



中國港灣工程有限責任公司

(於中華人民共和國註冊成立之有限責任公司)

香港代表：振華工程有限公司

CHINA HARBOUR ENGINEERING COMPANY LIMITED

(Incorporated in People's Republic of China with limited liability)

HONG KONG REPRESENTATIVE: ZHEN HUA ENGINEERING CO., LTD.

Date : 19 March 2020
Our Ref. : CHEC317/OUT/2020/03/04.05/000674

By Hand

The Project Manager's Representative

AECOM Asia Company Limited

8/F Grand Central Plaza Tower 2,
138 Shatin Rural Committee Road
Shatin, Hong Kong.

Attn : Mr. Yu Cho Yuen, Jason

Dear Sir,

Contract No. HY/2019/01

**Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities –
Phase 2 and Other Works**

EP Condition 5.4 – Monthly EM&A Report (February 2020)

Pursuant to the Condition 5.4 of the EP-353/2009/K, we are pleased to submit one soft copy and three hard copies of the certified Monthly EM&A Report for February 2020 for your on-ward submission.

Thank you for your kind attention.

Yours faithfully,

For and on behalf of

China Harbour Engineering Co. Ltd.

Johnason Ko
Construction Manager

JK/MW/csh

Encl.

c.c The Project Manager for the Contract (CE1/SD, HyD) Attn : Mr. Joseph Chung (w/e)



A900692

香港北角英皇道 370-374 號振華大廈 19 樓

19/F., China Harbour Building, 370-374 King's Road, North Point, Hong Kong.

Tel: (852) 2887 8118

Fax: (852) 2512 0427

Website: <http://www.checkk.com>

18 March 2020

By Fax (3748 8900) and By Post

AECOM Asia Co. Ltd.
The PRE's Office
550 Cheung Tung Road, Lantau, Hong Kong

Attention: Mr. Jason Yu

Dear Sir,

**Re: Agreement No. CE 48/2011 (EP)
Environmental Project Office for the
HZMB Hong Kong Link Road, HZMB Hong Kong Boundary Crossing Facilities, and
Tuen Mun-Chek Lap Kok Link – Investigation**

**Contract No. HY/2019/01
HZMB HKBCF – Phase 2 and Other Works
Monthly EM&A Report for February 2020**

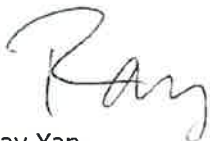
Reference is made to the Environmental Team's submission of Monthly EM&A Report for February 2020 certified by the ET Leader (ET's ref.: "MCL/ED/0178/2020/C" dated 18 February 2020) and provided to us via e-mail on 18 February 2020.

We are pleased to inform you that we have no further comments on the captioned submission. We write to verify the captioned submission in accordance with Condition 5.4 of the Environmental Permit No. EP-353/2009/K (the EP).

The ET Leader is reminded that it is the ET's responsibility to ensure the report be timely submitted to the Director of Environmental Protection and the reported information be true, valid and correct as per Conditions 5.4 and 5.5 of the EP respectively.

Thank you very much for your attention and please feel free to contact the undersigned should you require further information.

Yours faithfully,
For and on behalf of
Ramboll Hong Kong Limited



Ray Yan
Independent Environmental Checker
HZMB HKBCF

c.c.	HyD	Attn.: Mr. Andy Ho	(By Fax: 3188 6614)
	HyD	Attn.: Mr. Harry Louie	(By Fax: 3188 6614)
	Fugro	Attn.: Mr. Calvin Leung	(By Fax: 2450 6138)
	CHEC	Attn.: Mr. Johnason Ko	(By Fax: 2887 3104)

Internal: DY, YH, MY, ENPO Site



FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre
5 Lok Yi Street, Tai Lam
Tuen Mun, NT
Hong Kong

Date 18 March 2020

Our Ref. MCL/ED/0178/2020/C

Ramboll Hong Kong Limited
21/F, BEA Harbour View Centre,
56 Gloucester Road,
Wan Chai, Hong Kong

BY EMAIL

Attn.: Mr. Ray Yan, Independent Environmental Checker

Dear Sir,

**EP Condition 5.4 – Monthly EM&A Report for
Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Phase 2 and
Other Works (Contract No. HY/2019/01)**

Pursuant to Condition 5.4 of the Environmental Permit (EP-353/2009K) for the captioned project, we hereby submit the certified Monthly EM&A Report for February 2020 for your verification.

Thank you for your attention, should there be any comments or queries, please contact our Mr. Cyrus Lai at 3565-4442 or the undersigned at 3565-4441.

Yours faithfully,
for and on behalf of
FUGRO TECHNICAL SERVICES LIMITED



Calvin Leung
Environmental Team Leader

c.c. AECOM Attn: Mr. Jason Yu, Mr. Winston Wong, Mr. Gordon Kok
 Ramboll Attn: Mr. Y.H. Hui, Mr. Manson Yeung
 CHEC Attn: Mr. Marko Chan, Mr. Matthew Wu



Monthly EM&A Report (February 2020)

0002/20/ED/0015 04 | 29 February 2020

Contact No. HY/2019/01 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

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Client Address	China Harbour Building, 370-4 King's Road, North Point Hong Kong
Client Contact	Matthew Wu

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Environmental Team

Initials	Name	Role	Signature
MP	Calvin M.P. Leung	Environmental Team Leader	
CY	Cyrus C.Y. Lai	Senior Environmental Consultant	
KH	Toby K.H. Wan	Assistant Environmental Consultant	

EXECUTIVE SUMMARY

This Monthly Environmental Monitoring and Audit (EM&A) Report is prepared for Contract No. HY/2019/01 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works" (hereafter referred to as "the Contract") for the Highways Department of Hong Kong Special Administrative Region (HKSAR). Contract No. HY/2019/01 was awarded to China Harbour Engineering Co. Limited and Fugro Technical Services Limited (FTS) was appointed as the Environmental Team (ET) by the Contractor.

Contract No. HY/2019/01 is part of the "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities" (HZMB HKBCF) Project which is a "Designated Project" under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) and for which an EIA Report (Register No. AEIAR-145/2009) was prepared and approved. The current Environmental Permit (EP) for HKBCF, namely No. EP-353/2009/K, was issued on 11 April 2016. These documents are available through the EIA Ordinance Register. Commencement of the Contract took place on 4 December 2019 and the construction site preparation works commenced in early February 2020.

Fugro Technical Services Limited (FTS) has been appointed by the Contractor to implement the Environmental Monitoring & Audit (EM&A) programme for the Contract in accordance with the Updated EM&A Manual for HKBCF (Version 1.0) and will be providing environmental team services for the Contract.

This is the 1st Monthly EM&A Report for the Contract which summaries findings of the EM&A programme during the reporting period from 5 February 2020 to 29 February 2020.

Environmental Monitoring and Audit Progress

The monthly EM&A programme was undertaken in accordance with the Updated EM&A Manual for HKBCF (Version 1.0). It should be noted that the air quality and noise monitoring works for the Contract are covered by Contract No. HY/2019/01 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works". The ET of the Contract or another ET of the HZMB project is required to conduct impact air quality monitoring at AMS6 and dolphin monitoring as part of EM&A programme if the impact air quality monitoring work and the post-construction dolphin monitoring is no longer covered by Contract No. HY/2011/03 and Contract No. HY/2013/04 respectively. However, this is subject to ENPO's final decision on which ET should carry out the monitoring work at these stations.

Breaches of Action and Limit Levels

No Action and Limit Level exceedance was recorded for air quality monitoring in the reporting month. Also, no Action and Limit Level exceedance was recorded for construction noise monitoring in the reporting month.

Complaint Log

No complaints were received in the reporting period.

Notifications of any Summons and Successful Prosecutions

No notifications of summons and prosecutions were received in the reporting period.

Reporting Change

There were no reporting changes during the reporting month.

Future Key Issues

The main works will be anticipated in the next reporting period are as follow:

- Site Fence at South Public Transport Interchanges (SPTI) (land-based);
- Recessed Cover near building 035 (land-based);
- UPS room at South Public Transport Interchanges (SPTI) and North Public Transport Interchanges (NPTI) (land-based);
- Minor Works near building 062 (land-based);
- Site hoarding at Vehicle Clearance Plaza (VCP) (land-based);
- Excavation at Vehicle Clearance Plaza (VCP) (land-based);
- Road & Drain works at South Public Transport Interchanges (SPTI) and North Public Transport Interchanges (NPTI) (land-based);
- Vertical access at Passenger Clearance Building (PCB) (land-based);
- Site office renovation at WA3 (land-based).

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1. INTRODUCTION

1.1 Background

- 1.1.1 Fugro Technical Services Limited was commissioned by China Harbour Engineering Co. Limited (also referred to as "the Contractor") to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for Contract No. HY/2019/01 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works".
- 1.1.2 Contract No. HY/2019/01 is part of the "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities" (HZMB HKBCF) Project which is a "Designated Project" under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) and for which an EIA Report (Register No. AEIAR-145/2009) was prepared and approved. The current Environmental Permit (EP) for HKBCF, namely No. EP-353/2009/K, was issued on 11 April 2016. These documents are available through the EIA Ordinance Register. The general layout of the Project area is shown in **Figure 1**. Commencement of the Contract took place on 4 December 2019 and the construction site preparation works commenced in early February 2020.
- 1.1.3 This is the 1st Monthly EM&A report to document the findings of site inspection activities and EM&A programme carried out by the Contractor of Contract No. HY/2019/01 from 5 February 2020 to 29 February 2020 (reporting period) and is submitted to fulfil Condition 5.4 of the EP.

1.2 Project Description

- 1.2.1 The works to be executed under Contract No. HY/2019/01 include the following major items:
- Landscaping and establishment works;
 - Irrigation system and associated drainage pumping system and facilities;
 - Erection and installation in the Passenger Clearance Building;
 - Public transport interchange (PTI) public toilet, satellite refuse collection point (RCP) and observation guard booths;
 - PTI cross boundary shuttle (CBS) / cross boundary coach (CBC) lanes and covered walkway;
 - Vehicle clearance plazas (VCP) vehicle kiosks and associate automatic vehicle clearance supporting system (AVCSS).

1.3 Project Organization

1.3.1 The Project Organization structure is shown in **Appendix B**. The key personnel contact names and numbers are summarized in **Table 1.1**.

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone
Engineer or Engineer's Representative (AECOM Asia Co. Ltd.)	Senior Resident Engineer	Mr. Jason Yu	3748 8903
	Resident Engineer	Mr. Winston Wong	3748 8918
	Resident Engineer	Mr. Gordon Kok	3748 8967
Environmental Project Office / Independent Environmental Checker (Ramboll Hong Kong Limited)	Environmental Project Office Leader	Mr. Y. H. Hui	3465 2888
	Independent Environmental Checker (IEC)	Mr. Ray Yan	3465 2836
	Environmental Site Supervisor	Mr. Manson Yeung	9700 6767
Contractor (China Harbour Engineering Co. Ltd)	Environmental Manager	Mr. Marko Chan	9427 2879
	Environmental Officer	Mr. Matthew Wu	6076 2675
Environmental Team (Fugro Technical Services Limited)	Environmental Team Leader (ETL)	Mr. Calvin Leung	3565 4441

1.4 Construction Programme and Activities

1.4.1 The site layout plan of the Contract is shown in **Figure 1**.

1.4.2 The construction programme of this Contract is shown in **Appendix A**.

1.5 Works undertaken during the month

1.5.1 The main construction works carried out in the reporting period were as follow:

- Site Fence at SPTI (land-based);
- Recessed Cover near building 035 (land-based);
- UPS room at SPTI and NPTI (land-based);
- Minor Works near building 062 (land-based);
- Site hoarding VCP (land-based);
- Excavation at VCP (land-based);
- Road & Drain works at SPTI and NPTI (land-based);
- Vertical access at PCB (land-based);
- Site office renovation at WA3 (land-based).

1.6 Status of Environmental Licences, Notification and Permits

1.6.1 A summary of the relevant permits, licenses and/or notifications on environmental protection for this Contract is presented in **Table 1.2**.

Table 1.2 Environmental Licenses, Notification and Permits Summary

Permit/ Notification/ License	Reference No	Valid From	Valid Till
Environmental Permit	EP-353/2009/K	11-Apr-16	Not Applicable
Notification pursuant to Air Pollution (Construction Dust) Regulation	451380	28-Nov-19	Not Applicable
Billing Account for Disposal of C&D waste	A/C No. 7036097	18-Dec-19	Not Applicable
Chemical Waste Producer Registration	5296-951-C1186-32	6-Feb-20	Not Applicable
Water Discharge License	451376	TBA	Under Application
Construction Noise Permit	TBA	TBA	Under Application

2. AIR QUALITY

2.1 Monitoring Requirement

2.1.1 In accordance with the Contract Specific EM&A Manual, 1-hour and 24-hour Total Suspended Particulates (TSP) levels should be measured at the designated air quality monitoring stations to indicate the impacts of construction dust on air quality. Impact 1-hour TSP monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was carried out for at least once every 6 days.

2.2 Monitoring Equipment

2.2.1 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) deployed at the designated monitoring stations. The HVS shall meet all the requirements of the EM&A Manual.

2.2.2 A portable direct reading dust meter was used to carry out the 1-hour TSP monitoring.

2.2.3 The model of the air quality monitoring equipment used is summarized in **Table 2.1**.

Table 2.1 Air Quality Monitoring Equipment

Item	Location	Brand	Model	Equipment	Serial No.
1	AMS2	Tisch	TE-5170 (TSP)	High Volume Sampler	HVS-01
			TE-300-310X	-Mass Flow Controller	3002
			TE-5005X	-Blower Motor Assembly	4607
			TE-5007X	-Mechanical Timer	5596
			TE-5009X	-Continuous Flow Recorder	5752
2	AMS3C	Tisch	TE-5170 (TSP)	High Volume Sampler	HVS-02
			TE-300-310X	-Mass Flow Controller	3000
			TE-5005X	-Blower Motor Assembly	4610
			TE-5007X	-Mechanical Timer	5597
			TE-5009X	-Continuous Flow Recorder	5756
3	AMS7B	Tisch	TE-5170 (TSP)	High Volume Sampler	HVS-03
			TE-300-310X	-Mass Flow Controller	2792
			TE-5005X	-Blower Motor Assembly	3802
			TE-5007X	-Mechanical Timer	5781
			TE-5009X	-Continuous Flow Recorder	5483
4		Tisch	TE-5025A	HVS Sampler Calibrator	438320/2456
5		Sibata	Model LD-3B	Sibata Portable TSP Monitors	296094
6	597310				
7	466711				
			Model LD-5R		

2.3 Monitoring Methodology for HVS

2.3.1 The following guidelines were adopted during the installation of HVS:

- Sufficient support is provided to secure the samplers against gusty wind.
- No two samplers are placed less than 2 meters apart.
- The distance between the sampler and an obstacle, such as buildings, is at least twice the height that the obstacle protrudes above the sampler.
- A minimum of 2 meters of separation from walls, parapets and penthouses is required for rooftop samples.
- A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
- No furnaces or incineration flues are nearby.
- Airflow around the samplers is unrestricted.
- The samplers are more than 20 meters from the drip line.
- Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.
- Permission must be obtained to set up the samplers and to obtain access to the monitoring stations.
- A secured supply of electricity is needed to operate the samplers.

2.3.2 Prior to the commencement of the dust sampling, the flow rate of the high volume sampler shall be properly set. The power supply should be checked to ensure the proper functioning of the sampler. The sampler is recommended to be operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air monitoring station.

2.3.3 The filter holding frame should be removed by loosening the four nuts and placing carefully a weighted and conditioned filter at the centre with the stamped number upwards on a supporting screen.

2.3.4 The filter should be aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. The filter holding frame should be tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.

2.3.5 A programmed timer should be used to control the duration of operation. Information should be recorded on the record sheet, which included the starting time, the weather condition and the filter number.

2.3.6 After sampling process is finished, the filter should be removed and sent to the laboratory for weighting. The elapsed time should also be recorded.

2.3.7 All filters should be equilibrated in a conditioning environment for 24 hours before weighting. The conditioning environment temperature should be between 25°C and 30°C and not vary by more than $\pm 3^\circ\text{C}$; the relative humidity (RH) should be $< 50\%$ and not vary by more than $\pm 5\%$. A convenient working RH is 40%.

2.4 Maintenance and Calibration for HVS

- 2.4.1 The high volume motors and their accessories should be properly maintained, including routine motor brushes replacement and electrical wiring checking, to ensure that the equipment and a continuous power supply were in good working condition.
- 2.4.2 Initial calibration of dust monitoring equipment shall be conducted upon installation and thereafter at fortnightly intervals. The transfer standard shall be traceable to the internationally recognized primary standard and be calibrated annually. The calibration certificate for the HVS is provided in **Appendix D**.

2.5 Monitoring Methodology for Direct Reading Dust Meter

- 2.5.1 Portable Laser Particle Photometer Monitors should be operated in accordance with the Manufacturer's instruction Manual as below:
- a) Pulling up the air sampling inlet cover
 - b) Changing the Mode 0 to BG
 - c) Pressing Start/Stop switch
 - d) Turning the knob to SENSI.ADJ and press it
 - e) Pressing Start/Stop switch again
 - f) Returning the knob to the position MEASURE slowly
 - g) Pressing the timer set switch to set measuring time
 - h) Removing the cap and start the measurement

2.6 Maintenance and Calibration for Direct Reading Dust Meter

- 2.6.1 ET shall submit sufficient information to the IEC to prove that the instrument is capable of achieving comparable results to the HVS. The instrument should also be calibrated regularly, and the 1-hour sampling shall be determined periodically by the HVS to check the validity and accuracy of the results measured by direct reading method. The calibration certificate for the direct reading dust meter is provided in **Appendix D**.

2.7 Monitoring Locations

- 2.7.1 In accordance with the Contract Specific EM&A Manual, four air quality monitoring locations, namely AMS2, AMS3C, AMS6 and AMS7B were set up at the proposed locations. AMS2, AMS3C and AMS7B are covered by Contract No. HY/2019/01 "Hong Kong-Zhuhai- Macao Bridge Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works"
- 2.7.2 AMS6 is covered by Contract No. HY/2011/03 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road (HZMB HKLR) – Section between Scenic Hill and HKBCF". The ET of the Contract or another ET of the HZMB project is required to conduct impact air quality monitoring at AMS6 as part of EM&A programme if this air quality monitoring station is no longer covered by Contract No. HY/2011/03.
- 2.7.3 The most updated locations are summarized in **Table 2.2** and the locations of the air monitoring stations shown in **Figure 2**.

Table 2.2 Air Quality Monitoring Location

Monitoring Station	Location
AMS2	Tung Chung Development Pier
AMS3C	Ying Tung Estate Market Rooftop
AMS6	Dragonair / CNAC (Group) Building (HKIA)
AMS7B	Third Runway Site Office

Remarks: The ET of this Contract should conduct impact air quality monitoring at station AMS6 listed in the table as part of EM&A programme according to latest notification from ENPO when the monitoring station is no longer covered by another ET of the HZMB project.

2.8 Monitoring Results

- 2.8.1 The schedule of air quality monitoring in reporting month is provided in **Appendix E**.
- 2.8.2 No Action / Limit Level exceedance was recorded for 1-hr and 24-hr TSP at AMS2, AMS3C and AMS7B.
- 2.8.3 The monitoring results for AMS6 are reported in the monthly EM&A Reports prepared for Contract No. HY/2011/03.
- 2.8.4 The weather conditions during the monitoring are provided in **Appendix K**.
- 2.8.5 The monitoring data of 1-hr TSP and 24-hr TSP are summarized in **Table 2.3**. Detailed monitoring data are presented in **Appendix F**.

Table 2.3 Summary of Air Quality Monitoring Results

Monitoring Station	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
1-hour TSP				
AMS2	99	61-179	374	500
AMS3C	91	53-180	368	
AMS7B	89	61-144	370	
24-hour TSP				
AMS2	44	22-65	176	260
AMS3C	40	17-67	167	
AMS7B	51	20-77	183	

- 2.8.6 The Event and Action Plan for air quality is given in **Appendix H**.
- 2.8.7 The wind data obtained from the on-site wind station during the reporting period is provided in **Appendix G**.

3. NOISE

3.1 Monitoring Requirement

3.1.1 In accordance with the Contract Specific EM&A Manuals, L_{eq} (30min) monitoring is conducted for at least once a week during the construction phase between 0700 and 1900 on normal weekdays at the designated monitoring locations.

3.2 Monitoring Equipment

3.2.1 The sound level meter used in noise monitoring shall comply with the International Electrotechnical Commission Publication (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications as referred to in the Technical Memorandum issued under the Noise Control Ordinance (NCO).

3.2.2 Sound level calibrator shall be used for the on-site calibration of the meter. This calibrator complies with the IEC Publication 942 (1988) Class 1 and ANSI S1.40 - 1984. Noise measurements were only accepted to be valid if the calibration levels from before and after the measurement agree to within 1.0 dB(A).

3.2.3 Measurements shall be recorded to the nearest 0.1dB(A). Sound level meters are programmed to measure A-weighted equivalent continuous sound pressure level at 30-minute intervals between 0700 and 1900 on normal weekdays at least once a week when construction activities are underway.

3.2.4 The model of the noise monitoring equipment used is summarized in **Table 3.1**.

Table 3.1 Construction Noise Monitoring Equipment

Item	Brand	Model	Equipment	Serial No.
1	Casella	CEL-63X Series	Integrating Sound Level Meter	1488279
2	Casella	CEL-63X Series	Integrating Sound Level Meter	1488289
3	Casella	CEL-120/1	Calibrator	2383886
4	Casella	CEL-120/1	Calibrator	4358250
5	Benetech	GM816	Wind Speed Anemometer	N/A

3.3 Monitoring Parameters and Frequency

3.3.1 The parameters and frequencies of impact noise monitoring is summarized in **Table 3.2**.

Table 3.2 Monitoring Parameters and Frequencies of Noise Monitoring

Parameter	Frequency
L_{eq} (30min) L_{10} and L_{90} will be recorded for reference	At each station at 0700-1900 hours on normal weekdays at a frequency of once a week

3.4 Monitoring Methodology

3.4.1 Noise measurement should be conducted as the following procedures:

- Free field measurements was made at monitoring location M-N3. A correction of +3 dB(A) shall be made to the free field measurements.
- The battery condition should be checked to ensure good functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time should set as follow:
 - (i) Frequency weighting: A
 - (ii) Time weighting: Fast
 - (iii) Measurement time: continuous 5 minutes interval
- Prior to and after noise measurement, the meter shall be calibrated using the calibrator for 94.0 dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB(A), the measurement will be considered invalid and repeat of noise measurement is required after re-calibration or repair of the equipment.
- The wind speed at the monitoring station shall be checked with the portable wind meter. Noise monitoring should be cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.
- Noise measurement should be paused during periods of high intrusive noise if possible and observation shall be recorded when intrusive noise is not avoided.
- At the end of the monitoring period, the L_{eq} , L_{10} and L_{90} should be recorded. In addition, site conditions and noise sources should also be recorded on a standard record sheet.

3.5 Maintenance and Calibration

3.5.1 Maintenance and calibration procedures should also be carried out, including:

- The microphone head of the sound level meter and calibrator should be cleaned with a soft cloth at quarterly intervals.
- The sound level meter and calibrator should be calibrated annually by a HOKLAS laboratory or the manufacturer.
- The calibration certificates for noise monitoring equipment are provided in **Appendix D**.

3.6 Monitoring Locations

- 3.6.1 In accordance with the Contract Specific EM&A Manual, two noise monitoring locations, namely NMS2 and NMS3C are covered under Contract No. HY/2019/01 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works.
- 3.6.2 Due to rejection from Ho Yu College (NMS3) for setting up a noise monitoring station at their school, an alternative location at site boundary of the site office area at Works Area WA2 (NMS3B) is proposed. Impact noise monitoring has been relocated from NMS3B to Ying Tung Estate Market Rooftop (NMS3C) on 20 August 2018 under Contract No. HY/2013/04. The same baseline and Action and Limit levels for noise, as derived from the baseline monitoring data recorded at Ho Yu College, are adopted for this alternative noise monitoring location.
- 3.6.3 The most updated locations are summarized in **Table 3.3** and the locations of the noise monitoring stations shown in **Figure 3**.

Table 3.3 Construction Noise Monitoring Location

Monitoring Station	Location
NMS2	Seaview Crescent
NMS3C	Ying Tung Estate Refuse Collection Point

Remark: The Limit Levels for schools will be applied for this alternative monitoring location at NMS3C.

3.7 Monitoring Results

- 3.7.1 The schedule of noise monitoring in reporting month is provided in **Appendix E**.
- 3.7.2 No raining and wind with speed over 5 m/s was observed during noise monitoring according to the onsite observation. The weather conditions during the monitoring month are provided in **Appendix K**.
- 3.7.3 The noise monitoring data are summarized in **Table 3.4**. Detailed monitoring data are presented in **Appendix F**.

Table 3.4 Summary of Construction Noise Monitoring Results

Time Period	Noise Monitoring Stations	L_{eq} (30min) dB(A) (Range)	Action Level	Limit Level dB(A)
0700-1900 hrs on normal weekdays	NMS2	60-63	When one documented complaint is received	75
	NMS3C	62-67		70/65

Remark:

NMS2: Façade Measurement

NMS3C: Free-field measurement (+3 dB(A) correction has been applied), reduction to 65dB(A) during school examination periods will be applied.

- 3.7.4 No Action / Limit Level exceedance of location NMS2 and NMS3C was recorded for construction noise in the reporting month.
- 3.7.5 During the monitoring month, at NMS2, non-project related construction activities at Ying Tung Estate was observed. At NMS3C, road traffic along the Ying Tung Road and non-project related construction activities at the nearby construction site was observed.
- 3.7.6 School calendar of Ho Yu College was checked against noise monitoring days at NMS3C.
- 3.7.7 The Action and Limit Levels for noise impact monitoring have been set and are presented in **Appendix C**.
- 3.7.8 The Event and Action Plan for noise is given in **Appendix H**.

4. ECOLOGY MONITORING

4.1 Monitoring Requirements

- 4.1.1 All marine-based construction activities for the HKBCF project were completed in January 2019. No marine-based construction activities were required under this Contract.
- 4.1.2 The ecological monitoring works for the HKBCF project are now covered by Contract No. HY/2013/04 "Hong Kong-Zhuhai-Macao-Bridge HKBCF – Infrastructure Works Stage II (Southern Portion)". The ET of the Contract or another ET of the HZMB project is required to conduct post-construction dolphin monitoring at 24 transects as part of EM&A programme if these transects are no longer covered by Contract No. HY/2013/04.

4.2 Monitoring Locations

- 4.2.1 The survey shall follow the pre-set and fixed transect lines in the two areas defined by Agriculture, Fisheries and Conservation Department (AFCD) as: Northeast Lantau survey area; and Northwest Lantau survey area. The details of the monitoring locations and the survey methods are covered in the monthly EM&A Reports prepared by Contract No. HY/2013/04.

4.3 Monitoring Results

- 4.3.1 The dolphin survey results for all transects are reported in the monthly EM&A Reports prepared by Contract No. HY/2013/04.
- 4.3.2 The Action and Limit Levels for Chinese White Dolphin Monitoring are provided in **Table 4.1** & **Table 4.2**.

Table 4.1 Action and Limit Levels for Chinese White Dolphin Monitoring – Approach to Define Action Level (AL) and Limit Level (LL)

	North Lantau Social Cluster	
	NEL	NWL
Action Level	(STG < 70% of baseline) & (ANI < 70% of baseline)	(STG < 70% of baseline) & (ANI < 70% of baseline)
Limit Level	[(STG < 40% of baseline) & (ANI < 40% of baseline)] AND [(STG < 40% of baseline) & (ANI < 40% of baseline)]	

Remark: For North Lantau Social Cluster, action level will be trigger if either NEL or NWL fall below the criteria; limit level will be triggered if both NEL and NWL fall below the criteria.

Table 4.2 Derived Value of Action Level (AL) and Limit Level (LL) for Chinese White Dolphin Monitoring

	North Lantau Social Cluster	
	NEL	NWL
Action Level	(STG < 4.2) & (ANI < 15.5)	(STG < 6.9) & (ANI < 31.3)
Limit Level	[(STG < 2.4) & (ANI < 8.9)] AND [(STG < 3.9) & (ANI < 17.9)]	

- 4.3.3 If exceedance(s) at these transects is/are recorded by the ET of the Contract or referred by the other ET under the HZMB project to the Contract, the ET of the Contract will carry out an investigation and findings will be reported in the monthly EM&A Report.
- 4.3.4 The event and action plan is provided in **Appendix H**.

5. SITE INSPECTION AND AUDIT

5.1 Site Inspection

- 5.1.1 Site audits were carried out by ET on weekly basis to monitor the implementation of proper environmental management practices and mitigation measures in the Project site.
- 5.1.2 In the reporting month, four site inspections were carried out on 4, 12, 19 and 26 February 2020. Site inspection on 4 February 2020 was not cover in the construction period.
- 5.1.3 No monitoring and audit of landscape and visual mitigation measures were implemented as no landscape works were conducted during the reporting month.
- 5.1.4 No outstanding issues were reported during the reporting month. Details of observations recorded during the site inspections are summarized in **Appendix M**.

5.2 Advice on the Solid and Liquid Waste Management Status

- 5.2.1 The Contractor registered as a chemical waste producer for the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting.
- 5.2.2 The monthly summary of waste flow table is detailed in **Appendix I**.
- 5.2.3 If off-site disposal is required, the excavated marine mud from the land-based works shall be disposed of at the designated disposal sites within Hong Kong as allocated by the Marine Fill Committee or other locations as agreed by the Director. The Contractor shall ensure no spilling and overflowing of materials during loading / unloading / transportation is allowed.
- 5.2.4 The Contractor was reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packing, Labelling and Storage of Chemical Waste.

6. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

6.1 Environmental Exceedance

- 6.1.1 No Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at station AMS2, AMS3C and AMS7B in the reporting period.
- 6.1.2 Summary of Action and Limit Level exceedance of 1-hour TSP level and 24-hour TSP level at AMS6 shall be referred to the monthly EM&A report prepared by Contract No. HY/2011/03.

6.2 Complaints, Notification of Summons and Prosecution

- 6.2.1 No environmental complaint, notification of summons and successful prosecution were received in the reporting month.
- 6.2.2 Cumulative complaint log, summaries of complaints, notification of summons and successful prosecutions are presented in **Appendix L**.

7. IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURE

7.1 Implementation Status

The Contractor had implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EP and EM&A Manuals. The implementation status of the environmental mitigation measures during the reporting period is summarized in **Appendix J**.

8. FUTURE KEY ISSUES

8.1 Construction Programme for the Next Month

- Site Fence at SPTI (land-based);
- Recessed Cover near building 035 (land-based);
- UPS room at SPTI and NPTI (land-based);
- Minor Works near building 062 (land-based);
- Site hoarding VCP (land-based);
- Excavation at VCP (land-based);
- Road & Drain works at SPTI and NPTI (land-based);
- Vertical access at PCB (land-based);
- Site office renovation at WA3 (land-based).

8.2 Key Issues for the Coming Month

8.2.1 Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, waste management and landscape and visual impact issues.

8.3 Monitoring Schedules for the Next Month

8.3.1 The tentative schedule for environmental monitoring in the coming month is provided in **Appendix E**.

9. CONCLUSION AND RECOMMENDATION

9.1 Conclusions

- 9.1.1 1-hour TSP and 24-hour TSP impact monitoring at AMS2, AMS3C and AMS7B were carried out in the reporting month, no Action / Limit Level exceedance was recorded during the period.
- 9.1.2 Summary of Action and Limit Level exceedance of 1-hour TSP level and 24-hour TSP level at AMS6 shall be referred to the monthly EM&A report prepared by Contract No. HY/2011/03.
- 9.1.3 Construction noise monitoring were carried out in the reporting month, no Action / Limit Level exceedance was recorded during the period.
- 9.1.4 Four environmental site inspections were carried out in the reporting month. Recommendations on mitigation measures for chemical and waste management were given to the Contractor for remediating the deficiencies identified during the site inspections.
- 9.1.5 Referring to the Contractor's information, no environmental complaint, notification of summons and successful prosecution was received in the reporting month.

9.2 Comment and Recommendations

- 9.2.1 The recommended environmental mitigation measures, as proposed in the EIA reports and EM&A Manuals shall be effectively implemented to minimize the potential environmental impacts from the Project. The EM&A programme would effectively monitor the environmental impacts generated from the construction activities and ensure the proper implementation of mitigation measures.
- 9.2.2 According to the environmental site inspections performed in the reporting month, the following recommendations were provided:

Air Quality Impact

- No specific observation was identified in the reporting month.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- Stagnant water should be removed.

Chemical and Waste Management

- The opening of drip tray should be plugged to prevent chemical leakage.

Landscape and Visual Impact

- No specific observation was identified in the reporting month.

Permit/ Licenses

- No specific observation was identified in the reporting month.

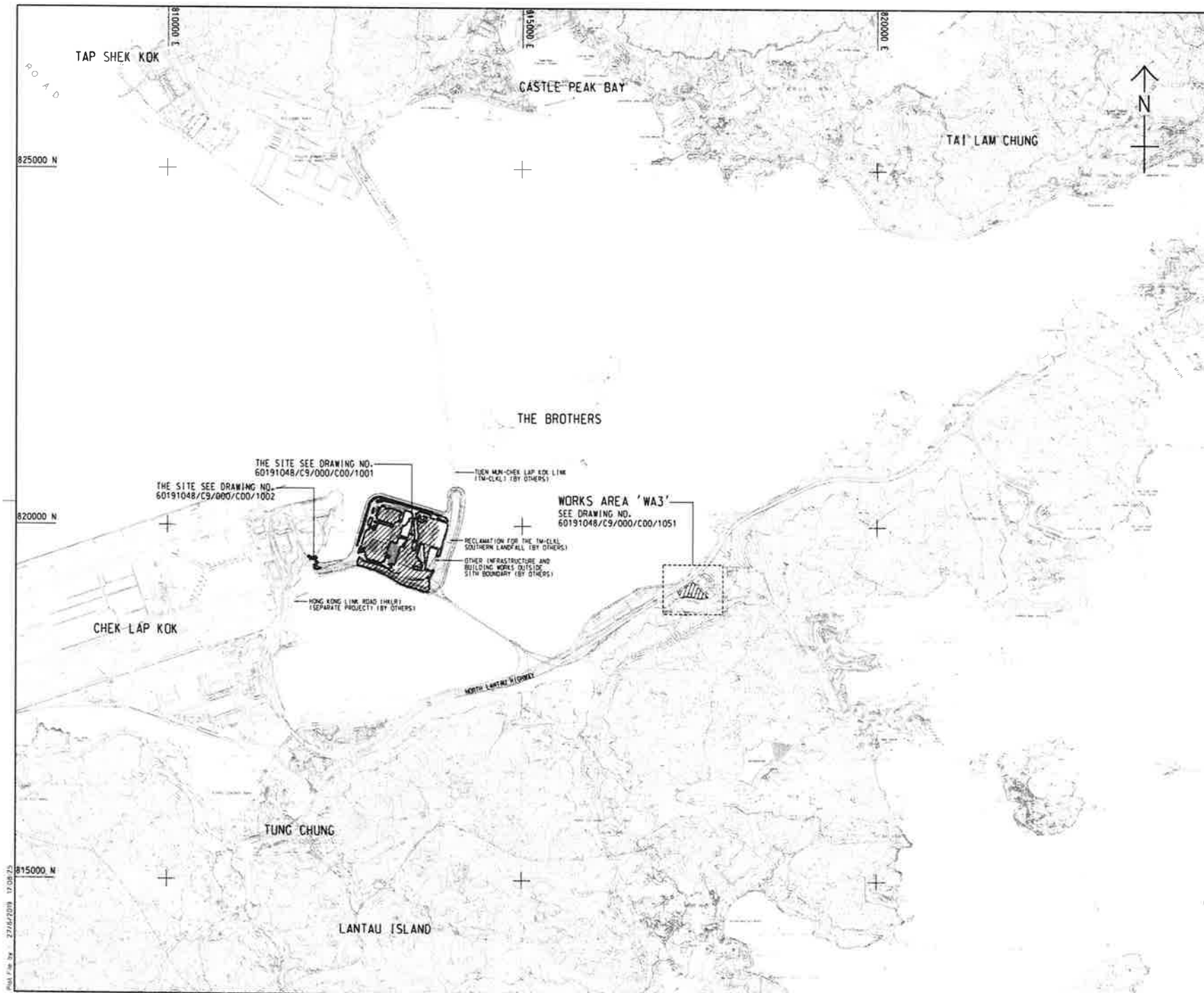
Others

- The caps for the water-safety barriers should be provided.



Figure 1

The Site Layout Plan of the Contract



- NOTES:**
1. COORDINATES ARE RELATED TO HONG KONG METRIC GRID (1980).
 2. DIMENSIONS ARE IN MILLIMETER AND CHAINAGE ARE IN METRES UNLESS OTHERWISE SHOWN.

LEGEND:

— SITE BOUNDARY

 WORKS AREA

THE SITE SEE DRAWING NO. 60191048/C9/000/C00/1001

THE SITE SEE DRAWING NO. 60191048/C9/000/C00/1002

— TUEN MAN-CHEK LAP KOK LINK (TM-CLL) (BY OTHERS)

WORKS AREA 'WA3' SEE DRAWING NO. 60191048/C9/000/C00/1051

— RECLAMATION FOR THE TM-CLL SOUTHERN LAND (BY OTHERS)

— OTHER INFRASTRUCTURE AND BUILDING WORKS OUTSIDE SITE BOUNDARY (BY OTHERS)

— HONG KONG LINK ROAD (HLR) (SEPARATE PROJECT) (BY OTHERS)

TENDER DRAWING		17th OCT	JUL 19
NO.	REVISION	DATE	BY

ROADS DEPARTMENT
 道路工程處
 HONG KONG-ZHONGJI-MACAO BRIDGE
 HONG KONG BOUNDARY CROSSING FACILITIES
 - PHASE 2 AND OTHER WORKS

SITE LOCATION PLAN

AECOM + **Aedas**
 Rogers Stirk Harbour + Partners
 BURD HAPFOLD ATKINS ADI

DRGNO 圖號	60191048/C9/000/C00/1000		
DESIGNED BY 設計	TJH	CHECKED BY 校核	HY/2019/01
DATE 日期	JC	SCALE 比例尺	1:25000
SCALE 比例尺	A1 : 25000	UNIT 單位	SC1
PROJECTION 投影	METRES	© COPYRIGHT RESERVED 版權所有	

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SATELLITE REFUSE COLLECTION POINT

CBC, CBS BAYS

PUBLIC TOILETS

ADDITIONAL RAILING

SECURITY MEASURE AT EXISTING GATE

EXISTING GUARD BOOTHS TO BE DEMOLISHED

REPROVISION OF GUARD BOOTHS

CBC PICK UP BAYS

FRANCHISED BUS PICK-UP BAYS

LANDSCAPING WORKS AREA

NORTH PUBLIC TRANSPORT INTERCHANGE

SOUTH PUBLIC TRANSPORT INTERCHANGE

INBOUND VEHICLE CLEARANCE PLAZA

DRAINAGE IMPROVEMENT WORKS AT VEHICLE INSPECTION PIT

VEHICLE KIOSKS, CANOPIES AND ASSOCIATED ROAD PAVEMENT

OUTBOUND VEHICLE CLEARANCE PLAZA

C&ED INBOUND CARGO EXAMINATION BUILDING

FIRE STATION CUM AMBULANCE DEPOT

SLIDING GATE

ACCESS ROAD TO GENERATOR AND UPS ROOM

GENERATOR AND UPS ROOM

REMARKS:

- IN SPTI:
 - DEMOLISH 2 NOS. EXISTING GUARD BOOTHS AND RE-PROVISION TO REVISED LOCATIONS AS SHOWN
 - CONSTRUCT COVERED WALKWAYS FOR THE NEW FB AND CBC PICK UP BAYS
 - MODIFY EXISTING DUCTING AND POLES FOR ELY SYSTEM, ROAD LIGHTING AND PILLAR BOXES, AND THE ASSOCIATED CABLING WORKS
 - RELOCATE AND REINSTATE 3 NOS. OF EXISTING BUS OPERATOR OFFICES AND FOOD TRUCK
 - REPLACEMENT OF DRAINPIIT COVERS
- IN NPTI:
 - CONSTRUCT COVERED WALKWAYS FOR THE NEW CBC, CBC PICK UP BAYS AND PUBLIC TOILETS
 - PROVIDE AUTOMATIC IRRIGATION SYSTEM AT SLOPES
 - MODIFY EXISTING COVERED WALKWAY AND PROVISION OF LIGHTING
 - REPLACEMENT OF DRAINPIIT COVERS
- LANDSCAPING WORKS AREA:
 - CONSTRUCT IRRIGATION SYSTEM WITH 13 NOS. OF NEW WATER POINT AND THE AUTOMATIC IRRIGATION SYSTEM AND PROVIDE MAINTENANCE WORKS
 - LANDSCAPE SOFTWORK, ESTABLISHMENT AND MAINTENANCE WORKS
 - CONSTRUCT RIVER WASHED STONE SWATHE AND MAINTENANCE WORKS
 - PROTECT EXISTING PLANTING AND HARD STRUCTURES
- PASSENGER CLEARANCE BUILDING
 - VERTICAL ACCESS
 - IMPROVEMENT WORKS FOR WATER FEATURE
 - MINOR REMAINING WORKS
 - PROVISION OF NEW CENTRAL AVSS EQUIPMENT WITH SUFFICIENT CAPACITY, PROCESSING POWER AND STORAGE TO ACCOMMODATE BOTH THE EXISTING AND NEW AVSS
- VEHICLE KIOSKS AT INBOUND & OUTBOUND VCP
 - PROVISION OF AVSS AT NEW KIOSKS TO SERVE 24 NOS. VEHICULAR LINES
 - REPLACEMENT OF BARRIER GATE WITH SKIRTING AT 72 NOS. EXISTING KIOSK
- C&ED INBOUND CARGO EXAMINATION BUILDING
 - PROVISION OF NEW CENTRAL AVSS EQUIPMENT WITH SUFFICIENT CAPACITY, PROCESSING POWER AND STORAGE TO ACCOMMODATE BOTH THE EXISTING AND NEW AVSS

ABBREVIATION:

- SPTI - SOUTH PUBLIC TRANSPORT INTERCHANGE
- NPTI - NORTH PUBLIC TRANSPORT INTERCHANGE
- VCP - VEHICLE CLEARANCE PLAZA
- PCB - PASSENGER CLEARANCE BUILDING
- FB - FRANCHISED BUS
- CBC - CROSS BOUNDARY COACH
- CBS - CROSS BOUNDARY SHUTTLE
- ELY - EXTRA LOW VOLTAGE
- AVSS - AUTOMATIC VEHICLE CLEARANCE SUPPORT SYSTEM

NOTE:

- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60191048/C9/000/C00/1002

LEGEND:

- SITE BOUNDARY
- AMENITY AREA
- FOOTPATH
- COVERED WALKWAY
- SECURITY FENCE
- TREE PLANTING
- IRRIGATION POINT

TENDER DRAWING TITLE SHEET JUL 19

HONG KONG HIGHWAYS DEPARTMENT

HONG KONG-THEMATIC HAZARD BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES - PHASE 2 AND OTHER WORKS

GENERAL ARRANGEMENT SHEET 1 OF 2

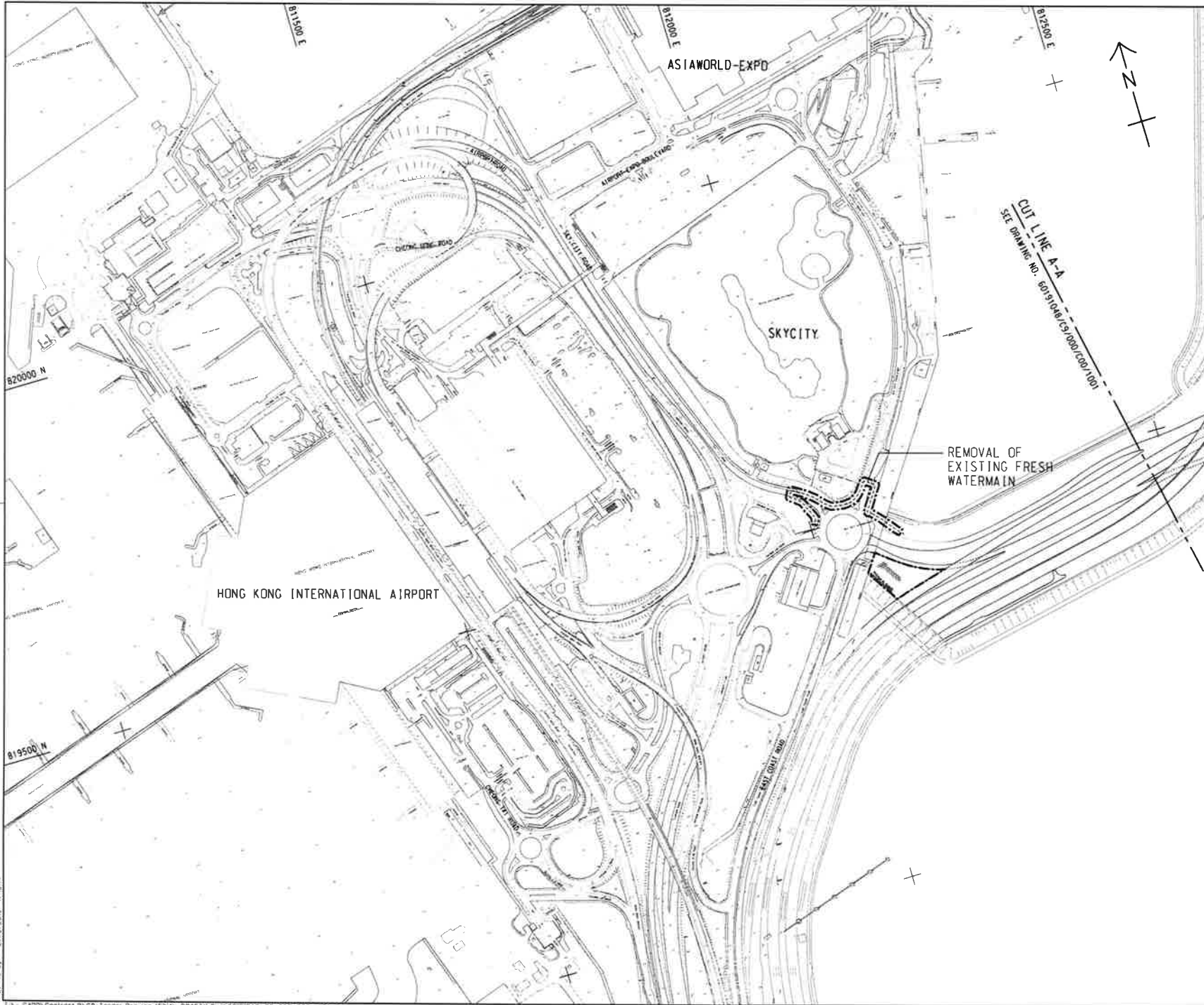
AECOM Aedas Rogers Stirk Harbour + Partners BURO HAPPOLD ATKINS ADI

DRAWING NO. 60191048/C9/000/C00/1001

DATE: 11/07/2019 BY: JTC CHECKED: JTC DATE: 11/07/2019 SCALE: 1:1000 UNIT: METRES

PROJECT NO. 08/01/2019 944657

CUT LINE A-A SEE DRAWING NO. 60191048/C9/000/C00/1002



NOTE:
 1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60191048/C9/000/C00/1001.

TENDER DRAWING	DATE: JUL 19
NO.	REV.

HA HIGHWAYS DEPARTMENT
 香港公路局
 Major Works Project Management Office (Level 10, West)

HONG KONG-ZHUHAI-MACAO BRIDGE
 HONG KONG BOUNDARY CROSSING FACILITIES
 - PHASE 2 AND OTHER WORKS

GENERAL ARRANGEMENT
 SHEET 2 OF 2

AECOM Aedas
 Rogers Stirk Harbour + Partners
 BURC HAPPOLD ATKINS ADI

DRG. NO. 60191048/C9/000/C00/1002
 圖號: 60191048/C9/000/C00/1002

DESIGNED BY	CHKD BY	DATE	SCALE
THK	HY/2019/01		SCALE

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Figure 2

The Location of the Air Quality Monitoring Station

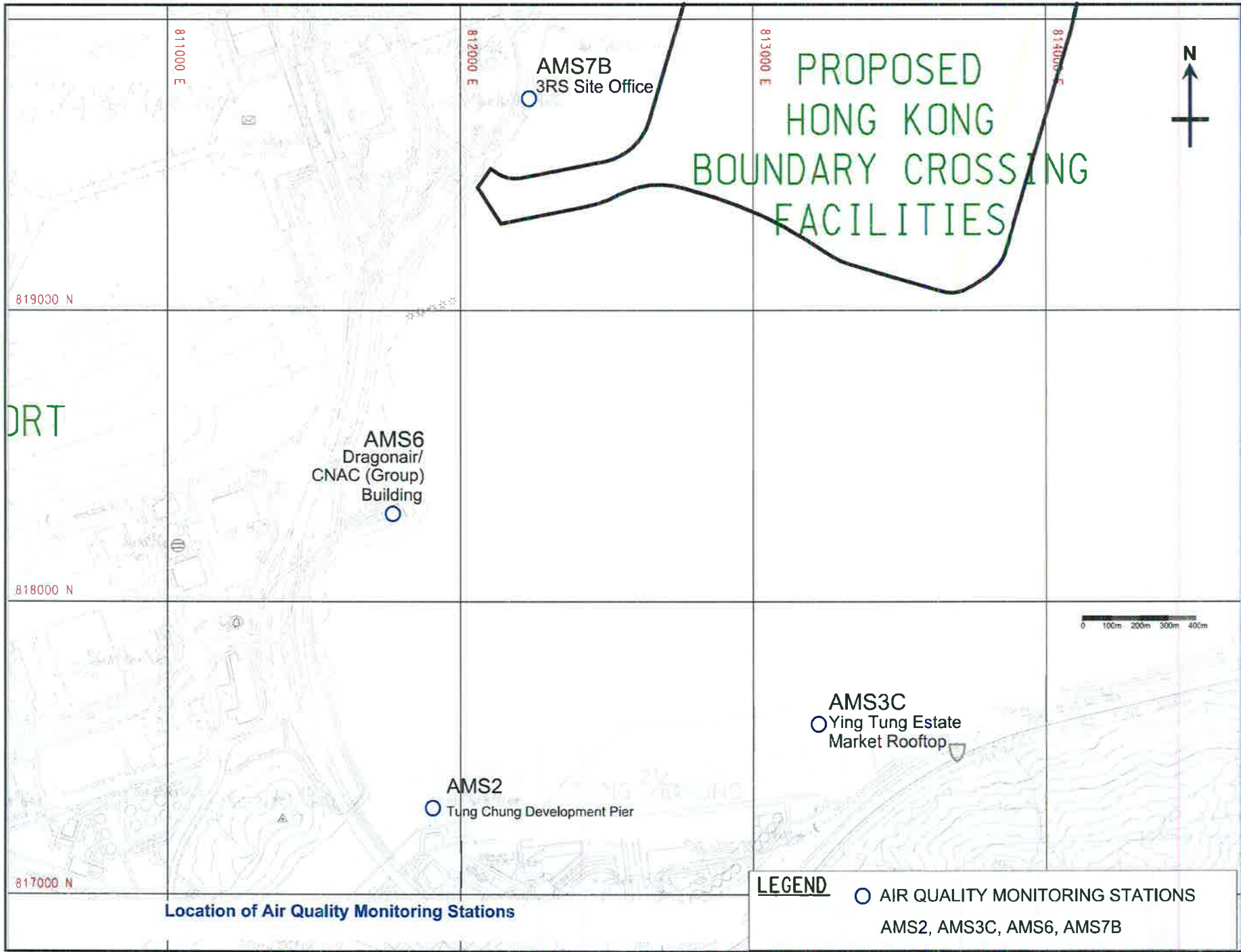
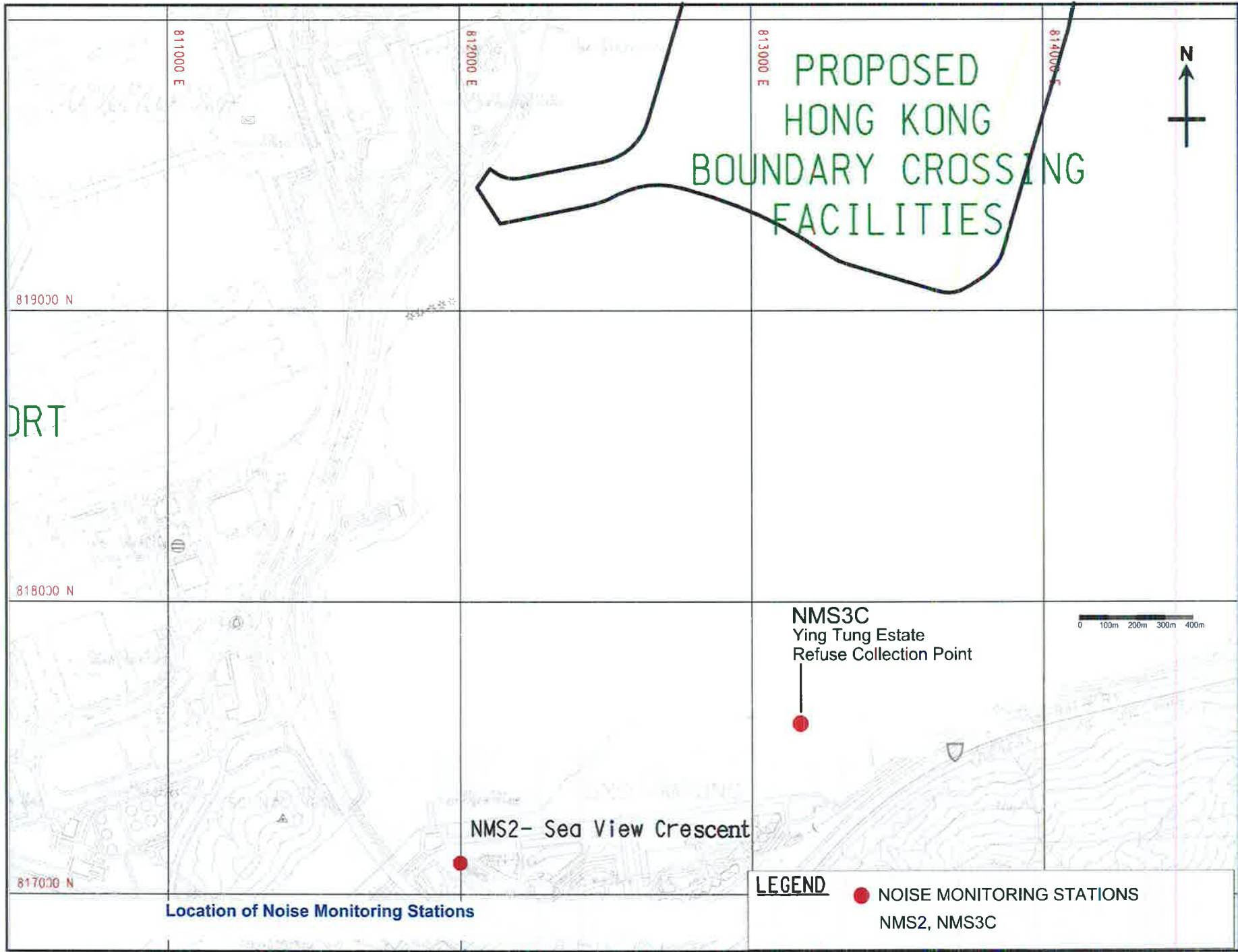




Figure 3

The Location of the Noise Monitoring Station





Appendix A

Construction Programme

HKZMB HK Boundary Crossing Facilities - Phase 2 and Other Works

03-Feb-20

Activity ID	Activity Name	Remaining Duration	Start	Latest Start	Finish	Latest Finish	Total Float	2020												2021												2022	
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Construction of Additional Drains at Vehicle Inspection Pit Near Building No. 023 (4A.K)																																	
A4360	Additional Drainage Works	51	08-Jun-20	31-Aug-20	07-Aug-20	31-Oct-20	70																										
Installation of Sliding Gate at Building No. 041 (4A.J)																																	
A4980	Design for Sliding Gate	44	04-Dec-19 A	23-Sep-20	17-Mar-20	05-Nov-20	233																										
A6650	Acceptance for Design of Sliding Gate	91	18-Mar-20	06-Nov-20	16-Jun-20	04-Feb-21	233																										
A6680	Procurement of Sliding Gate	91	17-Jun-20	05-Feb-21	15-Sep-20	06-May-21	233																										
A6710	Installation of Security Fence and Sliding Gate (Fire Station cum Ambulance Depot 041)	75	15-Sep-20	07-May-21	15-Dec-20	05-Aug-21	187																										
A6720	T&C	50	19-Feb-21	06-Oct-21	21-Apr-21	03-Dec-21	187																										
Painting for Volleyball Court																																	
A7260	Painting for Volleyball Ground	50	16-Dec-20	06-Aug-21	18-Feb-21	05-Oct-21	187																										
SECTION 1: WORKS OF VERTICAL ACCESS TO THE ROOF OF PCB WITHIN PORTION A (4)																																	
Vertical Access to the Roof of PCB at Zone C (4.B)																																	
A3700	Design for Maintenance Access Equipment and Fittings and Walkway at Roof	5	04-Dec-19 A	03-Feb-20	07-Feb-20	07-Feb-20	0																										
A3710	Acceptance of the Design for Maintenance Access Equipment and Fittings and Walkway at Roof	3	08-Feb-20	08-Feb-20	10-Feb-20*	10-Feb-20	0																										
A3720	Design for Steel Grating at Vertical Access to PCB, the Associated Support and Fixings	65	08-Jan-20 A	23-Feb-20	07-Apr-20	27-Apr-20	20																										
A3730	Acceptance of Design for Steel Grating at Vertical Access to PCB, the Associated Support and Fixings	31	08-Apr-20	28-Apr-20	08-May-20	28-May-20	20																										
A3750	Steel Prefabrication for the Staircase (include shop drawing)	75	11-Feb-20	11-Feb-20	13-May-20	13-May-20	0																										
A3760	Plinth Construction	50	08-Feb-20	25-Mar-20	07-Apr-20	28-May-20	39																										
A3770	Site Delivery and Assembly	12	14-May-20	14-May-20	28-May-20	28-May-20	0																										
A3780	Installation of the Steel Staircase	45	29-May-20	29-May-20	22-Jul-20	22-Jul-20	0																										
A3790	MEP Installation	24	23-Jul-20	23-Jul-20	19-Aug-20	19-Aug-20	0																										
A6730	Time Risk Allowance for Installation Works	6	20-Aug-20	20-Aug-20	26-Aug-20	26-Aug-20	0																										
Vertical Access to the Roof of PCB at Zone G (4.C)																																	
A3810	Steel Prefabrication for the Staircase	75	11-Feb-20	11-Feb-20	13-May-20	13-May-20	0																										
A3820	Plinth Construction	50	08-Feb-20	25-Mar-20	07-Apr-20	28-May-20	39																										
A3830	Site Delivery and Assembly	12	14-May-20	14-May-20	28-May-20	28-May-20	0																										
A3840	Installation of the Steel Staircase	45	29-May-20	29-May-20	22-Jul-20	22-Jul-20	0																										
A3890	MEP Installation	24	23-Jul-20	23-Jul-20	19-Aug-20	19-Aug-20	0																										
A6740	Time Risk Allowance for Installation Works	6	20-Aug-20	20-Aug-20	26-Aug-20	26-Aug-20	0																										
Existing Temporary Access Scaffold Tower at Zone F (4.A)																																	
A4300	Maintenance of the Existing Temporary Access Scaffold Tower at Zone F	163	04-Dec-19 A	03-Feb-20	19-Aug-20	19-Aug-20	0																										
A4310	Demolition of the Existing Temporary Access Scaffold Tower at Zone F	9	20-Aug-20	20-Aug-20	29-Aug-20	29-Aug-20	0																										
T&C																																	
A6140	T&C	24	30-Jul-20	30-Jul-20	26-Aug-20	26-Aug-20	0																										
A6150	FSD & TPIDC Inspection & Approval	21	06-Aug-20	06-Aug-20	29-Aug-20	29-Aug-20	0																										
A6160	Completion of Section 1: Works of Vertical Access to Roof of PCB within Portion A (270 days)	0			29-Aug-20	29-Aug-20	0																										
SECTION 1A: IMPROVEMENT WORKS FOR THE EXISTING WATER FEATURES AT PCB WITHIN PORTION A (4.D-W)																																	
A6210	Design for Water Leakage Detection System	0	04-Dec-19 A	01-Feb-20	31-Dec-19 A	01-Feb-20																											
A6220	Acceptance for the Design for Water Leakage Detection System	0	02-Jan-20 A	01-Feb-20	28-Jan-20 A	01-Feb-20																											
A6230	Procurement for the Existing Water Features WF1 - 20	20	29-Jan-20 A	03-Feb-20	25-Feb-20	25-Feb-20	0																										
A6310	Installation for the Existing Water Features WF1 - 20	80	27-Feb-20	26-Feb-20	05-Jun-20	04-Jun-20	-1																										
A6410	Improvement Works for the Existing Water Feature inside Plant Room and MCC Room	80	27-Feb-20	26-Feb-20	05-Jun-20	04-Jun-20	-1																										
A6750	Time Risk Allowance for Installation Works	6	06-Jun-20	05-Jun-20	12-Jun-20	11-Jun-20	-1																										
A6760	T&C	8	13-Jun-20	12-Jun-20	22-Jun-20	20-Jun-20	-1																										
A7270	Section 1A: Improvement Works for the Existing Water Features at PCB within Portion A (200 Days)	0			22-Jun-20*	21-Jun-20	-1																										
SECTION 1B: INSTALLATION OF WATERPROOF MEMBRANE FOR THE EXISTING WATER FEATURES (Omission PMI 10)																																	
SECTION 1C: INSTALLATION OF WATER SKIMMERS, SOLAR REFLECTIVE FILMS AND GLAZED DOORS																																	
A3910	Installation of Water Skimmers at Water Features WF6 - 15 (4.Y) Omission PMI 10)	0	31-Jan-20 A	21-Jun-20	31-Jan-20 A	21-Jun-20																											
A3920	Installation of Solar Reflective Films	100	03-Feb-20	29-Jan-20	04-Jun-20	30-May-20	-4																										
A3930	Installation of Glazed Doors and Door Stop (4A.G)	100	03-Feb-20	29-Jan-20	04-Jun-20	30-May-20	-4																										

■ Actual Work ◆ Milestone
■ Remaining Work
■ Critical

UPDATED WORKS PROGRAMME FOR PHASE 2 AND OTHER WORKS, HKZMB

Date	Revision	Checked	Approved
03-Feb-20	Works Programme for Phase 2	ZJ	

HKZMB HK Boundary Crossing Facilities - Phase 2 and Other Works

03-Feb-20

Activity ID	Activity Name	Remaining Duration	Start	Latest Start	Finish	Latest Finish	Total Float	2020												2021												2022		
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
A3940	Supply and Install C&ED Dog Latrine (4A.F)	100	03-Feb-20	29-Jan-20	04-Jun-20	30-May-20	-4	[Gantt bar: 03-Feb-20 to 04-Jun-20]																										
A6840	Time Risk Allowance for Installation	15	05-Jun-20	01-Jun-20	22-Jun-20	17-Jun-20	-4	[Gantt bar: 05-Jun-20 to 22-Jun-20]																										
A6850	Handing over the Completed Minor Works to the Maintenance Authority	3	23-Jun-20	18-Jun-20	26-Jun-20	20-Jun-20	-4	[Gantt bar: 23-Jun-20 to 26-Jun-20]																										
A7290	Section 1C: Installation of Water Skimmers, C&ED Dog Latrine, Solar Reflectives Films and Glazed Doors (200 days)	0			26-Jun-20*	21-Jun-20	-5	[Gantt bar: 26-Jun-20 to 21-Jun-20]																										
SECTION 1D: INSTALLATION OF MINOR REMAINING WORKS AT PCB WITHIN PORTION A (4B)																																		
Civil Items																																		
A0710	Drainage Works - Storm & Foul Water: CCTV (4B.A)	100	03-Feb-20	29-Jan-20	04-Jun-20	30-May-20	-4	[Gantt bar: 03-Feb-20 to 04-Jun-20]																										
A0720	Road Works: TTA: Demolition and Re-pave (4B.B)	100	10-Feb-20	05-Feb-20	11-Jun-20	06-Jun-20	-4	[Gantt bar: 10-Feb-20 to 11-Jun-20]																										
A0730	Paved Footpath: Rectify Paving Block and Cover of the Delivery Hatch and Smoke Vent (4B.C)	100	17-Feb-20	12-Feb-20	18-Jun-20	13-Jun-20	-4	[Gantt bar: 17-Feb-20 to 18-Jun-20]																										
A0740	Drop Off Deck: Rectify Defects, Stop Leakage and Install a SS Channel and Connecting Drain Pipe (4B.D)	100	24-Feb-20	19-Feb-20	26-Jun-20	20-Jun-20	-4	[Gantt bar: 24-Feb-20 to 26-Jun-20]																										
A0750	External Footbridges: Removal of Extra Sealant at Movement Joint and Paint (4B.E)	100	24-Feb-20	19-Feb-20	26-Jun-20	20-Jun-20	-4	[Gantt bar: 24-Feb-20 to 26-Jun-20]																										
A0760	CUE: Rectification of Ground Water Seepage at the Movement Joint Trench (4B.F)	100	24-Feb-20	19-Feb-20	26-Jun-20	20-Jun-20	-4	[Gantt bar: 24-Feb-20 to 26-Jun-20]																										
ABWF Items (4B.G)																																		
A0830	Paint Touch-up Remedial Works to the Emblem of C&ED and Alignment Rectification of Character Blocks	100	03-Feb-20	29-Jan-20	04-Jun-20	30-May-20	-4	[Gantt bar: 03-Feb-20 to 04-Jun-20]																										
A0840	Repair Defective Self-Closing Device of External Facade Glass Doors	100	10-Feb-20	05-Feb-20	11-Jun-20	06-Jun-20	-4	[Gantt bar: 10-Feb-20 to 11-Jun-20]																										
A0850	Installation of Missing Pins at Smoke vent's Fall-safe Catch	100	17-Feb-20	12-Feb-20	18-Jun-20	13-Jun-20	-4	[Gantt bar: 17-Feb-20 to 18-Jun-20]																										
A0860	Modification Works to Existing Doors in the PCB	100	24-Feb-20	19-Feb-20	26-Jun-20	20-Jun-20	-4	[Gantt bar: 24-Feb-20 to 26-Jun-20]																										
A0870	Investigation of Automatic Swing Facade Door and Submission of Report	100	24-Feb-20	19-Feb-20	26-Jun-20	20-Jun-20	-4	[Gantt bar: 24-Feb-20 to 26-Jun-20]																										
Mechanical, Electrical and Plumbing (MEP) Works (4B.S-W)																																		
A0910	DCS: Installation of Straining Element for Each of the Two Sea Water ABS (4B.S)	100	03-Feb-20	19-Feb-20	04-Jun-20	20-Jun-20	14	[Gantt bar: 03-Feb-20 to 04-Jun-20]																										
A0920	Supplement and Installation of 104 nos. MSFD with Air Ducting and Grilles for TAD	100	03-Feb-20	19-Feb-20	04-Jun-20	20-Jun-20	14	[Gantt bar: 03-Feb-20 to 04-Jun-20]																										
A0930	Interface Testing between PCB SCADA and the MSFDs Microswitches for the 104 nos. of Newly Installed MSFDs of TADs	50	01-Apr-20	22-Apr-20	04-Jun-20	20-Jun-20	14	[Gantt bar: 01-Apr-20 to 04-Jun-20]																										
A0940	Investigation and Rectification of the Interfacing of Monitoring of the Fire Services Systems	100	03-Feb-20	19-Feb-20	04-Jun-20	20-Jun-20	14	[Gantt bar: 03-Feb-20 to 04-Jun-20]																										
A0950	Fire Services System: Provide Rectification Program of Faults Signals (288 nos.) in AFA (KD4 achievement)	35	04-Feb-20	03-Feb-20	14-Mar-20	13-Mar-20	-1	[Gantt bar: 04-Feb-20 to 14-Mar-20]																										
A0960	Fire Services System: Completion of Approx. 30% Rectification of Faults in AFA (KD 4 achievement)	35	04-Feb-20	03-Feb-20	14-Mar-20	13-Mar-20	-1	[Gantt bar: 04-Feb-20 to 14-Mar-20]																										
A0970	Fire Services System: Completion of Remaining Rectification of Faults in AFA	60	16-Mar-20	07-Apr-20	30-May-20	20-Jun-20	18	[Gantt bar: 16-Mar-20 to 30-May-20]																										
A0980	Coordination with and Provision of Information to the PCB SCADA	114	04-Feb-20	03-Feb-20	22-Jun-20	20-Jun-20	-1	[Gantt bar: 04-Feb-20 to 22-Jun-20]																										
A0990	Modification and Testing of the Existing UPS LVSBs and UPS system.	90	03-Feb-20	29-Jan-20	23-May-20	18-May-20	-4	[Gantt bar: 03-Feb-20 to 23-May-20]																										
A4740	Electrical Services: Modification and Lighting Rectification Work	90	03-Feb-20	29-Jan-20	23-May-20	18-May-20	-4	[Gantt bar: 03-Feb-20 to 23-May-20]																										
A4750	Providing Zoning and Proposal of Zoning and T&C of BOH LCS	90	03-Feb-20	29-Jan-20	23-May-20	18-May-20	-4	[Gantt bar: 03-Feb-20 to 23-May-20]																										
A4760	Checking Investigating and Rectifying any Defect of Insulation of Outgoing Circuit of Essential LVSB	90	03-Feb-20	29-Jan-20	23-May-20	18-May-20	-4	[Gantt bar: 03-Feb-20 to 23-May-20]																										
A4800	Checking and Site-investigating, Rectifying and Replacing Defective Existing Lighting FOH LED	90	03-Feb-20	29-Jan-20	23-May-20	18-May-20	-4	[Gantt bar: 03-Feb-20 to 23-May-20]																										
A6000	Time for Risk Allowance	10	24-May-20	19-May-20	02-Jun-20	28-May-20	-5	[Gantt bar: 24-May-20 to 02-Jun-20]																										
A6870	T&C and Production of As-built Drawings	24	03-Jun-20	29-May-20	26-Jun-20	21-Jun-20	-5	[Gantt bar: 03-Jun-20 to 26-Jun-20]																										
A7310	KD4 Completion of Approx. 30% of Fault Signal Rectification Works (100 days)	0			14-Mar-20*	13-Mar-20	-1	[Gantt bar: 14-Mar-20 to 13-Mar-20]																										
OTHER IMPROVEMENT WORKS AT PCB																																		
A0900	Identification of the Number of Faulty Long Lead Items such as Probe Type Detectors Shown in the AFA Panel (Omission)	0	04-Dec-19 A	02-Feb-20	31-Jan-20 A	02-Feb-20		[Gantt bar: 04-Dec-19 A to 31-Jan-20 A]																										
A6020	Fabrication and Supply of Holding Brackets for Baffle Ceiling Panel	100	03-Feb-20	29-Jan-20	04-Jun-20	30-May-20	-4	[Gantt bar: 03-Feb-20 to 04-Jun-20]																										
A6030	Modification of Existing Sub-main Power Distribution System for TD's Room in PCB	100	10-Feb-20	05-Feb-20	11-Jun-20	06-Jun-20	-4	[Gantt bar: 10-Feb-20 to 11-Jun-20]																										
A6040	Supply and Installation of Drip Tray at CUE	100	24-Feb-20	19-Feb-20	26-Jun-20	20-Jun-20	-4	[Gantt bar: 24-Feb-20 to 26-Jun-20]																										
A7320	KD5 Identification of the Number of Faulty Long Lead Items such as Probe Type Detectors Shown in the AFA Panel (60 days)	0			31-Jan-20 A	02-Feb-20		[Gantt bar: 31-Jan-20 A to 02-Feb-20]																										
Completion of Section 1D																																		
A7300	Section 1D: Installation of Minor Remaining Works at PCB within Portion A (200 days)	0			26-Jun-20*	21-Jun-20	-5	[Gantt bar: 26-Jun-20 to 21-Jun-20]																										
SECTION 2: IRRIGATION SYSTEM AT SLOPES OF NPTI WITHIN PORTION B (3)																																		
Design and Design Acceptance																																		
A6460	Design for Irrigation System (NPTI)	122	04-Dec-19 A	04-Feb-20	03-Jun-20	04-Jun-20	1	[Gantt bar: 04-Dec-19 A to 03-Jun-20]																										
A6470	Acceptance of the Design for Irrigation System (NPTI)	30	04-Jun-20	05-Jun-20	03-Jul-20	04-Jul-20	1	[Gantt bar: 04-Jun-20 to 03-Jul-20]																										
A6480	Submission of Material	122	04-Dec-19 A	04-Feb-20	03-Jun-20	04-Jun-20	1	[Gantt bar: 04-Dec-19 A to 03-Jun-20]																										
A6890	Acceptance of Submission of Material	30	04-Jun-20	05-Jun-20	03-Jul-20	04-Jul-20	1	[Gantt bar: 04-Jun-20 to 03-Jul-20]																										

█ Actual Work ◆ Milestones
█ Remaining Work
█ Critical

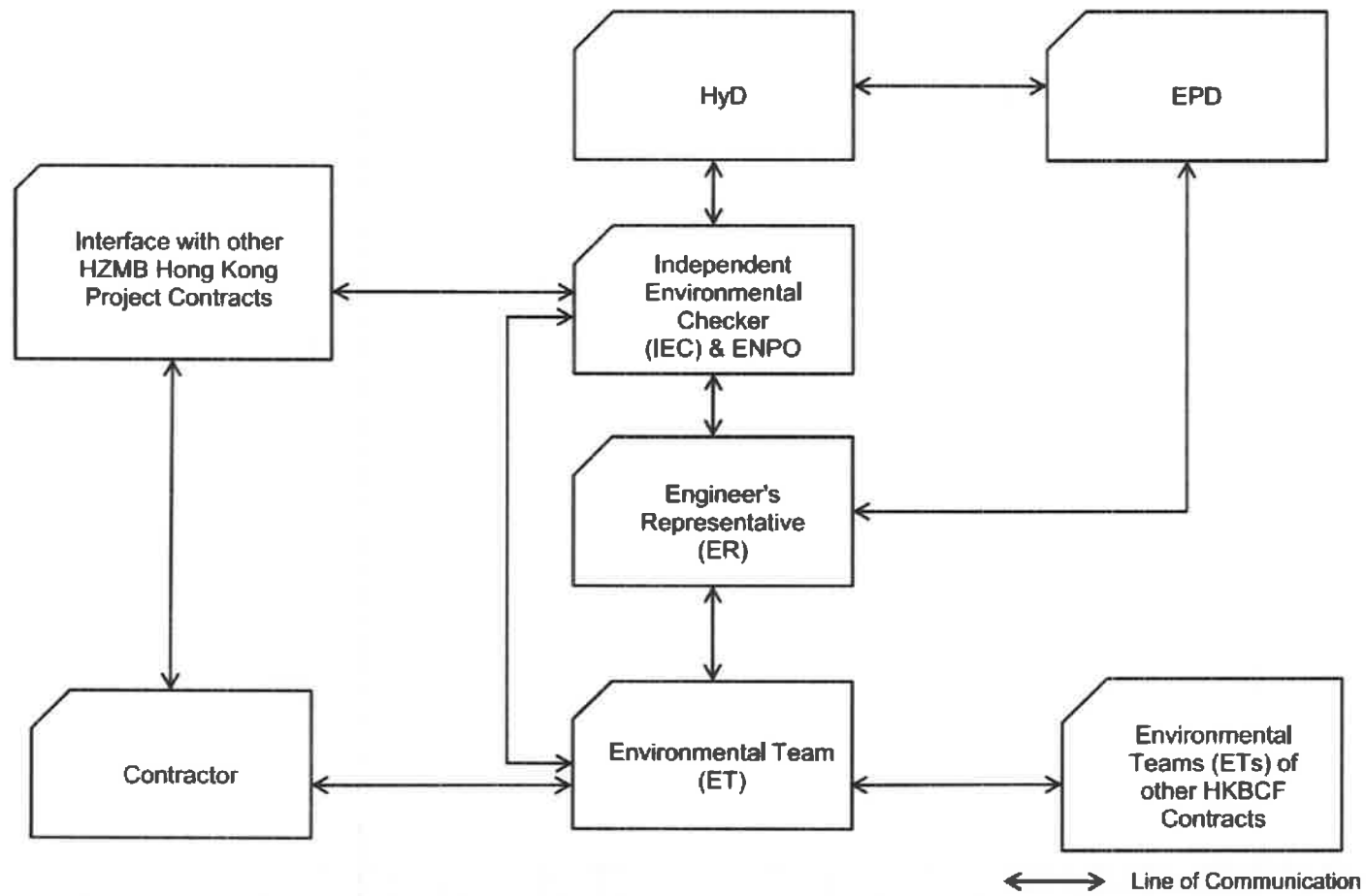
UPDATED WORKS PROGRAMME FOR PHASE 2 AND OTHER WORKS, HKZMB

Date	Revision	Checked	Approved
03-Feb-20	Works Programme for Phase 2	ZJ	



Appendix B

Project Organization Chart





Appendix C

Action and Limit Levels

Action / Limit Levels for Air Quality

Parameters	Action Level	Limit Level
24-hour TSP Level in $\mu\text{g}/\text{m}^3$	¹ For baseline level $\leq 200 \mu\text{g}/\text{m}^3$, Action level = $(\text{baseline level} * 1.3 + \text{Limit level})/2$; For baseline level $> 200 \mu\text{g}/\text{m}^3$ Action level = Limit level	260 $\mu\text{g}/\text{m}^3$
1-hour TSP Level in $\mu\text{g}/\text{m}^3$	² For baseline level $\leq 384 \mu\text{g}/\text{m}^3$, Action level = $(\text{baseline level} * 1.3 + \text{Limit level})/2$; For baseline level $> 384 \mu\text{g}/\text{m}^3$, Action level = Limit level	500 $\mu\text{g}/\text{m}^3$

Notes:

1. The Action Level for 24-hour TSP Level:

a) AMS 2 = $(71.1 * 1.3 + 260) / 2 = 176 \mu\text{g}/\text{m}^3$; b) AMS 3C = $(56.9 * 1.3 + 260) / 2 = 167 \mu\text{g}/\text{m}^3$;

c) AMS 6 = $(66.4 * 1.3 + 260) / 2 = 173 \mu\text{g}/\text{m}^3$; d) AMS 7B = $(82.3 * 1.3 + 260) / 2 = 183 \mu\text{g}/\text{m}^3$;

2. The Action Level for 1-hour TSP Level:

a) AMS 2 = $(191.5 * 1.3 + 500) / 2 = 374 \mu\text{g}/\text{m}^3$; b) AMS 3C = $(18.2 * 1.3 + 500) / 2 = 368 \mu\text{g}/\text{m}^3$;

c) AMS 6 = $(169.2 * 1.3 + 500) / 2 = 360 \mu\text{g}/\text{m}^3$; d) AMS 7B = $(184.2 * 1.3 + 500) / 2 = 370 \mu\text{g}/\text{m}^3$;

Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
0700 - 1900 hours on normal weekdays	When one documented complaint is received	75 dB(A) *

Note : If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

* Reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

Action and Limit Levels for

Chinese White Dolphin Monitoring – Approach to Define Action Level (AL) and Limit Level (LL)

	North Lantau Social Cluster	
	NEL	NWL
Action Level	(STG < 70% of baseline) & (ANI < 70% of baseline)	(STG < 70% of baseline) & (ANI < 70% of baseline)
Limit Level	[(STG < 40% of baseline) & (ANI < 40% of baseline)] AND [(STG < 40% of baseline) & (ANI < 40% of baseline)]	

Remark: For North Lantau Social Cluster, action level will be triggered if either NEL or NWL fall below the criteria; limit level will be triggered if both NEL and NWL fall below the criteria.

Derived Value of Action Level (AL) and Limit Level (LL) for Chinese White Dolphin Monitoring

	North Lantau Social Cluster	
	NEL	NWL
Action Level	(STG < 4.2) & (ANI < 15.5)	(STG < 6.9) & (ANI < 31.3)
Limit Level	[(STG < 2.4) & (ANI < 8.9)] AND [(STG < 3.9) & (ANI < 17.9)]	



Appendix D

Calibration Certificate of Monitoring Equipment



RECALIBRATION DUE DATE:
October 21, 2020

Certificate of Calibration

Calibration Certification Information			
Cal. Date: October 21, 2019	Rootsmeter S/N: 438320	Ta: 295	°K
Operator: Jim Tisch		Pa: 744.2	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 2456		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4200	3.2	2.00
2	3	4	1	1.0180	6.3	4.00
3	5	6	1	0.9030	7.9	5.00
4	7	8	1	0.8620	8.8	5.50
5	9	10	1	0.7120	12.6	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H (Ta/Pa)}$ (y-axis)
0.9849	0.6936	1.4066	0.9957	0.7012	0.8904
0.9808	0.9635	1.9892	0.9915	0.9740	1.2592
0.9787	1.0838	2.2240	0.9894	1.0957	1.4078
0.9775	1.1340	2.3325	0.9882	1.1464	1.4765
0.9724	1.3658	2.8131	0.9831	1.3807	1.7808
QSTD	m=	2.08799	QA	m=	1.30746
	b=	-0.03545		b=	-0.02244
	r=	0.99989		r=	0.99989

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

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

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



FUGRO TECHNICAL SERVICES LIMITED

Room 723 & 725, 7/F, Block B,
Profit Industrial Building,
1-15 Kwai Fung Crescent, Kwai Fong,
Hong Kong.

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

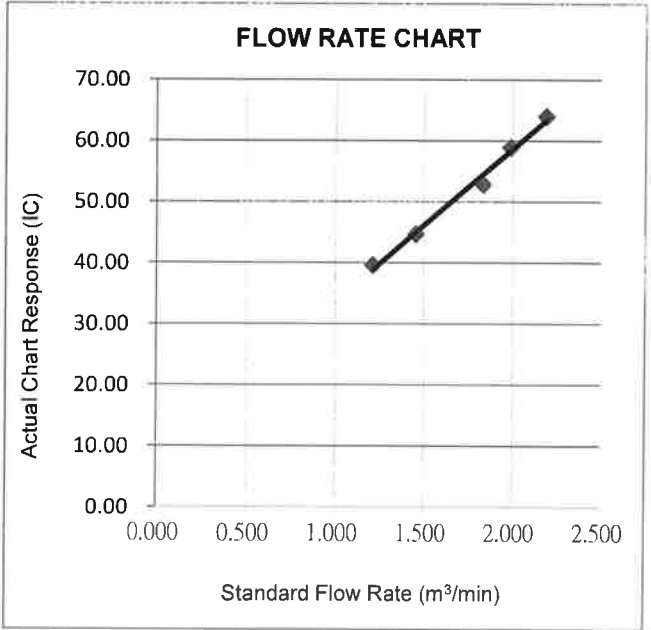
Project : Contract No. HY/2019/01 - Hong Kong-Zhuhai-Macao Bridge			Date of Calibration: 5-Feb-20		
Location : AMS2			Next Calibration Date: 4-May-20		
Brand:	Tisch		Technician: Sam Fong		
Model:	TE-5170	S/N:	HVS-01		

CONDITIONS					
Sea Level Pressure (hPa):	1020.6	Corrected Pressure (mm Hg):	766		
Temperature (°C):	17.5	Temperature (K):	291		

CALIBRATION ORIFICE					
Make:	Tisch	Qstd Slope:	2.08799		
Model:	TE-5025A	Qstd Intercept:	-0.03545		
Calibration Date:	21-Oct-19	Expiry Date:	21-Oct-20		
S/N:	2456				

CALIBRATION							
Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m ³ /min)	l (chart)	IC (corrected)	LINEAR REGRESSION
18	11.00	-8.90	19.900	2.189	63.00	64.04	Slope = 24.9577 Intercept = 8.7600 Corr. coeff.: 0.9950
13	8.70	-7.70	16.400	1.988	58.00	58.96	
10	7.60	-6.30	13.900	1.832	52.00	52.86	
7	4.40	-4.30	8.700	1.453	44.00	44.73	
5	2.70	-3.30	6.000	1.209	39.00	39.64	

Calculations:
 $Qstd = 1/m[\text{sqrt}(H2O(Pa/Pstd)(Tstd/Ta))]-b$
 $IC = l[\text{sqrt}(Pa/Pstd)(Tstd/Ta)]$
 Qstd = standard flow rate
 IC = corrected chart response
 l = actual chart response
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pa = actual pressure during calibration (mm Hg)
 Tstd = 298 deg K
 Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
 $1/m((l)[\text{sqrt}(298/Tav)(Pav/760)]-b)$
 m = sampler slope
 b = sampler intercept
 l = chart response
 Tav = daily average temperature
 Pav = daily average pressure



Wan Ka Ho
 Wan Ka Ho
 Project Consultant

Report Date: 14/2/2020



FUGRO TECHNICAL SERVICES LIMITED

Room 723 & 725, 7/F, Block B,
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Hong Kong.

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

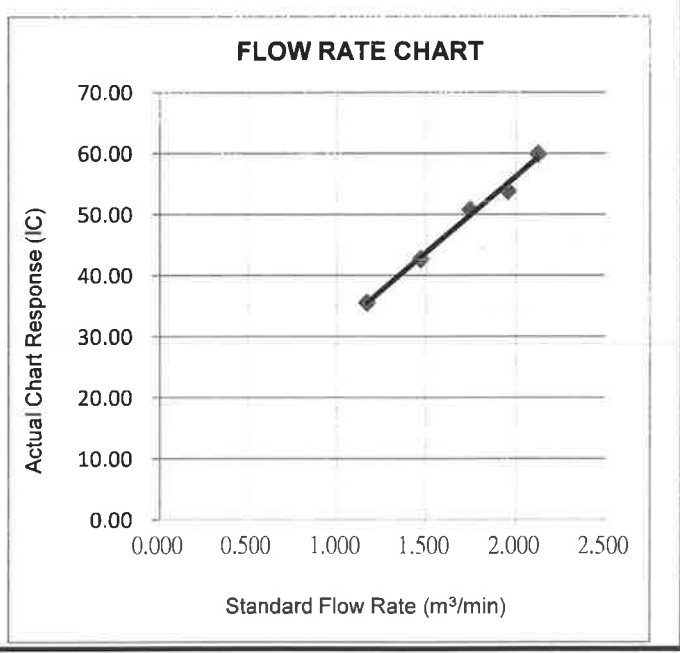
Project : Contract No. HY/2019/01 - Hong Kong-Zhuhai-Macao Bridge				Date of Calibration: 5-Feb-20	
Location : AMS3C				Next Calibration Date: 4-May-20	
Brand:	Tisch			Technician: Sam Fong	
Model:	TE-5170	S/N:	HVS-02		

CONDITIONS			
Sea Level Pressure (hPa):	1020.6	Corrected Pressure (mm Hg):	766
Temperature (°C):	17.5	Temperature (K):	291

CALIBRATION ORIFICE			
Make:	Tisch	Qstd Slope:	2.08799
Model:	TE-5025A	Qstd Intercept:	-0.03545
Calibration Date:	21-Oct-19	Expiry Date:	21-Oct-20
S/N:	2456		

CALIBRATION							
Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m ³ /min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	11.40	-7.30	18.700	2.122	59.00	59.97	Slope = 25.0744 Intercept = 6.1741 Corr. coeff.: 0.9962
13	9.10	-6.70	15.800	1.952	53.00	53.87	
10	7.30	-5.30	12.600	1.745	50.00	50.82	
7	4.70	-4.20	8.900	1.469	42.00	42.69	
5	2.60	-3.00	5.600	1.169	35.00	35.58	

Calculations:
 $Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$
 $IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$
 Qstd = standard flow rate
 IC = corrected chart response
 I = actual chart response
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pa = actual pressure during calibration (mm Hg)
 Tstd = 298 deg K
 Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
 $1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$
 m = sampler slope
 b = sampler intercept
 I = chart response
 Tav = daily average temperature
 Pav = daily average pressure



Wan Ka Ho

Wan Ka Ho
 Project Consultant

Report Date: 14/2/2020



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TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

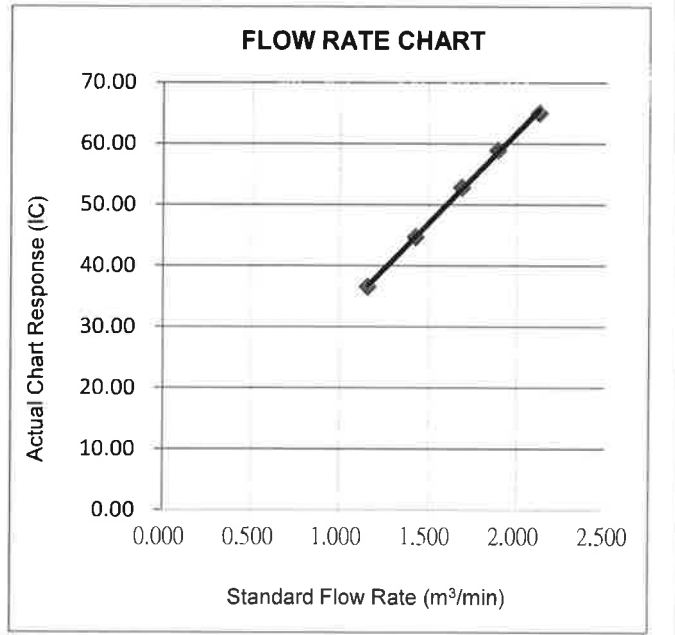
Project : Contract No. HY/2019/01 - Hong Kong-Zhuhai-Macao Bridge			Date of Calibration: 5-Feb-20		
Location : AMS7B			Next Calibration Date: 4-May-20		
Brand:	Tisch		Technician: Sam Fong		
Model:	TE-5170	S/N:	HVS-03		

CONDITIONS					
Sea Level Pressure (hPa):	1020.6	Corrected Pressure (mm Hg):	766		
Temperature (°C):	17.5	Temperature (K):	291		

CALIBRATION ORIFICE					
Make:	Tisch	Qstd Slope:	2.08799		
Model:	TE-5025A	Qstd Intercept:	-0.03545		
Calibration Date:	21-Oct-19	Expiry Date:	21-Oct-20		
S/N:	2456				

CALIBRATION							
Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m ³ /min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	10.90	-7.80	18.700	2.122	64.00	65.06	Slope = 29.8113 Intercept = 2.2229 Corr. coeff.: 0.9996
13	8.30	-6.50	14.800	1.890	58.00	58.96	
10	6.40	-5.40	11.800	1.689	52.00	52.86	
7	4.40	-4.00	8.400	1.428	44.00	44.73	
5	2.70	-2.80	5.500	1.159	36.00	36.59	

Calculations:
 $Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))]-b$
 $IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$
 Qstd = standard flow rate
 IC = corrected chart response
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 m = calibrator Qstd slope
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 m = sampler slope
 b = sampler intercept
 I = chart response
 Tav = daily average temperature
 Pav = daily average pressure



Wan Ka Ho
Wan Ka Ho
 Project Consultant

Report Date: 14/2/2020

CALIBRATION CERTIFICATE OF DUST METER

Client : Fugro Technical Services Limited

Project : Calibration Services

Client Supplied Information

Details of Unit Under Test, UUT

Description : Laser dust monitor
 Manufacturer : SIBATA
 Model No. : LD-3B
 Serial No. : 296094
 Specification Limit : NA
 Next Calibration Date : 21-Oct-2020

Laboratory Information

Description : TSP high volume air sampler
 Serial No. : 4350
 Date of Calibration : 22-Oct-2019 Ambient Temperature : 25 °C
 Calibration Location : Ma Wan A1 Site Boundary
 Method Used : By direct comparison the weight of dust particle trapped in a filter paper using high volume sampler (TSP method) for a certain period, with the reading of the UUT. They should be placed at the same location and powered on and off at the same time.

Calibration Results :

Reference concentration (mg/m ³)	Total count for 1 hour	CPM (Count per minute)
0.1287	3416	56.93
0.0888	2995	49.92
0.1141	3284	54.73

Remarks:

- The equipment being used in this calibration is traceable to recognized National Standards.
- The interpolation equation : Concentration (mg/m³) = K x [UUT reading (CPM)], where K = 0.002052
- Correlation coefficient (r) : 0.9983

Checked by : Chunf Date : 10-2-2020 Certified by : K. Kwok Tai Date : 10-2-2020
 CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

** End of Report **

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

MateriaLab

Report no. : 940891CA195965(3)

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CALIBRATION CERTIFICATE OF DUST METER

Client : Fugro Technical Services Limited

Project : Calibration Services

Client Supplied Information

Details of Unit Under Test, UUT

Description : Laser dust monitor
Manufacturer : SIBATA
Model No. : LD-5R
Serial No. : 466711
Specification Limit : NA
Next Calibration Date : 11-Jul-2020

Laboratory Information

Description : Reference balance
Equipment ID. : R-053-12
Date of Calibration : 12-Jul-2019 Ambient Temperature : 22 °C
Calibration Location : Calibration Laboratory of FTS
Method Used : By direct comparison the weight of dust particle trapped in a filter paper using high volume sampler (TSP method) for a certain period, with the reading of the UUT. They should be placed at the same location and powered on and off at the same time.

Calibration Results :

Reference concentration (mg/m ³)	Total count for 1 hour	CPM (Count per minute)
0.0678	2060	34.33
0.0424	1095	18.25
0.0364	757	12.62

Remarks:

1. The equipment being used in this calibration is traceable to recognized National Standards.
2. The interpolation equation : Concentration (mg/m³) = K x [UUT reading (CPM)], where K = 0.002248
3. Correlation coefficient (r) : 0.9974

Checked by : comf Date : 12-7-2019 Certified by : K.T. Leung Date : 20-7-2019
CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

** End of Report **



CALIBRATION REPORT OF WIND METER

Project: Contract No. HY/2019/01 - Hong Kong-Zhuhai-Macao Bridge Location: AMS3C	Date of Calibration: 5-Feb-2020 Next Calibration Date: 4-Jul-2020 Technician: Sam Fong
Brand: Global Water Model: GL500-7-2	S/N: 1847003409
Brand: Benetech Model: GM816	Anemometer Equipment ID: 08
Procedures: 1. Wind Still Test: The wind speed sensor was held by hand until stabilized. 2. Wind Speed Test: The wind meter was calibrated in-situ and compared with the Anemometer. 3. Wind Direction Test: The wind meter was calibrated in-situ and compared with a marine compass from four directions.	

Wind Still Test:

Wind Speed (m/s)
0.00

Wind Speed Test:

Global Water (m/s)	Anemometer (m/s)
2.3	2.6
3.0	2.8
3.4	3.0

Wind Direction Test:

	Marine Compass (o)
252	250
72	70
0	357
340	341

Wan Ka Ho

Wan Ka Ho
Project Consultant

Report Date: 14/2/2020

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

MaterialLab

Report No. : 183057CA195782(1)

Page 1 of 1

CALIBRATION CERTIFICATE OF ANEMOMETER

Client Supplied Information

Client : Fugro Technical Services Ltd.

Project : Calibration Services

Details of Unit Under Test, UUT

Description : Anemometer

Manufacturer : Benetech

Model No. : GM816

Serial No. : N/A

Equipment ID.: WS-08

Next Calibration Date : 17-Jun-2020

Laboratory Information

Details of Reference Equipment –

Description : Reference Anemometer

Equipment ID.: R-101-4

Date of Calibration : 18-Jun-2019 Ambient Temperature : 22 °C

Calibration Location : Calibration Laboratory of FTS

Method Used : R-C-279

Calibration Results :

Reference Reading (m/s)	UUT Reading (m/s)	Error (m/s)
2.05	1.0	-1.1
4.08	3.1	-1.0
6.07	4.8	-1.3
8.03	6.7	-1.3
10.14	8.8	-1.3

Remark :

1. The equipment being used in this calibration is traceable to recognized National Standards.

Checked by : William Date : 20-6-2019 Certified by : Kih Leung Date : 24-6-2019
CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

** End of Report **

CALIBRATION CERTIFICATE OF SOUND LEVEL METER

Client Supplied Information

Client : Fugro Technical Services Ltd.

Project : Calibration Services

Details of Unit Under Test, UUT

 Description : Sound Level Meter
 Manufacturer : Casella

	Meter	Microphone	Preamplifier
Model No.	CEL-63X	CE-251	CEL-495
Serial No.	1488279	03876	002752

Equipment ID : N-52

Next Calibration Date : 12-Jan-2021

Specification Limit : EN 61672: 2003 Type 1

Laboratory Information
Details of Reference Equipment -

Description : B & K Acoustic Multifunction Calibrator 4226 (Traditional free field setting)

Equipment ID. : R-108-1

Date of Calibration : 13-Jan-2020

Calibration Location : Calibration Laboratory of FTS Ambient Temperature : 22 °C

Method Used : By direct comparison

Calibration Results :

Parameters		Mean Value (dB)	Specification Limit(dB)
A-weighting frequency response	4000Hz	1.4	2.6 to -0.6
	2000Hz	1.3	2.8 to -0.4
	1000Hz	0.0	1.1 to -1.1
	500Hz	-3.4	-1.8 to -4.6
	250Hz	-8.8	-7.2 to -10.0
	125Hz	-16.3	-14.6 to -17.6
	63Hz	-26.3	-24.7 to -27.7
	31.5Hz	-39.0	-37.4 to -41.4
Differential level linearity	94dB-104dB	0.0	± 0.6
	104dB-114dB	0.0	± 0.6

Remarks :

- The equipment used in this calibration is traceable to recognized National Standards.
- The mean value is the average of four measurements.
- For calibration: Reference SPL are 94, 104 & 114dB, range setting is 20-140dB & time weighting is fast
- The UUT complies with EN 61672: 2003 Type 1 sound level meter for the above measurement.
- The values given in this Calibration Certificate only relate to the values at the time of the test and any uncertainties will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling or the capability of any other laboratory to repeat the measurement.

 Checked by : William Date : 20-1-2020 Certified by : K.T. Leung Date : 21-1-2020
 CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

**** End of Report ****

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

MateriaLab

Report no.: 183057CA196350

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CALIBRATION CERTIFICATE OF SOUND LEVEL METER

Client Supplied Information

Client : Fugro Technical Services Ltd.

Address : Room 723 & 725, 7/F., Block B Profit Industrial Building, 1-15 Kwai Fung Crescent, Kwai Chung, N.T.

Project : Calibration Services

Details of Unit Under Test, UUT

Description : Sound Level Meter

Manufacturer : Casella

Model No.

Serial No.

Next Calibration Date : 23-Oct-2020

Specification Limit : EN 61672: 2003 Type 1

	Meter	Microphone	Preamplifier
Model No.	CEL-63X	CE-251	CEL-495
Serial No.	1488289	02789	004065

Laboratory Information

Details of Reference Equipment -

Description : B & K Acoustic Multifunction Calibrator 4226 (Traditional free field setting)

Equipment ID. : R-108-1

Date of Calibration : 24-Oct-2019 Ambient Temperature : 22 °C

Calibration Location : Calibration Laboratory of FTS

Method Used : By direct comparison

Calibration Results :

Parameters	Mean Value (dB)	Specification Limit(dB)
A-weighting frequency response	4000Hz	2.1
	2000Hz	1.6
	1000Hz	0.1
	500Hz	-3.3
	250Hz	-8.7
	125Hz	-16.2
	63Hz	-26.2
	31.5Hz	-38.9
Differential level linearity	94dB-104dB	± 0.6
	104dB-114dB	± 0.6

Remarks :

1. The equipment used in this calibration is traceable to recognized National Standards.
2. The mean value is the average of four measurements.
3. For calibration: Reference SPL are 94, 104 & 114dB, range setting is 20-140dB & time weighting is fast
4. The equipment does comply with EN 61672: 2003 Type 1 sound level meter for the above measurement.
5. The values given in this Calibration Certificate only relate to the values at the time of the test and any uncertainties will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling or the capability of any other laboratory to repeat the measurement.

Checked by : William Date : 1-11-2019 Certified by : R.T. Young Date : 1-11-2019
CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

** End of Report **



CALIBRATION CERTIFICATE OF SOUND CALIBRATOR

Client Supplied Information

Client : Fugro Technical Services Ltd.

Project : Calibration Services

Details of Unit Under Test, UUT

Description : Sound Calibrator
Manufacturer : Casella (Model CEL-120/1)
Serial No. : 2383886
Equipment ID : N/A
Next Calibration Date : 12-Jan-2021
Specification Limit : EN 60942: 2003 Type 1

Laboratory Information

Description : Reference Sound level meter
Equipment ID. : R-119-1
Date of Calibration : 13-Jan-2020 Ambient Temperature: 22 °C
Calibration Location : Calibration Laboratory of FTS
Method Used : By direct comparison

Calibration Results :

Parameters (Setting of UUT)	Mean Value (error of measurement)	Specification Limit(dB)
94dB	-0.2 dB	±0.4dB
114dB	-0.1 dB	

Remarks :

1. The equipment used in this calibration is traceable to recognized National Standards.
2. The mean value is the average of four measurements.
3. The equipment does comply with the specification limit.
4. The values given in this Calibration Certificate only relate to the values at the time of the test and any uncertainties will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling or the capability of any other laboratory to repeat the measurement.

Checked by : William Date : 20-1-2020 Certified by : K. Leung Date : 21-1-2020

CA-R-297 (22/07/2009)

Leung Kwok Tai (Assistant Manager)

** End of Report **

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

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Report no.: 183057CA195873(2)

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CALIBRATION CERTIFICATE OF SOUND CALIBRATOR

Client Supplied Information

Client : Fugro Technical Services Ltd.

Project : Calibration Services

Details of Unit Under Test, UUT

Description : Sound Calibrator
Manufacturer : Casella (Model CEL-120/1)
Serial No. : 4358250
Equipment ID : N-33
Next Calibration Date : 25-Jul-2020
Specification Limit : EN 60942: 2003 Type 1

Laboratory Information

Description : Reference Sound level meter
Equipment ID. : R-119-1
Date of Calibration : 26-Jul-2019 Ambient Temperature : 22 °C
Calibration Location : Calibration Laboratory of FTS
Method Used : By direct comparison

Calibration Results :

Parameters (Setting of UUT)	Mean Value (error of measurement)	Specification Limit(dB)
94dB	0.0 dB	±0.4dB
114dB	0.0 dB	

Remarks :

1. The equipment used in this calibration is traceable to recognized National Standards.
2. The mean value is the average of four measurements.
3. The equipment does comply with the specification limit.
4. The values given in this Calibration Certificate only relate to the values at the time of the test and any uncertainties will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling or the capability of any other laboratory to repeat the measurement.

Checked by: William Date: 26-7-2019 Certified by: F. T. Leung Date: 26-7-2019
CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

** End of Report **



Appendix E

Environmental Monitoring Schedule

Project: Contract No. HY/2019/01 - Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Impact Monitoring Schedule (February 2020)

Sun	Mon	Tue	Wed	Thur	Fri	Sat
February						1
2	3	4	5 Dust Monitoring	6	7 Noise Monitoring	8
9	10	11 Dust Monitoring Noise Monitoring	12	13	14	15
16	17 Dust Monitoring Noise Monitoring	18	19	20	21	22 Dust Monitoring
23	24	25	26	27	28 Dust Monitoring Noise Monitoring	29

Remarks

1. Actual monitoring may be subjected to change due to any safety concern or adverse weather condition;
2. Dust Monitoring: 24-hours TSP Monitoring per 6 days, and 3 x 1-hour TSP Monitoring per 6 days;
3. Noise Monitoring: Leq (30 min) between 0700 and 1900 hours;
4. Dust Monitoring Location: AMS2 (Tung Chung New Development Pier), AMS3C (Ying Tung Estate Market Rooftop) and AMS7B (3RS Site Offices)
5. Noise Monitoring Location: NMS2 (Seaview Crescent), NMS3C (Ying Tung Estate Refuse Collection Point)

Project: Contract No. HY/2019/01 - Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Impact Monitoring Schedule (March 2020)

Sun	Mon	Tue	Wed	Thur	Fri	Sat
1 March	2	3 Dolphin Monitoring	4	5 Dust Monitoring Noise Monitoring	6	7
8	9 Dolphin Monitoring	10	11 Dust Monitoring Noise Monitoring	12	13	14
15	16	17 Dust Monitoring Noise Monitoring Dolphin Monitoring	18	19 Dolphin Monitoring	20	21
22	23 Dust Monitoring Noise Monitoring	24	25	26	27	28 Dust Monitoring
29	30	31				

Remarks

1. Actual monitoring may be subjected to change due to any safety concern or adverse weather condition
2. Dust Monitoring: 24-hours TSP Monitoring per 6 days, and 3 x 1-hour TSP Monitoring per 6 days
3. Noise Monitoring: Leq (30 min) between 0700 and 1900 hours
4. Dolphin Monitoring: Chinese White Dolphin (post-construction phase, monthly); monitoring conducted and data collected by TM-CLKL Contract No. HY/2012/08
5. Dust Monitoring Location: AMS2 (Tung Chung New Development Pier), AMS3C (Ying Tung Estate Market Rooftop) and AMS7B (3RS Site Offices)
6. Noise Monitoring Location: NMS2 (Seaview Crescent), NMS3C (Ying Tung Estate Refuse Collection Point)



Appendix F

Air Quality Monitoring Results
and Construction Noise Monitoring Results

**1-hour TSP Monitoring Result for
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works**

AMS2 - Tung Chung Development Pier

Date	Weather Condition	Start Time	1-hour TSP ($\mu\text{g}/\text{m}^3$)			Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
			1st Measurement	2nd Measurement	3rd Measurement		
5-Feb-20	Fine	08:30	79	88	84	374	500
11-Feb-20	Fine	12:11	179	162	166		
17-Feb-20	Fine	11:52	62	73	79		
22-Feb-20	Fine	09:53	103	118	111		
28-Feb-20	Fine	13:17	61	61	63		
		Min	61				
		Max	179				
		Average	99				

AMS3C - Ying Tung Estate Market Rooftop

Date	Weather Condition	Start Time	1-hour TSP ($\mu\text{g}/\text{m}^3$)			Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
			1st Measurement	2nd Measurement	3rd Measurement		
5-Feb-20	Fine	08:42	61	67	69	368	500
11-Feb-20	Fine	11:20	174	180	167		
17-Feb-20	Fine	12:20	68	72	65		
22-Feb-20	Fine	10:07	90	86	77		
28-Feb-20	Fine	13:34	53	70	64		
		Min	53				
		Max	180				
		Average	91				

AMS7B - 3RS Site Offices

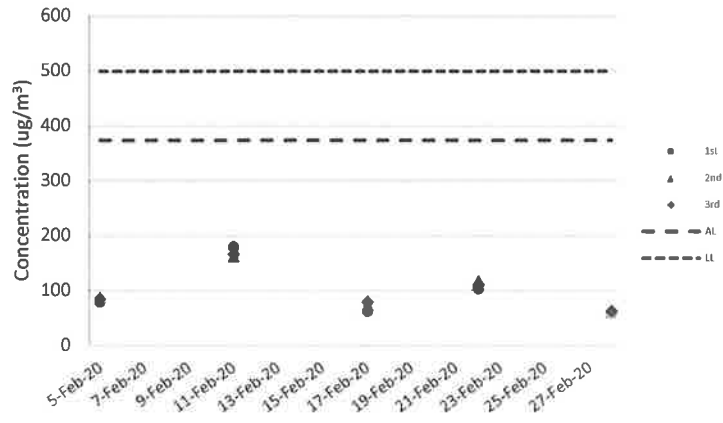
Date	Weather Condition	Start Time	1-hour TSP ($\mu\text{g}/\text{m}^3$)			Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
			1st Measurement	2nd Measurement	3rd Measurement		
5-Feb-20	Fine	09:00	63	67	61	370	500
11-Feb-20	Fine	11:48	115	144	130		
17-Feb-20	Fine	11:36	82	95	92		
22-Feb-20	Fine	09:33	85	92	101		
28-Feb-20	Fine	13:02	63	71	67		
		Min	61				
		Max	144				
		Average	89				

Note:

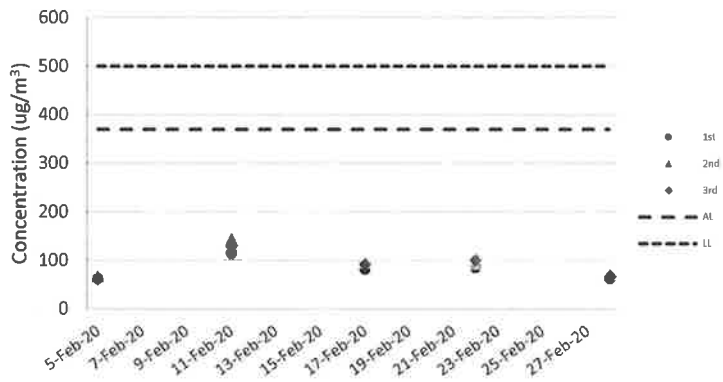
Underline: Exceedance of Action Level

Underline and Bold: Exceedance of Limit Level

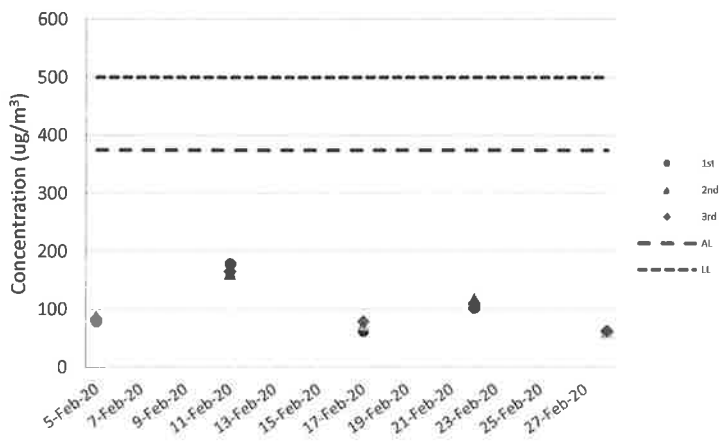
1-hr TSP AMS2



1-hr TSP AMS3C



1-hr TSP AMS7B



**24-hour TSP Monitoring Result for
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works**

AMS2 - Tung Chung Development Pier

Start Date	Weather Condition	Air Temperature (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Sampling Time(hrs)	Flow Rate (m ³ /min.)		Average flow (m ³ /min.)	Total volume (m ³)	Conc. (ug/m ³)	Action Level (ug/m ³)	Limit Level (ug/m ³)
				Initial	Final			Initial	Final					
5-Feb-20	Fine	290.5	765.5	2.7024	2.7605	0.0581	24	1.28	1.25	1.26	1821.5	32	176	260
11-Feb-20	Fine	290.6	765.4	2.7517	2.8698	0.1181	24	1.28	1.25	1.26	1821.2	65		
17-Feb-20	Fine	286.6	769.7	2.7360	2.7759	0.0399	24	1.29	1.25	1.27	1832.7	22		
22-Feb-20	Fine	293.1	769.3	2.7046	2.8474	0.1428	24	1.60	1.57	1.59	2284.1	63		
28-Feb-20	Fine	293.8	763.6	2.7028	2.7695	0.0667	24	1.27	1.25	1.26	1813.4	37		
												Min		
												Max	65	
												Average	44	

AMS3C - Ying Tung Estate Market Rooftop

Start Date	Weather Condition	Air Temperature (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Sampling Time(hrs)	Flow Rate (m ³ /min.)		Average flow (m ³ /min.)	Total volume (m ³)	Conc. (ug/m ³)	Action Level (ug/m ³)	Limit Level (ug/m ³)
				Initial	Final			Initial	Final					
5-Feb-20	Fine	290.5	765.5	2.7062	2.7698	0.0636	24	1.38	1.35	1.36	1961.5	32	167	260
11-Feb-20	Fine	290.6	765.4	2.7279	2.8597	0.1318	24	1.37	1.35	1.36	1961.3	67		
17-Feb-20	Fine	286.6	769.7	2.7313	2.7651	0.0338	24	1.39	1.35	1.37	1972.7	17		
22-Feb-20	Fine	293.1	769.3	2.6945	2.8245	0.1300	24	1.70	1.67	1.68	2422.0	54		
28-Feb-20	Fine	293.8	763.6	2.6731	2.7334	0.0603	24	1.36	1.35	1.36	1953.5	31		
												Min		
												Max	67	
												Average	40	

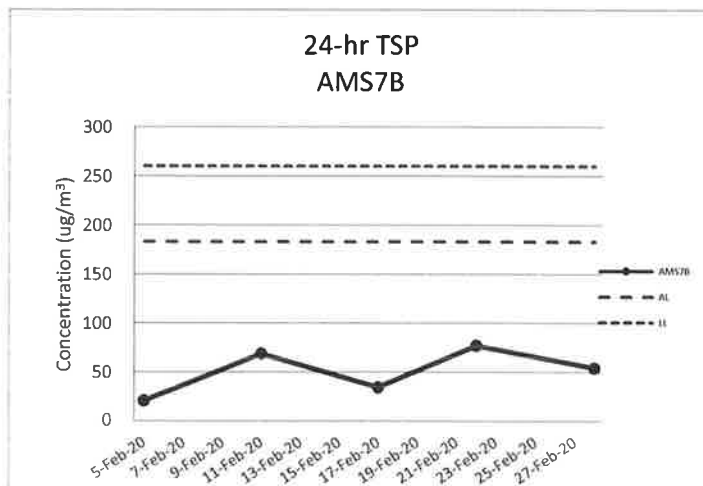
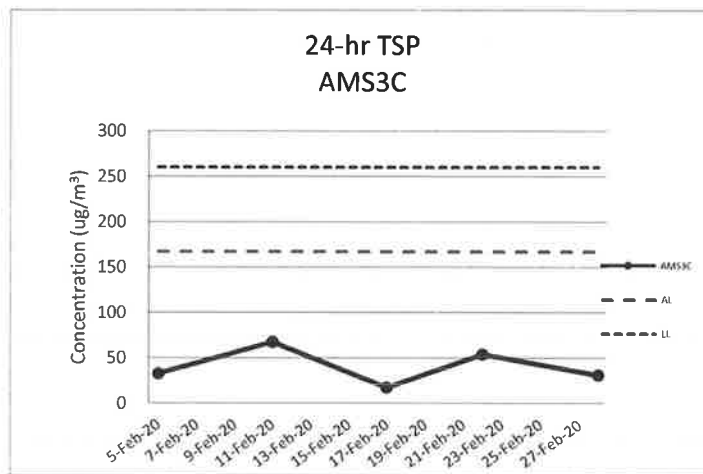
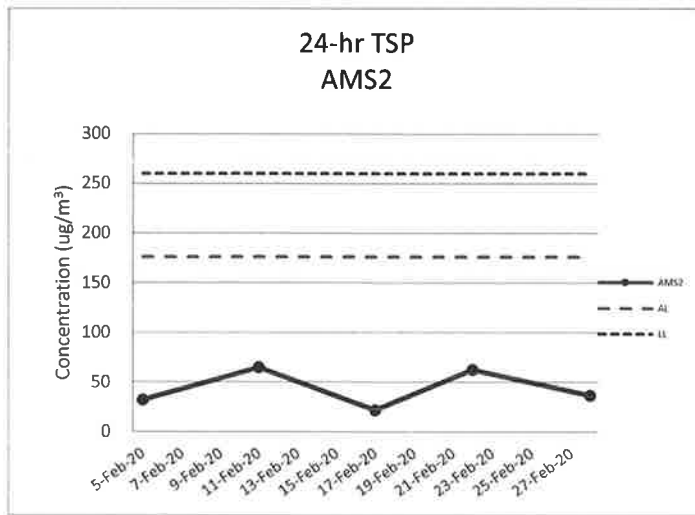
AMS7B - 3RS Site Offices

Start Date	Weather Condition	Air Temperature (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Sampling Time(hrs)	Flow Rate (m ³ /min.)		Average flow (m ³ /min.)	Total volume (m ³)	Conc. (ug/m ³)	Action Level (ug/m ³)	Limit Level (ug/m ³)
				Initial	Final			Initial	Final					
5-Feb-20	Fine	290.5	765.5	2.7073	2.7529	0.0456	24	1.56	1.54	1.55	2230.3	20	183	260
11-Feb-20	Fine	290.6	765.4	2.7384	2.8917	0.1533	24	1.56	1.54	1.55	2230.1	69		
17-Feb-20	Fine	286.6	769.7	2.7320	2.8088	0.0768	24	1.58	1.54	1.56	2241.6	34		
22-Feb-20	Fine	293.1	769.3	2.6917	2.8778	0.1861	24	1.63	1.74	1.68	2421.9	77		
28-Feb-20	Fine	293.8	763.6	2.6829	2.8136	0.1307	24	1.69	1.67	1.68	2416.3	54		
												Min		
												Max	77	
												Average	51	

Note:

Underline: Exceedance of Action Level

Underline and Bold: Exceedance of Limit Level



**Noise Impact Monitoring Result for
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works**

NMS2 - Seaview Crescent

Date	Start Time	L _{eq} 30min dB(A)	L ₁₀ dB(A)	L ₉₀ dB(A)	Wind Speed (m/s)	Weather	Limit Level dB(A)
7-Feb-20	12:19	62	66	58	0.2	Fine	75
11-Feb-20	13:25	60	63	56	0.8	Fine	75
17-Feb-20	10:40	63	65	57	0.4	Fine	75
28-Feb-20	14:15	62	64	58	2.5	Fine	75
	Max	63					
	Min	60					

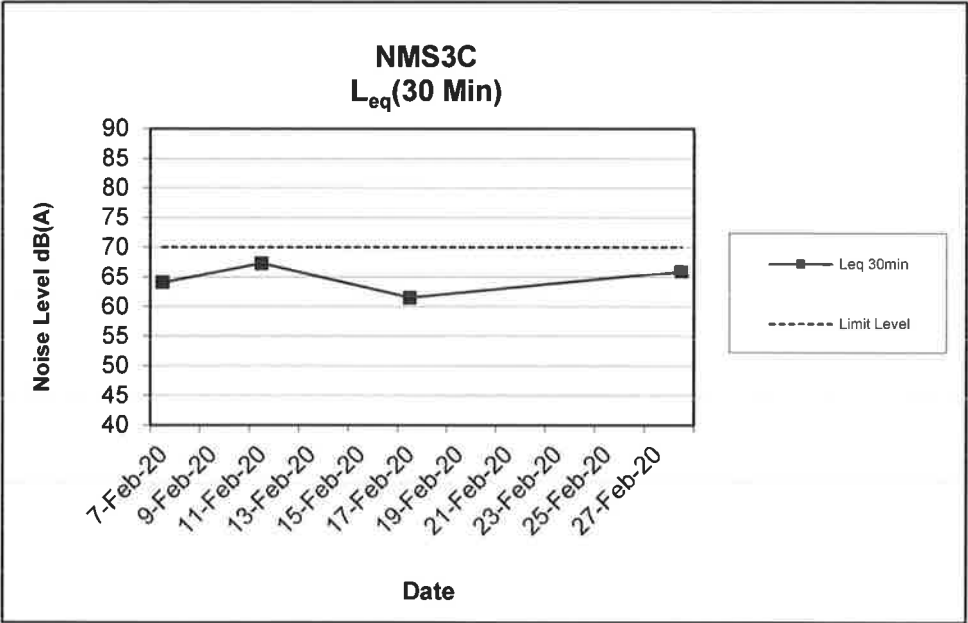
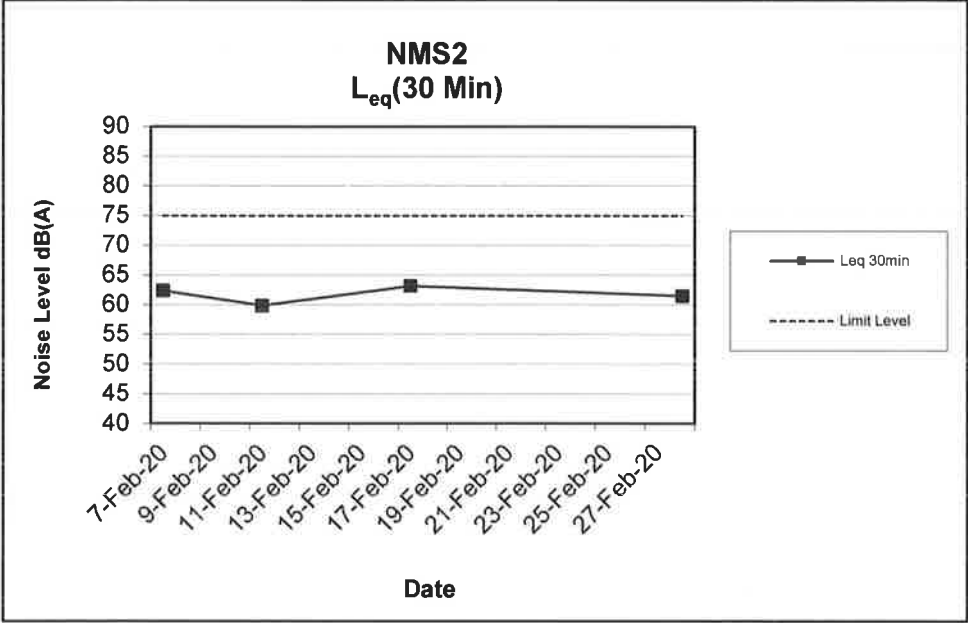
NMS3C - Ying Tung Estate Refuse Collection Point

Date	Start Time	L _{eq} 30min dB(A)	L ₁₀ dB(A)	L ₉₀ dB(A)	Wind Speed (m/s)	Weather	Limit Level dB(A)
7-Feb-20	10:19	64	67	62	0.3	Fine	70
11-Feb-20	10:43	67	70	63	3.2	Fine	70
17-Feb-20	13:41	62	64	60	0.3	Fine	70
28-Feb-20	13:35	66	69	60	0.8	Fine	70
	Max	67					
	Min	62					

Note:

NMS2: Façade Measurement

NMS3C: Free-field measurement (+3dB(A) correction has been applied), reduction to 65dB(A) during school examination periods will be applied.
No raining or wind with speed over 5 m/s was observed during noise monitoring according to the onsite observation.





Appendix G

Wind Data

Wind Data for
 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/5/2020 00:00	2.4	W
2/5/2020 01:00	2.3	NW
2/5/2020 02:00	2.3	SW
2/5/2020 03:00	2.8	S
2/5/2020 04:00	2.3	S
2/5/2020 05:00	2.3	S
2/5/2020 06:00	2.3	W
2/5/2020 07:00	2.3	NE
2/5/2020 08:00	2.3	N
2/5/2020 09:00	2.3	NW
2/5/2020 10:00	5.6	SW
2/5/2020 11:00	2.4	SE
2/5/2020 12:00	2.7	SE
2/5/2020 13:00	2.4	SE
2/5/2020 15:00	2.3	SE
2/5/2020 16:00	2.6	SE
2/5/2020 17:00	2.4	SE
2/5/2020 18:00	2.3	SW
2/5/2020 19:00	2.3	SW
2/5/2020 20:00	2.3	SW
2/5/2020 21:00	2.8	SW
2/5/2020 22:00	2.8	SW
2/5/2020 23:00	2.3	NW
2/6/2020 00:00	2.9	SE
2/6/2020 01:00	2.3	W
2/6/2020 02:00	2.4	W
2/6/2020 03:00	2.5	W
2/6/2020 04:00	3.4	NW
2/6/2020 05:00	2.3	W
2/6/2020 06:00	2.3	N
2/6/2020 07:00	4.0	S
2/6/2020 08:00	2.3	E
2/6/2020 09:00	5.6	SE
2/6/2020 11:00	2.3	W
2/6/2020 12:00	4.3	SW
2/6/2020 13:00	3.4	SE
2/6/2020 14:00	2.7	SW
2/6/2020 15:00	2.3	SE
2/6/2020 16:00	2.3	SE
2/6/2020 17:00	2.3	SW

Wind Data for
 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/6/2020 18:00	3.6	SE
2/6/2020 19:00	2.5	SW
2/6/2020 20:00	2.4	S
2/6/2020 21:00	2.4	SE
2/6/2020 22:00	2.3	SW
2/6/2020 23:00	2.3	NE
2/7/2020 00:00	2.3	SW
2/7/2020 01:00	2.3	N
2/7/2020 02:00	3.1	NW
2/7/2020 03:00	2.3	NW
2/7/2020 04:00	2.3	SE
2/7/2020 05:00	2.3	SE
2/7/2020 06:00	2.3	E
2/7/2020 07:00	2.3	W
2/7/2020 08:00	2.3	NW
2/7/2020 09:00	2.3	SE
2/7/2020 10:00	2.3	W
2/7/2020 11:00	2.3	SE
2/7/2020 12:00	2.3	SE
2/7/2020 13:00	2.3	N
2/7/2020 14:00	2.3	SE
2/7/2020 15:00	2.3	NE
2/7/2020 16:00	2.3	S
2/7/2020 17:00	2.3	SW
2/7/2020 18:00	2.3	W
2/7/2020 19:00	2.3	NW
2/7/2020 20:00	2.3	S
2/7/2020 21:00	2.9	W
2/7/2020 22:00	2.3	S
2/7/2020 23:00	2.3	S
2/8/2020 00:00	2.3	E
2/8/2020 01:00	2.3	SW
2/8/2020 02:00	2.5	S
2/8/2020 03:00	2.4	SW
2/8/2020 04:00	2.6	S
2/8/2020 05:00	2.3	SW
2/8/2020 06:00	2.5	S
2/8/2020 07:00	2.3	SW
2/8/2020 08:00	2.3	SW
2/8/2020 09:00	2.4	SW
2/8/2020 10:00	2.5	SW

Wind Data for
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/8/2020 11:00	2.3	SW
2/8/2020 12:00	2.4	SW
2/8/2020 13:00	2.5	SE
2/8/2020 14:00	2.6	S
2/8/2020 15:00	2.7	SW
2/8/2020 16:00	2.7	S
2/8/2020 17:00	2.3	S
2/8/2020 18:00	2.3	SW
2/8/2020 19:00	2.3	N
2/8/2020 20:00	2.5	SW
2/8/2020 21:00	2.4	S
2/8/2020 22:00	2.3	NW
2/8/2020 23:00	2.3	S
2/9/2020 00:00	2.3	N
2/9/2020 01:00	2.4	S
2/9/2020 02:00	2.6	SW
2/9/2020 03:00	2.3	W
2/9/2020 04:00	2.9	SW
2/9/2020 05:00	2.4	W
2/9/2020 06:00	2.3	W
2/9/2020 07:00	2.3	SW
2/9/2020 08:00	2.3	S
2/9/2020 09:00	2.4	S
2/9/2020 10:00	2.3	NW
2/9/2020 11:00	2.3	W
2/9/2020 12:00	2.3	S
2/9/2020 13:00	2.3	W
2/9/2020 14:00	2.3	NW
2/9/2020 15:00	2.3	SE
2/9/2020 16:00	2.3	E
2/9/2020 17:00	2.3	SE
2/9/2020 18:00	2.3	NW
2/9/2020 19:00	2.3	N
2/9/2020 20:00	2.3	NW
2/9/2020 21:00	2.3	NW
2/9/2020 22:00	2.3	S
2/9/2020 23:00	2.4	SW
2/10/2020 00:00	3.1	S
2/10/2020 01:00	2.7	SW
2/10/2020 02:00	2.3	N
2/10/2020 03:00	2.3	SW

Wind Data for
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/10/2020 04:00	2.3	W
2/10/2020 05:00	2.3	SW
2/10/2020 06:00	2.3	S
2/10/2020 07:00	2.3	W
2/10/2020 08:00	2.3	W
2/10/2020 09:00	2.3	SW
2/10/2020 10:00	2.3	SE
2/10/2020 11:00	2.4	SW
2/10/2020 12:00	2.5	SW
2/10/2020 13:00	2.3	SE
2/10/2020 14:00	2.4	SE
2/10/2020 15:00	2.3	N
2/10/2020 16:00	2.5	NW
2/10/2020 17:00	2.3	NW
2/10/2020 18:00	2.3	N
2/10/2020 19:00	2.3	NE
2/10/2020 20:00	2.3	NW
2/10/2020 21:00	2.3	N
2/10/2020 22:00	2.3	NW
2/10/2020 23:00	2.3	W
2/11/2020 00:00	2.3	NW
2/11/2020 01:00	2.3	S
2/11/2020 02:00	2.3	NW
2/11/2020 03:00	2.3	W
2/11/2020 04:00	2.3	SW
2/11/2020 05:00	2.3	E
2/11/2020 06:00	2.3	SW
2/11/2020 07:00	2.4	W
2/11/2020 08:00	2.3	SE
2/11/2020 09:00	2.3	SE
2/11/2020 10:00	3.8	SW
2/11/2020 11:00	2.3	W
2/11/2020 12:00	2.3	SW
2/11/2020 13:00	2.4	N
2/11/2020 14:00	2.5	SE
2/11/2020 15:00	2.3	NW
2/11/2020 16:00	2.3	SW
2/11/2020 17:00	2.4	N
2/11/2020 18:00	2.3	N
2/11/2020 19:00	2.3	SW
2/11/2020 20:00	2.3	N

Wind Data for
 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/11/2020 21:00	2.3	S
2/11/2020 22:00	2.3	S
2/11/2020 23:00	2.3	W
2/12/2020 00:00	2.3	NW
2/12/2020 01:00	2.3	S
2/12/2020 02:00	2.3	NW
2/12/2020 03:00	2.3	N
2/12/2020 04:00	2.3	E
2/12/2020 05:00	2.3	NW
2/12/2020 06:00	2.3	N
2/12/2020 07:00	2.3	W
2/12/2020 08:00	2.3	NE
2/12/2020 09:00	2.3	S
2/12/2020 10:00	2.3	SE
2/12/2020 12:00	2.3	W
2/12/2020 13:00	3.1	S
2/12/2020 14:00	2.5	N
2/12/2020 15:00	2.3	W
2/12/2020 16:00	2.3	N
2/12/2020 17:00	2.3	N
2/12/2020 18:00	2.4	W
2/12/2020 19:00	2.3	S
2/12/2020 20:00	2.3	N
2/12/2020 21:00	2.3	NW
2/12/2020 22:00	2.3	W
2/12/2020 23:00	2.3	N
2/13/20 00:00:00	2.3	N
2/13/20 01:00:00	2.3	N
2/13/20 02:00:00	2.3	NW
2/13/20 03:00:00	2.3	NW
2/13/20 04:00:00	2.3	NW
2/13/20 05:00:00	2.3	NW
2/13/20 06:00:00	2.3	NW
2/13/20 07:00:00	2.3	N
2/13/20 08:00:00	2.3	N
2/13/20 09:00:00	2.3	SE
2/13/20 10:00:00	2.4	N
2/13/20 11:00:00	2.3	NW
2/13/20 12:00:00	2.4	S
2/13/20 13:00:00	2.3	NW
2/13/20 14:00:00	2.3	N

Wind Data for
 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/13/20 15:00:00	2.3	N
2/13/20 16:00:00	2.3	N
2/13/20 17:00:00	2.3	W
2/13/20 18:00:00	2.3	N
2/13/20 19:00:00	2.3	SE
2/13/20 20:00:00	2.3	NE
2/13/20 21:00:00	2.3	S
2/13/20 22:00:00	2.3	E
2/13/20 23:00:00	2.3	N
2/14/20 00:00:00	2.3	S
2/14/20 01:00:00	4.0	SW
2/14/20 02:00:00	2.5	W
2/14/20 03:00:00	2.3	N
2/14/20 04:00:00	2.3	E
2/14/20 05:00:00	3.4	NW
2/14/20 06:00:00	2.6	SW
2/14/20 07:00:00	3.3	SW
2/14/20 08:00:00	4.0	SW
2/14/20 09:00:00	2.3	S
2/14/20 10:00:00	2.3	N
2/14/20 11:00:00	3.0	N
2/14/20 12:00:00	4.1	W
2/14/20 13:00:00	2.7	NW
2/14/20 14:00:00	2.3	W
2/14/20 15:00:00	3.4	S
2/14/20 16:00:00	2.3	NE
2/14/20 17:00:00	2.7	SE
2/14/20 18:00:00	2.3	S
2/14/20 19:00:00	2.4	NE
2/14/20 20:00:00	2.3	N
2/14/20 21:00:00	2.3	E
2/14/20 22:00:00	2.4	NW
2/14/20 23:00:00	2.3	S
2/15/20 00:00:00	2.3	NE
2/15/20 01:00:00	2.3	SW
2/15/20 02:00:00	2.3	SE
2/15/20 03:00:00	4.6	SW
2/15/20 04:00:00	2.3	W
2/15/20 05:00:00	2.3	S
2/15/20 06:00:00	2.3	W
2/15/20 07:00:00	3.3	SE

Wind Data for
 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/15/20 08:00:00	3.6	S
2/15/20 09:00:00	2.5	NE
2/15/20 10:00:00	2.3	SE
2/15/20 11:00:00	2.8	SE
2/15/20 12:00:00	3.5	NW
2/15/20 13:00:00	2.3	NE
2/15/20 14:00:00	2.3	S
2/15/20 15:00:00	2.3	SE
2/15/20 16:00:00	2.3	SE
2/15/20 17:00:00	2.4	SE
2/15/20 18:00:00	2.3	NW
2/15/20 19:00:00	2.3	S
2/15/20 20:00:00	2.3	W
2/15/20 21:00:00	2.3	S
2/15/20 22:00:00	2.4	N
2/15/20 23:00:00	2.3	SE
2/16/20 00:00:00	2.3	NW
2/16/20 01:00:00	2.3	N
2/16/20 02:00:00	2.4	NE
2/16/20 03:00:00	2.3	W
2/16/20 04:00:00	2.3	W
2/16/20 05:00:00	2.5	N
2/16/20 06:00:00	3.8	NW
2/16/20 07:00:00	2.3	SW
2/16/20 08:00:00	2.4	SE
2/16/20 09:00:00	2.3	N
2/16/20 10:00:00	2.3	NW
2/16/20 11:00:00	2.3	SW
2/16/20 12:00:00	2.3	N
2/16/20 13:00:00	3.0	S
2/16/20 14:00:00	2.3	SE
2/16/20 15:00:00	3.7	N
2/16/20 16:00:00	2.3	SW
2/16/20 17:00:00	2.3	SE
2/16/20 18:00:00	2.3	S
2/16/20 19:00:00	2.3	N
2/16/20 20:00:00	2.3	SE
2/16/20 21:00:00	2.5	SE
2/16/20 22:00:00	2.5	W
2/16/20 23:00:00	2.3	SW
2/17/20 00:00:00	2.3	SW

Wind Data for
 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/17/20 01:00:00	2.7	S
2/17/20 02:00:00	2.4	S
2/17/20 03:00:00	3.5	S
2/17/20 04:00:00	2.5	S
2/17/20 05:00:00	2.4	SW
2/17/20 06:00:00	2.7	SW
2/17/20 07:00:00	2.9	S
2/17/20 08:00:00	2.6	W
2/17/20 09:00:00	3.5	SE
2/17/20 10:00:00	2.4	S
2/17/20 11:00:00	2.3	S
2/17/20 12:00:00	3.2	SE
2/17/20 13:00:00	3.6	S
2/17/20 14:00:00	2.7	S
2/17/20 15:00:00	3.2	S
2/17/20 16:00:00	2.7	SW
2/17/20 17:00:00	3.1	S
2/17/20 18:00:00	2.5	SW
2/17/20 19:00:00	2.3	NE
2/17/20 20:00:00	2.3	SW
2/17/20 21:00:00	2.3	W
2/17/20 22:00:00	2.7	NW
2/17/20 23:00:00	2.3	SE
2/18/20 00:00:00	2.4	SW
2/18/20 01:00:00	2.3	N
2/18/20 02:00:00	2.3	E
2/18/20 03:00:00	2.3	E
2/18/20 04:00:00	2.3	N
2/18/20 05:00:00	2.3	N
2/18/20 06:00:00	2.3	SE
2/18/20 07:00:00	2.3	SE
2/18/20 08:00:00	2.3	NW
2/18/20 09:00:00	2.6	SW
2/18/20 10:00:00	2.3	S
2/18/20 11:00:00	2.3	NW
2/18/20 12:00:00	2.3	SE
2/18/20 13:00:00	2.3	SE
2/18/20 14:00:00	2.3	SE
2/18/20 15:00:00	2.3	S
2/18/20 16:00:00	2.3	SE
2/18/20 17:00:00	2.3	NW

Wind Data for
 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/18/20 18:00:00	2.3	NW
2/18/20 19:00:00	2.3	W
2/18/20 20:00:00	2.5	S
2/18/20 21:00:00	2.6	NW
2/18/20 22:00:00	2.3	NE
2/18/20 23:00:00	2.4	SE
2/19/20 00:00:00	2.3	SE
2/19/20 01:00:00	2.3	E
2/19/20 02:00:00	2.3	SW
2/19/20 03:00:00	2.3	S
2/19/20 04:00:00	2.6	SE
2/19/20 05:00:00	3.1	SE
2/19/20 06:00:00	2.8	S
2/19/20 07:00:00	2.3	SE
2/19/20 08:00:00	2.6	SE
2/19/20 09:00:00	3.9	SE
2/19/20 10:00:00	2.4	SW
2/19/20 11:00:00	2.3	NW
2/19/20 12:00:00	4.0	SE
2/19/20 13:00:00	2.4	N
2/19/20 14:00:00	4.0	SE
2/19/20 15:00:00	2.4	S
2/19/20 16:00:00	2.3	SE
2/19/20 17:00:00	2.3	SE
2/19/20 18:00:00	2.3	E
2/19/20 19:00:00	2.3	NE
2/19/20 20:00:00	2.3	W
2/19/20 21:00:00	2.3	NW
2/19/20 22:00:00	2.3	S
2/19/20 23:00:00	2.3	N
2/20/20 00:00:00	2.4	SE
2/20/20 01:00:00	2.3	SE
2/20/20 02:00:00	2.4	SE
2/20/20 03:00:00	2.4	SE
2/20/20 04:00:00	2.4	SE
2/20/20 05:00:00	2.3	S
2/20/20 06:00:00	2.3	W
2/20/20 07:00:00	2.3	SE
2/20/20 08:00:00	2.3	E
2/20/20 09:00:00	2.3	NW
2/20/20 10:00:00	2.9	SE

Wind Data for
 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/20/20 11:00:00	2.3	SE
2/20/20 12:00:00	2.4	SE
2/20/20 13:00:00	2.4	W
2/20/20 14:00:00	3.7	SE
2/20/20 15:00:00	2.3	SE
2/20/20 16:00:00	2.4	S
2/20/20 17:00:00	2.9	SE
2/20/20 18:00:00	2.7	SE
2/20/20 19:00:00	2.3	NW
2/20/20 20:00:00	2.5	E
2/20/20 21:00:00	2.4	NW
2/20/20 22:00:00	4.5	W
2/20/20 23:00:00	2.4	W
2/21/20 00:00:00	2.8	W
2/21/20 01:00:00	2.4	SE
2/21/20 02:00:00	2.8	SE
2/21/20 03:00:00	2.5	SE
2/21/20 04:00:00	2.3	W
2/21/20 05:00:00	2.3	N
2/21/20 06:00:00	2.3	W
2/21/20 07:00:00	2.3	N
2/21/20 08:00:00	3.0	S
2/21/20 09:00:00	2.5	SE
2/21/20 10:00:00	5.3	S
2/21/20 11:00:00	3.0	SE
2/21/20 12:00:00	3.2	SE
2/21/20 13:00:00	2.4	N
2/21/20 14:00:00	2.5	SW
2/21/20 15:00:00	2.3	SE
2/21/20 16:00:00	2.3	SW
2/21/20 17:00:00	2.3	SE
2/21/20 18:00:00	2.3	SE
2/21/20 19:00:00	2.3	NW
2/21/20 20:00:00	2.3	N
2/21/20 21:00:00	2.3	SW
2/21/20 22:00:00	2.3	N
2/21/20 23:00:00	2.3	N
2/22/20 00:00:00	2.3	W
2/22/20 01:00:00	2.3	W
2/22/20 02:00:00	2.3	W
2/22/20 03:00:00	2.3	N

Wind Data for
 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/22/20 04:00:00	2.3	N
2/22/20 05:00:00	2.3	N
2/22/20 06:00:00	2.3	N
2/22/20 07:00:00	2.3	N
2/22/20 08:00:00	2.3	NW
2/22/20 09:00:00	2.3	N
2/22/20 10:00:00	2.3	SE
2/22/20 11:00:00	2.3	NW
2/22/20 12:00:00	3.1	SE
2/22/20 13:00:00	2.3	N
2/22/20 14:00:00	2.4	SE
2/22/20 15:00:00	2.3	W
2/22/20 16:00:00	2.3	SW
2/22/20 17:00:00	2.3	NW
2/22/20 18:00:00	2.4	SE
2/22/20 19:00:00	3.3	S
2/22/20 20:00:00	3.0	SW
2/22/20 21:00:00	2.6	W
2/22/20 22:00:00	3.4	SE
2/22/20 23:00:00	2.9	S
2/23/20 00:00:00	3.0	E
2/23/20 01:00:00	3.8	W
2/23/20 02:00:00	3.9	S
2/23/20 03:00:00	2.7	SE
2/23/20 04:00:00	2.5	W
2/23/20 05:00:00	2.4	S
2/23/20 06:00:00	3.4	SE
2/23/20 07:00:00	2.3	W
2/23/20 08:00:00	3.2	S
2/23/20 09:00:00	2.3	E
2/23/20 10:00:00	3.4	SE
2/23/20 11:00:00	2.3	NE
2/23/20 12:00:00	2.4	N
2/23/20 13:00:00	2.3	S
2/23/20 14:00:00	2.3	S
2/23/20 15:00:00	2.6	S
2/23/20 16:00:00	2.5	SW
2/23/20 17:00:00	2.4	SE
2/23/20 18:00:00	2.5	SE
2/23/20 19:00:00	2.5	SE
2/23/20 20:00:00	3.7	SE

Wind Data for
 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/23/20 21:00:00	6.0	SE
2/23/20 22:00:00	4.4	SE
2/23/20 23:00:00	6.9	S
2/24/20 00:00:00	6.9	SE
2/24/20 01:00:00	5.7	E
2/24/20 02:00:00	4.0	SE
2/24/20 03:00:00	2.8	S
2/24/20 04:00:00	2.4	E
2/24/20 05:00:00	3.9	S
2/24/20 06:00:00	2.6	NE
2/24/20 07:00:00	5.0	SE
2/24/20 08:00:00	2.3	NE
2/24/20 09:00:00	2.5	NE
2/24/20 10:00:00	2.4	SW
2/24/20 11:00:00	4.5	W
2/24/20 12:00:00	2.4	SW
2/24/20 13:00:00	2.4	NE
2/24/20 14:00:00	2.6	SW
2/24/20 15:00:00	2.3	N
2/24/20 16:00:00	3.4	W
2/24/20 17:00:00	2.3	W
2/24/20 18:00:00	2.3	N
2/24/20 19:00:00	2.3	NE
2/24/20 20:00:00	2.8	SW
2/24/20 21:00:00	2.4	W
2/24/20 22:00:00	2.9	S
2/24/20 23:00:00	2.3	S
2/25/20 00:00:00	2.3	S
2/25/20 01:00:00	2.5	NW
2/25/20 02:00:00	2.5	SW
2/25/20 03:00:00	2.3	SW
2/25/20 04:00:00	2.3	S
2/25/20 05:00:00	3.2	W
2/25/20 06:00:00	2.3	W
2/25/20 07:00:00	2.3	NW
2/25/20 08:00:00	2.3	NE
2/25/20 09:00:00	2.3	SE
2/25/20 10:00:00	2.3	S
2/25/20 11:00:00	2.3	S
2/25/20 12:00:00	2.3	N
2/25/20 13:00:00	2.3	NW

Wind Data for
 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/25/20 14:00:00	2.7	SE
2/25/20 15:00:00	2.3	E
2/25/20 16:00:00	2.3	SW
2/25/20 17:00:00	2.3	W
2/25/20 18:00:00	2.3	SW
2/25/20 19:00:00	2.3	NW
2/25/20 20:00:00	2.3	S
2/25/20 21:00:00	2.3	NE
2/25/20 22:00:00	2.3	N
2/25/20 23:00:00	2.3	SW
2/26/20 00:00:00	2.3	NW
2/26/20 01:00:00	2.3	NE
2/26/20 02:00:00	2.3	N
2/26/20 03:00:00	2.3	N
2/26/20 04:00:00	2.3	NW
2/26/20 05:00:00	2.3	NW
2/26/20 06:00:00	2.3	N
2/26/20 07:00:00	2.3	NW
2/26/20 08:00:00	2.3	N
2/26/20 09:00:00	2.3	N
2/26/20 10:00:00	2.3	N
2/26/20 11:00:00	2.3	NW
2/26/20 12:00:00	2.4	NW
2/26/20 13:00:00	2.3	N
2/26/20 14:00:00	2.3	NW
2/26/20 15:00:00	2.3	E
2/26/20 16:00:00	2.5	W
2/26/20 17:00:00	2.3	SW
2/26/20 18:00:00	2.3	NW
2/26/20 19:00:00	2.3	S
2/26/20 20:00:00	2.3	S
2/26/20 21:00:00	2.3	SW
2/26/20 22:00:00	2.3	SW
2/26/20 23:00:00	2.3	W
2/27/20 00:00:00	2.3	W
2/27/20 01:00:00	2.3	W
2/27/20 02:00:00	2.3	W
2/27/20 03:00:00	2.3	N
2/27/20 04:00:00	2.4	N
2/27/20 05:00:00	2.9	W
2/27/20 06:00:00	2.5	N

Wind Data for
 Hong Kong-Zhuhai-Macao Bridge
 Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/27/20 07:00:00	2.4	S
2/27/20 08:00:00	2.4	S
2/27/20 09:00:00	2.3	NW
2/27/20 10:00:00	3.7	SE
2/27/20 11:00:00	2.4	SW
2/27/20 12:00:00	9.2	SE
2/27/20 13:00:00	2.4	SE
2/27/20 14:00:00	2.5	SW
2/27/20 15:00:00	2.7	W
2/27/20 16:00:00	2.7	W
2/27/20 17:00:00	3.9	S
2/27/20 18:00:00	2.3	S
2/27/20 19:00:00	2.4	SE
2/27/20 20:00:00	2.3	W
2/27/20 21:00:00	2.4	SW
2/27/20 22:00:00	2.7	W
2/27/20 23:00:00	4.0	W
2/28/20 00:00:00	2.3	N
2/28/20 01:00:00	3.0	N
2/28/20 02:00:00	2.3	S
2/28/20 03:00:00	2.3	W
2/28/20 04:00:00	6.4	SE
2/28/20 05:00:00	2.5	SE
2/28/20 06:00:00	2.3	E
2/28/20 07:00:00	2.7	S
2/28/20 08:00:00	2.5	N
2/28/20 09:00:00	2.3	SE
2/28/20 10:00:00	2.4	S
2/28/20 11:00:00	2.3	SW
2/28/20 12:00:00	2.4	W
2/28/20 13:00:00	2.4	W
2/28/20 14:00:00	2.3	N
2/28/20 15:00:00	2.3	SE
2/28/20 16:00:00	2.4	W
2/28/20 17:00:00	2.3	SW
2/28/20 18:00:00	2.3	SW
2/28/20 19:00:00	2.3	W
2/28/20 20:00:00	2.3	W
2/28/20 21:00:00	2.6	W
2/28/20 22:00:00	2.4	NW
2/28/20 23:00:00	2.3	NW

Wind Data for
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works

Date	Wind Speed (m/s)	Wind Direction
2/29/20 00:00:00	2.7	SE
2/29/20 01:00:00	2.3	N
2/29/20 02:00:00	2.3	NW
2/29/20 03:00:00	2.3	N
2/29/20 04:00:00	2.3	N
2/29/20 05:00:00	2.3	N
2/29/20 06:00:00	2.3	N
2/29/20 07:00:00	2.3	N
2/29/20 08:00:00	2.3	SW
2/29/20 09:00:00	2.4	S
2/29/20 10:00:00	2.3	NW
2/29/20 11:00:00	2.5	S
2/29/20 12:00:00	2.5	NE
2/29/20 13:00:00	2.3	N
2/29/20 14:00:00	2.3	SE
2/29/20 15:00:00	2.4	SE
2/29/20 16:00:00	2.3	NW
2/29/20 17:00:00	2.3	NW
2/29/20 18:00:00	2.3	NW
2/29/20 19:00:00	2.3	N
2/29/20 20:00:00	2.3	NW
2/29/20 21:00:00	2.3	N
2/29/20 22:00:00	2.3	N
2/29/20 23:00:00	2.3	N
3/1/20 00:00:00	2.3	N



Appendix H

Event and Action Plan

Event / Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	ACTION LEVEL			
1. Exceedance for one sample	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 	<ol style="list-style-type: none"> 1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	LIMIT LEVEL			
1. Exceedance for one sample	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 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.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation 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. 	<ol style="list-style-type: none"> 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.

Event / Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level	<ol style="list-style-type: none"> 1. <u>Notify IEC and Contractor;</u> 2. <u>Identify source, investigate the causes of exceedance and propose remedial measures;</u> 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. <u>Inform IEC, ER, EPD and Contractor;</u> 2. <u>Identify source;</u> 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 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. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 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. 	<ol style="list-style-type: none"> 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.



Appendix I

Waste Flow Table

Waste Flow Table for Year 2020										
Monthly Ending	Actual Quantities of Inert C&D Materials Generated Monthly					Actual Quantities of Non-inert C&D Wastes Generated Monthly				
	Total Quantity Generated (Inert C&D)	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
2020 Jan	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2020 Feb	Nil	Nil	0.0931	Nil	Nil	Nil	Nil	0.335	Nil	0.0065
2020 Mar										
2020 Apr										
2020 May										
2020 Jun										
2020 Jul										
2020 Aug										
2020 Sep										
2020 Oct										
2020 Nov										
2020 Dec										
Total	0	0	0.0931	0	0	0	0	0.3350	0	0.0065

Note:

- 1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
- 2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging materials.
- 3) Total Quantity Generated (Inert) = Hard Rock and Large Broken Concrete + Reused in the Contract + Disposed as Public Fill – Imported Fill



Appendix J

Implementation Status of
Environment mitigation Measures (Construction Phase)

Implementation Status of Environment Mitigation Measures (Construction Phase) - Contract No. HY/2019/01

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
Air Quality				
S5.5.6.1	A1	1) The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	All construction sites	Implemented
S5.5.6.2	A2	2) Proper watering of exposed spoil should be undertaken throughout the construction phase: <ul style="list-style-type: none"> •Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; •Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; •A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones. •The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; •Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; 	All construction sites	Implemented
S5.5.6.2	A2	<ul style="list-style-type: none"> •When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; •The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials, •Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; •Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; •Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; •Any skip hoist for material transport should be totally enclosed by impervious sheeting; •Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top 	All construction sites	Implemented

Implementation Status of Environment Mitigation Measures (Construction Phase) - Contract No. HY/2019/01

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
S5.5.6.2	A2	<ul style="list-style-type: none"> • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies 	All construction sites	N/A
S5.5.6.3	A3	3) The Contractor should undertake proper watering on all exposed spoil (with at least 8 times per day) throughout the construction phase.	All construction sites	Implemented
S5.5.6.4	A4	4) Project Manager to incorporate the controlled measures into the Particular Specification (PS) for the civil work. The PS should also draw the contractor's attention to the relevant latest Practice Notes issued by EPD.	All construction sites	Implemented
S5.5.6.4	A5	5) Implement regular dust monitoring under EM&A programme during the construction stage.	Selected representative dust monitoring station	Implemented
S5.5.7.1	A6	<p>The following mitigation measures should be adopted to prevent fugitive dust emissions for concrete batching plant;</p> <ul style="list-style-type: none"> • Loading, unloading, handling, transfer or storage of any dusty materials should be carried out in totally enclosed system; • All dust-laden air or waste gas generated by the process operations should be properly extracted and vented to fabric filtering system to meet the emission limits for TSP; • Vents for all silos and cement/pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system; • The materials which may generate airborne dusty emissions should be wetted by water spray system; • All receiving hoppers should be enclosed on three sides up to 3m above unloading point; • All conveyor transfer points should be totally enclosed; • All access and route roads within the premises should be paved and wetted; and • Vehicle cleaning facilities should be provided and used by all concrete trucks before leaving the premises to wash off any dust on the wheels and/or body. 	Selected representative dust monitoring station	Implemented
S5.5.2.7	A7	<p>The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point:</p> <ul style="list-style-type: none"> • All road surface within the barging facilities will be paved; • Dust enclosures will be provided for the loading ramp; • Vehicles will be required to pass through designated wheels wash facilities; and • Continuous water spray at the loading points. 	All construction sites	Implemented
Construction Noise (Air borne)				
S6.4.10	N1	<p>1) Use of good site practices to limit noise emissions by considering the following:</p> <ul style="list-style-type: none"> • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; 	All construction sites	Implemented

Implementation Status of Environment Mitigation Measures (Construction Phase) - Contract No. HY/2019/01

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
		<ul style="list-style-type: none"> •mobile plant should be sited as far away from NSRs as possible and practicable; •material stockpiles, mobile container site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 		
S6.4.11	N2	2) Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	All construction sites	Implemented
S6.4.12	N3	3) Install movable noise barriers (typically density@14kg/m acoustic mat or full enclosure close to noisy plants including compressor, generators, saw.	For plant items listed in Appendix 6D of the EIA report at all construction sites	N/A
S6.4.13	N4	4) Select "Quiet plants" which comply with the BS 5228 Part 1 or TM standards.	For plant items listed in Appendix 6D of the EIA report at all construction sites	Implemented
S6.4.14	N5	5) Sequencing operation of construction plants where practicable	All construction sites where practicable	Implemented
S5.1	N6	6) Implement a noise monitoring under EM&A programme.	Selected representative noise monitoring station	Implemented
Waste Management (Construction Noise)				
S8.3.8	WM1	<p>Construction and Demolition Material</p> <p>The following mitigation measures should be implemented in handling the waste:</p> <ul style="list-style-type: none"> •Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; •Carry out on-site sorting; •Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; •Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; and •Implement an enhanced Waste Management Plan similar to E7WBTC (Works) No. 19/2005 - "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. •In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and get its approval before implementation. 	All construction sites	N/A
S8.3.9- S8.3.11	WM2	<p>C&D Waste</p> <ul style="list-style-type: none"> •Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. •The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage. 	All construction sites	Implemented

Implementation Status of Environment Mitigation Measures (Construction Phase) - Contract No. HY/2019/01

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
S8.2.12- S8.3.15	WM3	<p>Chemical Waste</p> <ul style="list-style-type: none"> •Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. •Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. •The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated. •Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD. 	All construction sites	Partially Implemented
S8.3.16	WM4	<p>Sewage</p> <ul style="list-style-type: none"> •Adequate numbers of portable toilets should be provided for the workers. The portable toilets should be maintained in a state which will not deter the workers from utilizing these portable toilets. Night soil should be collected by licensed collectors regularly. 	All construction sites	Implemented
S8.3.17- S8.3.19	WM5	<p>General Refuse</p> <ul style="list-style-type: none"> •General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. •A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. •Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. •Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor. •Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes. 	All construction sites	Implemented

Implementation Status of Environment Mitigation Measures (Construction Phase) - Contract No. HY/2019/01

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
Water Quality (Construction Phase)				
S9.11.1.7	W2	<p>Land Works</p> <p>General construction activities on land should also be governed by standard good working practice. Specific measures to be written into the works contracts should include:</p> <ul style="list-style-type: none"> •wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters; •sewage effluent and discharges from on-site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided; •storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks; •silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm; •temporary access roads should be surfaced with crushed stone or gravel; •rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; •measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system; •open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms; •manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers; •discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system; •all vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit; •wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain; •the section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel; •wastewater generated from concreting, plastering, Internal decoration, cleaning work and other similar activities, shall be screened to remove large objects; •vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site disposal; •the contractors shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately; •waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance; •all fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank; and •surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system. 	All land-based construction sites	Implemented

Implementation Status of Environment Mitigation Measures (Construction Phase) - Contract No. HY/2019/01

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
Ecology (Construction Phase)				
S10.7	E4	•Watering to reduce dust generation; prevention of siltation of freshwater habitats; Site runoff should be desilted, to reduce the potential for suspended sediments, organics and other contaminants to enter streams and standing freshwater	Seawall, reclamation area	N/A
Landscape & Visual (Construction Phase)				
S14.3.3.3	LV2	Mitigate both Landscape and Visual Impacts G1. Grass-hydroseed bare soil surface and stock pile areas; G2. Add planting strip and automatic irrigation system if appropriate at some portions of bridge or footbridge to screen bridge and traffic. G3. Providing aesthetic architectural design on related buildings (e.g. similar materials for PCB building facade to Airport buildings, roof planting and subtle materials for other facilities buildings and so on), and the related infrastructure (e.g. parapet planting and transparent cover for elevated footbridges) to provide harmonic atmosphere of the HKBCF. G4. Vegetation reinstatement and upgrading to disturbed areas; G5. Maximizing new tree, shrub and other vegetation planting to compensate tree felled and vegetation removed; G6. Providing planting area around peripheral of HKBCF for tree planting screening effect; G7. Providing salt-tolerant native trees along the planter strip at affected seawall and newly reclaimed coastline; and G8. Reserve of loose natural granite rocks for re-use. Provide new coastline to adopt "natural-look" by means of using armour rocks in the form of natural rock materials and planting strip area accommodating screen buffer to enhance "natural-look" of the new coastline.	All construction site areas	N/A
S14.3.3.3	LV3	Mitigate Visual Impacts V1. Minimize time for construction activities during construction period. V2. Provide screen hoarding at the portion of the project site/ works areas / storage areas near VSRs who have close low- level views to the Project during HKBCF construction.	All construction site areas	N/A
S15.2.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	All construction sites	Implemented
S15.5 – S15.6	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	All construction sites	Implemented



Appendix K

Weather and Meteorological Conditions during
Reporting Month

Station: Hong Kong Observatory

Date	Mean Pressure (hPa)	Air Temperature			Mean Relative Humidity (%)	Total Rainfall (mm)
		Maximum (deg. C)	Mean (deg. C)	Minimum (deg. C)		
February 2020						
1	1022.4	18.8	16.0	14.1	72	0
2	1022.0	19.5	17.1	15.9	77	0
3	1020.3	20.4	18.1	16.6	78	Trace
4	1020.2	19.0	17.3	15.4	84	0.8
5	1020.6	18.3	17.5	16.6	83	1
6	1019.8	18.6	17.1	15.9	77	Trace
7	1021.1	20.6	18.7	17.3	82	0
8	1024.0	19.6	17.8	16.7	76	0
9	1025.7	18.5	16.5	15.0	77	Trace
10	1023.1	18.6	16.9	15.5	76	0
11	1020.5	19.1	17.6	16.8	86	0.8
12	1017.9	24.7	20.6	18.4	89	0
13	1015.4	20.5	19.6	18.9	94	41.6
14	1013.8	22.5	20.4	19.5	94	9.7
15	1013.6	22.3	21.0	19.4	95	Trace
16	1020.1	22.4	14.2	10.6	82	25.5
17	1026.2	18.0	13.6	10.3	53	0
18	1026.4	18.4	14.7	11.6	57	0
19	1024.6	19.4	16.3	14.0	69	0
20	1024.9	21.2	17.7	15.4	70	0
21	1026.7	22.6	18.9	16.5	73	0
22	1025.7	25.5	20.1	17.1	73	0
23	1024.6	23.9	19.4	17.5	71	0
24	1020.7	22.0	19.6	17.5	76	0
25	1017.9	25.0	21.8	19.7	84	Trace
26	1017.9	28.1	23.3	20.6	82	0
27	1019.6	22.6	20.5	19.1	84	0.4
28	1018.0	25.3	20.8	18.1	78	0
29	1014.7	26.6	22.5	20.2	80	0

Remark: The corresponding weather station at Hong Kong International Airport were unavailable at the time of preparation of this report.
Source: Hong Kong Observatory



Appendix L

Cumulative Statistics on Environmental Complaints,
Notifications of Summons and Successful Prosecutions

Environmental Complaints Log

Reference No.	Date of Complaint Received	Received From	Received By	Nature of Complaint	Date of Investigation	Outcome	Date of Reply

Cumulative Statistics on Complaints

Environmental Parameters	Cumulative No. Brought Forward	No. of Complaints This Month	Cumulative Project-to-Date
Air	0	0	0
Noise	0	0	0
Water	0	0	0
Waste	0	0	0
Total	0	0	0

Cumulative Statistics on Notification of Summons and Successful Prosecutions

Environmental Parameters	Cumulative No. Brought Forward	No. of Notification of Summons and Prosecutions This Month	Cumulative Project-to-Date
Air	0	0	0
Noise	0	0	0
Water	0	0	0
Waste	0	0	0
Total	0	0	0



Appendix M

Summary of Site Audit in the Reporting Month

Summary of Site Audit in the Reporting Month

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality		NA	
Noise		NA	
Water Quality	12 February 2020	Reminder: Stagnant water should be removed.	NA
Chemical and Waste Management	12 February 2020	Observation: The opening of drip tray should be plugged to prevent chemical leakage.	14 February 2020
Land Contamination		NA	
Landscape and Visual Impact		NA	
Permit / Licenses		NA	
Others	26 February 2020	Reminder: The caps for the water-safety barriers should be provided.	NA



Appendix N

Outstanding Issues and Deficiencies

Summary of Outstanding Issues and Deficiencies in the Reporting Month

Parameters	Outstanding Issues	Deficiencies
Air Quality	NA	Any items of deficiencies can be referred to Appendix M.
Noise	NA	
Water Quality	NA	
Chemical and Waste Management	NA	
Land Contamination	NA	
Landscape and Visual Impact	NA	
Permit / Licenses	NA	
Others	NA	