004
Table 10.6, Figure 10.5.1-10.5.5	OM3 Buffer Tree and Shrub Planting to screen proposed roads and associated structures.	Work site / During Design Stage and Operation Phases	CEDD/HyD		√	√		ETWB TCW 2/2004
Table 10.6, Figure 10.5.1-10.5.5	OM5 Aesthetic streetscape design.	Work site / During Design Stage and Operation Phases	CEDD/HyD		√	√		ETWB TCW 2/2004
Table 10.6, Figure 10.5.1-10.5.5	OM6 Aesthetic design of roadside amenity areas	Work site / During Design Stage and Operation Phases	CEDD/HyD		√	√		ETWB TCW 2/2004

- Des - Design, C - Construction, O – Operation, and Dec – Decommissioning

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.	75 dB(A)

Notes: If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.
**The Limit level shall be 70 dB(A) and 65 dB(A) for educational institute during normal teaching periods and school examination periods, respectively.*

Action and Limit Level for Air Monitoring

Monitoring Locations	1-hour TSP Level inμg/m3		24-hour TSP Level inμg/m3	
	Action Level	Limit Level	Action Level	Limit Level
CMA5b Pedestrian Plaza	339.7	500	209.9	260
CMA6a WDII PRE Site Office	333.0	500	207.1	260

Appendix 4.2

Copies of Calibration Certificates

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0426 01-02 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	Larson Davis	,	PCB
Type/Model No.:	LxT1	,	377B02
Serial/Equipment No.:	0003737	,	171529
Adaptors used:	-	,	-

Item submitted by

Customer Name:	Lam Environmental Service Ltd.
Address of Customer:	-
Request No.:	-
Date of receipt:	26-Apr-2017

Date of test: 28-Apr-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	18-Jun-2017	CIGISMEC
Signal generator	DS 360	61227	01-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1010 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

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

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

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 04-May-2017 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0426 01-02 **Page** 2 **of** 2

1, Electrical Tests

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

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	0.8	2.1
	Lin	Pass	1.6	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	N/A	N/A	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

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

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

3, Response to associated sound calibrator

N/A

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

- End -

Calibrated by: Lai Sheng Jie **Date:** 28-Apr-2017

Checked by: Fung Chi Yip **Date:** 04-May-2017

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.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 16CA1117 01-01

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2236	,	4188
Serial/Equipment No.:	2100736	,	2288941
Adaptors used:	-	,	-

Item submitted by

Customer Name:	Lam Geotechnics Limited
Address of Customer:	-
Request No.:	-
Date of receipt:	17-Nov-2016

Date of test: 18-Nov-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	18-Jun-2017	CIGISMEC
Signal generator	DS 360	33873	18-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI

Ambient conditions

Temperature:	23 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

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

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

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 21-Nov-2016 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 16CA1117 01-01 Page 2 of 2

1, Electrical Tests

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

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

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

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

3, Response to associated sound calibrator

N/A

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

- End -

Calibrated by: Fung Chi Yip Date: 18-Nov-2016

Checked by: Lam Tze Wai Date: 21-Nov-2016

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.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0426 01-02 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	Larson Davis	,	PCB
Type/Model No.:	LxT1	,	377B02
Serial/Equipment No.:	0003737	,	171529
Adaptors used:	-	,	-

Item submitted by

Customer Name:	Lam Environmental Service Ltd.
Address of Customer:	-
Request No.:	-
Date of receipt:	26-Apr-2017

Date of test: 28-Apr-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	18-Jun-2017	CIGISMEC
Signal generator	DS 360	61227	01-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1010 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

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

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

Actual Measurement data are documented on worksheets.

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 04-May-2017 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

CERTIFICATE OF CALIBRATION

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1, Electrical Tests

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

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	0.8	2.1
	Lin	Pass	1.6	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100μs rectangular pulse	N/A	N/A	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

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

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

3, Response to associated sound calibrator

N/A

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

- End -

Calibrated by: Lai Sheng Jie **Date:** 28-Apr-2017

Checked by: Fung Chi Yip **Date:** 04-May-2017

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.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 16CA1117 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.:	10707358
Adaptors used:	-

Item submitted by

Curstomer:	Lam Geotechnics Ltd.
Address of Customer:	-
Request No.:	-
Date of receipt:	17-Nov-2016

Date of test: 18-Nov-2016

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	14-Apr-2017	SCL
Preamplifier	B&K 2673	2239857	28-Apr-2017	CEPREI
Measuring amplifier	B&K 2610	2346941	26-Apr-2017	CEPREI
Signal generator	DS 360	61227	18-Apr-2017	CEPREI
Digital multi-meter	34401A	US36087050	18-Apr-2017	CEPREI
Audio analyzer	8903B	GB41300350	19-Apr-2017	CEPREI
Universal counter	53132A	MY40003662	19-Apr-2017	CEPREI

Ambient conditions

Temperature:	23 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

1, 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.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.

3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

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

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

Approved Signatory: Huang Jian Min/Feng Jun Qi **Date:** 21-Nov-2016 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon 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.
香港黃竹坑道37號利達中心12樓
12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

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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.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.12	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 = 0.002 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 = 991.6 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 = 0.6 %**

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.

- End -

Calibrated by: Fung Chi Yip **Date:** 18-Nov-2016

Checked by: Lam Tze Wai **Date:** 21-Nov-2016

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

Calibration Certificate

Certificate Number 2016009653

Customer:

Model Number	CAL200	***Procedure Number***	D0001.8386		
Serial Number	13437	***Technician***	Scott Montgomery		
Test Results	**Pass**	***Calibration Date***	2 Nov 2016		
Initial Condition	As Manufactured	***Calibration Due***			
		Temperature	25	°C	± 0.3 °C
Description	Larson Davis CAL200 Acoustic Calibrator	***Humidity***	28	%RH	± 3 %RH
		Static Pressure	101.2	kPa	± 1 kPa

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

Compliance Standards Compliant to Manufacturer Specifications per D0001.8190 and the following standards:
IEC 60942:2003 ANSI S1.40-2006

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

The quality system is registered to ISO 9001:2008.

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

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

Standards Used

Description	Cal Date	Cal Due	Cal Standard
Agilent 34401A DMM	09/07/2016	09/07/2017	001021
Sound Level Meter / Real Time Analyzer	04/07/2016	04/07/2017	001051
Microphone Calibration System	08/17/2016	08/17/2017	005446
1/2" Preamplifier	10/06/2016	10/06/2017	006506
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/22/2016	08/22/2017	006507
1/2 inch Microphone - RI - 200V	03/15/2016	03/15/2017	006510
Pressure Transducer	07/01/2016	07/01/2017	007368

TISCH Environmental

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

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 20, 2017 Rootsmeter S/N 0438320 Ta (K) - 293
Operator Tisch Orifice I.D. - 0005 Pa (mm) - 759.46

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3960	3.2	2.00
2	NA	NA	1.00	0.9970	6.4	4.00
3	NA	NA	1.00	0.8910	7.8	5.00
4	NA	NA	1.00	0.8500	8.7	5.50
5	NA	NA	1.00	0.6990	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
1.0120	0.7249	1.4257		0.9958	0.7133	0.8784
1.0078	1.0108	2.0163		0.9916	0.9946	1.2423
1.0058	1.1288	2.2543		0.9896	1.1107	1.3889
1.0047	1.1820	2.3643		0.9885	1.1630	1.4567
0.9993	1.4296	2.8514		0.9832	1.4066	1.7568
Qstd slope (m) =		2.02533		Qa slope (m) =		1.26823
intercept (b) =		-0.03593		intercept (b) =		-0.02214
coefficient (r) =		0.99983		coefficient (r) =		0.99983
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA5b	**Calibration Date**	:	16-Jun-17
Equipment no.	:	HVS010	**Calibration Due Date**	:	16-Aug-17

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	302	Kelvin	**Pressure, P_a**	1005	mmHg

Orifice Transfer Standard Information					
Equipment No.	**Ori001**	**Slope, m_c**	2.02533	**Intercept, bc**	-0.03593
Last Calibration Date	20-Mar-17	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	20-Mar-18	$= m_c \times Q_{std} + b_c$			

Calibration of TSP

Calibration Point	Manometer Reading H (inches of water) (up)	(down)	(difference)	Q_{std} (m^3 / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC $(W(P_a/1013.3 \times 298/T_a)^{1/2}/35.31)$ Y-axis
1	1.4	1.4	2.8	0.8351	36	35.6140
2	2.2	2.2	4.4	1.0423	42	41.5497
3	3.5	3.5	7.0	1.3101	50	49.4639
4	4.5	4.5	9.0	1.4831	56	55.3996
5	5.6	5.6	11.2	1.6524	61	60.3460

By Linear Regression of Y on X

Slope, m = 30.4653 Intercept, b = 9.9483

Correlation Coefficient* = 0.9996

Calibration Accepted = Yes/~~No~~**

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

** Delete as appropriate.

Remarks : As per client's provided information, the equipment reference no. of the calibrated High Volume Sampler has been re-assigned from EL222 to HVS010 with respect to the update in quality management system.

Calibrated by	:	Jackey MA	**Checked by**	:	Pauline Wong
Date	:	16-Jun-17	**Date**	:	16-Jun-17

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA5b	**Calibration Date**	:	07-Aug-17
Equipment no.	:	HVS010	**Calibration Due Date**	:	07-Oct-17

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	304	Kelvin	**Pressure, P_a**	1006	mmHg

Orifice Transfer Standard Information					
Equipment No.	**Ori001**	**Slope, m_c**	2.02533	**Intercept, bc**	-0.03593
Last Calibration Date	20-Mar-17	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	20-Mar-18	$= m_c \times Q_{std} + b_c$			

Calibration of TSP

Calibration Point	**Manometer Reading H (inches of water)** (up)	(down)	(difference)	**Q_{std}** (m^3 / min.) **X-axis**	**Continuous Flow Recorder, W** (CFM)	**IC** $(W(P_a/1013.3 \times 298/T_a)^{1/2}/35.31)$ **Y-axis**
1	1.4	1.4	2.8	0.8328	33	32.5548
2	2.3	2.3	4.6	1.0624	40	39.4604
3	3.6	3.6	7.2	1.3247	48	47.3525
4	4.7	4.7	9.4	1.5111	54	53.2715
5	5.8	5.8	11.6	1.6767	58	57.2176

By Linear Regression of Y on X

Slope, m = 29.6169 Intercept, b = 8.0158

Correlation Coefficient* = 0.9994

Calibration Accepted = Yes/~~No~~**

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

** Delete as appropriate.

Remarks : As per client's provided information, the equipment reference no. of the calibrated High Volume Sampler has been re-assigned from EL222 to HVS010 with respect to the update in quality management system.

Calibrated by	:	Jackey MA	**Checked by**	:	Pauline Wong
Date	:	07-Aug-17	**Date**	:	07-Aug-17

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA6a	**Calibration Date**	:	16-Jun-17
Equipment no.	:	HVS013	**Calibration Due Date**	:	16-Aug-17

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	302	Kelvin	**Pressure, P_a**	1005	mmHg

Orifice Transfer Standard Information					
Equipment No.	**Ori001**	**Slope, m_c**	2.02533	**Intercept, bc**	-0.03593
Last Calibration Date	20-Mar-17	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	20-May-17	$= m_c \times Q_{std} + b_c$			

Calibration of TSP

Calibration Point	Manometer Reading H (inches of water) (up)	(down)	(difference)	Q_{std} (m^3 / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC $(W(P_a/1013.3 \times 298/T_a)^{1/2}/35.31)$ Y-axis
1	1.5	1.5	3.0	0.8638	32	31.6569
2	2.4	2.4	4.8	1.0879	39	38.5819
3	3.6	3.6	7.2	1.3284	46	45.5068
4	4.7	4.7	9.4	1.5153	54	53.4211
5	6.0	6.0	12.0	1.7098	60	59.3567

By Linear Regression of Y on X

Slope, m	=	33.0592	Intercept, b	=	2.6936
Correlation Coefficient*	=	0.9982			
Calibration Accepted	=	Yes/~~No~~**			

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

** Delete as appropriate.

Remarks : As per client's provided information, the equipment reference no. of the calibrated High Volume Sampler has been re-assigned from EL551 to HVS013 with respect to the update in quality management system.

Calibrated by	:	Jackey MA	**Checked by**	:	Pauline Wong
Date	:	16-Jun-17	**Date**	:	16-Jun-17

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	CMA6a	**Calibration Date**	:	07-Aug-17
Equipment no.	:	HVS013	**Calibration Due Date**	:	07-Oct-17

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	304	Kelvin	**Pressure, P_a**	1006	mmHg

Orifice Transfer Standard Information					
Equipment No.	**Ori001**	**Slope, m_c**	2.02533	**Intercept, bc**	-0.03593
Last Calibration Date	20-Mar-17	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	20-May-17	$= m_c \times Q_{std} + b_c$			

Calibration of TSP

Calibration Point	Manometer Reading H (inches of water) (up)	(down)	(difference)	Q_{std} (m^3 / min.) X-axis	Continuous Flow Recorder, W (CFM)	IC $(W(P_a/1013.3\times298/T_a)^{1/2}/35.31)$ Y-axis
1	1.5	1.5	3.0	0.8614	33	32.5548
2	2.4	2.4	4.8	1.0849	41	40.4469
3	3.7	3.7	7.4	1.3428	50	49.3255
4	4.8	4.8	9.6	1.5269	56	55.2445
5	6.1	6.1	12.2	1.7191	62	61.1636

By Linear Regression of Y on X

Slope, m	=	33.4343	Intercept, b	=	4.0483
Correlation Coefficient*	=	0.9996			
Calibration Accepted	=	Yes/~~No~~**			

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

** Delete as appropriate.

Remarks : As per client's provided information, the equipment reference no. of the calibrated High Volume Sampler has been re-assigned from EL551 to HVS013 with respect to the update in quality management system.

Calibrated by	:	Jackey MA	**Checked by**	:	Pauline Wong
Date	:	07-Aug-17	**Date**	:	07-Aug-17

Appendix 5.1

Monitoring Schedules for Reporting Month and Coming Reporting Month

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

Environmental Monitoring Schedule
August 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				27-Jul	28-Jul 24hr TSP	29-Jul 1hr TSP
30-Jul	31-Jul	1-Aug	2-Aug	3-Aug 24hr TSP	4-Aug 1hr TSP Noise (daytime)	5-Aug
6-Aug	7-Aug Noise (daytime)	8-Aug	9-Aug 24hr TSP	10-Aug 1hr TSP	11-Aug	12-Aug
13-Aug	14-Aug	15-Aug 24hr TSP	16-Aug 1hr TSP	17-Aug Noise (daytime)	18-Aug	19-Aug
20-Aug	21-Aug 24hr TSP	22-Aug 1hr TSP	23-Aug	24-Aug	25-Aug Noise (daytime)	26-Aug 24hr TSP (CMA6a)
27-Aug	28-Aug 1hr TSP (CMA6a)	29-Aug 24hr TSP (CMA5b) 1hr TSP (CMA5b)				

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

Tentative Environmental Monitoring Schedule
September 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27-Aug	28-Aug Noise (daytime)	29-Aug Noise (daytime)	30-Aug	31-Aug	1-Sep 24hr TSP	2-Sep 1hr TSP
3-Sep	4-Sep Noise (daytime)	5-Sep Noise (daytime)	6-Sep	7-Sep 24hr TSP	8-Sep 1hr TSP	9-Sep
10-Sep	11-Sep Noise (daytime)	12-Sep Noise (daytime)	13-Sep 24hr TSP	14-Sep 1hr TSP	15-Sep	16-Sep
17-Sep	18-Sep Noise (daytime)	19-Sep 24hr TSP Noise (daytime)	20-Sep 1hr TSP	21-Sep	22-Sep	23-Sep
24-Sep	25-Sep 24hr TSP Noise (daytime)	26-Sep 1hr TSP Noise (daytime)	27-Sep			

Appendix 5.2

Noise Monitoring Results and Graphical Presentations

Noise Monitoring Result for EP-376/2009

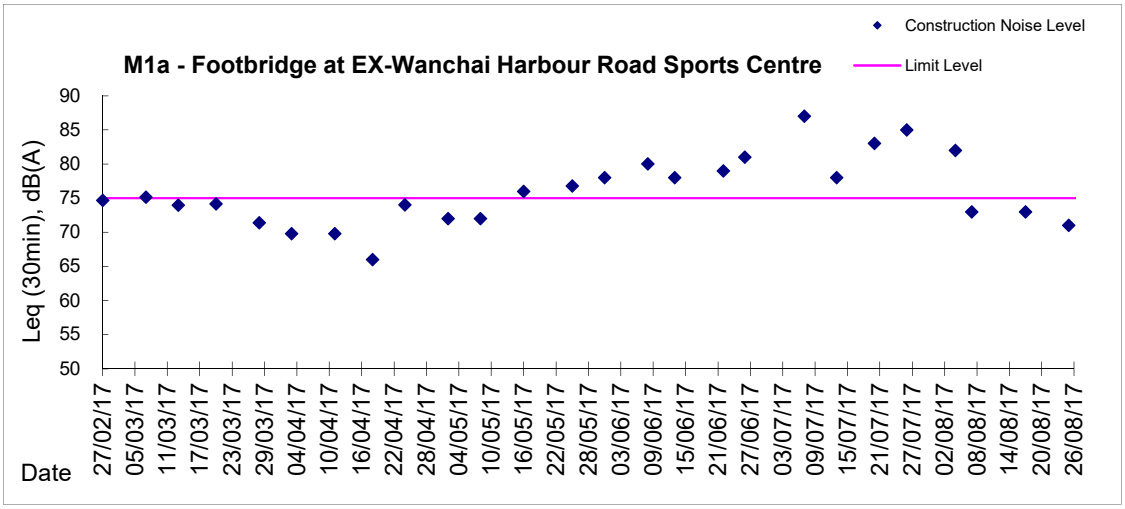
Day Time (0700 - 1900hrs on normal weekdays)

Location: M1a - Footbridge at EX-Wanchai Harbour Road Sports Centre

Date	Time	Weather	Measurement Noise Level			Baseline Level	Construction Noise Level	Limit Level
			Leq	L10	L90	Leq	Leq	Leq
			Unit: dB(A), (30-min)					
4/8/2017	14:45	Cloudy	82.2	84.7	77.5	73	**82**	75
7/8/2017	13:15	Fine	76.1	78.0	73.5	73	73	75
17/8/2017	09:55	Fine	76.1	78.5	72.4	73	73	75
25/8/2017	09:45	Fine	75.0	76.6	72.8	73	71	75

Graphic Presentation of Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)



Appendix 5.3

Air Quality Monitoring Results and Graphical Presentations

Location: CMA5b - Pedestrian Plaza

Report on 24-hour TSP monitoring for EP-376/2009
Action Level - 209.9 µg/m3
Limit Level - 260 µg/m3

Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, m^3/min			Total Volume, m^3	TSP Level, $\mu g/m^3$
				Initial	Final	Initial	Final		Initial, Q_{si}	Final, Q_{sf}	Average		
28-Jul-17	8:00	Fine	21444	2.8268	2.9865	8774.88	8798.88	24.00	0.86	0.85	0.85	1231	129.7
3-Aug-17	8:00	Rainy	21524	2.8295	2.9241	8801.88	8825.88	24.00	0.98	0.98	0.98	1418	66.7
9-Aug-17	8:00	Cloudy	21184	2.8226	2.8866	8828.90	8852.90	24.00	0.95	0.95	0.95	1365	46.9
15-Aug-17	8:00	Cloudy	1823	2.7881	2.8598	8855.90	8879.90	24.00	0.95	0.95	0.95	1368	52.4
21-Aug-17	8:00	Fine	21097	2.8941	3.1042	8882.90	8906.90	24.00	0.94	0.94	0.94	1358	154.7
29-Aug-17	15:40	Fine	21090	2.8938	3.0707	8912.91	8936.91	24.00	1.08	1.08	1.08	1557	113.6

Remarks: Due to interruption of electricity, the 24hr TSP monitoring was rescheduled from 26 August 2017 to 29 August 2017.

Report on 1-hour TSP monitoring for EP-376/2009
Action Level - 339.7 µg/m3
Limit Level - 500 µg/m3

Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, m^3/min			Total Volume, m^3	TSP Level, $\mu g/m^3$
				Initial	Final	Initial	Final		Initial, Q_{si}	Final, Q_{sf}	Average		
29-Jul-17	8:25	Fine	21548	2.8420	2.8542	8798.88	8799.88	1.00	0.85	0.85	0.85	51	238.4
29-Jul-17	9:50	Fine	21509	2.8222	2.8356	8799.88	8800.88	1.00	0.85	0.85	0.85	51	261.9
29-Jul-17	13:00	Fine	21525	2.8114	2.8276	8800.88	8801.88	1.00	0.85	0.85	0.85	51	316.6
4-Aug-17	8:25	Cloudy	21641	2.8434	2.8474	8825.88	8826.88	1.00	0.98	0.98	0.98	59	67.7
4-Aug-17	10:20	Cloudy	21621	2.8699	2.8734	8826.88	8827.88	1.00	0.98	0.98	0.98	59	59.2
4-Aug-17	13:00	Cloudy	21615	2.8024	2.8105	8827.88	8828.88	1.00	0.98	0.98	0.98	59	137.1
10-Aug-17	8:20	Cloudy	21590	2.8173	2.8216	8852.90	8853.90	1.00	0.95	0.95	0.95	57	75.6
10-Aug-17	10:25	Cloudy	1834	2.7823	2.7855	8853.90	8854.90	1.00	0.95	0.95	0.95	57	56.3
10-Aug-17	13:00	Cloudy	21601	2.8182	2.8244	8854.90	8855.90	1.00	0.95	0.95	0.95	57	109.0
16-Aug-17	8:25	Cloudy	21715	2.8529	2.8593	8879.90	8880.90	1.00	0.95	0.95	0.95	57	112.2
16-Aug-17	10:05	Cloudy	21678	2.8481	2.8544	8880.90	8881.90	1.00	0.95	0.95	0.95	57	110.4
16-Aug-17	13:00	Cloudy	21696	2.8536	2.8601	8881.90	8882.90	1.00	0.95	0.95	0.95	57	113.9
22-Aug-17	8:45	Cloudy	21843	2.8571	2.8751	8906.90	8907.90	1.00	0.97	0.97	0.97	58	307.9
22-Aug-17	10:30	Cloudy	21826	2.8857	2.9040	8907.90	8908.90	1.00	0.97	0.97	0.97	58	313.0
22-Aug-17	13:00	Cloudy	21801	2.8514	2.8702	8908.90	8909.90	1.00	0.97	0.97	0.97	58	321.6
29-Aug-17	9:35	Fine	21917	2.8378	2.8813	8909.91	8910.91	1.00	1.08	1.08	1.08	65	671.6
29-Aug-17	10:40	Fine	21091	2.8750	2.8816	8910.91	8911.91	1.00	1.08	1.08	1.08	65	101.9
29-Aug-17	13:00	Fine	21087	2.8827	2.8910	8911.91	8912.91	1.00	1.02	1.02	1.02	61	136.3

Remarks: Due to interruption of electricity, the 1hr TSP monitoring was rescheduled from 28 August 2017 to 29 August 2017.

Location: CMA6a - WDII PRE Office

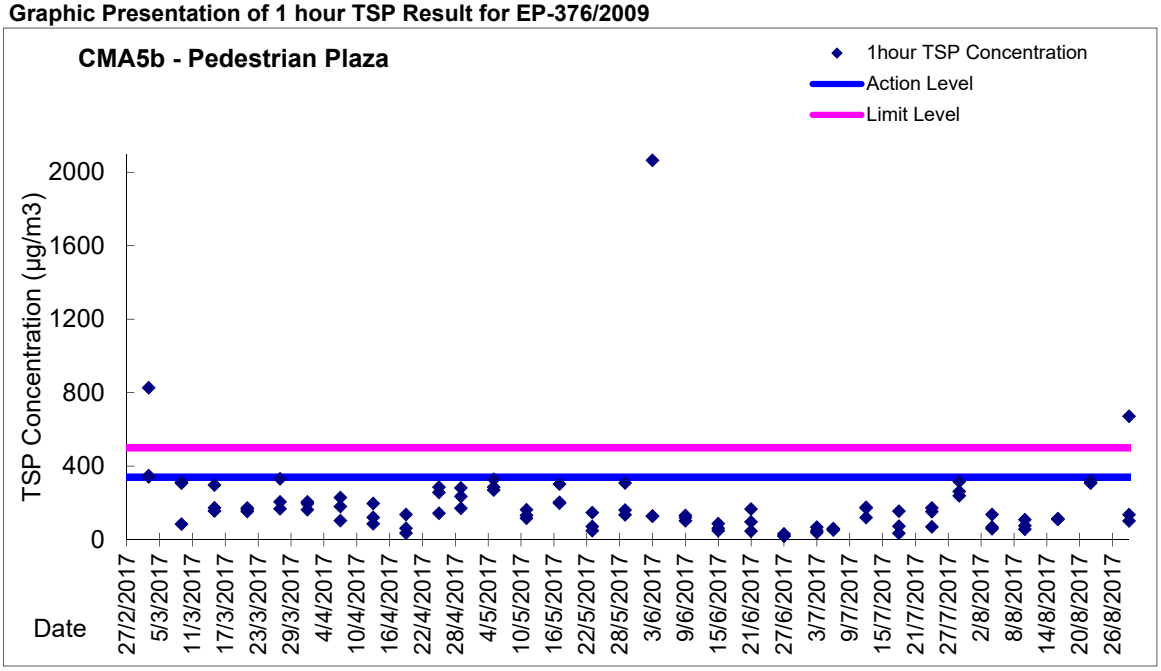
Report on 24-hour TSP monitoring for EP-376/2009
Action Level - 207.1 μg/m3
Limit Level - 260 μg/m3

Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, m^3/min			Total Volume, m^3	TSP Level, $\mu g/m^3$
				Initial	Final	Initial	Final		Initial, Q_{si}	Final, Q_{sf}	Average		
28-Jul-17	8:00	Fine	21442	2.8391	2.9243	2522.11	2546.11	24.00	1.12	1.12	1.12	1615	52.7
3-Aug-17	8:00	Rainy	21186	2.8680	2.9212	2549.13	2573.13	24.00	1.13	1.13	1.13	1622	32.8
9-Aug-17	8:00	Cloudy	21104	2.9045	2.9654	2576.17	2600.17	24.00	1.02	1.02	1.02	1462	41.7
15-Aug-17	8:00	Cloudy	21103	2.8910	2.9388	2603.17	2627.17	24.00	1.02	1.02	1.02	1465	32.6
21-Aug-17	8:00	Fine	21099	2.9044	3.0708	2630.17	2654.17	24.00	1.01	1.01	1.01	1456	114.3
26-Aug-17	8:00	Cloudy	21797	2.8565	2.9440	2657.17	2681.17	24.00	0.99	0.99	0.99	1425	61.4

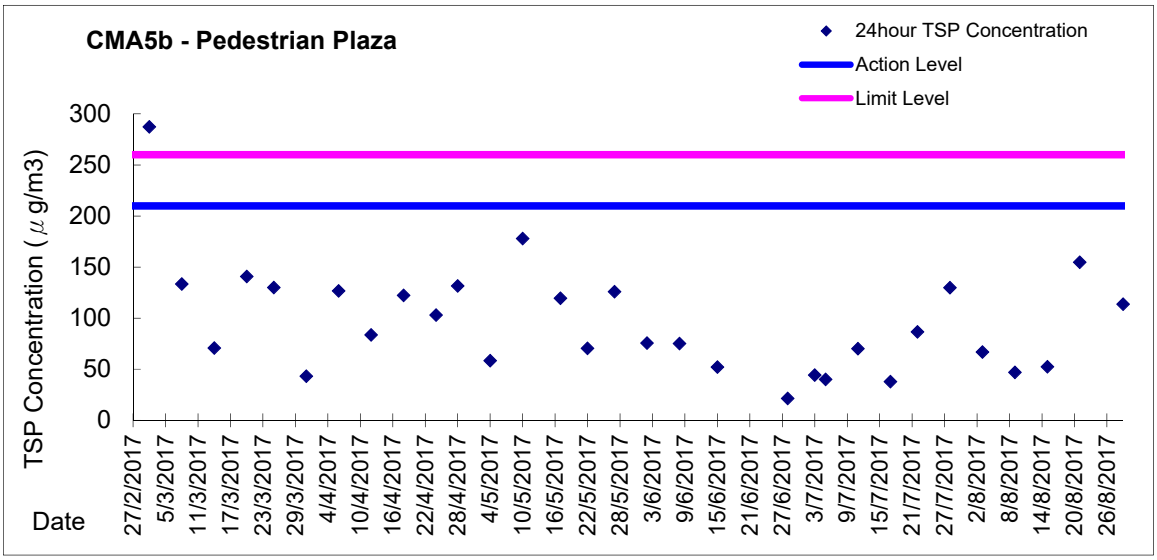
Report on 1-hour TSP monitoring for EP-376/2009
Action Level - 333 μg/m3
Limit Level - 500 μg/m3

Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling Time, hr	Flow Rate, m^3/min			Total Volume, m^3	TSP Level, $\mu g/m^3$
				Initial	Final	Initial	Final		Initial, Q_{si}	Final, Q_{sf}	Average		
29-Jul-17	8:25	Fine	21547	2.8227	2.8275	2546.11	2547.11	1.00	1.12	1.12	1.12	67	71.4
29-Jul-17	9:50	Fine	21532	2.8165	2.8216	2547.11	2548.11	1.00	1.12	1.12	1.12	67	75.9
29-Jul-17	13:00	Fine	21514	2.8329	2.8471	2548.11	2549.11	1.00	1.12	1.12	1.12	67	211.4
4-Aug-17	8:25	Cloudy	21639	2.8327	2.8355	2573.13	2574.13	1.00	1.01	1.01	1.01	61	46.1
4-Aug-17	10:25	Cloudy	21622	2.8630	2.8648	2574.13	2575.13	1.00	1.01	1.01	1.01	61	29.6
4-Aug-17	13:00	Cloudy	21616	2.7837	2.7863	2575.13	2576.13	1.00	1.01	1.01	1.01	61	42.8
10-Aug-17	8:35	Cloudy	1835	2.7828	2.7842	2600.17	2601.17	1.00	1.02	1.02	1.02	61	23.0
10-Aug-17	10:25	Cloudy	1833	2.8065	2.8080	2601.17	2602.17	1.00	1.02	1.02	1.02	61	24.6
10-Aug-17	13:00	Cloudy	1817	2.7897	2.7919	2602.17	2603.17	1.00	1.02	1.02	1.02	61	36.1
16-Aug-17	8:20	Cloudy	21714	2.8519	2.8552	2627.17	2628.17	1.00	1.02	1.02	1.02	61	54.0
16-Aug-17	10:05	Cloudy	21680	2.8460	2.8481	2628.17	2629.17	1.00	0.96	0.96	0.96	58	36.4
16-Aug-17	13:00	Cloudy	21695	2.8419	2.8447	2629.17	2630.17	1.00	0.99	0.99	0.99	59	47.2
22-Aug-17	8:25	Cloudy	21841	2.8513	2.8620	2654.17	2655.17	1.00	1.01	1.01	1.01	61	176.6
22-Aug-17	10:45	Cloudy	21820	2.8712	2.8828	2655.17	2656.17	1.00	1.01	1.01	1.01	61	191.4
22-Aug-17	13:00	Cloudy	21813	2.8825	2.8935	2656.17	2657.17	1.00	0.95	0.95	0.95	57	192.3
28-Aug-17	10:25	Rainy	21870	2.8465	2.8475	2681.17	2682.17	1.00	0.97	0.97	0.97	58	17.2
28-Aug-17	13:00	Rainy	21893	2.8375	2.8426	2682.17	2683.17	1.00	0.97	0.97	0.97	58	87.7
28-Aug-17	14:35	Rainy	21094	2.9009	2.9027	2683.17	2684.17	1.00	1.00	1.00	1.00	60	30.1

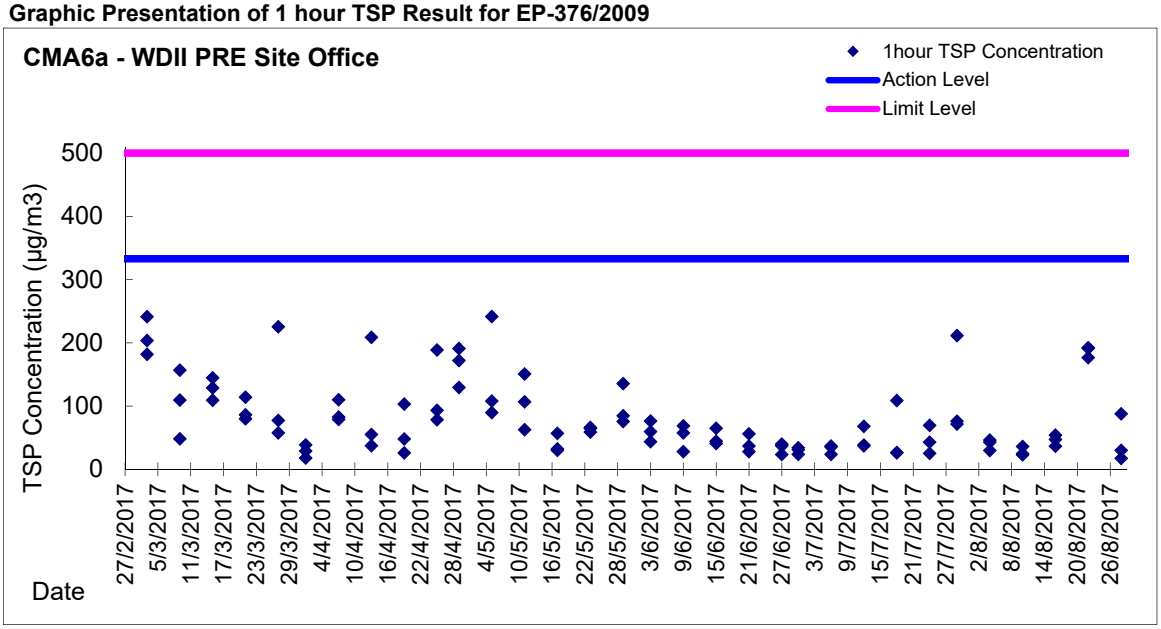
Graphic Presentation of 1 hour TSP Result for EP-376/2009



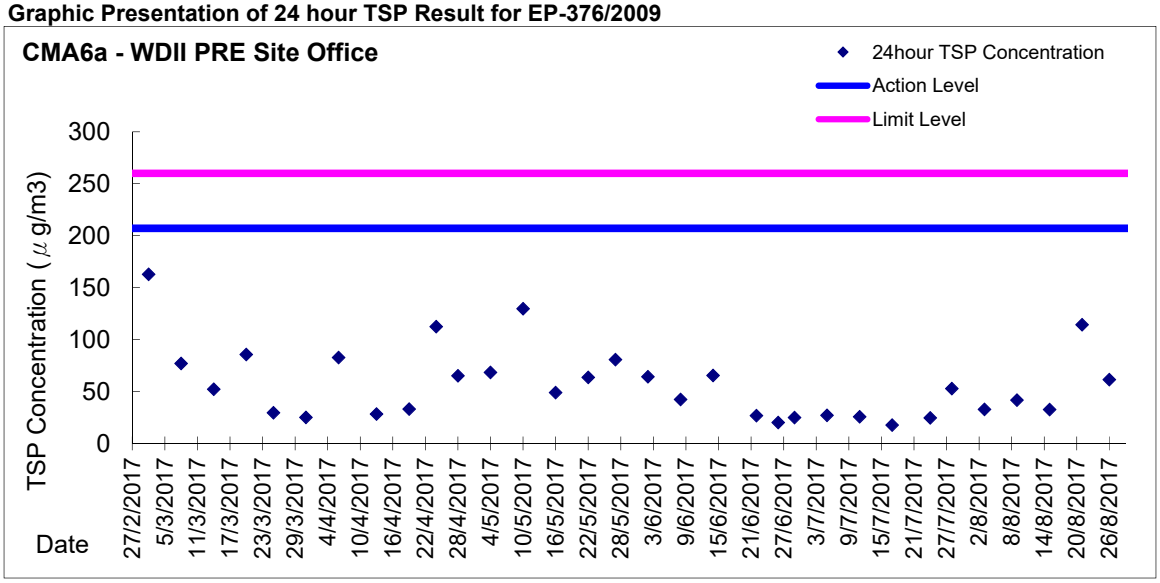
Graphic Presentation of 24 hour TSP Result for EP-376/2009



Graphic Presentation of 1 hour TSP Result for EP-376/2009



Graphic Presentation of 24 hour TSP Result for EP-376/2009



Appendix 6.1

Event Action Plans

Event/Action Plan for Construction Noise

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action Level being exceeded	1. Notify ER, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness. (The above actions should be taken within 2 working days after the exceedance is identified)	1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Advise the ER on the effectiveness of the proposed remedial measures. (The above actions should be taken within 2 working days after the exceedance is identified)	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures. (The above actions should be taken within 2 working days after the exceedance is identified)	1. Submit noise mitigation proposals to IEC and ER; 2. Implement noise mitigation proposals. (The above actions should be taken within 2 working days after the exceedance is identified)

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
Limit Level being exceeded	1. Inform IEC, ER, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. 4. Identify source and investigate the cause of exceedance; 5. 5. Carry out analysis of Contractor's working procedures; 6. 6. Discuss with the IEC, Contractor and ER on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. (The above actions should be taken within 2 working days after the exceedance is identified)	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. (The above actions should be taken within 2 working days after the exceedance is identified)	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated. (The above actions should be taken within 2 working days after the exceedance is identified)	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated. (The above actions should be taken within 2 working days after the exceedance is identified)

Event / Action Plan for Construction Air Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily. (The above actions should be taken within 2 working days after the exceedance is identified)	1. Check monitoring data submitted by ET; 2. Check Contractor's working method. (The above actions should be taken within 2 working days after the exceedance is identified)	1. Notify Contractor. (The above actions should be taken within 2 working days after the exceedance is identified)	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate. (The above actions should be taken within 2 working days after the exceedance is identified)
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring. (The above actions should be taken within 2 working days after the exceedance is identified)	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 ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures. (The above actions should be taken within 2 working days after the exceedance is identified)	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. (The above actions should be taken within 2 working days after the exceedance is identified)	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate. (The above actions should be taken within 2 working days after the exceedance is identified)
LIMIT LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. (The above actions should be taken within 2 working days after the exceedance is identified)	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 implementation of remedial measures. (The above actions should be taken within 2 working days after the exceedance is identified)	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. (The above actions should be taken within 2 working days after the exceedance is identified)	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate. (The above actions should be taken within 2 working days after the exceedance is identified)
2. Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement 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 IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. (The above actions should be taken within 2 working days after the exceedance is identified)	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 consolidation with the IEC, 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. (The above actions should be taken within 2 working days after the exceedance is identified)	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC 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. (The above actions should be taken within 2 working days after the exceedance is identified)

Event and Action Plan for Marine Water Quality

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

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

Event and Action Plan for Odour Patrol

Event	ACTION	
	Person-in-charge of Odour Monitoring	**Implementation Agent Identified by CEDD**
Action Level		
Exceedance of Action Level	1. Identify source/reason of exceedance; 2. Repeat odour patrol to confirm finding.	1. Carry out investigation to identify the source/reason of exceedance; 2. Rectify any unacceptable practice 3. Implement more mitigation measures if necessary; 4. Inform EPD or MD if exceedance is considered to be caused by expedient connections or floating debris.
Limit Level		
Exceedance of Limit Level	1. Identify source / reason of exceedance; 2. Repeat odour patrol to confirm findings; 3. Increase odour patrol frequency; 4. If exceedance stops, cease additional odour patrol.	1. Carry out investigation to identify the source/reason of exceedance. Investigation shall be completed within 2 weeks; 2. Rectify any unacceptable practice; 3. Formulate remedial actions; 4. Ensure remedial actions properly implemented; 5. If exceedance continues, consider what more/enhanced mitigation measures shall be implemented; 6. Inform EPD or MD if exceedance is considered to be caused by expedient connections or floating debris.

Appendix 6.2

Summary for Notification of Exceedance

Ref. No.	Date	Time	Location	Construction Noise Level, dB(A)	Parameter	Action Level	Limit Level dB(A)	Follow-up action	
X_16N099	4-Aug-17	14:45	M1a-Footbridge at Ex Harbour Road Sports Centre	82	Leq(30min)	when one documented complaint was received.	75	Possible reason: Action taken / to be taken: Remarks / Other Obs:	Breaking works next to the monitoring station under Contractor of HK/2009/02 was observed as the major noise contribution during monitoring. A repeat measurement was conducted to confirm result and reviewed the trend of previous noise monitoring and Contractor's working procedure. No construction work under EP-376/2009 was conducted by Contract HK/2012/08 around the concerned location during the time of measurement while breaking works next to the monitoring station under Contract HK/2009/02 was observed as the major noise contribution during monitoring. As such, the exceedance was considered as non-Project related under Contract HK/2012/08.

Ref. No.	Date	Time	Location	Measured TSP Level	Unit	Action Level	Limit Level	Follow-up action	
X_16A056	29-Aug-17	9:35	CMA5b- Pedestrian Plaza	**671.6**	1hr TSP (ug/m^3)	339.7	500	**Possible reason:**	TSP level potentially in relate to localized ambient condition affected by traffic and non-construction activity around the monitoring station.
								Action taken / to be taken:	Reviewed the trend of air quality measurement across monitoring stations. Analysis of contractor's working procedures.
								Remarks / Other Obs:	No construction works under EP-376/2009 was undertaken around the monitoring location on the monitoring date under Contractor of HK/2012/08 and no particular observation regarding air quality impact was observed during sampling. Nevertheless, non WDII-CWB Project construction activities and road traffic was observed opposite to the monitoring station on the monitoring date. Meanwhile, gardening and sweeping works conducted directly at the monitoring station by Pedestrian Plaza management office was observed across the monitoring period and would potentially contributed to the particulates level in the vicinity of the monitoring equipment. In view of the above, the exceedance was considered to be non-project related and potentially contributed by localized ambient condition affected by traffic and non-construction activity around the monitoring station. Nevertheless, the Contractor of HK/2012/08 was reminded to maintain regularly dust suppression measures for any potential dusty surface and dust generating operation around the concerned location to avoid any potential cumulative air quality impact.

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
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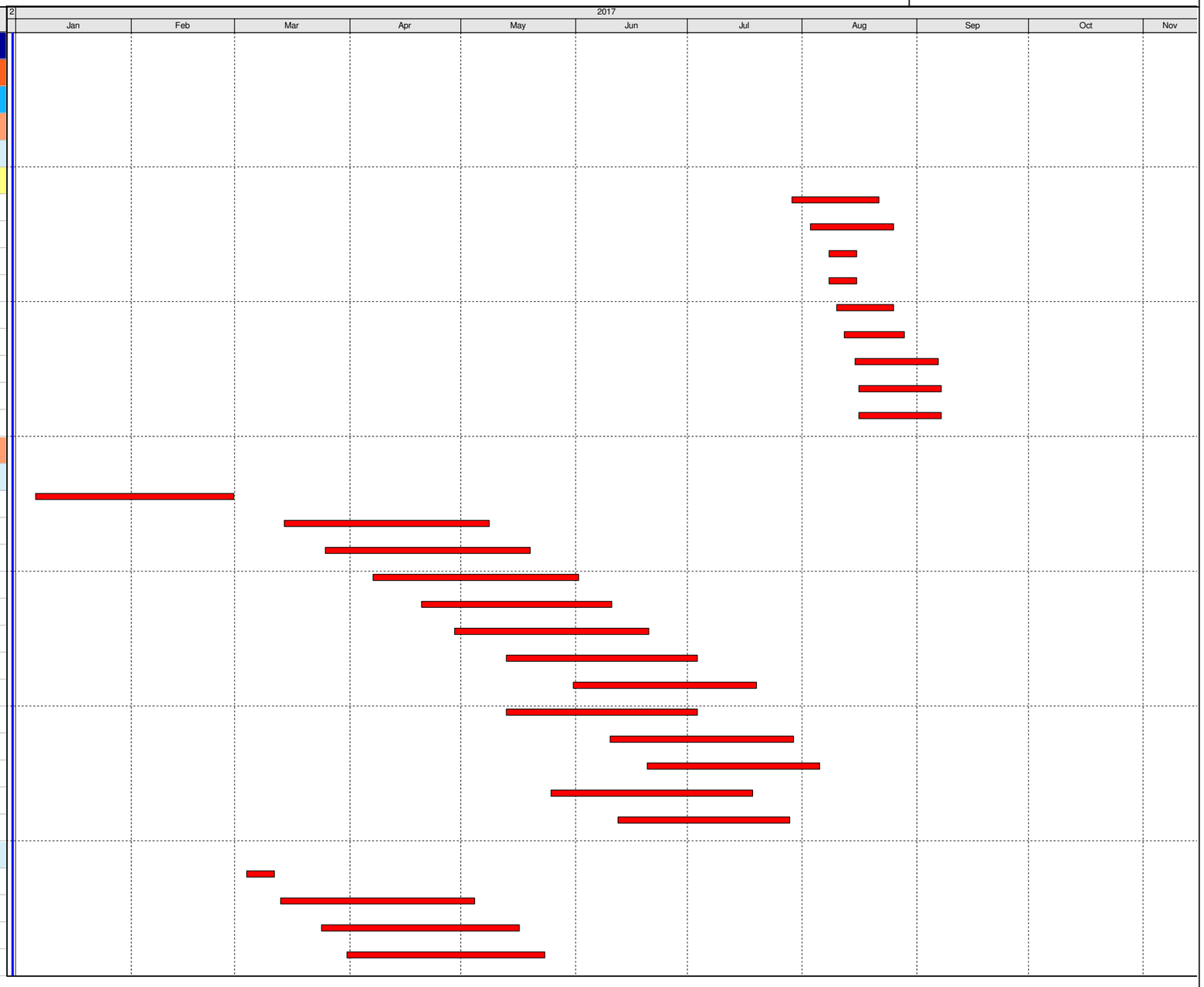
Appendix 10.1

Construction Programme of Individual Contracts

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

Activity ID	Activity Name	Remaining Dur	Early Start	Early Finish
HK/2012/08 Revised Works Programme Rev.9(DD 31 December 2016)				
Works for Section Completion				
Construction				
Section III - Road D11 & Part of Road P2, Area 4, Implement 1st Stage ITA				
Roadwork & Utilities				
Works after the Box Culvert Reinstatement				
SIII10300	Sec III - roadwork & utilities above box culvert K - storm water drain & subsoil drain	20	29-Jul-17	21-Aug-17
SIII10320	Sec III - roadwork & utilities above box culvert K - Watermain & Irrigation Mains	20	03-Aug-17	25-Aug-17
SIII10340	Sec III - roadwork & utilities above box culvert K - gas main and valve chamber	7	08-Aug-17	15-Aug-17
SIII10360	Sec III - roadwork & utilities above box culvert K - HEC cable duct and catchpit	7	08-Aug-17	15-Aug-17
SIII10380	Sec III - roadwork & utilities above box culvert K - sub-base	14	10-Aug-17	25-Aug-17
SIII10400	Sec III - roadwork & utilities above box culvert K - Road kerb	14	12-Aug-17	28-Aug-17
SIII10420	Sec III - roadwork & utilities above box culvert K - flexible pavement	20	15-Aug-17	06-Sep-17
SIII10440	Sec III - roadwork & utilities above box culvert K - Road Lighting, TCSS Ducts &Traffic Signs	20	16-Aug-17	07-Sep-17
SIII10480	Sec III - roadwork & utilities above box culvert K - lay footpath concrete paver/ pave footpath concrete	20	16-Aug-17	07-Sep-17
Section III A - Road A2, A4, A5, Area 11; Implement 2nd Stage ITA				
Roadwork & Utilities at CRIII/A1				
SIIIA10260	Sec III A - roadwork and utilities (Zone A1) - Backfill to pavement founding level	42	06-Jan-17	28-Feb-17
SIIIA10280	Sec III A - roadwork and utlities (Zone A1) - storm water drain & sub-soil drain	42	14-Mar-17	08-May-17
SIIIA10300	Sec III A - roadwork and utilities (Zone A1) - Fresh watermain & Irrigation Mains	42	25-Mar-17	19-May-17
SIIIA10320	Sec III A - roadwork and utilities (Zone A1) - Gas main	42	07-Apr-17	01-Jun-17
SIIIA10340	Sec III A - roadwork and utilities (Zone A1) - HEC	42	20-Apr-17	10-Jun-17
SIIIA10360	Sec III A - roadwork and utilities (Zone A1) - sub-base	42	29-Apr-17	20-Jun-17
SIIIA10380	Sec III A - roadwork and utilities (Zone A1) - road kerb	42	13-May-17	03-Jul-17
SIIIA10400	Sec III A - roadwork and utilities (Zone A1) - flexible pavement	42	31-May-17	19-Jul-17
SIIIA10420	Sec III A - roadwork and utilities (Zone A1) - construct u-channel	42	13-May-17	03-Jul-17
SIIIA10440	Sec III A - roadwork and utilities (Zone A1) - pave footpath concrete	42	10-Jun-17	29-Jul-17
SIIIA10460	Sec III A - roadwork and utilities (Zone A1) - Road Lighting, TCSS Ducts &Traffic Signs	40	20-Jun-17	05-Aug-17
SIIIA10480	Sec III A - roadwork and utilities (Zone A1) - lay footpath paving block	45	25-May-17	18-Jul-17
SIIIA10500	Sec III A - roadwork and utilities (Zone A1) - Road sign and road marking	40	12-Jun-17	28-Jul-17
Roadwork & Utilities at A2				
SIIIA10580	Sec III A - roadwork and utilities (Zone A2) - Backfill to pavement founding level	7	04-Mar-17	11-Mar-17
SIIIA10600	Sec III A - roadwork and utilities (Zone A2) - storm water drain & sub-soil drain	40	13-Mar-17	04-May-17
SIIIA10620	Sec III A - roadwork and utilities (Zone A2) - Fresh watermain & Irrigation Mains	40	24-Mar-17	16-May-17
SIIIA10640	Sec III A - roadwork and utilities (Zone A2) - Gas main	40	31-Mar-17	23-May-17



Data Date:
31-Dec-16

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

Works Programme for Utilities & Roadworks
(Ref. to DWP Rev.9)

Date	Revision	Checked	Approved
31-Dec-16	9		

Activity ID	Activity Name	Remaining Dur	Early Start	Early Finish
SIIIA10660	Sec III A - roadwork and utilities (Zone A2) - HEC	40	08-Apr-17	31-May-17
SIIIA10680	Sec III A - roadwork and utilities (Zone A2) - sub-base	40	19-Apr-17	07-Jun-17
SIIIA10700	Sec III A - roadwork and utilities (Zone A2) - road kerb	40	28-Apr-17	16-Jun-17
SIIIA10720	Sec III A - roadwork and utilities (Zone A2) - flexible pavement	50	10-May-17	08-Jul-17
SIIIA10740	Sec III A - roadwork and utilities (Zone A2) - construct u-channel	50	26-Apr-17	26-Jun-17
SIIIA10760	Sec III A - roadwork and utilities (Zone A2) - pave footpath concrete	40	08-May-17	23-Jun-17
SIIIA10780	Sec III A - roadwork and utilities (Zone A2) - Road Lighting, TCSS Ducts &Traffic Signs	40	17-May-17	04-Jul-17
SIIIA10800	Sec III A - roadwork and utilities (Zone A2) - lay footpath paving block	40	10-May-17	26-Jun-17
SIIIA10820	Sec III A - roadwork and utilities (Zone A2) - Road sign and road marking	40	22-May-17	08-Jul-17
Roadwork & Utilities at B				
SIIIA10840	Sec III A - roadwork and utilities (Zone B) - Backfill to pavement founding level	40	28-Feb-17	19-Apr-17
SIIIA10860	Sec III A - roadwork and utlities (Zone B) - storm water drain & sub-soil drain	40	05-Apr-17	26-May-17
SIIIA10880	Sec III A - roadwork and utilities (Zone B) - Fresh watermain & Irrigation Mains	40	10-Apr-17	01-Jun-17
SIIIA10900	Sec III A - roadwork and utilities (Zone B) - Gas main	40	10-Apr-17	01-Jun-17
SIIIA10920	Sec III A - roadwork and utilities (Zone B) - HEC	40	18-Apr-17	06-Jun-17
SIIIA10940	Sec III A - roadwork and utilities (Zone B) - sub-base	40	22-Apr-17	10-Jun-17
SIIIA10960	Sec III A - roadwork and utilities (Zone B) - road kerb	40	27-Apr-17	15-Jun-17
SIIIA10980	Sec III A - roadwork and utilities (Zone B) - flexible pavement	45	06-May-17	28-Jun-17
SIIIA11000	Sec III A - roadwork and utilities (Zone B) - construct u-channel	45	02-May-17	24-Jun-17
SIIIA11020	Sec III A - roadwork and utilities (Zone B) - pave footpath concrete	45	06-May-17	28-Jun-17
SIIIA11040	Sec III A - roadwork and utilities (Zone B) - Road Lighting, TCSS Ducts &Traffic Signs	45	12-May-17	05-Jul-17
SIIIA11060	Sec III A - roadwork and utilities (Zone B) - lay footpath paving block	45	10-May-17	03-Jul-17
SIIIA11080	Sec III A - roadwork and utilities (Zone B) - Road sign and road marking	45	17-May-17	10-Jul-17
Roadwork & Utilities at D				
SIIIA11090	Sec III A - roadwork and utlities (Zone D) - backfill to pavement founding level	25	10-Apr-17	13-May-17
SIIIA11100	Sec III A - roadwork and utilities (Zone D) - storm water drain & sub-soil drain	45	09-May-17	30-Jun-17
SIIIA11110	Sec III A - roadwork and utilities (Zone D) - Fresh watermain & Irrigation Mains	45	09-May-17	30-Jun-17
SIIIA11120	Sec III A - roadwork and utilities (Zone D) - Gas main	45	09-May-17	30-Jun-17
SIIIA11130	Sec III A - roadwork and utilities (Zone D) - HEC	45	09-May-17	30-Jun-17
SIIIA11140	Sec III A - roadwork and utilities (Zone D) - sub-base	45	25-May-17	18-Jul-17
SIIIA11150	Sec III A - roadwork and utilities (Zone D) - road kerb	45	05-Jun-17	27-Jul-17
SIIIA11160	Sec III A - roadwork and utilities (Zone D) - flexible pavement	45	14-Jun-17	05-Aug-17
SIIIA11170	Sec III A - roadwork and utilities (Zone D) - construct u-channel	45	09-Jun-17	01-Aug-17
SIIIA11180	Sec III A - roadwork and utilities (Zone D) - pave footpath concrete	45	12-Jun-17	03-Aug-17
SIIIA11190	Sec III A - roadwork and utilities (Zone D) - Road Lighting, TCSS Ducts &Traffic Signs	45	19-Jun-17	10-Aug-17
SIIIA11200	Sec III A - roadwork and utilities (Zone D) - lay footpath paving block	45	19-Jun-17	10-Aug-17
SIIIA11210	Sec III A - roadwork and utilities (Zone D) - road sign & road marking	45	26-Jun-17	17-Aug-17
Section V - Remaining At-Grade Road; Remove 2nd Stage ITA				
Roadwork & Utilities				
SV10020	Sec V - Roadwork & Utilities - Backfilling to pavement formation	20	30-Mar-17	26-Apr-17

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

Activity ID	Activity Name	Remaining Dur	Early Start	Early Finish
SV10040	Sec V - Roadwork & Utilities - Stormwater Drainage Works	45	21-Apr-17	15-Jun-17
SV10060	Sec V - Roadwork & Utilities - Sewerage Works	45	21-Apr-17	15-Jun-17
SV10080	Sec V - Roadwork & Utilities - Watermain & Irrigation Mains	45	21-Apr-17	15-Jun-17
SV10100	Sec V - Roadwork & Utilities - Gas Main	45	05-May-17	27-Jun-17
SV10120	Sec V - Roadwork & Utilities - HEC cable duct and drawpit	45	12-May-17	05-Jul-17
SV10140	Sec V - Roadwork & Utilities - Telecom cable duct and drawpit	45	18-May-17	11-Jul-17
SV10160	Sec V - Roadwork & Utilities - lay & compact sub-base	45	29-May-17	21-Jul-17
SV10180	Sec V - Roadwork & Utilities - construct road kerb	45	01-Jun-17	24-Jul-17
SV10200	Sec V - Roadwork & Utilities - flexible pavement	45	03-Jun-17	26-Jul-17
SV10220	Sec V - Roadwork & Utilities - footpath paving block	45	07-Jun-17	29-Jul-17
SV10240	Sec V - Roadwork & Utilities - concrete footpath	45	13-Jun-17	04-Aug-17
SV10260	Sec V - Roadwork & Utilities - construct surface channel	45	13-Jun-17	04-Aug-17
SV10280	Sec V - Roadwork & Utilities - Road Lighting, TCSS Ducts &Traffic Signs	45	15-Jun-17	07-Aug-17
Section IV - Slip Road 3				
Roadwork & Utilities (Remaining)				
SIV10020	Sec IV - Roadwork & Utilities at SR3 - Backfill to road formation	25	28-Mar-17	29-Apr-17
SIV10040	Sec IV - Roadwork & Utilities at SR3 - Sewerage Works	50	19-Apr-17	19-Jun-17
SIV10060	Sec IV - Roadwork & Utilities at SR3 - Stormwater Drainage Works and Subsoil drain	50	09-May-17	07-Jul-17
SIV10080	Sec IV - Roadwork & Utilities at SR3 - Fresh watermain & Irrigation Mains	50	12-May-17	11-Jul-17
SIV10100	Sec IV - Roadwork & Utilities at SR3 - Salt water main	50	18-May-17	17-Jul-17
SIV10120	Sec IV - Roadwork & Utilities at SR3 - Gas main	50	24-May-17	22-Jul-17
SIV10140	Sec IV - Roadwork & Utilities at SR3 - HEC cable duct and drawpit	50	24-May-17	22-Jul-17
SIV10160	Sec IV - Roadwork & Utilities at SR3 - Telcom cable duct and drawpit	50	24-May-17	22-Jul-17
SIV10180	Sec IV - Roadwork & Utilities at SR3 - lay and compact sub-base	50	31-May-17	28-Jul-17
SIV10200	Sec IV - Roadwork & Utilities SR3 - lay road kerb	50	06-Jun-17	03-Aug-17
SIV10220	Sec IV - Roadwork & Utilities at SR3 - Pave flexible pavement	50	12-Jun-17	09-Aug-17
SIV10240	Sec IV - Roadwork & Utilities at SR3 - Road Lighting, TCSS Ducts &Traffic Signs	50	17-Jun-17	15-Aug-17