Ref.: HYDHZMBEEM00_0_8662L.22

17 February 2022

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 January 2022**

Reference is made to the Environmental Team's submission of Monthly EM&A Report for January 2022 certified by the ET Leader (ET's ref.: "MCL/ED/0066/2022/C" dated 17 February 2022) and provided to us via e-mail on 17 February 2022.

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).

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

Brian Tam
Independent Environmental Checker
HZMB HKBCF

| | | | |
|---|---|---|---|
| c.c. | HyD | Attn.: Mr. Patrick Ng | (By Fax: 3188 6614) |
| | HyD | Attn.: Mr. Alan Ip | (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

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

**FUGRO TECHNICAL SERVICES LIMITED**
Fugro Development Centre
5 Lok Yi Street, Tai Lam
Tuen Mun, NT
Hong Kong

Date 17 February 2022
Our Ref. MCL/ED/0066/2022/C

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

BY EMAIL

Attn.: Mr. Brian Tam, 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 January 2022 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. Gordon Kok
Ramboll Attn: Mr. Y. H. Hui, Mr. K. C. Chan
CHEC Attn: Mr. Marko Chan, Mr. Matthew Wu

# Monthly EM&A Report (January 2022)

0002/20/ED/0441 01 |

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

# Document Control

## Document Information

| | |
|---|---|
| Project Title | Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Phase 2 and Other Works (Contract No. HY/2019/01) |
| Document Title | Monthly EM&A Report (January 2022) |
| Fugro Project No. | 0002/20 |
| Fugro Document No. | 0002/20/ED/0441 |
| Issue Number | 01 |

## Client Information

| | |
|---|---|
| Client | China Harbour Engineering Co., Ltd. - Contract No. HY/2019/01 |
| Client Address | China Harbour Building, 370-4 King's Road, North Point Hong Kong |
| Client Contact | Matthew Wu |

## 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 is providing environmental team services for the Contract.

This is the 24th Monthly EM&A Report for the Contract which summaries findings of the EM&A programme during the reporting period from 1 January 2022 to 31 January 2022.

**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, noise and the post-construction dolphin 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 as part of EM&A programme if the impact air quality monitoring work is no longer covered by Contract No. HY/2011/03 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**

As informed by AECOM, the commencement date of the 12-month establishment period for the landscape monitoring under this contract is 5 January 2022. Bi-monthly landscape and visual site audits will be conducted from 5 Jan 2022 to 4 Jan 2023.

**Future Key Issues**

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

- Excavation at Vehicle Clearance Plaza (VCP) (land-based);
- Road & Drain works at South Public Transport Interchanges (SPTI), North Public Transport Interchanges (NPTI) and Vehicle Clearance Plaza (VCP) (land-based);
- Covered Walkway at South Public Transport Interchanges (SPTI) and North Public Transport Interchanges (NPTI) (land-based);
- Kiosks Construction at Vehicle Clearance Plaza (VCP) (land-based);
- Landscape Works at G1 and G5 (land-based);
- Conceal Conduits Works at Vehicle Clearance Plaza (VCP) (land-based);
- E&M Works at South Public Transport Interchanges (SPTI) (land-based);
- Irrigation System at G1 and G5 (land-based).

# Contents

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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 24th 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 1 January 2022 to 31 January 2022 (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. 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. Brian Tam | 9700 6767 |
| | Environmental Site Supervisor | Mr. K. C. Chan | 3465 2882 |
| 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:

- Excavation at VCP (land-based);
- Road & Drain works at SPTI, NPTI and VCP (land-based);
- Covered Walkway at SPTI and NPTI (land-based);
- Kiosks Construction at VCP (land-based);
- Landscape Works at G1 and G5 (land-based);
- Conceal Conduits Works at VCP (land-based);
- E&M Works at SPTI (land-based);
- Irrigation System at G1 and G5 (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 |
| Construction Noise Permit | GW-RS0401-21 | 13-Jun-21 | 12-Dec-21 |
| Construction Noise Permit | GW-RS0955-21 | 13-Dec-21 | 11-Jun-22 |
| Water Discharge License | WT00035721-2020 | 8-Jun-21 | 30-Apr 25 |

# 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 | AMS7C | Tisch | TE-5170 (TSP) | High Volume Sampler | HVS-03 |
| | | | TE-300-310X | -Mass Flow Controller | 2037 |
| | | | TE-5005X | -Blower Motor Assembly | 3477 |
| | | | TE-5007X | -Mechanical Timer | 2697 |
| | | | TE-5009X | -Continuous Flow Recorder | 4371 |
| 4 | | Tisch | TE-5025A | HVS Sampler Calibrator | 438320/2456 |
| 5 | | Sibata | Model LD-5R | Sibata Portable TSP Monitors | 892186 |
| 6 | | | Model LD-5R | | 892187 |
| 7 | | | Model LD-5R | | 892189 |

## 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 ±3°C; the relative humidity (RH) should be <50% and not vary by more than ±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 Due to the existing air quality monitoring location AMS7B would be hand over back to Airport Authority for their construction works. A new alternative air quality monitoring location is still under processing. Air quality monitoring location AMS7B was temporary suspended, effective from 10 December 2020.

2.7.4 According to the email date 11 August 2021, EPD have no comment on the Proposal for Relocation of Monitoring Location AMS 7B, the monitoring location AMS 7B are proposed to be relocated by alternative monitoring location AMS 7C for air quality monitoring. The monitoring location AMS 7C has resumed air quality monitoring on 5 October 2021.

2.7.5 The most updated locations of air quality monitoring are summarized in **Table 2.2** and they are 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) |
| AMS7C | East Sea Rescue Berth – Airport Fire ContingentThird 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 AMS7C.

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 (µg/m$^3$) | Range (µg/ m$^3$) | Action Level (µg/ m$^3$) | Limit Level (µg/ m$^3$) |
|---|---|---|---|---|
| 1-hour TSP | | | | |
| AMS2 | 51 | 39 – 62 | 374 | 500 |
| AMS3C | 74 | 62 – 94 | 368 | |
| AMS7C | 53 | 46 - 65 | 370 | |
| 24-hour TSP | | | | |
| AMS2 | 51 | 27-84 | 176 | 260 |
| AMS3C | 49 | 24-105 | 167 | |
| AMS7C | 47 | 32-73 | 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 | 1488302 |
| 2 | Casella | CEL-63X Series | Integrating Sound Level Meter | 1488303 |
| 3 | Casella | CEL-120/1 | Calibrator | 5230758 |
| 4 | Casella | CEL-120/1 | Calibrator | 5230950 |
| 5 | Smart Sensor | AR816 | Wind Speed Anemometer | H0423689 |

## 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)<br>$L_{10}$ 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 | 57-64 | When one documented complaint is received | 75 |
| | NMS3C | 63-68 | | 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 School calendar of Ho Yu College was checked against noise monitoring days at NMS3C. The examination periods of Ho Yu College were 5 January 2022 to 18 January 2022. Therefore, the limit level for NMS3C was 65 dB (A) on 5, 11, 17 January 2022.

3.7.5 No Action / Limit Level exceedance of location NMS2 was recorded for construction noise in the reporting month.

3.7.6 The measured noise level recorded at NMS3C on 17 January 2022 was 67.8 dB (A), which exceeded the limit level 65 dB (A). The noise level were higher than the baseline level of 66.3 dB (A). Therefore, baseline correction was carried out and the corrected noise levels which solely represent the noise level of construction works was 62.5 dB (A), therefore there was no exceedance after correction. As such the Event and Action Plan was not triggered.

3.7.7 During the monitoring month, at NMS3C, road traffic along the Ying Tung Road and non-project related construction activities at the nearby construction site was observed.

3.7.8 The Action and Limit Levels for noise impact monitoring have been set and are presented in **Appendix C**.

3.7.9 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 will be undertaken under this Contract. However, the ET of this Contract or another ET of the HZMB is required to conduct post-construction dolphin monitoring in accordance with Section 10.7 of the updated EM&A Manual.

4.1.2 The CV of the proposed dolphin specialist for this Contract has been submitted to IEC for review prior to submission to AFCD for approval.

4.1.3 According to the Proposal on Post-construction Dolphin Monitoring (PCDM) prepared by Contract No. HY/2013/04 which has been verified by ENPO and approved by EPD on 8 March 2019 (EPD ref. () in Ax(5) to E771/E1/100) , the completion date of the PCDM is in February 2021. Therefore, the reporting of Chinese White Dolphins monitoring works under this contract was completed on 1 March 2021.

## 4.2 Monitoring Locations and Methodology

4.2.1 In accordance with the requirements of the updated EM&A manual, the dolphin monitoring programme have adopted the standard line-transect method (Buckland et al. 2001) to survey the pre-set and fixed transect lines defined by AFCD in the Northeast Lantau (NEL) and Northwest Lantau (NWL) survey areas. The layout map of the transect lines provided by AFCD is presented in **Figure 4**.

# 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, five site inspections were carried out on 5, 13, 19, 26 and 31 January 2022.

5.1.3 To monitor and audit the implementation of landscape and visual mitigation measures, a Bi-weekly landscape and visual site audits were carried out on 3 January 2022 by a Registered Landscape Architect.

5.1.4 As informed by AECOM, the commencement date of the 12-month establishment period for the landscape monitoring under this contract is 5 January 2022. Bi-monthly landscape and visual site audits will be conducted from 5 Jan 2022 to 4 Jan 2023.

5.1.5 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 AMS7C in the reporting period.

6.1.2 No Action and Limit Level exceedance was recorded for construction noise monitoring at station NMS2 and NMS3C in the reporting period.

6.1.3 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

- Excavation at VCP (land-based);
- Road & Drain works at SPTI, NPTI and VCP (land-based);
- Covered Walkway at SPTI and NPTI (land-based);
- Kiosks Construction at VCP (land-based);
- Landscape Works at G1 and G5 (land-based);
- Conceal Conduits Works at VCP (land-based);
- E&M Works at SPTI (land-based);
- Irrigation System at G1 and G5 (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 AMS7C 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 Five 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 A Bi-weekly Landscape and Visual Site audits were carried out by a Registered Landscape Architect in the reporting month.

9.1.6 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

- No specific observation was identified in the reporting month.

Chemical and Waste Management

- Waste generated at the site should be removed as soon as possible.
- Provide mitigation measure for the generator to prevent spillage of oil.

Landscape and Visual Impact

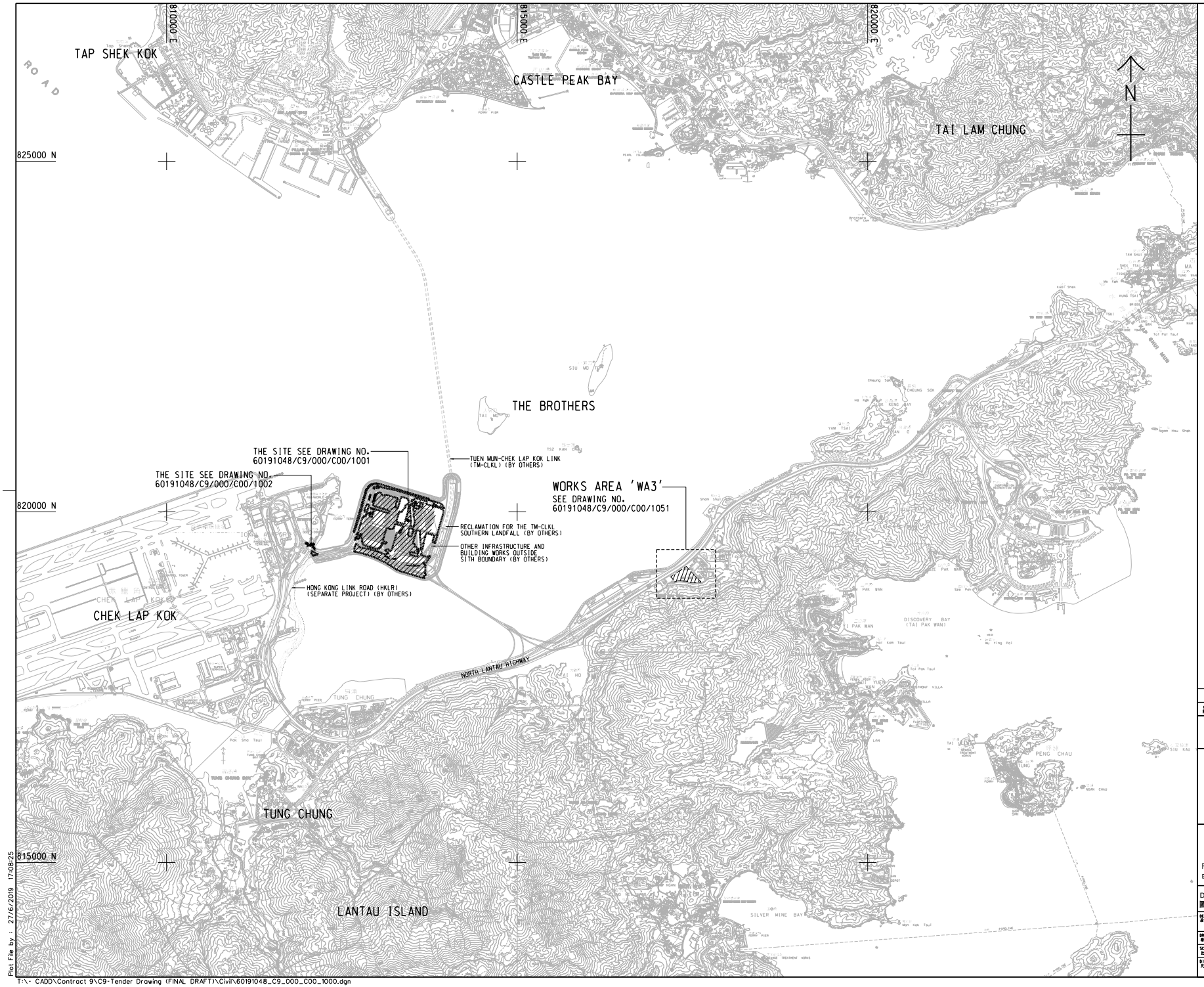
- No specific observation was identified in the reporting month.

Permit/ Licenses

- No specific observation was identified in the reporting month.

# 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

| REV. 修訂 | DESCRIPTION 內容摘要 | CHECKED 核查 | DATE 日期 |
|---|---|---|---|
| - | TENDER DRAWING | TTHK BCC | JUL 19 |

路政署
HIGHWAYS DEPARTMENT
主要工程管理處(專責事務)
Major Works Project Management Office (Special Duties)

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

# SITE LOCATION PLAN

AECOM
Rogers Stirk Harbour + Partners
BURO HAPPOLD ATKINS ADI
Aedas

DRG.NO. 圖紙編號 60191048/C9/000/C00/1000

| DESIGNED BY 設計 | CONTRACT NO. 合約編號 | P. Dir. APPROVED 批准人 |
|---|---|---|
| TTHK | HY/2019/01 | SCI |
| DRAWN BY 繪圖 JC | STATUS 狀態 | |
| SCALE 比例 A1 1 : 25000 | | |
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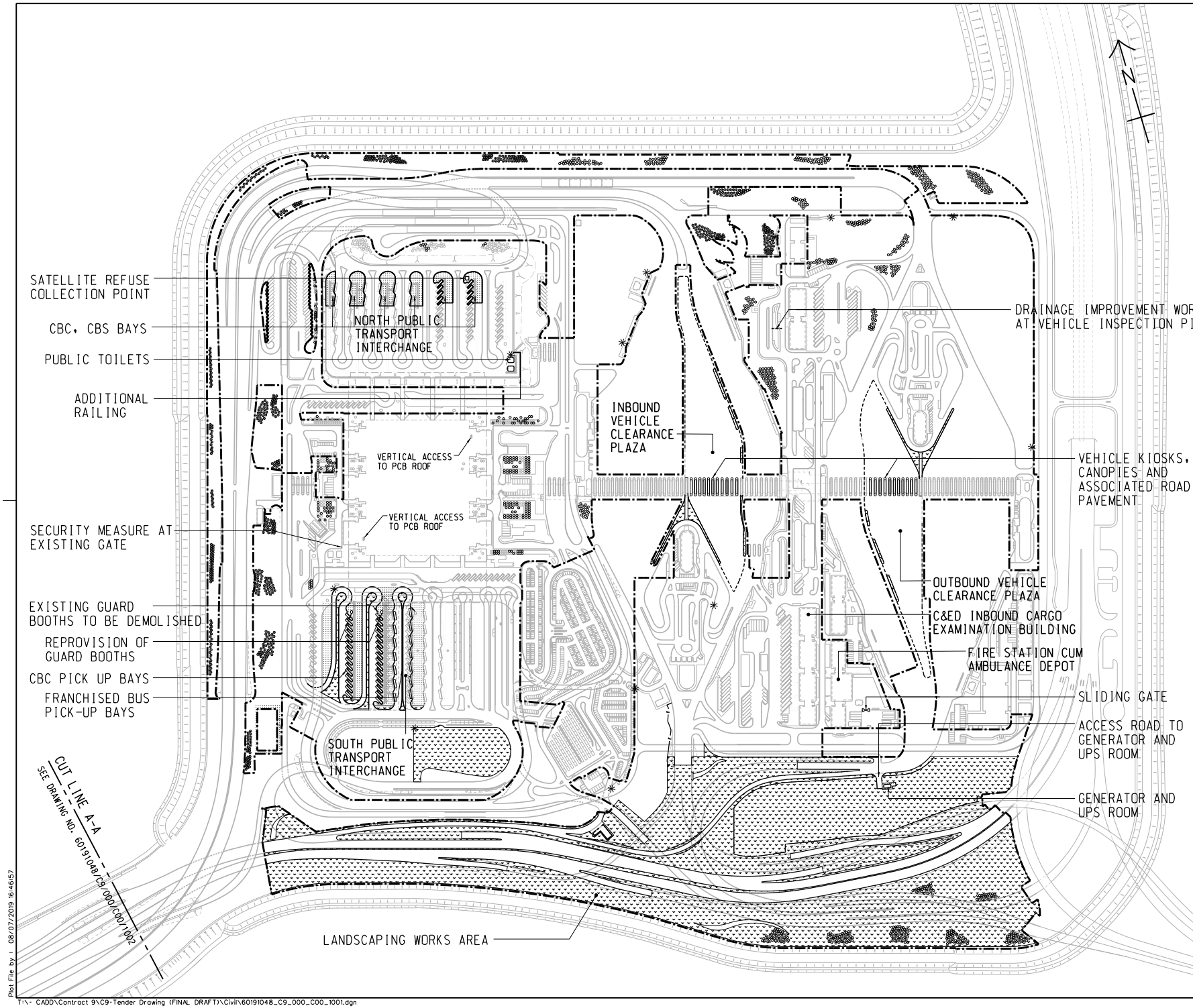


## REMARKS:

1. 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 ELV 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 DRAINPIT COVERS
2. IN NPTI:
   - CONSTRUCT COVERED WALKWAYS FOR THE NEW CBC, CBS PICK UP BAYS AND PUBLIC TOILETS
   - PROVIDE AUTOMATIC IRRIGATION SYSTEM AT SLOPES
   - MODIFY EXISTING COVERED WALKWAY AND PROVISION OF LIGHTING
   - REPLACEMENT OF DRAINPIT COVERS
3. 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
4. PASSENGER CLEARANCE BUILDING
   - VERTICAL ACCESS
   - IMPROVEMENT WORKS FOR WATER FEATURE
   - MINOR REMAINING WORKS
   - PROVISION OF NEW CENTRAL AVCSS EQUIPMENT WITH SUFFICIENT CAPACITY, PROCESSING POWER AND STORAGE TO ACCOMMODATE BOTH THE EXISTING AND NEW AVCSS
5. VEHICLE KIOSKS AT INBOUND & OUTBOUND VCP
   - PROVISION OF AVCSS AT NEW KIOSKS TO SERVE 24 NOS. VEHICULAR LANES
   - REPLACEMENT OF BARRIER GATE WITH SKIRTING AT 72 NOS. EXISTING KIOSK
6. C&ED INBOUND CARGO EXAMINATION BUILDING
   - PROVISION OF NEW CENTRAL AVCSS EQUIPMENT WITH SUFFICIENT CAPACITY, PROCESSING POWER AND STORAGE TO ACCOMMODATE BOTH THE EXISTING AND NEW AVCSS

## 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
ELV - EXTRA LOW VOLTAGE
AVCSS - AUTOMATIC VEHICLE CLEARANCE SUPPORT SYSTEM

## NOTE:

1. 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

| REV. 修訂 | DESCRIPTION 內容修訂 | CHECKED 核對 | DATE 日期 |
|---|---|---|---|
| - | TENDER DRAWING | TTHK BCC | JUL 19 |

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HONG KONG BOUNDARY CROSSING FACILITIES
- PHASE 2 AND OTHER WORKS

# GENERAL ARRANGEMENT

SHEET 1 OF 2

AECOM
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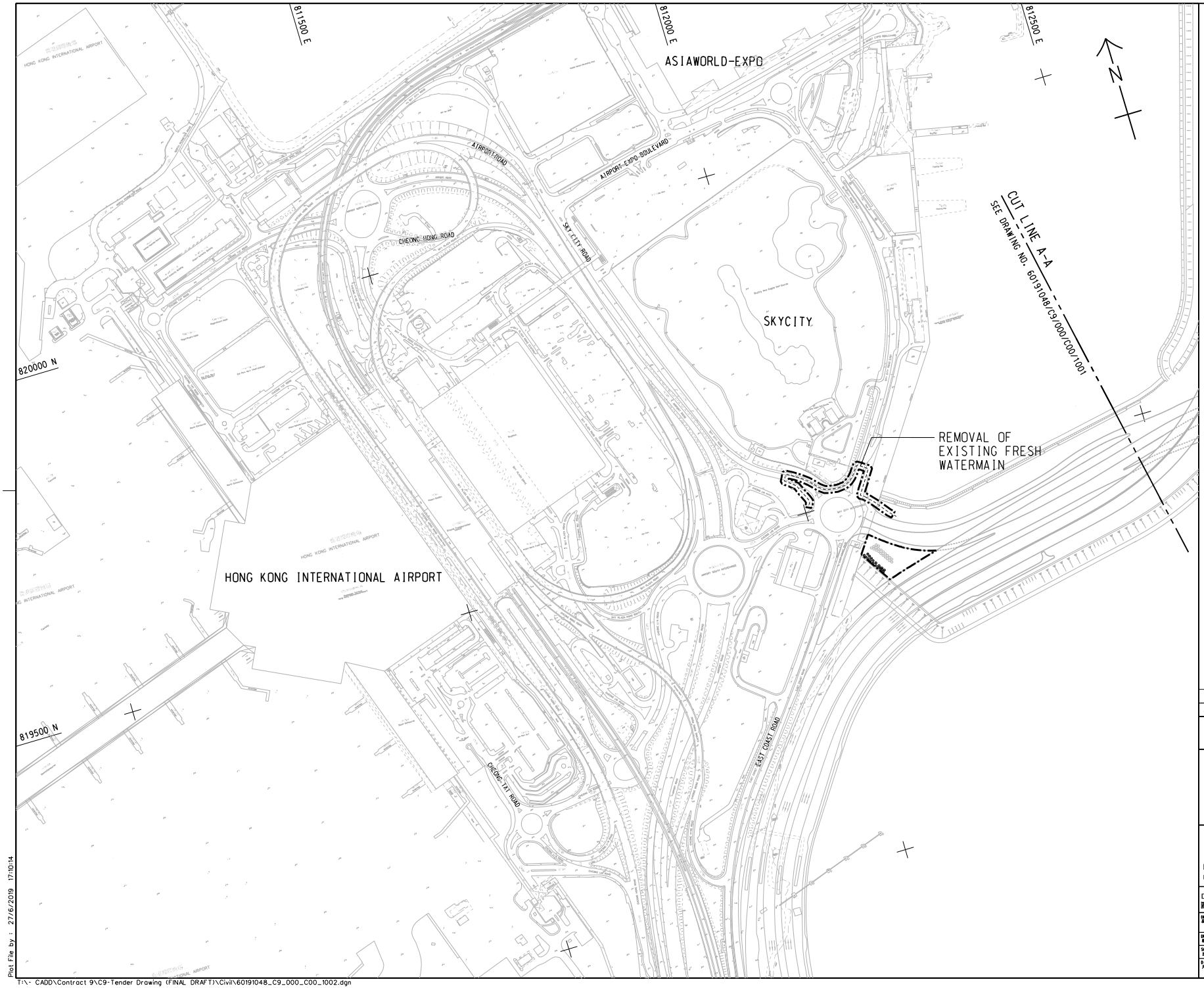


NOTE:

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

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# GENERAL ARRANGEMENT

SHEET 2 OF 2

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## SETTING OUT POINT

| POINT | EASTING | NORTHING |
|---|---|---|
| 301 | 817467.265 | 819162.683 |
| 302 | 817314.741 | 819069.828 |
| 303 | 817327.338 | 819049.295 |
| 304 | 817440.865 | 819117.811 |
| 305 | 817340.825 | 819027.314 |
| 306 | 817387.350 | 819023.403 |
| 307 | 817387.861 | 819043.396 |
| 308 | 817466.133 | 819091.047 |
| 309 | 817469.783 | 819087.181 |
| 310 | 817513.449 | 819113.764 |
| 311 | 817347.717 | 819016.082 |
| 312 | 817620.269 | 819000.620 |
| 313 | 817445.362 | 819013.131 |
| 314 | 817450.595 | 819032.307 |
| 315 | 817495.828 | 819059.595 |
| 316 | 817522.110 | 819075.388 |
| 317 | 817566.404 | 819028.472 |
| 318 | 817568.506 | 819008.526 |
| 319 | 817531.155 | 819001.066 |
| 320 | 817533.346 | 818991.306 |
| 321 | 817442.727 | 819003.476 |

817200 E
817400 E
817600 E
819200 N
819000 N
NORTH LANTAU HIGHWAY
CHEUNG TUNG ROAD
Siu Ho Wan Sewage Treatment Works

WORKS AREA FOR CONTRACT NO. HY/2019/01 AFTER 30 JUNE 2020

THE PROJECT MANAGER'S AND CONTRACTOR'S SITE ACCOMMODATION COMPOUND FOR HKBCF FOR CONTRACT NO. HY/2019/01

WORKS AREA TO BE SURRENDERED BY CONTRACT NO. HY/2019/01 ON 30 JUN 2020 OR LATER DATE AS INSTRUCTED

WORKS AREA FOR CONTRACT NO. HY/2019/01

10m WIDE COMMON ACCESS TO BE MAINTAINED UNDER CONTRACT NO. HY/2019/01

WORKS AREA TO BE SURRENDERED BY CONTRACT NO. HY/2019/01 ON 30 JUN 2020 OR LATER DATE AS INSTRUCTED

WORKS AREA TO BE SURRENDERED BY CONTRACT NO. HY/2019/01 ON 30 JUN 2020 OR LATER DATE AS INSTRUCTED

WORKS AREA TO BE SURRENDERED BY CONTRACT NO. HY/2019/01 ON 30 JUN 2020 OR LATER DATE AS INSTRUCTED

WORKS AREA TO BE SURRENDERED BY CONTRACT NO. HY/2019/01 ON 30 JUN 2020 OR LATER DATE AS INSTRUCTED

WORKS AREA TO BE SURRENDERED BY CONTRACT NO. HY/2019/01 ON 30 JUN 2020 OR LATER DATE AS INSTRUCTED

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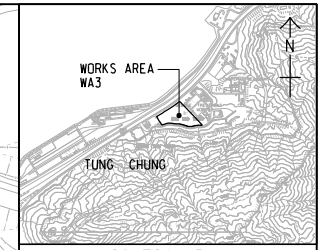


## LOCATION PLAN
SCALE 1 : 25000

## 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:

- WORKS AREA BOUNDARY
- PORTION 3.1
- PORTION 3.2
- PORTION 3.3
- PORTION 3.4
- PORTION 3.5
- PORTION 3.6
- PORTION 3.7
- PORTION 3.8
- PORTION 3.9
- PORTION 3.10
- PORTION 3.11
- PORTION 3.12
- NON-BUILDING AREA 8200m² (WHOLE)

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HONG KONG BOUNDARY CROSSING FACILITIES
- PHASE 2 AND OTHER WORKS

# WORKS AREA WA3

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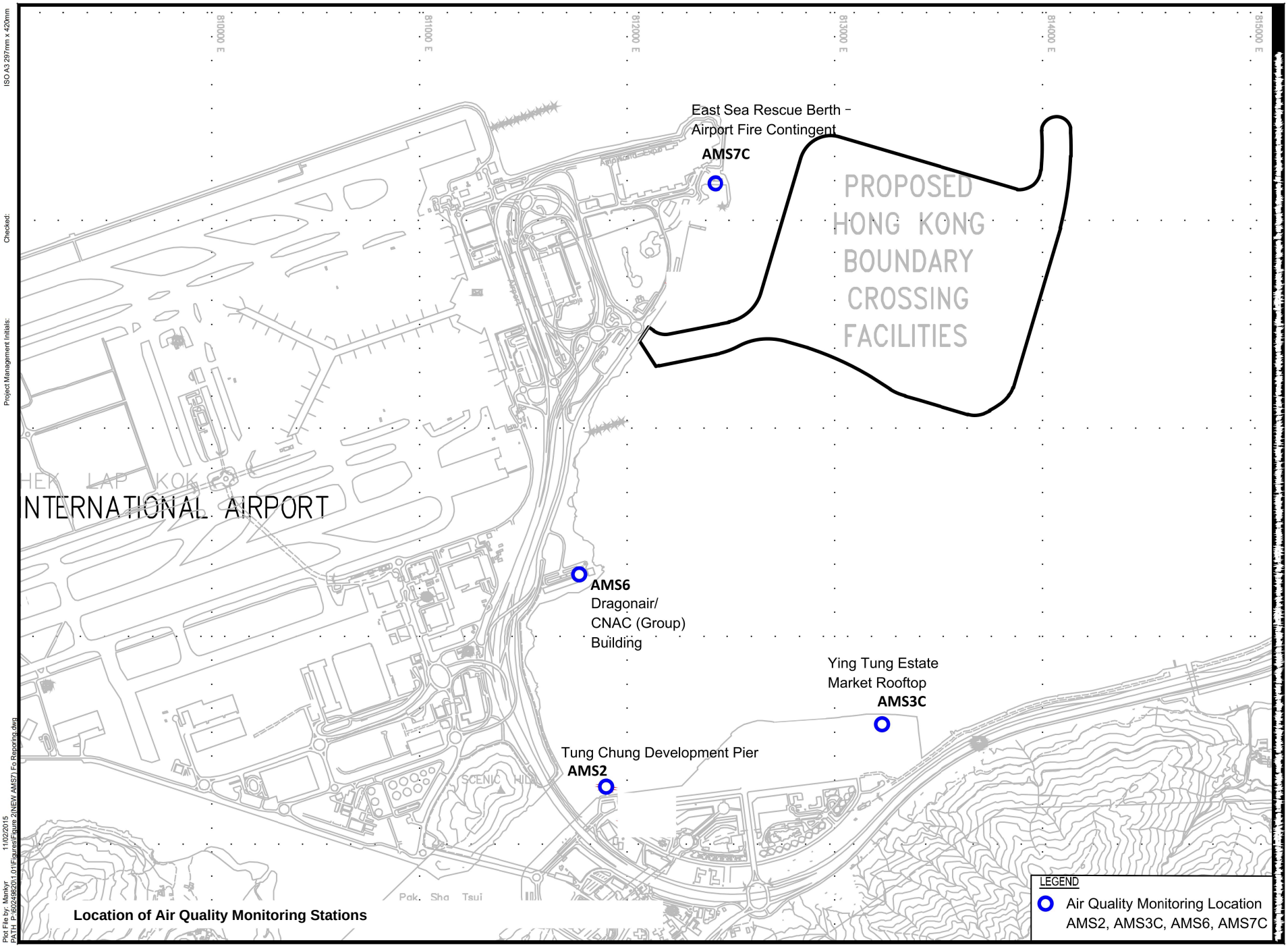
# Figure 2

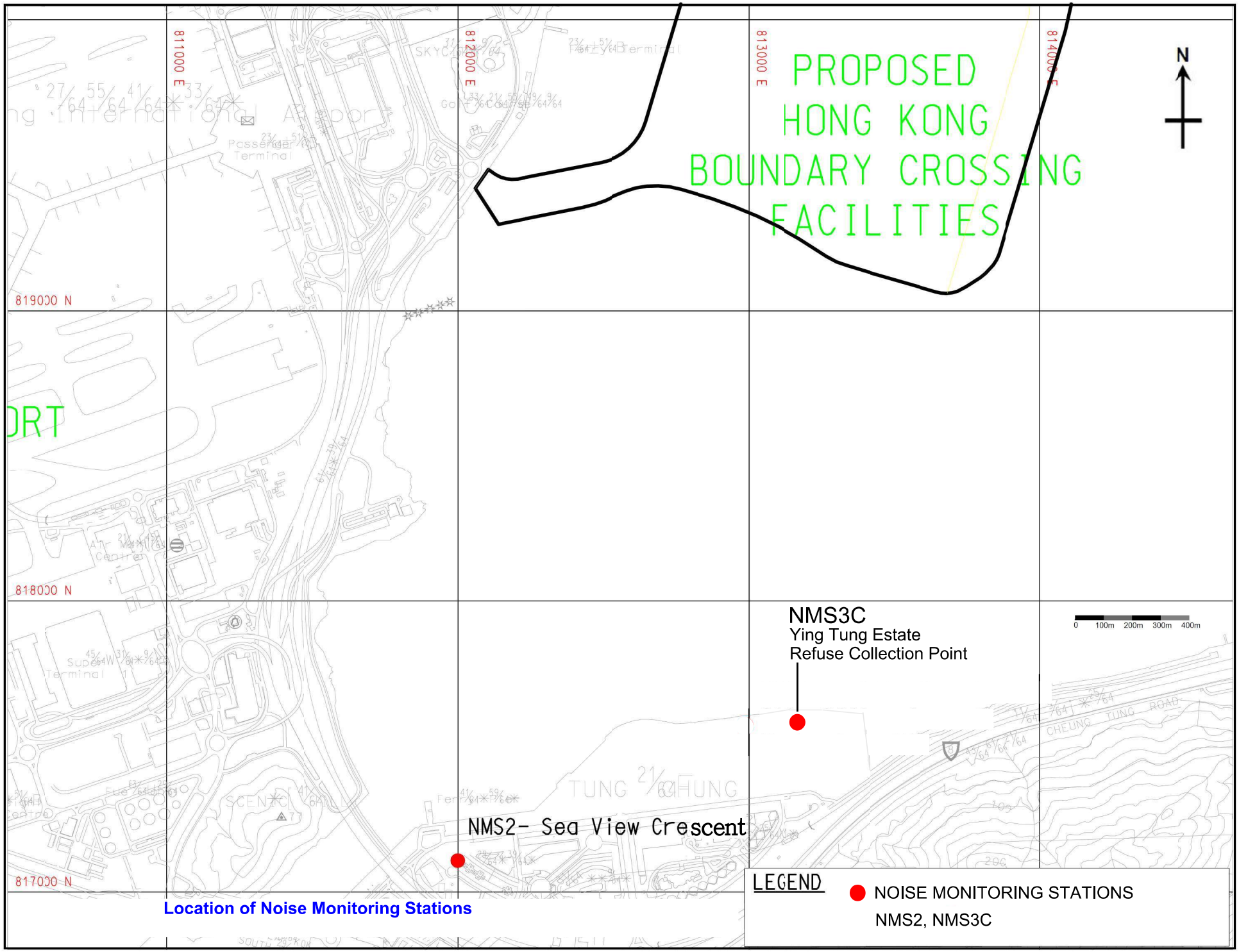
The Location of the Air Quality Monitoring Station




**Location of Air Quality Monitoring Stations**

# Figure 3

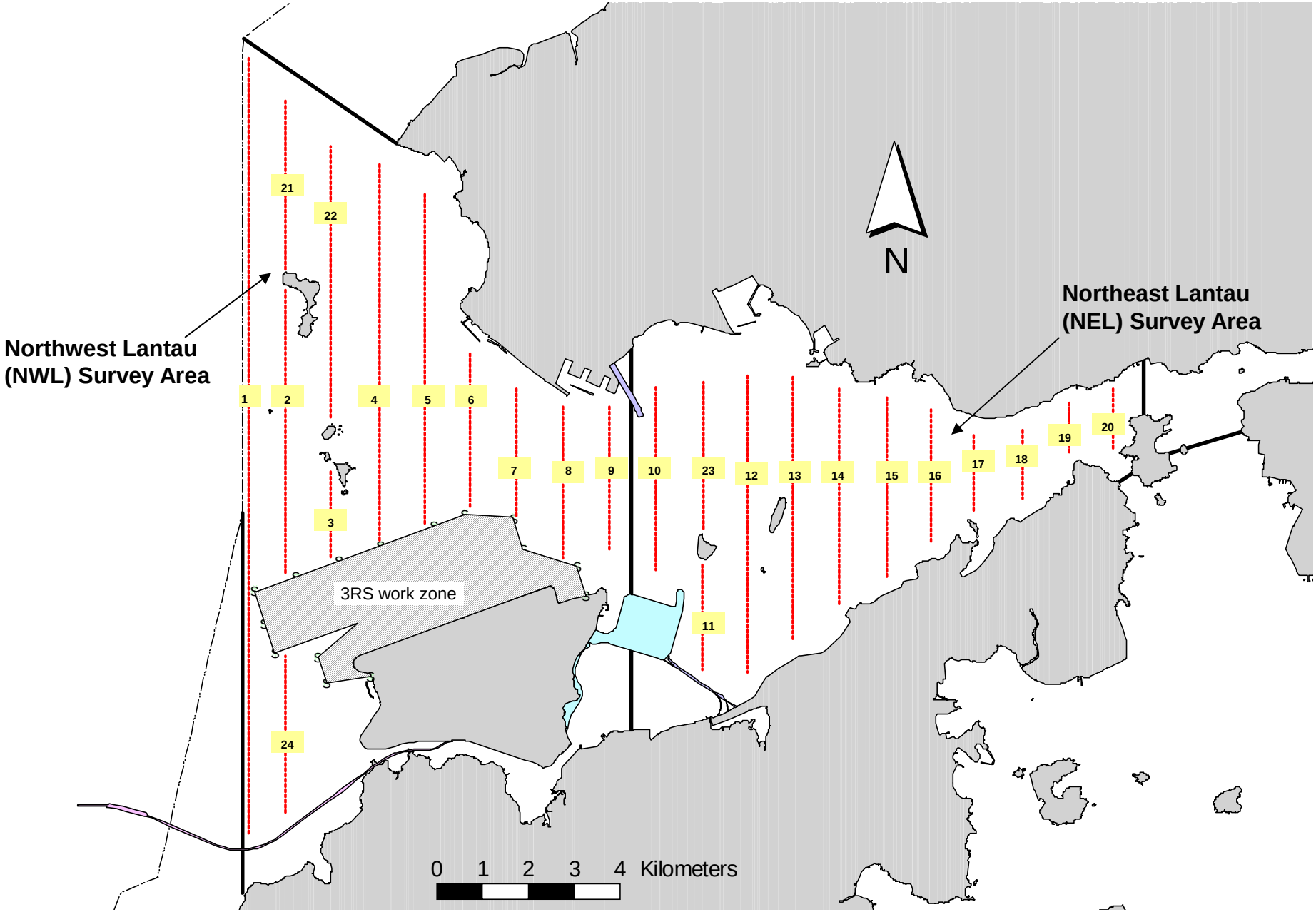
The Location of the Noise Monitoring Station




Location of Noise Monitoring Stations

# Figure 4

Post-Construction Dolphin Monitoring Line Transect Layout Map



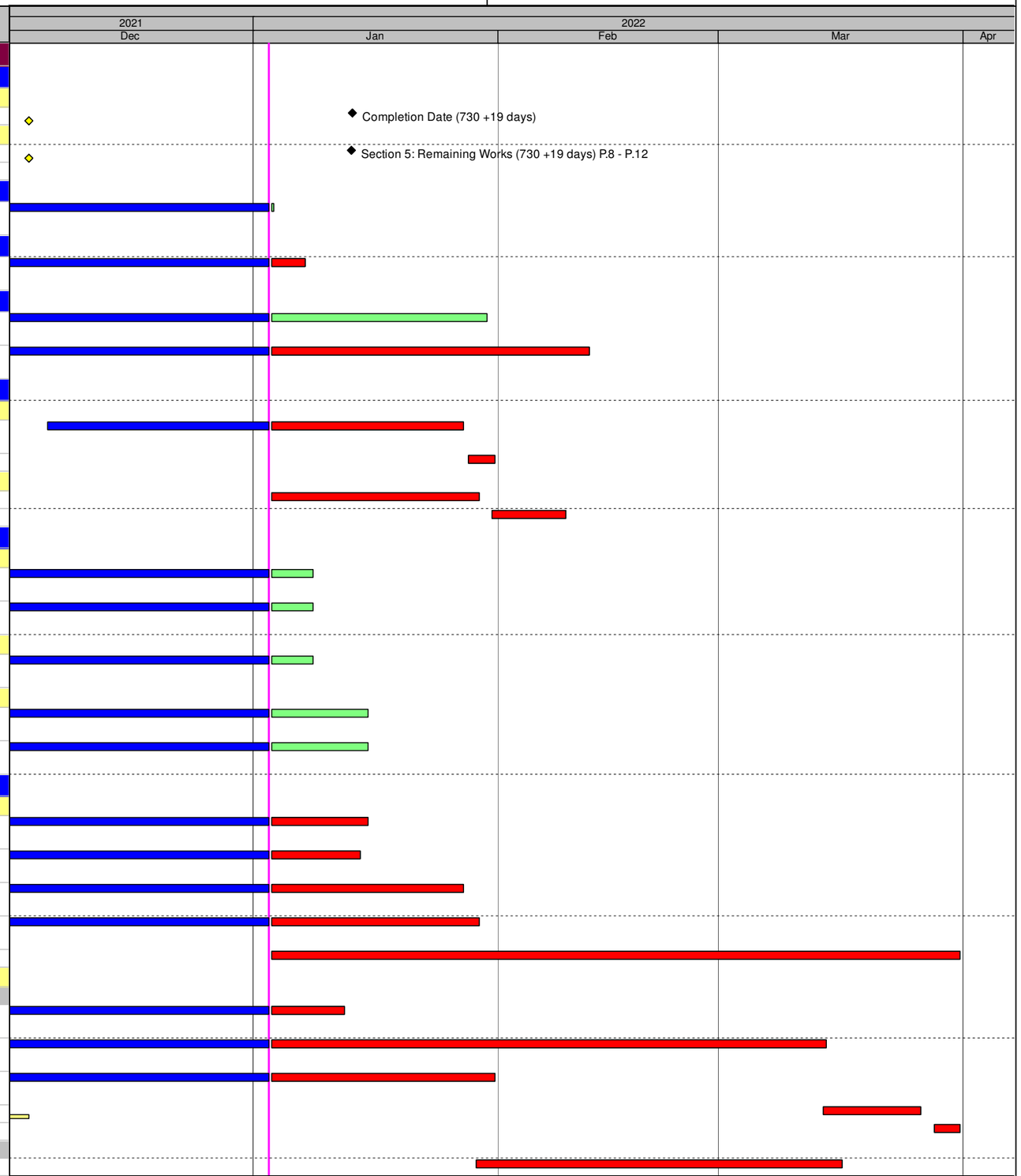

Transect Line Layout in Northwest and Northeast Lantau Survey Areas

# Appendix A

Construction Programme

**HKZMB HK Boundary Crossing Facilities - Phase 2 and Other Works** | **As of 03-Jan-22**

| Activity ID | Activity Name | Remaining Duration | Start | Finish |
|---|---|---|---|---|
| **Revised Works Programme for HKZMB Phase 2 and Other Works (HY/2019/01)** | | | | |
| ***CONTRACT DATES*** | | | | |
| **Starting Date** | | | | |
| A0090 | Completion Date (730 +19 days) | 0 | | 13-Jan-22* |
| **Sectional Completion** | | | | |
| A0310 | Section 5: Remaining Works (730 +19 days) P.8 - P.12 | 0 | | 13-Jan-22* |
| A0320 | Section 6: Establishment Works (1095 + 19 days) | 0 | | 07-Dec-22* |
| ***SUBMISSIONS*** | | | | |
| A0460 | Acceptance of TTA | 1 | 01-Jan-20 A | 03-Jan-22 |
| ***CONTRACTOR'S DESIGN*** | | | | |
| A7980 | Acceptance of the Design for Pump House | 5 | 16-Aug-20 A | 07-Jan-22 |
| ***BUILDING INFORMATION MODELING*** | | | | |
| A7580 | Completion of BIM 3D Model | 28 | 17-Feb-20 A | 30-Jan-22 |
| A7590 | As-built BIM Model | 41 | 08-Jan-21 A | 12-Feb-22 |
| ***REFINEMENT WORKS AT HKP (4A)*** | | | | |
| **Installation of Sliding Gate at Building No. 041 (4A.J)** | | | | |
| A6710 | Installation of Security Fence and Sliding Gate (Fire Station cum Ambulance Depot 041) | 22 | 06-Dec-21 A | 27-Jan-22 |
| A6720 | T&C | 3 | 28-Jan-22 | 31-Jan-22 |
| **Painting for Volleyball Court** | | | | |
| A8850 | Pavement rectification | 24 | 03-Jan-22* | 29-Jan-22 |
| A8860 | Painting for Volleyball Ground, Part 2 | 6 | 31-Jan-22* | 09-Feb-22 |
| ***SECTION 3: NPTI - PUBLIC TOILET, COVERED WALKWAY & PAVEMENT (6)*** | | | | |
| **Additional and Modification to Existing Covered Walkway, Area 1 - 6 (6.E)** | | | | |
| A6980 | Installation of aluminum honey comb panels to the existing covered walkways | 6 | 29-Dec-20 A | 08-Jan-22 |
| A6990 | T&C | 6 | 07-Jul-21 A | 08-Jan-22 |
| **Additional & Modification of Covered Walkway adjacent to Building 003, Area 7 (6.C)** | | | | |
| A7010 | T&C | 6 | 16-Aug-21 A | 08-Jan-22 |
| **Public Toilet Type 1, Building 003 (6.B)** | | | | |
| A3390 | TPIDC Authority Inspection & Approval | 12 | 30-Aug-21 A | 15-Jan-22 |
| A6100 | ASD Approval, WWO Part V submission & Approval | 12 | 30-Aug-21 A | 15-Jan-22 |
| ***SECTION 5: REMAINING WORKS*** | | | | |
| **External Works at Plaza** | | | | |
| A1540B | Pavement Works (Roadbase and Base Course) at Outbound North | 12 | 10-May-21 A | 15-Jan-22 |
| A1540C | Pavement Works (Roadbase and Base Course) at Inbound South | 11 | 08-Jun-21 A | 14-Jan-22 |
| A8770 | Pavement Works (Wearing Course) at Outbound | 22 | 08-Nov-21 A | 27-Jan-22 |
| A8780 | Pavement Works (Wearing Course) at Inbound | 24 | 08-Nov-21 A | 29-Jan-22 |
| A8790 | Road Marking & Signs | 73 | 03-Jan-22 | 31-Mar-22 |
| **Inbound: 11 No. of Private Car Kiosks between 027/028** | | | | |
| ***Builder Works (5.A)*** | | | | |
| A1080C | ABWF Works at 4th Group Kiosks (3 nos.) | 9 | 27-Jul-21 A | 12-Jan-22 |
| A1080D | ABWF Works at Kiosks at Inbound VCP (miscellanous external railing, cladding etc.) | 58 | 17-Aug-21 A | 14-Mar-22 |
| A1180A | MJ, Fall Arrest System, Maintenance Access | 25 | 01-Sep-21 A | 31-Jan-22 |
| A4480 | Removal of all hoarding after OPT | 12 | 14-Mar-22* | 26-Mar-22 |
| A8800 | Removal of TTA | 4 | 28-Mar-22 | 31-Mar-22 |
| ***E&M Works*** | | | | |
| A1120-46.2 | 8.1.2.2-Termination & Installation Test of all ODB (027/028) | 37 | 29-Jan-22 | 16-Mar-22 |




Baseline | Critical
Actual Work | Baseline Milestone
Remaining Work | Milestone

**UPDATED WORKS PROGRAMME**
**FOR PHASE 2 AND OTHER WORKS, HKZMB**

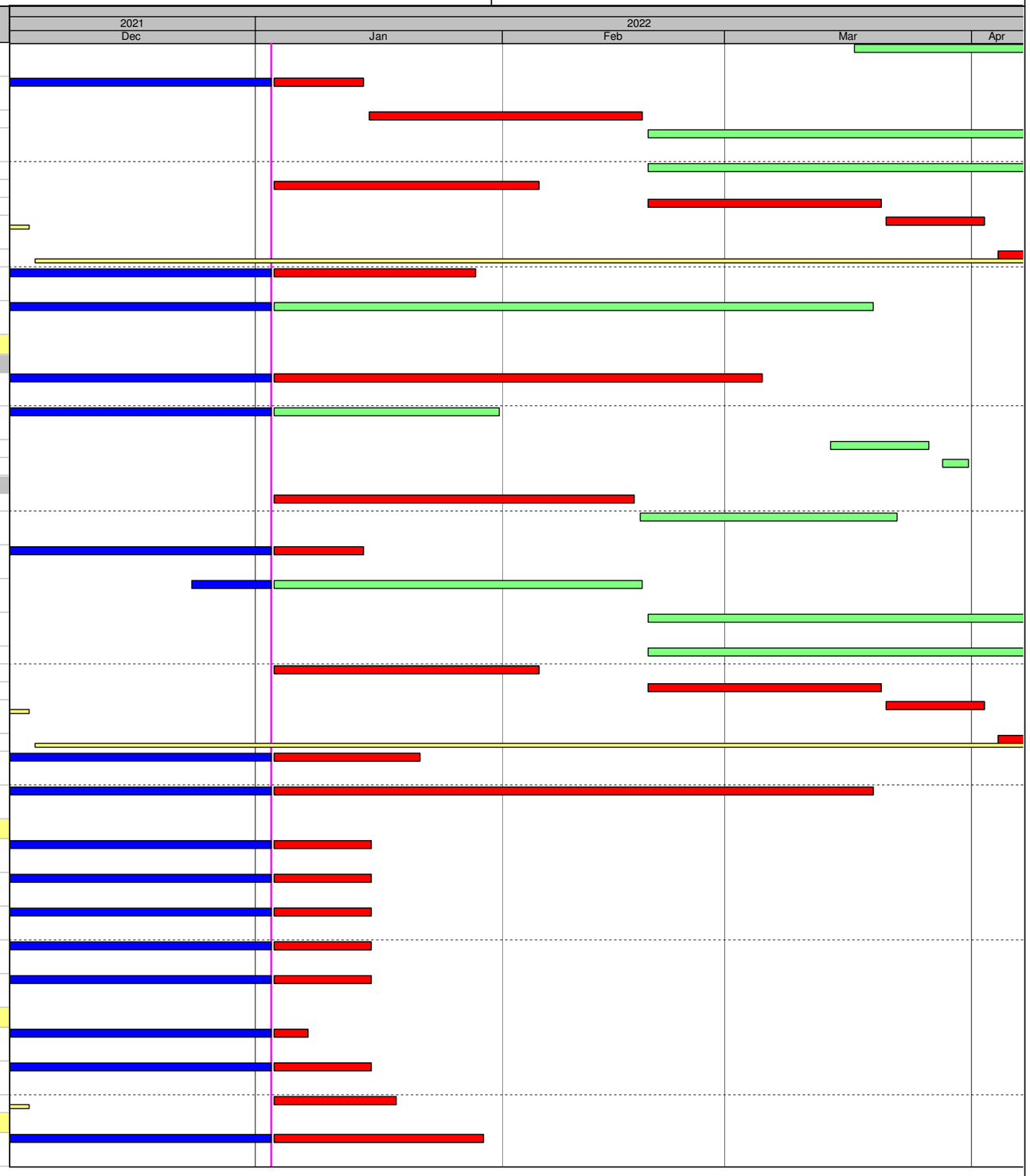


| Date | Revision | Checked | Approved |
|---|---|---|---|
| 09-Nov-21 | Revised Works Programme for Phase 2 | ZJ | |
| 06-Jan-22 | Revised Works Programme for Phase 2 | ZJ | |

# HKZMB HK Boundary Crossing Facilities - Phase 2 and Other Works

As of 03-Jan-22

| Activity ID | Activity Name | Remaining Duration | Start | Finish |
|---|---|---|---|---|
| A1120-46.4 | 8.1.2.2-Integrate all ODBs into Existing ODB network(027/028) (IB & OB together 24 kiosks) | 28 | 17-Mar-22 | 22-Apr-22 |
| A1120-54 | 8.1.2A-Relocation of Inbound VID and VTS Equipment | 11 | 04-Oct-21 A | 14-Jan-22 |
| A1120-60 | 8.1.3 - System Configuration of AVCSS | 27 | 15-Jan-22 | 18-Feb-22 |
| A1120-70 | 8.1.4-Complete Training, SAT (exclude ODB) (12 AVCSS Kiosks at 027/028) | 53 | 19-Feb-22 | 26-Apr-22 |
| A1120-80 | 8.1.5-Preparation of O&M Manual and Spare Parts | 60 | 19-Feb-22 | 05-May-22 |
| A1130-10 | 8.1.7-D1-TTA for OPT (027/028) | 27 | 03-Jan-22 | 05-Feb-22 |
| A1130-20 | 8.1.7-OPT (027/028) | 30 | 19-Feb-22 | 20-Mar-22 |
| A1130-30 | 8.1.7A - Migration/Integration with existing AVCSS (Existing 72 Kiosks + 24 Phase 2 Kiosks) | 12 | 21-Mar-22 | 02-Apr-22 |
| A1130-40 | 8.1.6-T&C maintenance Services | 225 | 04-Apr-22 | 06-Jan-23 |
| A1190 | E&M Works at Roof | 23 | 24-Jul-21 A | 28-Jan-22 |
| A8370 | Update and modification of District Cooling System (DCS) (incl. water balancing for new kiosks and calibration works) | 63 | 01-Nov-21 A | 19-Mar-22 |
| **Outbound: 11 No. of Private Car Kiosks between 029/030** | | | | |
| ***Builder's Works (5.A)*** | | | | |
| A1270D | ABWF Works at Kiosks at Outbound VCP (miscellanous external railing, cladding etc.) | 51 | 25-May-21 A | 05-Mar-22 |
| A1380A | MJ, Fall Arrest System, Maintenance Access | 25 | 25-Aug-21 A | 31-Jan-22 |
| A4670 | Removal of all hoarding after OPT | 12 | 14-Mar-22* | 26-Mar-22 |
| A8810 | Removal of TTA | 4 | 28-Mar-22 | 31-Mar-22 |
| ***E&M Works*** | | | | |
| A1310-46.2 | 8.1.2.2-Termination & Installation Test of all ODB (029/030) | 37 | 03-Jan-22 | 17-Feb-22 |
| A1310-46.4 | 8.1.2.2-Integrate all ODBs into Existing ODB network(027/028) (IB & OB together 24 kiosks) | 28 | 18-Feb-22 | 22-Mar-22 |
| A1310-54 | 8.1.2A-Relocation of Outbound VID and VTS Equipment | 11 | 04-Oct-21 A | 14-Jan-22 |
| A1310-60 | 8.1.3 - System Configuration of AVCSS | 38 | 24-Dec-21 A | 18-Feb-22 |
| A1310-70 | 8.1.4-Complete Training, SAT (exclude ODB) (12 AVCSS Kiosks at 029/030) | 53 | 19-Feb-22 | 26-Apr-22 |
| A1310-80 | 8.1.5-Preparation of O&M Manual and Spare Parts | 60 | 19-Feb-22 | 05-May-22 |
| A1320-10 | 8.1.7-D1-TTA for OPT (029/030) | 27 | 03-Jan-22 | 05-Feb-22 |
| A1320-20 | 8.1.7-OPT (029/030) | 30 | 19-Feb-22 | 20-Mar-22 |
| A1320-30 | 8.1.17A - Migration/Integration with existing AVCSS (Existing 72 Kiosks+24 Phase 2 Kiosks) | 12 | 21-Mar-22 | 02-Apr-22 |
| A1320-40 | 8.1.6-T&C maintenance Services | 225 | 04-Apr-22 | 06-Jan-23 |
| A1390 | E&M Works at Roof | 17 | 03-Aug-21 A | 21-Jan-22 |
| A8380 | Update and modification of District Cooling System (DCS) (incl. water balancing for new kiosks and calibration works) | 63 | 01-Nov-21 A | 19-Mar-22 |
| **SPTI Stage 3B** | | | | |
| A8660 | Rigid Pavement Type A | 12 | 17-Aug-21 A | 15-Jan-22 |
| A8670 | Kerb & Planter Barrier | 12 | 18-Aug-21 A | 15-Jan-22 |
| A8690 | Flexible Pavement Type C (incl. SOL353) | 12 | 18-Sep-21 A | 15-Jan-22 |
| A8710 | Footpath Paving Block | 12 | 21-Sep-21 A | 15-Jan-22 |
| A8720 | Canopy Lighting and E&M Works | 12 | 03-Nov-21 A | 15-Jan-22 |
| **Pump House for Landscape (2)** | | | | |
| A2910 | Acceptance of the Design for Pump House | 5 | 16-Aug-20 A | 07-Jan-22 |
| A2990 | Final Connection and T&C | 12 | 01-Nov-21 A | 15-Jan-22 |
| A6440 | WSD Inspection & Approval, Final Connection | 16 | 03-Jan-22 | 18-Jan-22 |
| **Substation Paving Unit** | | | | |
| A8820 | Substation: Modification of existing MH/drawpit covers, construct U-channel and catch pit and conncection | 24 | 13-Nov-21 A | 29-Jan-22 |




Baseline
Actual Work
Remaining Work
Critical
Baseline Milestone
Milestone

**UPDATED WORKS PROGRAMME**
**FOR PHASE 2 AND OTHER WORKS, HKZMB**



| Date | Revision | Checked | Approved |
|---|---|---|---|
| 09-Nov-21 | Revised Works Programme for Phase 2 | ZJ | |
| 06-Jan-22 | Revised Works Programme for Phase 2 | ZJ | |

## HKZMB HK Boundary Crossing Facilities - Phase 2 and Other Works

**As of 03-Jan-22**

| Activity ID | Activity Name | Remaining Duration | Start | Finish |
|---|---|---|---|---|
| A8830 | Substation: Site formation for Pavement Works | 24 | 20-Dec-21 A | 29-Jan-22 |
| A8840 | Substation: Pavement Works (KP1 & K1 ) (Paving Unit) | 25 | 28-Dec-21 A | 31-Jan-22 |
| **Irrigation System (Southern Portion)** | | | | |
| ***Irrigation System at Southern Portion*** | | | | |
| A7910 | Irrigaton Pipe Laying (incl. install sprinklers and QCV) | 10 | 02-Jan-21 A | 13-Jan-22 |
| A7930 | T&C | 14 | 14-Jan-22 | 29-Jan-22 |
| **Irrigation System (Water Point)** | | | | |
| A7160 | T&C | 24 | 04-Oct-21 A | 29-Jan-22 |
| **Completion of Section 5** | | | | |
| A7490 | Section 5: Remaining Works (730 + 12 days) | 0 | | 31-Mar-22* |
| ***SECTION 6: ESTABLISHMENT WORKS*** | | | | |
| A3550 | Establishment Works | 339 | 08-Dec-21 A | 07-Dec-22 |


Baseline
Actual Work
Remaining Work
Critical
Baseline Milestone
Milestone

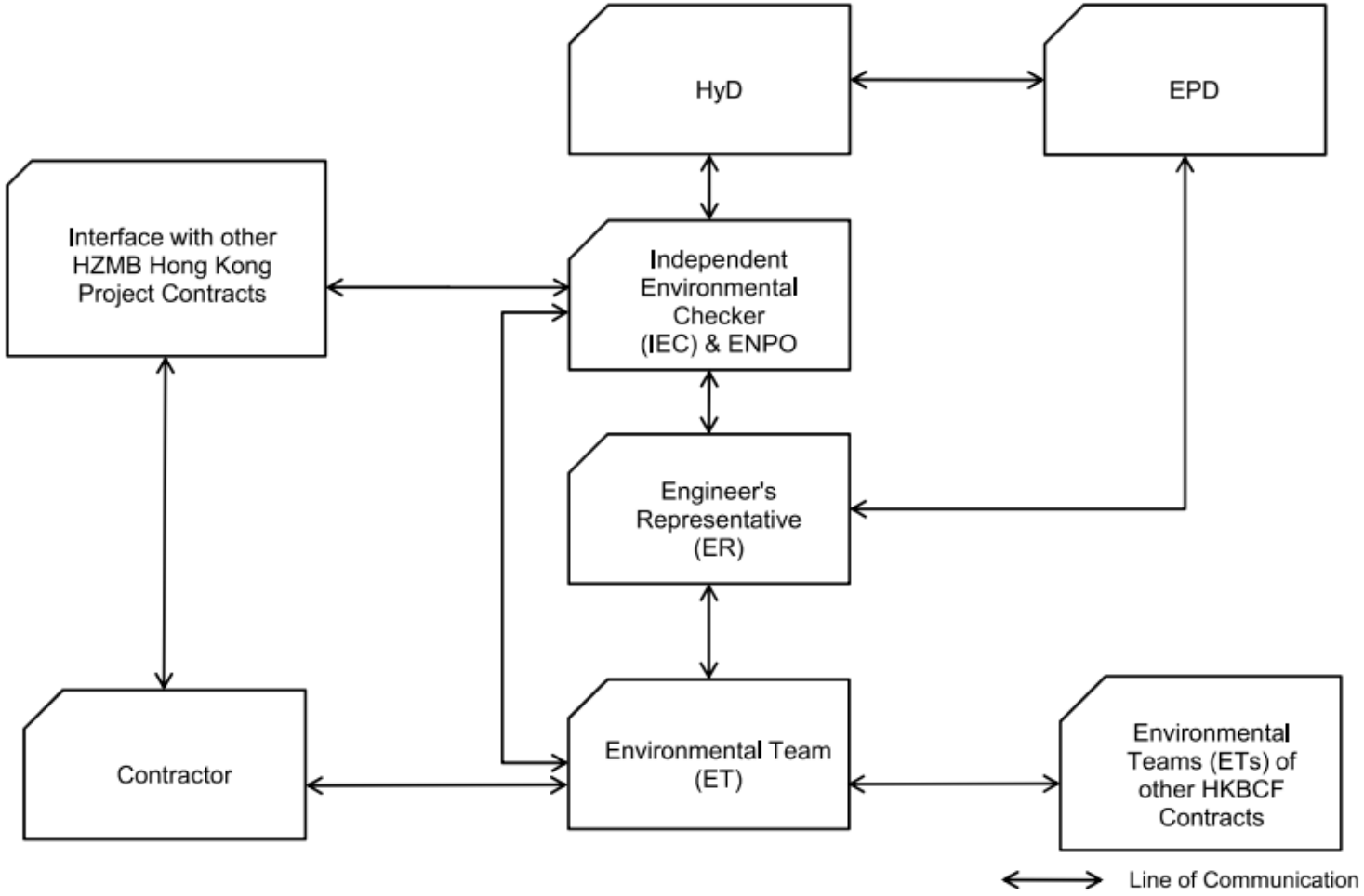
**UPDATED WORKS PROGRAMME**
**FOR PHASE 2 AND OTHER WORKS, HKZMB**



| Date | Revision | Checked | Approved |
|---|---|---|---|
| 09-Nov-21 | Revised Works Programme for Phase 2 | ZJ | |
| 06-Jan-22 | Revised Works Programme for Phase 2 | ZJ | |

# Appendix B

Project Organization Chart


HyD
EPD
Interface with other HZMB Hong Kong Project Contracts
Independent Environmental Checker (IEC) & ENPO
Engineer's Representative (ER)
Contractor
Environmental Team (ET)
Environmental Teams (ETs) of other HKBCF Contracts
Line of Communication

# Appendix C

Action and Limit Levels

## Action / Limit Levels for Air Quality

| Parameters | Action Level | Limit Level |
|---|---|---|
| 24-hour TSP Level in µg/$m^3$ | [1]For baseline level ≤ 200 µg/$m^3$, Action level = (baseline level * 1.3 + Limit level)/2; For baseline level > 200 µg/$m^3$ Action level = Limit level | 260 µg/$m^3$ |
| 1-hour TSP Level in µg/$m^3$ | [2]For baseline level ≤ 384 µg/$m^3$, Action level = (baseline level * 1.3 + Limit level)/2; For baseline level > 384 µg/$m^3$, Action level = Limit level | 500 µg/$m^3$ |

Notes:

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

a) AMS 2 = (71.1*1.3 + 260) / 2 = 176 µg/$m^3$; b) AMS 3C = (56.9*1.3 + 260) / 2 = 167 µg/$m^3$;

c) AMS 6 = (66.4*1.3 + 260) / 2 = 173 µg/$m^3$; d) AMS 7B = (82.3*1.3 + 260) / 2 = 183 µg/$m^3$;

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

a) AMS 2 = (191.5*1.3 + 500) / 2 = 374 µg/$m^3$; b) AMS 3C = (18.2.2*1.3 + 500) / 2 = 368 µg/$m^3$;

c) AMS 6 = (169.2*1.3 + 500) / 2 = 360 µg/$m^3$; d) AMS 7B = (184.2*1.3 + 500) / 2 = 370 µg/$m^3$;

## 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.

# Appendix D

Calibration Certificate of Monitoring Equipment

TISCH Environmental

| RECALIBRATION DUE DATE: |
|---|
| June 4, 2022 |

# Certificate of Calibration

| Calibration Certification Information | | | | |
|---|---|---|---|---|
| **Cal. Date:** | June 4, 2021 | **Rootsmeter S/N:** 438320 | **Ta:** 294 | °K |
| **Operator:** | Jim Tisch | | **Pa:** 750.3 | 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 | 1.4450 | 3.2 | 2.00 |
| 2 | 3 | 4 | 1 | 1.0220 | 6.4 | 4.00 |
| 3 | 5 | 6 | 1 | 0.9070 | 8.0 | 5.00 |
| 4 | 7 | 8 | 1 | 0.8650 | 8.8 | 5.50 |
| 5 | 9 | 10 | 1 | 0.7130 | 12.8 | 8.00 |

**Data Tabulation**

| Vstd (m3) | Qstd (x-axis) | $\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis) | Va | Qa (x-axis) | $\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis) |
|---|---|---|---|---|---|
| 0.9964 | 0.6896 | 1.4147 | 0.9957 | 0.6891 | 0.8853 |
| 0.9922 | 0.9708 | 2.0007 | 0.9915 | 0.9701 | 1.2519 |
| 0.9900 | 1.0915 | 2.2368 | 0.9893 | 1.0908 | 1.3997 |
| 0.9890 | 1.1433 | 2.3460 | 0.9883 | 1.1425 | 1.4680 |
| 0.9836 | 1.3795 | 2.8294 | 0.9829 | 1.3786 | 1.7705 |
| **QSTD** | **m=** | **2.04731** | **QA** | **m=** | **1.28199** |
| | **b=** | **0.00573** | | **b=** | **0.00358** |
| | **r=** | **0.99996** | | **r=** | **0.99996** |

**Calculations**

| | | | |
|---|---|---|---|
| **Vstd=** | ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta) | **Va=** | ΔVol((Pa-ΔP)/Pa) |
| **Qstd=** | Vstd/ΔTime | **Qa=** | Va/ΔTime |

**For subsequent flow rate calculations:**

**Qstd=** $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

**Qa=** $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

**RECALIBRATION**

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

**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: 9-Dec-21
Location : AMS2
Next Calibration Date: 8-Mar-22
Brand: Tisch
Technician: Ting Chan
Model: TE-5170 S/N: HVS-01

### CONDITIONS

| | | | |
|---|---|---|---|
| Sea Level Pressure (hPa): | 1022.3 | Corrected Pressure (mm Hg): | 767 |
| Temperature (℃): | 20.2 | Temperature (K): | 293 |

### CALIBRATION ORIFICE

| | | | |
|---|---|---|---|
| Make: | Tisch | Qstd Slope: | 2.04731 |
| Model: | TE-5025A | Qstd Intercept: | 0.00573 |
| Calibration Date: | 4-Jun-21 | Expiry Date: | 4-Jun-22 |
| S/N: | 2456 | | |

### CALIBRATION

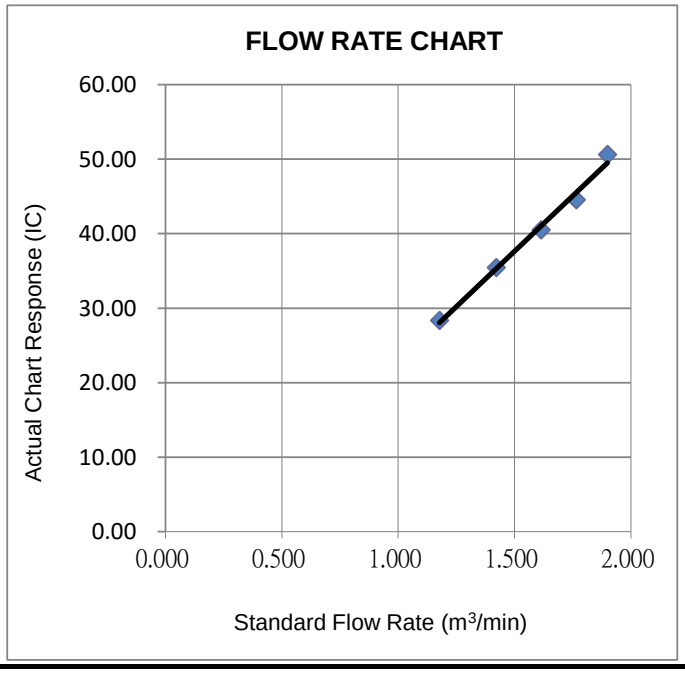
| Plate No. | H2O (L) (in) | H2O (R) (in) | H2O (in) | Qstd ($m^3$/min) | I (chart) | IC (corrected) | LINEAR REGRESSION | |
|---|---|---|---|---|---|---|---|---|
| 18 | 6.80 | -8.00 | 14.800 | 1.900 | 50.00 | 50.62 | Slope = | 29.7591 |
| 13 | 6.00 | -6.80 | 12.800 | 1.766 | 44.00 | 44.54 | Intercept = | -7.0140 |
| 10 | 4.90 | -5.80 | 10.700 | 1.615 | 40.00 | 40.50 | Corr. coeff.= | 0.9954 |
| 7 | 3.70 | -4.60 | 8.300 | 1.422 | 35.00 | 35.43 | | |
| 5 | 1.90 | -3.80 | 5.700 | 1.178 | 28.00 | 28.35 | | |

**Calculations:**

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[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)[Sqrt(298/Tav)(Pav/760)]-b)
m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure




**Report Date:** **10/12/2021**

**Wan Ka Ho**
Project Consultant

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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: 9-Dec-21
Location : AMS3C
Next Calibration Date: 8-Mar-22
Brand: Tisch
Technician: Ting Chan
Model: TE-5170 S/N: HVS-02

### CONDITIONS

| | | | |
|---|---|---|---|
| Sea Level Pressure (hPa): | 1022.3 | Corrected Pressure (mm Hg): | 767 |
| Temperature (℃): | 20.2 | Temperature (K): | 293 |

### CALIBRATION ORIFICE

| | | | |
|---|---|---|---|
| Make: | Tisch | Qstd Slope: | 2.04731 |
| Model: | TE-5025A | Qstd Intercept: | 0.00573 |
| Calibration Date: | 4-Jun-21 | Expiry Date: | 4-Jun-22 |
| S/N: | 2456 | | |

### CALIBRATION

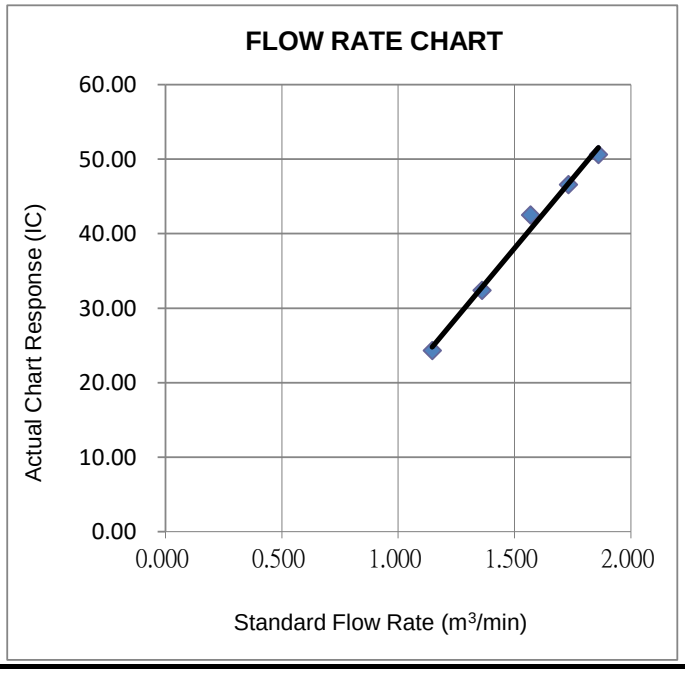
| Plate No. | H2O (L) (in) | H2O (R) (in) | H2O (in) | Qstd ($m^3$/min) | I (chart) | IC (corrected) | LINEAR REGRESSION | |
|---|---|---|---|---|---|---|---|---|
| 18 | 6.20 | -8.00 | 14.200 | 1.861 | 50.00 | 50.62 | Slope = | 37.4548 |
| 13 | 5.80 | -6.50 | 12.300 | 1.731 | 46.00 | 46.57 | Intercept = | -18.1567 |
| 10 | 4.50 | -5.60 | 10.100 | 1.569 | 42.00 | 42.52 | Corr. coeff.= | 0.9947 |
| 7 | 3.60 | -4.00 | 7.600 | 1.360 | 32.00 | 32.40 | | |
| 5 | 2.20 | -3.20 | 5.400 | 1.146 | 24.00 | 24.30 | | |

**Calculations:**

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[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)[Sqrt(298/Tav)(Pav/760)]-b)
m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure




**Report Date:** **13/9/2021**

**Wan Ka Ho**
Project Consultant

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19/F, Fugro House – KCC2,
1 Kwai On Rd,
Kwai Chung, NT,
Hong Kong

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Project : Contract No. HY/2019/01 - Hong Kong-Zhuhai-Macao Bridge
Date of Calibration: 9-Dec-21
Location : AMS7C
Next Calibration Date: 8-Mar-22
Brand: Tisch
Technician: Ting Chan
Model: TE-5170 S/N: HVS-03

### CONDITIONS

| | | | |
|---|---|---|---|
| Sea Level Pressure (hPa): | 1022.3 | Corrected Pressure (mm Hg): | 767 |
| Temperature (℃): | 20.2 | Temperature (K): | 293 |

### CALIBRATION ORIFICE

| | | | |
|---|---|---|---|
| Make: | Tisch | Qstd Slope: | 2.04731 |
| Model: | TE-5025A | Qstd Intercept: | 0.00573 |
| Calibration Date: | 4-Jun-21 | Expiry Date: | 4-Jun-22 |
| S/N: | 2456 | | |

### CALIBRATION

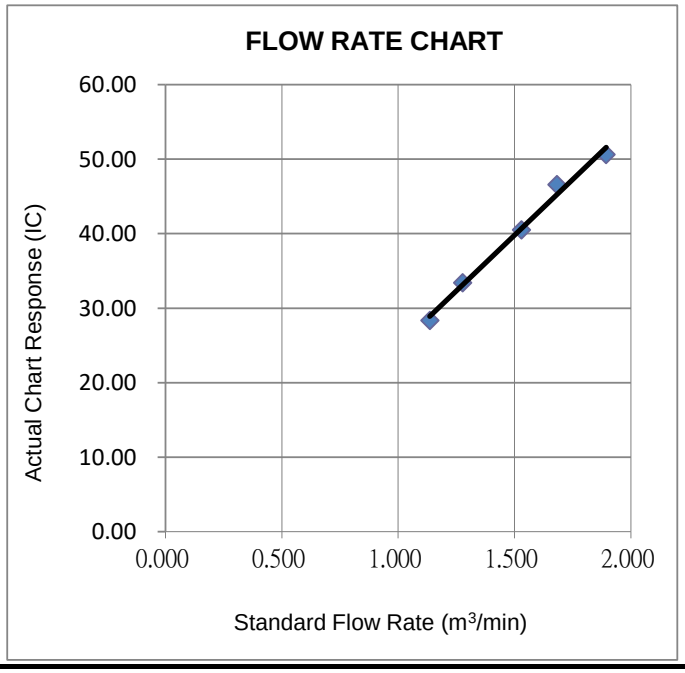
| Plate No. | H2O (L) (in) | H2O (R) (in) | H2O (in) | Qstd ($m^3$/min) | I (chart) | IC (corrected) | LINEAR REGRESSION | |
|---|---|---|---|---|---|---|---|---|
| 18 | 6.80 | -7.90 | 14.700 | 1.894 | 50.00 | 50.63 | Slope = | 29.9386 |
| 13 | 5.80 | -5.80 | 11.600 | 1.682 | 46.00 | 46.58 | Intercept = | -5.1209 |
| 10 | 4.80 | -4.80 | 9.600 | 1.530 | 40.00 | 40.51 | Corr. coeff.= | 0.9954 |
| 7 | 3.20 | -3.50 | 6.700 | 1.277 | 33.00 | 33.42 | | |
| 5 | 2.50 | -2.80 | 5.300 | 1.136 | 28.00 | 28.35 | | |

**Calculations:**

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[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)[Sqrt(298/Tav)(Pav/760)]-b)
m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure




**Report Date:** **6/10/2020**

**Wan Ka Ho**
Project Consultant

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# CALIBRATION REPORT OF WIND METER

**Project: Contract No. HY/2019/01 - Hong Kong-Zhuhai-Macao Bridge**
**Location: AMS3C**

**Date of Calibration: 28-Dec-2021**
**Next Calibration Date: 27-Jun-2022**
**Technician: Ting Chan**

**Brand: Global Water**
**Model: GL500-7-2**

**Anemometer**

**Brand: Smart Sensor**
**Model: AR816** **Serial No: H0423689**

**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) |
|---|---|
| 1.8 | 1.8 |
| 2.6 | 2.5 |
| 4.2 | 4.3 |

**Wind Direction Test:**

| | Marine Compass (o) |
|---|---|
| 0 | 0 |
| 113 | 112 |
| 254 | 254 |
| 286 | 285 |

**Report Date: 29/12/2021**

**Wan Ka Ho**
Project Consultant

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FUGRO TECHNICAL SERVICES LIMITED
Fugro Development Centre
5 Lok Yi Street, Tai Lam
Tuen Mun, NT
Hong Kong

Report no. : 940891CA211483



# 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. | : 892186 |
| Specification Limit | : NA |
| Next Calibration Date | : 02-Jun-2022 |

**Laboratory Information**

| | |
|---|---|
| Description | : 1. Balance 2. TSP high volume air sampler |
| Equipment ID. / Serial no. | : 1. C-065-9 2. 4350 |
| Date of Calibration | : 03-Jun-2021 Ambient Temperature : 25 ± 10 °C |
| Calibration Location | : General Chemical Laboratory of FTS and 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) |
|---|---|---|
| 0.0569 | 2147 | 35.78 |
| 0.0675 | 2299 | 38.32 |
| 0.1122 | 2675 | 44.58 |

**Remarks:**

1. The equipment being used in this calibration is traceable to recognized National Standards.
2. The interpolation equation : Concentration ($mg/m^3$) = K x [ UUT reading (CPM) ], where K = 0.001994
3. Correlation coefficient (r) : 0.9948

Checked by : _____ Date : 23-6-2021 Certified by : _____ Date : 30-6-2021

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

Leung Kwok Tai (Assistant Manager)

** End of Report **

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5 Lok Yi Street, Tai Lam
Tuen Mun, NT
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Report no. : 940891CA211924(2)A



# 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. | : 892187 |
| Specification Limit | : NA |
| Next Calibration Date | : 11-Jul-2022 |

**Laboratory Information**

| | |
|---|---|
| Description | : 1. Balance 2. TSP high volume air sampler |
| Equipment ID. / Serial no. | : 1. C-065-9 2. 4350 |
| Date of Calibration | : 12-Jul-2021 Ambient Temperature : 25 ± 10 °C |
| Calibration Location | : General Chemical Laboratory of FTS and 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) |
|---|---|---|
| 0.0424 | 1512 | 25.20 |
| 0.0194 | 1041 | 17.35 |
| 0.0230 | 1090 | 18.17 |

**Remarks:**

1. The equipment being used in this calibration is traceable to recognized National Standards.
2. The interpolation equation : Concentration ($mg/m^3$) = K x [ UUT reading (CPM) ], where K = 0.001398
3. Correlation coefficient (r) : 0.9987
4. This is to supersede the previous report no. 940891CA211924(2).

Checked by : Date : 3-9-2021 Certified by : Date : 6-9-2021

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

Leung Kwok Tai (Assistant Manager)

** End of Report **

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

Report no. : 940891CA211924(3)A



# 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. | : 892189 |
| Specification Limit | : NA |
| Next Calibration Date | : 11-Jul-2022 |

**Laboratory Information**

Description : 1. Balance 2. TSP high volume air sampler

Equipment ID. / Serial no. : 1. C-065-9 2. 4350

Date of Calibration : 12-Jul-2021 Ambient Temperature : 25 ± 10 °C

Calibration Location : General Chemical Laboratory of FTS and 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) |
|---|---|---|
| 0.0424 | 1498 | 24.97 |
| 0.0194 | 1052 | 17.53 |
| 0.0230 | 1088 | 18.13 |

**Remarks:**

1. The equipment being used in this calibration is traceable to recognized National Standards.
2. The interpolation equation : Concentration ($mg/m^3$) = K x [ UUT reading (CPM) ], where K = 0.001400
3. Correlation coefficient (r) : 0.9973
4. This is to supersede the previous report no. 940891CA211924(3).

Checked by : Date : 3-9-2021 Certified by : Date : 6-9-2021

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

Leung Kwok Tai (Assistant Manager)

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Report no.: 212769CA211755(1)



# 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

| | Meter | Microphone | Preamplifier |
|---|---|---|---|
| Model No. | CEL-63X | CE-251 | CEL-495 |
| Serial No. | 1488302 | 02795 | 003538 |

Equipment ID : N-30

Next Calibration Date : 25-Jul-2022

Specification Limit : EN 61672-1: 2003 Class 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 : 26-Jul-2021

Calibration Location : Calibration Laboratory of FTS

Method Used : By direct comparison

Ambient Temperature : 20±2 °C

Relative Humidity : <80% R.H.

**Calibration Results :**

| Parameters | | Mean Value (dB) | Specification Limit(dB) |
|---|---|---|---|
| A-weigthing frequency response | 4000Hz | 1.2 | 2.6 to -0.6 |
| | 2000Hz | 1.3 | 2.8 to -0.4 |
| | 1000Hz | 0.0 | 1.1 to -1.1 |
| | 500Hz | -3.3 | -1.8 to -4.6 |
| | 250Hz | -8.7 | -7.2 to -10.0 |
| | 125Hz | -16.1 | -14.6 to -17.6 |
| | 63Hz | -26.2 | -24.7 to -27.7 |
| | 31.5Hz | -39.2 | -37.4 to -41.4 |
| Differential level linearity | 94dB-104dB | 0.3 | ± 0.6 |
| | 104dB-114dB | -0.3 | ± 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. The expanded uncertainty is 0.3 dB with a coverage factor of 2 at a confidence level of 95%.
4. For calibration: Reference SPL are 94, 104 & 114dB, range setting is 20-140dB & time weighting is fast
5. The UUT does comply with EN 61672-1: 2003 Class 1 sound level meter for the above measurement.
6. The values given in this Calibration Certificate only relate to unit under test and the values measured at the time of the test. Any uncertainties will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during tranportation, overloading, mis-handling or the capability of any other laboratory to repeat the measurement.

Checked by : Cenny Date : 30-7-2021 Certified by : K T Leung Date : 30-7-2021

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

Leung Kwok Tai (Assistant Manager)

** End of Report **

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Tuen Mun, NT
Hong Kong

Report no.: 212769CA212069



# 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

| | Meter | Microphone | Preamplifier |
|---|---|---|---|
| Model No. : | CEL-63X | CE-251 | CEL-495 |
| Serial No. : | 1488303 | 02849 | 0043415 |

Equipment ID : N/A
Next Calibration Date : 25-Aug-2022
Specification Limit : EN 61672-1: 2003 Class 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 : 26-Aug-2021
Calibration Location : Calibration Laboratory of FTS
Method Used : By direct comparison
Ambient Temperature : 20±2 °C
Relative Humidity : <80% R.H.

**Calibration Results :**

| Parameters | | Mean Value (dB) | Specification Limit(dB) |
|---|---|---|---|
| A-weigthing 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 | -16.2 | -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 | 0.3 | ± 0.6 |
| | 104dB-114dB | -0.3 | ± 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. The expanded uncertainty is 0.3 dB with a coverage factor of 2 at a confidence level of 95%.
4. For calibration: Reference SPL are 94, 104 & 114dB, range setting is 20-140dB & time weighting is fast
5. The UUT does comply with EN 61672-1: 2003 Class 1 sound level meter for the above measurement.
6. The values given in this Calibration Certificate only relate to unit under test and the values measured at the time of the test. Any uncertainties will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during tranportation, overloading, mis-handling or the capability of any other laboratory to repeat the measurement.

Checked by : Cmy Date : 27-8-2021 Certified by : K.T. Leung Date : 27-8-2021

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

Leung Kwok Tai (Assistant Manager)

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Report no.: 212769CA211664



# CALIBRATION CERTIFICATE OF SOUND CALIBRATOR

Client : Fugro Technical Services Ltd.

Project : Calibration Services

**Client Supplied Information**

**Details of Unit Under Test, UUT**

| | | |
|---|---|---|
| Description | : | Sound Calibrator |
| Manufacturer | : | Casella (Model CEL-120/1) |
| Serial No. | : | 5230758 |
| Equipment ID | : | N/A |
| Next Calibration Date | : | 15-Jul-2022 |
| Specification Limit | : | EN 60942: 2003 Class 1 |

**Laboratory Information**

**Details of Calibration Equipment**

| | | |
|---|---|---|
| Description | : | Reference Sound level meter |
| Equipment ID. | : | R-119-2 |
| Date of Calibration | : | 16-Jul-2021 |
| Calibration Location | : | Calibration Laboratory of FTS |
| Method Used | : | By direct comparison |

Ambient Temperature : 20±2 °C

Relative Humidity : <80% R.H.

**Calibration Results :**

| Parameters (Setting of UUT) | Mean Value (error of measurement) | Specification Limit(dB) |
|---|---|---|
| 94dB | -0.2 dB | ±0.4dB |
| 114dB | -0.2 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 expanded uncertainty is 0.3 dB with a coverage factor of 2 at a confidence level of 95%.
4. The unit under test complies with the specification limit.
5. The values given in this Calibration Certificate only relate to the unit-under-test and the values measured at the time of the test. Any uncertainties quoted will not include allowances for the environmental changes, variation and shock during transportation, or the capability of any other laboratory to repeat the measurement.

Checked by : Date : 20-7-2021 Certified by : Date : 20-7-2021

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

Leung Kwok Tai (Assistant Manager)

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Report no.: 212769CA211553(1)



# CALIBRATION CERTIFICATE OF SOUND CALIBRATOR

Client : Fugro Technical Services Ltd.

Project : Calibration Services

**Client Supplied Information**

Details of Unit Under Test, UUT

| | | |
|---|---|---|
| Description | : | Sound Calibrator |
| Manufacturer | : | Casella (Model CEL-120/1) |
| Serial No. | : | 5230950 |
| Equipment ID | : | N/A |
| Next Calibration Date | : | 05-Jul-2022 |
| Specification Limit | : | EN 60942: 2003 Class 1 |

**Laboratory Information**

Details of Calibration Equipment

| | | |
|---|---|---|
| Description | : | Reference Sound level meter |
| Equipment ID. | : | R-119-2 |
| Date of Calibration | : | 06-Jul-2021 |
| Calibration Location | : | Calibration Laboratory of FTS |
| Method Used | : | By direct comparison |

Ambient Temperature : 20±2 °C

Relative Humidity : <80% R.H.

**Calibration Results :**

| Parameters (Setting of UUT) | Mean Value (error of measurement) | Specification Limit(dB) |
|---|---|---|
| 94dB | -0.4 dB | ±0.4dB |
| 114dB | -0.3 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 unit under test complies with the specification limit.
4. The values given in this Calibration Certificate only relate to the unit-under-test and the values measured at the time of the test. Any uncertainties quoted will not include allowances for the environmental changes, variation and shock during transportation, or the capability of any other laboratory to repeat the measurement.

Checked by : William Date : 7-7-2021 Certified by : K.T.Leung Date : 7-7-2021

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

Leung Kwok Tai (Assistant Manager)

** End of Report **

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Report No. : 212769CA211337



# CALIBRATION CERTIFICATE OF ANEMOMETER

**Client Supplied Information**

Client : Fugro Technical Services Ltd.

Project : Calibration Services

**Details of Unit Under Test, UUT**

Description : Anemometer

Manufacturer : Smart Sensor

Model No. : AR816

Serial No. : H0423689

Equipment ID. : WS-03

Next Calibration Date : 15-Jun-2022

**Laboratory Information**

Details of Reference Equipment –

Description : Reference Anemometer

Equipment ID. : R-101-4

Date of Calibration : 16-Jun-2021 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) |
|---|---|---|
| 1.99 | 2.0 | 0.0 |
| 4.00 | 4.0 | 0.0 |
| 6.00 | 5.9 | -0.1 |
| 8.00 | 7.5 | -0.5 |
| 10.01 | 9.0 | -1.0 |

**Remark :**

1. The equipment being used in this calibration is traceable to recognized National Standards.
2. The reported readings in this calibration are an average from 10 trials.

Checked by : William Date : 22-6-2021 Certified by : K T Leung Date : 22.6.2021

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

Leung Kwok Tai (Assistant Manager)

** End of Report **

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# 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 (January 2022)

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

**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 AMS7C (East Sea Rescue Berth – Airport Fire ContingentThird Runway Site Office)
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 (February 2022)

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

**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 AMS7C (East Sea Rescue Berth – Airport Fire ContingentThird Runway Site Office)
5. 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 (µg/m³) 1st Measurement | 2nd Measurement | 3rd Measurement | Action Level (ug/m$^3$) | Limit Level (ug/m$^3$) |
|---|---|---|---|---|---|---|---|
| 5-Jan-22 | Fine | 13:23 | 51 | 54 | 47 | 374 | 500 |
| 11-Jan-22 | Fine | 10:40 | 39 | 42 | 42 | | |
| 17-Jan-22 | Fine | 13:09 | 57 | 62 | 62 | | |
| 22-Jan-22 | Fine | 09:25 | 53 | 57 | 50 | | |
| 28-Jan-22 | Fine | 13:12 | 48 | 56 | 62 | | |
| 31-Jan-22 | Fine | 12:50 | 44 | 50 | 41 | | |
| | | Min | 39 | | | | |
| | | Max | 62 | | | | |
| | | Average | 51 | | | | |

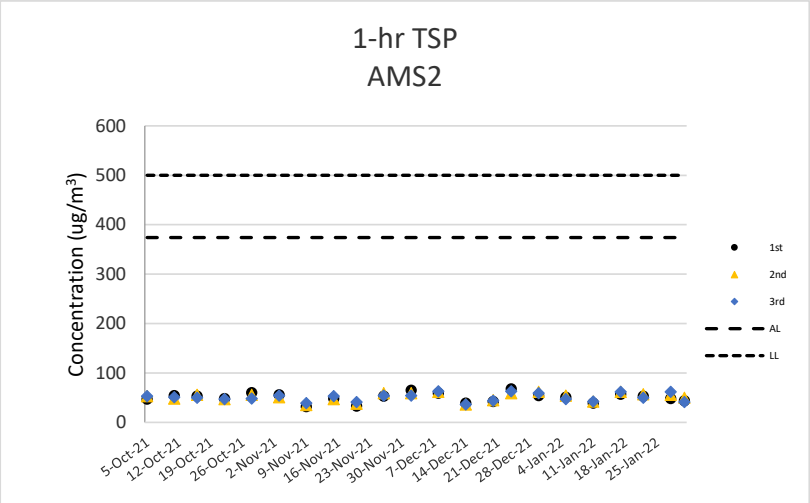
**AMS3C - Ying Tung Estate Market Rooftop**

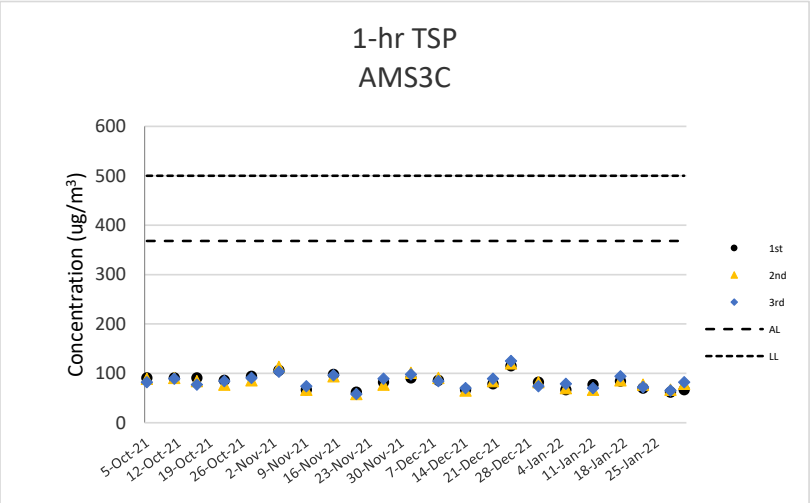
| Date | Weather Condition | Start Time | 1-hour TSP (µg/m³) 1st Measurement | 2nd Measurement | 3rd Measurement | Action Level (ug/m$^3$) | Limit Level (ug/m$^3$) |
|---|---|---|---|---|---|---|---|
| 5-Jan-22 | Fine | 13:30 | 67 | 70 | 79 | 368 | 500 |
| 11-Jan-22 | Fine | 11:00 | 77 | 67 | 70 | | |
| 17-Jan-22 | Fine | 13:18 | 84 | 86 | 94 | | |
| 22-Jan-22 | Fine | 09:15 | 70 | 77 | 72 | | |
| 28-Jan-22 | Fine | 13:20 | 62 | 67 | 65 | | |
| 31-Jan-22 | Fine | 13:04 | 67 | 79 | 82 | | |
| | | Min | 62 | | | | |
| | | Max | 94 | | | | |
| | | Average | 74 | | | | |

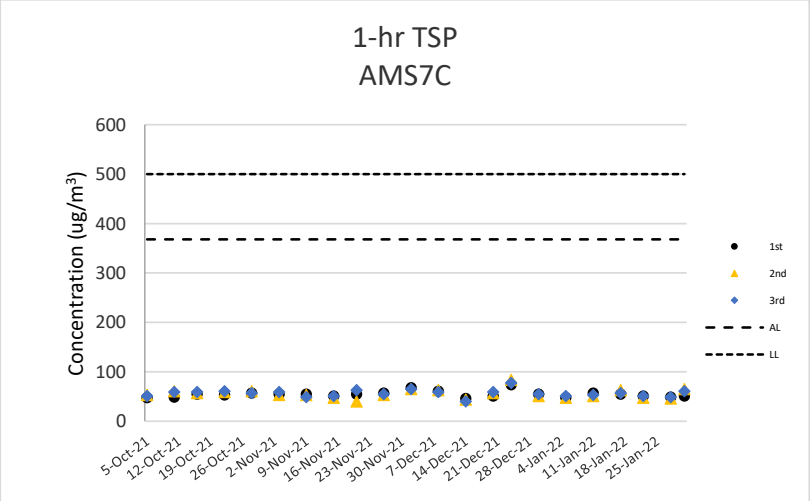
**AMS7C - East Sea Rescue Berth – Airport Fire ContingentThird Runway Site Office**

| Date | Weather Condition | Start Time | 1-hour TSP (µg/m³) 1st Measurement | 2nd Measurement | 3rd Measurement | Action Level (ug/m$^3$) | Limit Level (ug/m$^3$) |
|---|---|---|---|---|---|---|---|
| 5-Jan-22 | Fine | 13:12 | 48 | 48 | 51 | 370 | 500 |
| 11-Jan-22 | Fine | 11:20 | 57 | 51 | 53 | | |
| 17-Jan-22 | Fine | 13:01 | 55 | 63 | 57 | | |
| 22-Jan-22 | Fine | 09:34 | 51 | 48 | 51 | | |
| 28-Jan-22 | Fine | 13:37 | 49 | 46 | 49 | | |
| 31-Jan-22 | Fine | 13:21 | 51 | 65 | 61 | | |
| | | Min | 46 | | | | |
| | | Max | 65 | | | | |
| | | Average | 53 | | | | |

Note:
Underline: Exceedance of Action Level
**Underline and Bold**: Exceedance of Limit Level
1. Air quality monitoring location AMS7B was temporary suspended, effective from 10 December 2020.
2. According to the email date 11 August 2021, EPD have no comment on the Proposal for Relocation of Monitoring Location AMS 7B, the monitoring location AMS 7B are proposed to be relocated by alternative monitoring location AMS 7C for air quality monitoring.


1-hr TSP
AMS2
Concentration (ug/m³)
600
500
400
300
200
100
0
5-Oct-21
12-Oct-21
19-Oct-21
26-Oct-21
2-Nov-21
9-Nov-21
16-Nov-21
23-Nov-21
30-Nov-21
7-Dec-21
14-Dec-21
21-Dec-21
28-Dec-21
4-Jan-22
11-Jan-22
18-Jan-22
25-Jan-22
1st
2nd
3rd
AL
LL


1-hr TSP
AMS3C
Concentration (ug/m³)
600
500
400
300
200
100
0
5-Oct-21
12-Oct-21
19-Oct-21
26-Oct-21
2-Nov-21
9-Nov-21
16-Nov-21
23-Nov-21
30-Nov-21
7-Dec-21
14-Dec-21
21-Dec-21
28-Dec-21
4-Jan-22
11-Jan-22
18-Jan-22
25-Jan-22
1st
2nd
3rd
AL
LL


1-hr TSP
AMS7C
Concentration (ug/m³)
600
500
400
300
200
100
0
5-Oct-21
12-Oct-21
19-Oct-21
26-Oct-21
2-Nov-21
9-Nov-21
16-Nov-21
23-Nov-21
30-Nov-21
7-Dec-21
14-Dec-21
21-Dec-21
28-Dec-21
4-Jan-22
11-Jan-22
18-Jan-22
25-Jan-22
1st
2nd
3rd
AL
LL

## 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-Jan-22 | Fine | 287.8 | 766.4 | 2.7854 | 2.9719 | 0.1865 | 24 | 1.61 | 1.58 | 1.59 | 2296.2 | 81 | 176 | 260 |
| 11-Jan-22 | Fine | 293.3 | 766.8 | 2.7756 | 2.8364 | 0.0608 | 24 | 1.60 | 1.58 | 1.59 | 2287.1 | 27 | | |
| 17-Jan-22 | Fine | 293.7 | 764.0 | 2.8074 | 2.9998 | 0.1924 | 24 | 1.59 | 1.58 | 1.59 | 2284.7 | 84 | | |
| 22-Jan-22 | Fine | 290.4 | 763.3 | 2.7161 | 2.7870 | 0.0709 | 24 | 1.60 | 1.58 | 1.59 | 2289.7 | 31 | | |
| 28-Jan-22 | Fine | 293.1 | 763.0 | 2.7820 | 2.8804 | 0.0984 | 24 | 1.59 | 1.58 | 1.59 | 2285.0 | 43 | | |
| 31-Jan-22 | Fine | 291.3 | 768.5 | 2.7167 | 2.8059 | 0.0892 | 24 | 1.60 | 1.58 | 1.59 | 2291.6 | 39 | | |
| | | | | | | | | | | | Min | 27 | | |
| | | | | | | | | | | | Max | 84 | | |
| | | | | | | | | | | | Average | 51 | | |

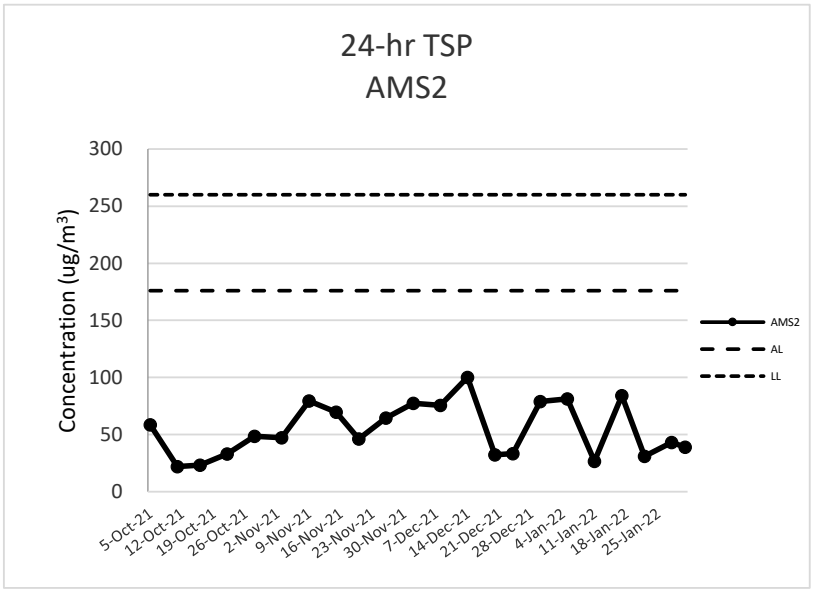
**AMS3C - Ying Tung Estate Market Rooftop**

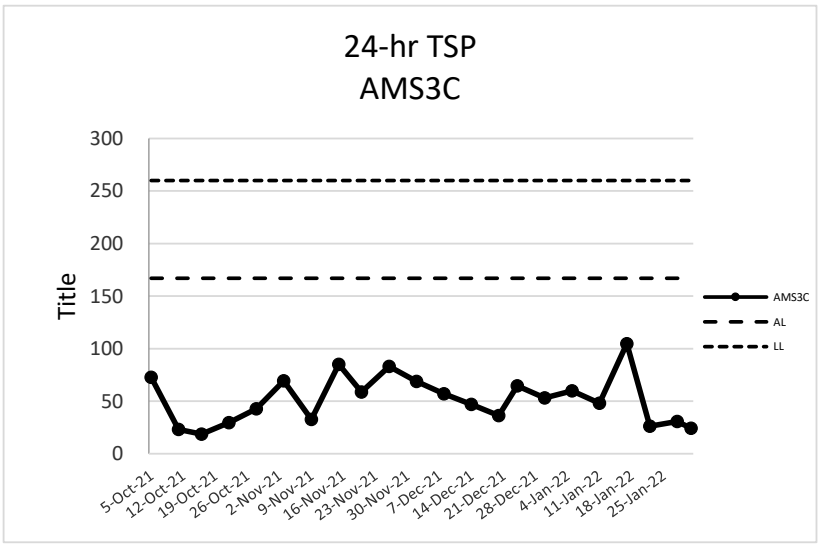
| Start Date | Weather Condition | Air Temperature (K) | Atmospheric Pressure, Pa (mmHg) | Filter Weight (g) | | Particulate weight (g) | Sampling Time(hrs) | Flow Rate ($m^3$/min.) | | Average flow ($m^3$/min.) | Total volume ($m^{3)}$ | Conc. ($ug/m^3$) | Action Level ($ug/m^3$) | Limit Level ($ug/m^3$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Initial | Final | | | Initial | Final | | | | | |
| 5-Jan-22 | Fine | 287.8 | 766.4 | 2.7844 | 2.9193 | 0.1349 | 24 | 1.58 | 1.55 | 1.56 | 2252.8 | 60 | 167 | 260 |
| 11-Jan-22 | Fine | 293.3 | 766.8 | 2.7674 | 2.8752 | 0.1078 | 24 | 1.57 | 1.55 | 1.56 | 2245.6 | 48 | | |
| 17-Jan-22 | Fine | 293.7 | 764.0 | 2.7996 | 3.0347 | 0.2351 | 24 | 1.56 | 1.55 | 1.56 | 2243.6 | 105 | | |
| 22-Jan-22 | Fine | 290.4 | 763.3 | 2.7169 | 2.7757 | 0.0588 | 24 | 1.57 | 1.55 | 1.56 | 2247.6 | 26 | | |
| 28-Jan-22 | Fine | 293.1 | 763.0 | 2.7729 | 2.8417 | 0.0688 | 24 | 1.56 | 1.55 | 1.56 | 2243.9 | 31 | | |
| 31-Jan-22 | Fine | 291.3 | 768.5 | 2.7703 | 2.8248 | 0.0545 | 24 | 1.57 | 1.55 | 1.56 | 2249.1 | 24 | | |
| | | | | | | | | | | | Min | 24 | | |
| | | | | | | | | | | | Max | 105 | | |
| | | | | | | | | | | | Average | 49 | | |

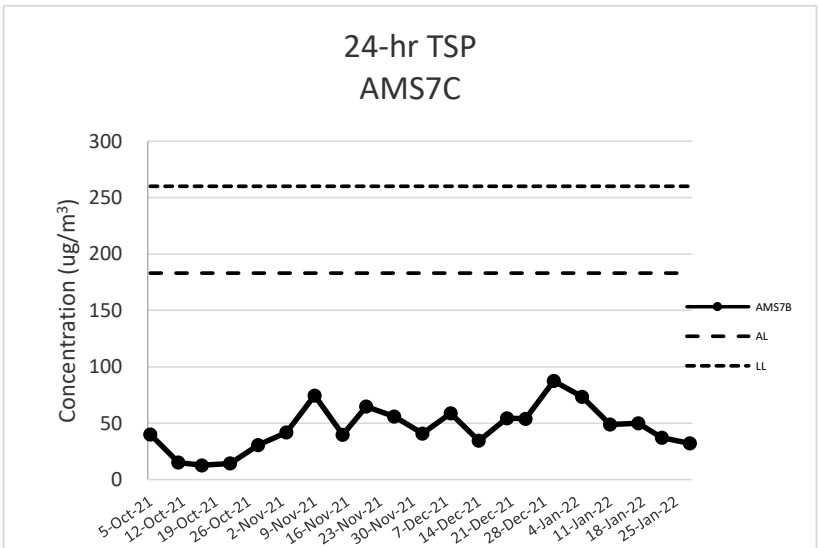
**AMS7C - East Sea Rescue Berth – Airport Fire ContingentThird Runway Site Office**

| 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-Jan-22 | Fine | 287.8 | 766.4 | 2.7834 | 2.9443 | 0.1609 | 24 | 1.54 | 1.51 | 1.52 | 2191.3 | 73 | 183 | 260 |
| 11-Jan-22 | Fine | 293.3 | 766.8 | 2.7683 | 2.8750 | 0.1067 | 24 | 1.52 | 1.51 | 1.52 | 2182.3 | 49 | | |
| 17-Jan-22 | Fine | 293.7 | 764.0 | 2.8004 | 2.9090 | 0.1086 | 24 | 1.52 | 1.51 | 1.51 | 2179.9 | 50 | | |
| 22-Jan-22 | Fine | 290.4 | 763.3 | 2.7058 | 2.7868 | 0.0810 | 24 | 1.53 | 1.51 | 1.52 | 2184.9 | 37 | | |
| 28-Jan-22 | Fine | 293.1 | 763.0 | 2.7598 | 2.8298 | 0.0700 | 24 | 1.52 | 1.51 | 1.51 | 2180.2 | 32 | | |
| 31-Jan-22 | Fine | 291.3 | 768.5 | 2.7625 | 2.8531 | 0.0906 | 24 | 1.53 | 1.51 | 1.52 | 2186.8 | 41 | | |
| | | | | | | | | | | | Min | 32 | | |
| | | | | | | | | | | | Max | 73 | | |
| | | | | | | | | | | | Average | 47 | | |

Note:
Underline: Exceedance of Action Level
**Underline and Bold**: Exceedance of Limit Level
1. Air quality monitoring location AMS7B was temporary suspended, effective from 10 December 2020.
2. According to the email date 11 August 2021, EPD have no comment on the Proposal for Relocation of Monitoring Location AMS 7B, the monitoring location AMS 7B are proposed to be relocated by alternative monitoring location AMS 7C for air quality monitoring.


24-hr TSP
AMS2
Concentration (ug/m3)
300
250
200
150
100
50
0
5-Oct-21
12-Oct-21
19-Oct-21
26-Oct-21
2-Nov-21
9-Nov-21
16-Nov-21
23-Nov-21
30-Nov-21
7-Dec-21
14-Dec-21
21-Dec-21
28-Dec-21
4-Jan-22
11-Jan-22
18-Jan-22
25-Jan-22
AMS2
AL
LL


24-hr TSP
AMS3C
Title
300
250
200
150
100
50
0
5-Oct-21
12-Oct-21
19-Oct-21
26-Oct-21
2-Nov-21
9-Nov-21
16-Nov-21
23-Nov-21
30-Nov-21
7-Dec-21
14-Dec-21
21-Dec-21
28-Dec-21
4-Jan-22
11-Jan-22
18-Jan-22
25-Jan-22
AMS3C
AL
LL


24-hr TSP
AMS7C
Concentration (ug/m3)
300
250
200
150
100
50
0
5-Oct-21
12-Oct-21
19-Oct-21
26-Oct-21
2-Nov-21
9-Nov-21
16-Nov-21
23-Nov-21
30-Nov-21
7-Dec-21
14-Dec-21
21-Dec-21
28-Dec-21
4-Jan-22
11-Jan-22
18-Jan-22
25-Jan-22
AMS7B
AL
LL

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

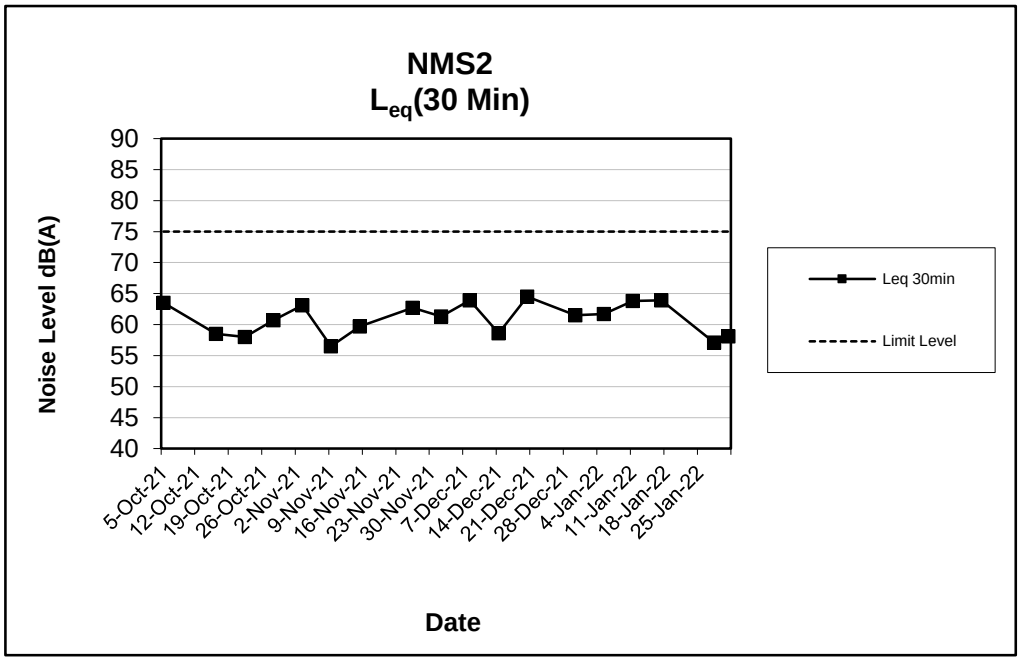
**NMS2 - Seaview Crescent**

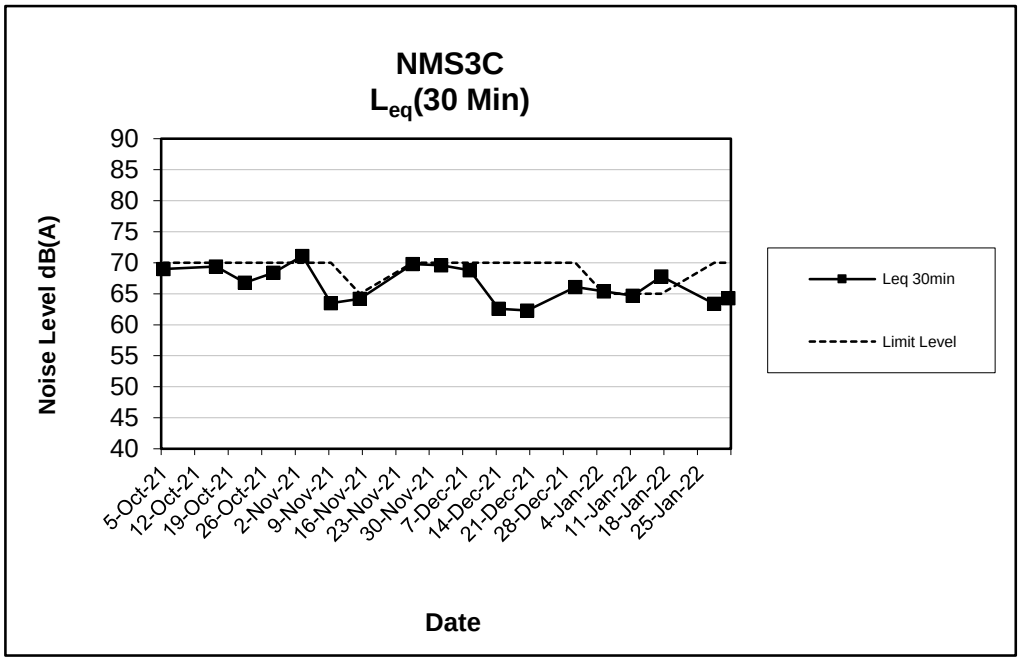
| Date | Start Time | $L_{eq}$ 30min dB(A) | $L_{10}$ dB(A) | $L_{90}$ dB(A) | Wind Speed (m/s) | Weather | Limit Level dB(A) |
|---|---|---|---|---|---|---|---|
| 5-Jan-22 | 14:15 | 62 | 65 | 59 | 0.6 | Fine | 75 |
| 11-Jan-22 | 11:15 | 64 | 69 | 61 | 1.2 | Fine | 75 |
| 17-Jan-22 | 14:05 | 64 | 67 | 62 | 0.7 | Fine | 75 |
| 28-Jan-22 | 13:59 | 57 | 61 | 55 | 0.4 | Fine | 75 |
| 31-Jan-22 | 13:36 | 58 | 61 | 56 | 1.0 | Fine | 75 |
| | **Max** | 64 | | | | | |
| | **Min** | 57 | | | | | |

**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) | Corrected Noise Level* |
|---|---|---|---|---|---|---|---|---|
| 5-Jan-22 | 13:34 | 65 | 68 | 64 | 0.9 | Fine | 65 | |
| 11-Jan-22 | 12:22 | 65 | 68 | 63 | 0.8 | Fine | 65 | |
| 17-Jan-22 | 13:23 | 68 | 71 | 66 | 0.8 | Fine | 65 | 62.5 |
| 28-Jan-22 | 13:20 | 63 | 67 | 62 | 0.3 | Fine | 70 | |
| 31-Jan-22 | 13:04 | 64 | 67 | 61 | 1.0 | Fine | 70 | |
| | **Max** | 68 | | | | | | |
| | **Min** | 63 | | | | | | |

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.
*Corrected Noise Level $=LOG(10^{(\text{Impact Noise Level }/10)} - 10^{(\text{Baseline Noise Level}/10)}) \times 10$
Baseline Noise Level = 66.3 dB(A)


NMS2
$L_{eq}$(30 Min)
Noise Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
5-Oct-21
12-Oct-21
19-Oct-21
26-Oct-21
2-Nov-21
9-Nov-21
16-Nov-21
23-Nov-21
30-Nov-21
7-Dec-21
14-Dec-21
21-Dec-21
28-Dec-21
4-Jan-22
11-Jan-22
18-Jan-22
25-Jan-22
Date
Leq 30min
Limit Level


NMS3C
$L_{eq}$(30 Min)
Noise Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
5-Oct-21
12-Oct-21
19-Oct-21
26-Oct-21
2-Nov-21
9-Nov-21
16-Nov-21
23-Nov-21
30-Nov-21
7-Dec-21
14-Dec-21
21-Dec-21
28-Dec-21
4-Jan-22
11-Jan-22
18-Jan-22
25-Jan-22
Date
Leq 30min
Limit Level

# 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 | Wind Direction |
|---|---|---|
| 01/01/2022 00:00 | 0.0 | W |
| 01/01/2022 01:00 | 0.7 | E |
| 01/01/2022 02:00 | 0.1 | NEN |
| 01/01/2022 03:00 | 0.0 | NE |
| 01/01/2022 04:00 | 0.0 | NEN |
| 01/01/2022 05:00 | 0.1 | NE |
| 01/01/2022 06:00 | 0.3 | NE |
| 01/01/2022 07:00 | 0.4 | NE |
| 01/01/2022 08:00 | 0.0 | SES |
| 01/01/2022 09:00 | 1.6 | SEE |
| 01/01/2022 10:00 | 0.2 | SEE |
| 01/01/2022 11:00 | 0.6 | NEE |
| 01/01/2022 12:00 | 0.9 | NEN |
| 01/01/2022 13:00 | 0.0 | NEN |
| 01/01/2022 14:00 | 0.1 | NEE |
| 01/01/2022 15:00 | 0.0 | NE |
| 01/01/2022 16:00 | 0.3 | NEN |
| 01/01/2022 17:00 | 0.0 | NEE |
| 01/01/2022 18:00 | 0.0 | NEE |
| 01/01/2022 19:00 | 0.6 | E |
| 01/01/2022 20:00 | 0.0 | SES |
| 01/01/2022 21:00 | 0.1 | NW |
| 01/01/2022 22:00 | 0.0 | SWS |
| 01/01/2022 23:00 | 0.0 | SWS |
| 02/01/2022 00:00 | 0.0 | SWS |
| 02/01/2022 01:00 | 0.0 | SWS |
| 02/01/2022 02:00 | 0.4 | N |
| 02/01/2022 03:00 | 0.2 | N |
| 02/01/2022 04:00 | 0.1 | NEN |
| 02/01/2022 05:00 | 0.0 | NW |
| 02/01/2022 06:00 | 1.0 | E |
| 02/01/2022 07:00 | 0.5 | E |
| 02/01/2022 08:00 | 0.6 | NEE |
| 02/01/2022 09:00 | 1.1 | NE |
| 02/01/2022 10:00 | 0.4 | N |
| 02/01/2022 11:00 | 0.0 | N |
| 02/01/2022 12:00 | 0.0 | NEN |
| 02/01/2022 13:00 | 0.1 | NEN |
| 02/01/2022 14:00 | 0.0 | SW |
| 02/01/2022 15:00 | 0.1 | N |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 02/01/2022 16:00 | 0.0 | NEN |
| 02/01/2022 17:00 | 0.6 | SEE |
| 02/01/2022 18:00 | 0.0 | NE |
| 02/01/2022 19:00 | 0.0 | SW |
| 02/01/2022 20:00 | 0.0 | SW |
| 02/01/2022 21:00 | 0.0 | E |
| 02/01/2022 22:00 | 0.1 | E |
| 02/01/2022 23:00 | 0.0 | NEN |
| 03/01/2022 00:00 | 0.0 | SW |
| 03/01/2022 01:00 | 0.0 | E |
| 03/01/2022 02:00 | 0.0 | S |
| 03/01/2022 03:00 | 0.0 | SW |
| 03/01/2022 04:00 | 0.0 | NE |
| 03/01/2022 05:00 | 0.0 | NEN |
| 03/01/2022 06:00 | 0.1 | N |
| 03/01/2022 07:00 | 0.0 | N |
| 03/01/2022 08:00 | 0.0 | N |
| 03/01/2022 09:00 | 0.0 | N |
| 03/01/2022 10:00 | 0.2 | N |
| 03/01/2022 11:00 | 0.0 | NW |
| 03/01/2022 12:00 | 0.5 | E |
| 03/01/2022 13:00 | 1.1 | NE |
| 03/01/2022 14:00 | 0.0 | N |
| 03/01/2022 15:00 | 0.1 | NEN |
| 03/01/2022 16:00 | 0.0 | N |
| 03/01/2022 17:00 | 0.0 | N |
| 03/01/2022 18:00 | 0.0 | SWW |
| 03/01/2022 19:00 | 0.0 | SW |
| 03/01/2022 20:00 | 1.1 | N |
| 03/01/2022 21:00 | 0.1 | NEN |
| 03/01/2022 22:00 | 1.1 | SW |
| 03/01/2022 23:00 | 2.0 | NWW |
| 04/01/2022 00:00 | 0.7 | N |
| 04/01/2022 01:00 | 0.8 | N |
| 04/01/2022 02:00 | 2.4 | N |
| 04/01/2022 03:00 | 0.3 | SW |
| 04/01/2022 04:00 | 0.1 | N |
| 04/01/2022 05:00 | 0.1 | NEE |
| 04/01/2022 06:00 | 0.1 | N |
| 04/01/2022 07:00 | 0.0 | SWW |
| 04/01/2022 08:00 | 0.1 | NEN |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 04/01/2022 09:00 | 2.0 | NWW |
| 04/01/2022 10:00 | 0.8 | N |
| 04/01/2022 11:00 | 0.3 | SW |
| 04/01/2022 12:00 | 0.0 | NEN |
| 04/01/2022 13:00 | 2.0 | N |
| 04/01/2022 14:00 | 0.5 | NEN |
| 04/01/2022 15:00 | 1.3 | N |
| 04/01/2022 16:00 | 0.7 | NE |
| 04/01/2022 17:00 | 0.0 | N |
| 04/01/2022 18:00 | 0.0 | NEE |
| 04/01/2022 19:00 | 0.0 | SEE |
| 04/01/2022 20:00 | 0.1 | NEE |
| 04/01/2022 21:00 | 0.0 | SE |
| 04/01/2022 22:00 | 0.0 | SW |
| 04/01/2022 23:00 | 0.0 | SWS |
| 05/01/2022 00:00 | 0.7 | SW |
| 05/01/2022 01:00 | 1.4 | S |
| 05/01/2022 02:00 | 0.1 | E |
| 05/01/2022 03:00 | 0.0 | NEN |
| 05/01/2022 04:00 | 0.2 | NWW |
| 05/01/2022 05:00 | 0.0 | SW |
| 05/01/2022 06:00 | 0.0 | N |
| 05/01/2022 07:00 | 0.0 | SW |
| 05/01/2022 08:00 | 0.0 | NE |
| 05/01/2022 09:00 | 0.6 | SWS |
| 05/01/2022 10:00 | 1.4 | N |
| 05/01/2022 11:00 | 0.0 | SES |
| 05/01/2022 12:00 | 0.0 | N |
| 05/01/2022 13:00 | 0.1 | NWN |
| 05/01/2022 14:00 | 0.0 | E |
| 05/01/2022 15:00 | 0.0 | SWS |
| 05/01/2022 16:00 | 0.0 | N |
| 05/01/2022 17:00 | 0.0 | SW |
| 05/01/2022 18:00 | 0.0 | S |
| 05/01/2022 19:00 | 0.0 | SW |
| 05/01/2022 20:00 | 0.0 | SW |
| 05/01/2022 21:00 | 0.0 | SW |
| 05/01/2022 22:00 | 0.3 | SWW |
| 05/01/2022 23:00 | 0.0 | SWS |
| 06/01/2022 00:00 | 0.1 | NE |
| 06/01/2022 01:00 | 0.7 | SW |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 06/01/2022 02:00 | 0.2 | SWS |
| 06/01/2022 03:00 | 1.4 | S |
| 06/01/2022 04:00 | 0.1 | SE |
| 06/01/2022 05:00 | 0.1 | E |
| 06/01/2022 06:00 | 4.9 | NEN |
| 06/01/2022 07:00 | 0.0 | SES |
| 06/01/2022 08:00 | 0.0 | S |
| 06/01/2022 09:00 | 0.0 | NEE |
| 06/01/2022 10:00 | 0.1 | N |
| 06/01/2022 11:00 | 0.0 | SE |
| 06/01/2022 12:00 | 0.0 | E |
| 06/01/2022 13:00 | 0.1 | SE |
| 06/01/2022 14:00 | 0.2 | N |
| 06/01/2022 15:00 | 0.0 | S |
| 06/01/2022 16:00 | 0.0 | NWW |
| 06/01/2022 17:00 | 0.3 | NE |
| 06/01/2022 18:00 | 0.9 | N |
| 06/01/2022 19:00 | 0.5 | NEN |
| 06/01/2022 20:00 | 0.8 | NEN |
| 06/01/2022 21:00 | 0.1 | N |
| 06/01/2022 22:00 | 0.1 | NEN |
| 06/01/2022 23:00 | 0.0 | E |
| 07/01/2022 00:00 | 0.0 | N |
| 07/01/2022 01:00 | 0.1 | N |
| 07/01/2022 02:00 | 0.0 | N |
| 07/01/2022 03:00 | 0.0 | N |
| 07/01/2022 04:00 | 0.0 | NEN |
| 07/01/2022 05:00 | 0.0 | SWW |
| 07/01/2022 06:00 | 0.0 | NEE |
| 07/01/2022 07:00 | 0.0 | SEE |
| 07/01/2022 08:00 | 0.0 | SWS |
| 07/01/2022 09:00 | 0.0 | NEE |
| 07/01/2022 10:00 | 0.1 | SEE |
| 07/01/2022 11:00 | 0.0 | NE |
| 07/01/2022 12:00 | 0.3 | NEE |
| 07/01/2022 13:00 | 0.2 | NEE |
| 07/01/2022 14:00 | 0.0 | NEN |
| 07/01/2022 15:00 | 0.0 | N |
| 07/01/2022 16:00 | 0.1 | N |
| 07/01/2022 17:00 | 0.0 | N |
| 07/01/2022 18:00 | 0.0 | S |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 07/01/2022 19:00 | 0.4 | N |
| 07/01/2022 20:00 | 0.3 | NE |
| 07/01/2022 21:00 | 0.1 | NEN |
| 07/01/2022 22:00 | 0.9 | N |
| 07/01/2022 23:00 | 0.0 | N |
| 08/01/2022 00:00 | 0.5 | NEN |
| 08/01/2022 01:00 | 0.0 | SEE |
| 08/01/2022 02:00 | 0.8 | NEN |
| 08/01/2022 03:00 | 0.1 | N |
| 08/01/2022 04:00 | 0.1 | N |
| 08/01/2022 05:00 | 0.4 | NWN |
| 08/01/2022 06:00 | 0.1 | NEN |
| 08/01/2022 07:00 | 0.1 | SEE |
| 08/01/2022 08:00 | 0.0 | E |
| 08/01/2022 09:00 | 0.0 | E |
| 08/01/2022 10:00 | 0.0 | N |
| 08/01/2022 11:00 | 0.2 | NEE |
| 08/01/2022 12:00 | 0.2 | SE |
| 08/01/2022 13:00 | 0.1 | W |
| 08/01/2022 14:00 | 0.0 | SWW |
| 08/01/2022 15:00 | 0.5 | N |
| 08/01/2022 16:00 | 0.2 | NEN |
| 08/01/2022 17:00 | 0.0 | NEN |
| 08/01/2022 18:00 | 0.0 | N |
| 08/01/2022 19:00 | 0.0 | NE |
| 08/01/2022 20:00 | 0.0 | NE |
| 08/01/2022 21:00 | 0.1 | SEE |
| 08/01/2022 22:00 | 0.0 | E |
| 08/01/2022 23:00 | 0.0 | NE |
| 09/01/2022 00:00 | 0.0 | NEE |
| 09/01/2022 01:00 | 0.3 | NEE |
| 09/01/2022 02:00 | 0.1 | SE |
| 09/01/2022 03:00 | 0.2 | NEE |
| 09/01/2022 04:00 | 0.0 | SE |
| 09/01/2022 05:00 | 0.0 | NEN |
| 09/01/2022 06:00 | 0.1 | N |
| 09/01/2022 07:00 | 0.0 | N |
| 09/01/2022 08:00 | 0.0 | N |
| 09/01/2022 09:00 | 0.1 | N |
| 09/01/2022 10:00 | 0.0 | NEE |
| 09/01/2022 11:00 | 1.1 | NEE |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 09/01/2022 12:00 | 0.1 | E |
| 09/01/2022 13:00 | 0.1 | N |
| 09/01/2022 14:00 | 0.1 | N |
| 09/01/2022 15:00 | 0.0 | NWN |
| 09/01/2022 16:00 | 0.0 | SWS |
| 09/01/2022 17:00 | 0.0 | NEE |
| 09/01/2022 18:00 | 0.2 | NEE |
| 09/01/2022 19:00 | 0.1 | SES |
| 09/01/2022 20:00 | 0.2 | SE |
| 09/01/2022 21:00 | 0.0 | SWS |
| 09/01/2022 22:00 | 0.1 | W |
| 09/01/2022 23:00 | 0.0 | S |
| 10/01/2022 00:00 | 0.0 | SWW |
| 10/01/2022 01:00 | 0.0 | NEN |
| 10/01/2022 02:00 | 0.5 | N |
| 10/01/2022 03:00 | 0.0 | N |
| 10/01/2022 04:00 | 0.2 | NEN |
| 10/01/2022 05:00 | 0.1 | N |
| 10/01/2022 06:00 | 0.0 | NWN |
| 10/01/2022 07:00 | 0.0 | NWW |
| 10/01/2022 08:00 | 0.0 | N |
| 10/01/2022 09:00 | 0.0 | NEE |
| 10/01/2022 10:00 | 0.2 | SE |
| 10/01/2022 11:00 | 0.2 | NEE |
| 10/01/2022 12:00 | 0.0 | SEE |
| 10/01/2022 13:00 | 0.1 | SES |
| 10/01/2022 14:00 | 0.0 | SWW |
| 10/01/2022 15:00 | 0.0 | SWW |
| 10/01/2022 16:00 | 0.0 | SWW |
| 10/01/2022 17:00 | 0.0 | NEN |
| 10/01/2022 18:00 | 0.0 | S |
| 10/01/2022 19:00 | 0.0 | SEE |
| 10/01/2022 20:00 | 0.0 | SW |
| 10/01/2022 21:00 | 0.0 | SES |
| 10/01/2022 22:00 | 0.0 | SWW |
| 10/01/2022 23:00 | 0.1 | SE |
| 11/01/2022 00:00 | 0.6 | NEN |
| 11/01/2022 01:00 | 2.4 | N |
| 11/01/2022 02:00 | 0.1 | NWW |
| 11/01/2022 03:00 | 0.6 | SES |
| 11/01/2022 04:00 | 0.0 | SEE |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 11/01/2022 05:00 | 0.2 | NEE |
| 11/01/2022 06:00 | 0.4 | NEE |
| 11/01/2022 07:00 | 0.5 | S |
| 11/01/2022 08:00 | 0.3 | NEE |
| 11/01/2022 09:00 | 0.2 | NEN |
| 11/01/2022 10:00 | 0.3 | NEE |
| 11/01/2022 11:00 | 0.0 | NEE |
| 11/01/2022 12:00 | 0.1 | NEN |
| 11/01/2022 13:00 | 0.3 | NEN |
| 11/01/2022 14:00 | 0.0 | NEN |
| 11/01/2022 15:00 | 0.0 | N |
| 11/01/2022 16:00 | 0.0 | E |
| 11/01/2022 17:00 | 0.0 | NEE |
| 11/01/2022 18:00 | 0.3 | NEN |
| 11/01/2022 19:00 | 0.1 | SE |
| 11/01/2022 20:00 | 0.0 | SES |
| 11/01/2022 21:00 | 0.0 | SWS |
| 11/01/2022 22:00 | 0.0 | NEN |
| 11/01/2022 23:00 | 0.0 | N |
| 12/01/2022 00:00 | 0.0 | SES |
| 12/01/2022 01:00 | 0.0 | S |
| 12/01/2022 02:00 | 1.0 | SE |
| 12/01/2022 03:00 | 0.0 | NE |
| 12/01/2022 04:00 | 0.0 | NEE |
| 12/01/2022 05:00 | 0.0 | E |
| 12/01/2022 06:00 | 0.0 | NEE |
| 12/01/2022 07:00 | 0.0 | NEE |
| 12/01/2022 08:00 | 0.0 | NEE |
| 12/01/2022 09:00 | 0.0 | NE |
| 12/01/2022 10:00 | 0.0 | E |
| 12/01/2022 11:00 | 0.0 | E |
| 12/01/2022 12:00 | 0.6 | NE |
| 12/01/2022 13:00 | 0.0 | SW |
| 12/01/2022 14:00 | 0.2 | NEN |
| 12/01/2022 15:00 | 0.0 | SES |
| 12/01/2022 16:00 | 0.0 | SW |
| 12/01/2022 17:00 | 1.1 | NEE |
| 12/01/2022 18:00 | 0.4 | NEE |
| 12/01/2022 19:00 | 0.1 | E |
| 12/01/2022 20:00 | 0.2 | NEN |
| 12/01/2022 21:00 | 0.1 | N |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 12/01/2022 22:00 | 0.0 | SW |
| 12/01/2022 23:00 | 0.1 | N |
| 13/01/2022 00:00 | 0.1 | N |
| 13/01/2022 01:00 | 0.0 | NWN |
| 13/01/2022 02:00 | 0.9 | NE |
| 13/01/2022 03:00 | 0.0 | SWS |
| 13/01/2022 04:00 | 0.0 | SE |
| 13/01/2022 05:00 | 0.0 | NEE |
| 13/01/2022 06:00 | 0.0 | NEE |
| 13/01/2022 07:00 | 0.0 | NEN |
| 13/01/2022 08:00 | 0.1 | SE |
| 13/01/2022 09:00 | 0.0 | NW |
| 13/01/2022 10:00 | 0.0 | SEE |
| 13/01/2022 11:00 | 0.0 | NEN |
| 13/01/2022 12:00 | 0.8 | N |
| 13/01/2022 13:00 | 0.1 | SES |
| 13/01/2022 14:00 | 0.0 | NE |
| 13/01/2022 15:00 | 0.1 | NEE |
| 13/01/2022 16:00 | 0.4 | NEN |
| 13/01/2022 17:00 | 0.0 | E |
| 13/01/2022 18:00 | 0.1 | NE |
| 13/01/2022 19:00 | 0.0 | SES |
| 13/01/2022 20:00 | 0.1 | NE |
| 13/01/2022 21:00 | 0.0 | SE |
| 13/01/2022 22:00 | 0.0 | NEE |
| 13/01/2022 23:00 | 0.1 | SE |
| 14/01/2022 00:00 | 0.5 | SE |
| 14/01/2022 01:00 | 0.0 | SEE |
| 14/01/2022 02:00 | 0.0 | SWW |
| 14/01/2022 03:00 | 0.0 | N |
| 14/01/2022 04:00 | 0.2 | SES |
| 14/01/2022 05:00 | 0.0 | NEN |
| 14/01/2022 06:00 | 0.0 | SE |
| 14/01/2022 07:00 | 0.0 | NE |
| 14/01/2022 08:00 | 0.2 | SE |
| 14/01/2022 09:00 | 0.0 | E |
| 14/01/2022 10:00 | 0.4 | SE |
| 14/01/2022 11:00 | 0.0 | E |
| 14/01/2022 12:00 | 0.0 | N |
| 14/01/2022 13:00 | 0.1 | SWS |
| 14/01/2022 14:00 | 0.8 | E |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 14/01/2022 15:00 | 0.5 | SES |
| 14/01/2022 16:00 | 0.0 | NEE |
| 14/01/2022 17:00 | 0.1 | N |
| 14/01/2022 18:00 | 0.3 | NEE |
| 14/01/2022 19:00 | 0.0 | SEE |
| 14/01/2022 20:00 | 0.4 | SW |
| 14/01/2022 21:00 | 0.0 | S |
| 14/01/2022 22:00 | 0.2 | SE |
| 14/01/2022 23:00 | 0.0 | NEN |
| 15/01/2022 00:00 | 0.0 | SEE |
| 15/01/2022 01:00 | 0.2 | NEN |
| 15/01/2022 02:00 | 0.0 | E |
| 15/01/2022 03:00 | 0.0 | N |
| 15/01/2022 04:00 | 0.7 | N |
| 15/01/2022 05:00 | 0.0 | NEE |
| 15/01/2022 06:00 | 0.0 | NEE |
| 15/01/2022 07:00 | 0.2 | SWS |
| 15/01/2022 08:00 | 0.0 | SWS |
| 15/01/2022 09:00 | 1.2 | N |
| 15/01/2022 10:00 | 0.1 | E |
| 15/01/2022 11:00 | 0.8 | SWW |
| 15/01/2022 12:00 | 0.1 | SWW |
| 15/01/2022 13:00 | 0.1 | SE |
| 15/01/2022 14:00 | 0.1 | NE |
| 15/01/2022 15:00 | 0.0 | SWS |
| 15/01/2022 16:00 | 0.0 | NW |
| 15/01/2022 17:00 | 0.1 | N |
| 15/01/2022 18:00 | 0.5 | N |
| 15/01/2022 19:00 | 0.1 | NWN |
| 15/01/2022 20:00 | 0.0 | S |
| 15/01/2022 21:00 | 0.0 | N |
| 15/01/2022 22:00 | 0.0 | SW |
| 15/01/2022 23:00 | 0.0 | SWS |
| 16/01/2022 00:00 | 0.0 | NWN |
| 16/01/2022 01:00 | 0.0 | S |
| 16/01/2022 02:00 | 0.0 | S |
| 16/01/2022 03:00 | 0.0 | W |
| 16/01/2022 04:00 | 0.1 | S |
| 16/01/2022 05:00 | 0.0 | SEE |
| 16/01/2022 06:00 | 0.0 | S |
| 16/01/2022 07:00 | 0.0 | SEE |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 16/01/2022 08:00 | 0.1 | NEE |
| 16/01/2022 09:00 | 0.3 | NWN |
| 16/01/2022 10:00 | 0.0 | SEE |
| 16/01/2022 11:00 | 0.2 | NEN |
| 16/01/2022 12:00 | 0.8 | NEN |
| 16/01/2022 13:00 | 0.2 | NEE |
| 16/01/2022 14:00 | 0.7 | SEE |
| 16/01/2022 15:00 | 0.8 | SE |
| 16/01/2022 16:00 | 0.2 | N |
| 16/01/2022 17:00 | 0.0 | SWW |
| 16/01/2022 18:00 | 0.1 | E |
| 16/01/2022 19:00 | 0.4 | N |
| 16/01/2022 20:00 | 0.0 | NE |
| 16/01/2022 21:00 | 0.0 | SW |
| 16/01/2022 22:00 | 0.1 | E |
| 16/01/2022 23:00 | 0.0 | N |
| 17/01/2022 00:00 | 0.3 | SW |
| 17/01/2022 01:00 | 0.0 | NEN |
| 17/01/2022 02:00 | 0.1 | SW |
| 17/01/2022 03:00 | 0.5 | N |
| 17/01/2022 04:00 | 0.0 | NEN |
| 17/01/2022 05:00 | 1.2 | SWS |
| 17/01/2022 06:00 | 0.7 | N |
| 17/01/2022 07:00 | 0.8 | NE |
| 17/01/2022 08:00 | 0.8 | N |
| 17/01/2022 09:00 | 0.0 | SE |
| 17/01/2022 10:00 | 0.0 | SES |
| 17/01/2022 11:00 | 0.0 | E |
| 17/01/2022 12:00 | 0.0 | NEE |
| 17/01/2022 13:00 | 0.0 | N |
| 17/01/2022 14:00 | 0.1 | N |
| 17/01/2022 15:00 | 0.0 | NE |
| 17/01/2022 16:00 | 0.0 | N |
| 17/01/2022 17:00 | 0.0 | E |
| 17/01/2022 18:00 | 0.0 | SES |
| 17/01/2022 19:00 | 0.0 | SEE |
| 17/01/2022 20:00 | 0.0 | NEN |
| 17/01/2022 21:00 | 0.0 | SW |
| 17/01/2022 22:00 | 0.0 | SWS |
| 17/01/2022 23:00 | 0.0 | S |
| 18/01/2022 00:00 | 0.0 | NWW |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 18/01/2022 01:00 | 0.0 | NWN |
| 18/01/2022 02:00 | 0.0 | SW |
| 18/01/2022 03:00 | 0.5 | SWS |
| 18/01/2022 04:00 | 0.0 | NWW |
| 18/01/2022 05:00 | 0.0 | NEE |
| 18/01/2022 06:00 | 0.0 | SES |
| 18/01/2022 07:00 | 0.0 | W |
| 18/01/2022 08:00 | 0.0 | NEN |
| 18/01/2022 09:00 | 0.2 | NEE |
| 18/01/2022 10:00 | 0.3 | NEE |
| 18/01/2022 11:00 | 0.0 | NE |
| 18/01/2022 12:00 | 0.0 | N |
| 18/01/2022 13:00 | 0.1 | NEN |
| 18/01/2022 14:00 | 0.0 | NEE |
| 18/01/2022 15:00 | 0.0 | NEN |
| 18/01/2022 16:00 | 0.3 | N |
| 18/01/2022 17:00 | 0.6 | SWS |
| 18/01/2022 18:00 | 0.1 | N |
| 18/01/2022 19:00 | 0.0 | NE |
| 18/01/2022 20:00 | 0.1 | N |
| 18/01/2022 21:00 | 0.0 | NEN |
| 18/01/2022 22:00 | 0.0 | N |
| 18/01/2022 23:00 | 0.1 | N |
| 19/01/2022 00:00 | 0.0 | NE |
| 19/01/2022 01:00 | 0.0 | N |
| 19/01/2022 02:00 | 0.0 | NEN |
| 19/01/2022 03:00 | 0.0 | S |
| 19/01/2022 04:00 | 0.0 | NEE |
| 19/01/2022 05:00 | 0.0 | NEN |
| 19/01/2022 06:00 | 0.0 | NE |
| 19/01/2022 07:00 | 0.1 | NEN |
| 19/01/2022 08:00 | 0.1 | E |
| 19/01/2022 09:00 | 0.4 | SE |
| 19/01/2022 10:00 | 0.0 | SEE |
| 19/01/2022 11:00 | 0.0 | W |
| 19/01/2022 12:00 | 0.1 | N |
| 19/01/2022 13:00 | 0.3 | NEN |
| 19/01/2022 14:00 | 0.2 | SW |
| 19/01/2022 15:00 | 0.1 | NW |
| 19/01/2022 16:00 | 0.0 | SE |
| 19/01/2022 17:00 | 0.0 | W |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 19/01/2022 18:00 | 0.0 | SWS |
| 19/01/2022 19:00 | 0.0 | W |
| 19/01/2022 20:00 | 0.1 | N |
| 19/01/2022 21:00 | 0.0 | NWN |
| 19/01/2022 22:00 | 0.0 | S |
| 19/01/2022 23:00 | 0.0 | SWW |
| 20/01/2022 00:00 | 0.0 | SWS |
| 20/01/2022 01:00 | 0.0 | SWS |
| 20/01/2022 02:00 | 0.0 | NWW |
| 20/01/2022 03:00 | 0.0 | SW |
| 20/01/2022 04:00 | 0.0 | SWW |
| 20/01/2022 05:00 | 0.0 | SW |
| 20/01/2022 06:00 | 0.1 | NE |
| 20/01/2022 07:00 | 0.0 | SWW |
| 20/01/2022 08:00 | 0.0 | SWS |
| 20/01/2022 09:00 | 0.0 | SEE |
| 20/01/2022 10:00 | 0.0 | SEE |
| 20/01/2022 11:00 | 0.1 | NEN |
| 20/01/2022 12:00 | 0.4 | E |
| 20/01/2022 13:00 | 0.2 | N |
| 20/01/2022 14:00 | 0.4 | NEN |
| 20/01/2022 15:00 | 0.0 | S |
| 20/01/2022 16:00 | 0.0 | SWS |
| 20/01/2022 17:00 | 0.0 | SEE |
| 20/01/2022 18:00 | 0.0 | NEE |
| 20/01/2022 19:00 | 0.0 | SW |
| 20/01/2022 20:00 | 0.0 | NE |
| 20/01/2022 21:00 | 0.0 | NEN |
| 20/01/2022 22:00 | 0.5 | N |
| 20/01/2022 23:00 | 0.0 | NE |
| 21/01/2022 00:00 | 0.1 | N |
| 21/01/2022 01:00 | 0.5 | NE |
| 21/01/2022 02:00 | 0.0 | E |
| 21/01/2022 03:00 | 0.0 | N |
| 21/01/2022 04:00 | 0.0 | NE |
| 21/01/2022 05:00 | 0.0 | SWW |
| 21/01/2022 06:00 | 0.0 | SE |
| 21/01/2022 07:00 | 0.0 | SW |
| 21/01/2022 08:00 | 0.1 | W |
| 21/01/2022 09:00 | 1.3 | SWS |
| 21/01/2022 10:00 | 0.0 | NEE |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 21/01/2022 11:00 | 0.2 | S |
| 21/01/2022 12:00 | 1.4 | SE |
| 21/01/2022 13:00 | 0.4 | N |
| 21/01/2022 14:00 | 0.1 | SWS |
| 21/01/2022 15:00 | 0.6 | NEN |
| 21/01/2022 16:00 | 0.0 | N |
| 21/01/2022 17:00 | 0.0 | N |
| 21/01/2022 18:00 | 1.2 | N |
| 21/01/2022 19:00 | 0.0 | SW |
| 21/01/2022 20:00 | 0.7 | NEN |
| 21/01/2022 21:00 | 0.0 | SES |
| 21/01/2022 22:00 | 0.0 | SWS |
| 21/01/2022 23:00 | 0.0 | SE |
| 22/01/2022 00:00 | 0.0 | NWN |
| 22/01/2022 01:00 | 0.0 | NEE |
| 22/01/2022 02:00 | 1.1 | SWS |
| 22/01/2022 03:00 | 0.0 | NEE |
| 22/01/2022 04:00 | 0.0 | NEE |
| 22/01/2022 05:00 | 0.0 | W |
| 22/01/2022 06:00 | 0.0 | SE |
| 22/01/2022 07:00 | 0.0 | SEE |
| 22/01/2022 08:00 | 0.0 | NEN |
| 22/01/2022 09:00 | 0.0 | N |
| 22/01/2022 10:00 | 0.0 | NEN |
| 22/01/2022 11:00 | 0.1 | SES |
| 22/01/2022 12:00 | 0.0 | S |
| 22/01/2022 13:00 | 0.1 | NEN |
| 22/01/2022 14:00 | 0.2 | NE |
| 22/01/2022 15:00 | 0.3 | N |
| 22/01/2022 16:00 | 0.0 | N |
| 22/01/2022 17:00 | 0.1 | N |
| 22/01/2022 18:00 | 0.9 | W |
| 22/01/2022 19:00 | 3.3 | NW |
| 22/01/2022 20:00 | 0.0 | N |
| 22/01/2022 21:00 | 1.3 | S |
| 22/01/2022 22:00 | 0.1 | E |
| 22/01/2022 23:00 | 0.1 | N |
| 23/01/2022 00:00 | 0.2 | N |
| 23/01/2022 01:00 | 0.0 | NEE |
| 23/01/2022 02:00 | 0.0 | E |
| 23/01/2022 03:00 | 1.9 | NEN |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 23/01/2022 04:00 | 0.1 | SEE |
| 23/01/2022 05:00 | 0.1 | SWW |
| 23/01/2022 06:00 | 0.0 | N |
| 23/01/2022 07:00 | 0.3 | E |
| 23/01/2022 08:00 | 0.0 | S |
| 23/01/2022 09:00 | 0.0 | E |
| 23/01/2022 10:00 | 0.0 | E |
| 23/01/2022 11:00 | 0.1 | SWS |
| 23/01/2022 12:00 | 0.1 | S |
| 23/01/2022 13:00 | 0.4 | S |
| 23/01/2022 14:00 | 0.0 | SW |
| 23/01/2022 15:00 | 0.0 | SWS |
| 23/01/2022 16:00 | 0.0 | N |
| 23/01/2022 17:00 | 0.0 | E |
| 23/01/2022 18:00 | 0.0 | SEE |
| 23/01/2022 19:00 | 0.0 | N |
| 23/01/2022 20:00 | 0.0 | NE |
| 23/01/2022 21:00 | 0.0 | SES |
| 23/01/2022 22:00 | 0.0 | NEN |
| 23/01/2022 23:00 | 0.0 | SWW |
| 24/01/2022 00:00 | 0.0 | NWW |
| 24/01/2022 01:00 | 0.0 | SWW |
| 24/01/2022 02:00 | 0.0 | S |
| 24/01/2022 03:00 | 0.0 | E |
| 24/01/2022 04:00 | 0.0 | S |
| 24/01/2022 05:00 | 0.0 | NEN |
| 24/01/2022 06:00 | 0.0 | SES |
| 24/01/2022 07:00 | 0.0 | NWN |
| 24/01/2022 08:00 | 0.0 | SW |
| 24/01/2022 09:00 | 0.0 | SEE |
| 24/01/2022 10:00 | 0.0 | NEN |
| 24/01/2022 11:00 | 3.3 | NE |
| 24/01/2022 12:00 | 0.0 | NEE |
| 24/01/2022 13:00 | 0.1 | N |
| 24/01/2022 14:00 | 0.0 | SEE |
| 24/01/2022 15:00 | 0.0 | NWW |
| 24/01/2022 16:00 | 0.0 | SES |
| 24/01/2022 17:00 | 0.0 | N |
| 24/01/2022 18:00 | 0.0 | NEN |
| 24/01/2022 19:00 | 0.2 | E |
| 24/01/2022 20:00 | 0.0 | SWS |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 24/01/2022 21:00 | 0.4 | NEN |
| 24/01/2022 22:00 | 1.2 | N |
| 24/01/2022 23:00 | 0.8 | NEN |
| 25/01/2022 00:00 | 0.0 | SEE |
| 25/01/2022 01:00 | 0.1 | NEN |
| 25/01/2022 02:00 | 0.0 | W |
| 25/01/2022 03:00 | 0.0 | SES |
| 25/01/2022 04:00 | 0.0 | NE |
| 25/01/2022 05:00 | 0.0 | N |
| 25/01/2022 06:00 | 0.0 | W |
| 25/01/2022 07:00 | 0.3 | NEN |
| 25/01/2022 08:00 | 0.0 | NEN |
| 25/01/2022 09:00 | 0.2 | NEN |
| 25/01/2022 10:00 | 0.0 | NEN |
| 25/01/2022 11:00 | 0.0 | N |
| 25/01/2022 12:00 | 0.0 | NE |
| 25/01/2022 13:00 | 0.6 | N |
| 25/01/2022 14:00 | 0.3 | NE |
| 25/01/2022 15:00 | 0.0 | NEE |
| 25/01/2022 16:00 | 0.1 | NEN |
| 25/01/2022 17:00 | 0.0 | SWS |
| 25/01/2022 18:00 | 0.0 | N |
| 25/01/2022 19:00 | 0.0 | N |
| 25/01/2022 20:00 | 0.0 | NEN |
| 25/01/2022 21:00 | 0.0 | NEN |
| 25/01/2022 22:00 | 0.0 | NEN |
| 25/01/2022 23:00 | 0.0 | NEN |
| 26/01/2022 00:00 | 0.0 | NEE |
| 26/01/2022 01:00 | 0.0 | NEN |
| 26/01/2022 02:00 | 0.0 | SE |
| 26/01/2022 03:00 | 0.0 | N |
| 26/01/2022 04:00 | 0.0 | E |
| 26/01/2022 05:00 | 0.0 | SES |
| 26/01/2022 06:00 | 0.0 | NWN |
| 26/01/2022 07:00 | 0.1 | N |
| 26/01/2022 08:00 | 0.1 | NWW |
| 26/01/2022 09:00 | 0.3 | N |
| 26/01/2022 10:00 | 1.3 | S |
| 26/01/2022 11:00 | 0.5 | N |
| 26/01/2022 12:00 | 0.6 | NEN |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 26/01/2022 13:00 | 0.4 | SES |
| 26/01/2022 14:00 | 0.0 | NWW |
| 26/01/2022 15:00 | 0.0 | N |
| 26/01/2022 16:00 | 0.1 | N |
| 26/01/2022 17:00 | 0.1 | NEE |
| 26/01/2022 18:00 | 0.0 | NWW |
| 26/01/2022 19:00 | 0.0 | N |
| 26/01/2022 20:00 | 0.0 | NE |
| 26/01/2022 21:00 | 0.0 | SEE |
| 26/01/2022 22:00 | 0.0 | SW |
| 26/01/2022 23:00 | 0.1 | NW |
| 27/01/2022 00:00 | 0.0 | SES |
| 27/01/2022 01:00 | 0.0 | NEE |
| 27/01/2022 02:00 | 0.4 | SW |
| 27/01/2022 03:00 | 0.0 | N |
| 27/01/2022 04:00 | 0.0 | S |
| 27/01/2022 05:00 | 0.1 | SWS |
| 27/01/2022 06:00 | 0.0 | NE |
| 27/01/2022 07:00 | 0.0 | SW |
| 27/01/2022 08:00 | 0.2 | E |
| 27/01/2022 09:00 | 0.0 | SW |
| 27/01/2022 10:00 | 0.2 | E |
| 27/01/2022 11:00 | 0.0 | W |
| 27/01/2022 12:00 | 0.0 | NEN |
| 27/01/2022 13:00 | 0.1 | N |
| 27/01/2022 14:00 | 0.0 | N |
| 27/01/2022 15:00 | 0.0 | N |
| 27/01/2022 16:00 | 0.1 | SEE |
| 27/01/2022 17:00 | 0.1 | NEN |
| 27/01/2022 18:00 | 0.0 | N |
| 27/01/2022 19:00 | 0.0 | NEN |
| 27/01/2022 20:00 | 0.0 | NE |
| 27/01/2022 21:00 | 0.0 | SEE |
| 27/01/2022 22:00 | 0.0 | SES |
| 27/01/2022 23:00 | 0.0 | NEE |
| 28/01/2022 00:00 | 0.0 | W |
| 28/01/2022 01:00 | 0.0 | N |
| 28/01/2022 02:00 | 0.0 | NWN |
| 28/01/2022 03:00 | 0.0 | W |
| 28/01/2022 04:00 | 0.0 | NWW |
| 28/01/2022 05:00 | 0.0 | NEE |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 28/01/2022 06:00 | 0.0 | NW |
| 28/01/2022 07:00 | 0.0 | SWS |
| 28/01/2022 08:00 | 0.0 | N |
| 28/01/2022 09:00 | 1.4 | NEN |
| 28/01/2022 10:00 | 0.4 | SW |
| 28/01/2022 11:00 | 0.3 | N |
| 28/01/2022 12:00 | 0.5 | N |
| 28/01/2022 13:00 | 1.0 | N |
| 28/01/2022 14:00 | 0.0 | NEN |
| 28/01/2022 15:00 | 0.4 | NEE |
| 28/01/2022 16:00 | 1.8 | NWN |
| 28/01/2022 17:00 | 0.1 | NW |
| 28/01/2022 18:00 | 0.0 | NWN |
| 28/01/2022 19:00 | 0.6 | SEE |
| 28/01/2022 20:00 | 0.5 | NEN |
| 28/01/2022 21:00 | 0.0 | W |
| 28/01/2022 22:00 | 0.0 | SE |
| 28/01/2022 23:00 | 0.7 | N |
| 29/01/2022 00:00 | 0.1 | E |
| 29/01/2022 01:00 | 0.0 | NEE |
| 29/01/2022 02:00 | 0.0 | NE |
| 29/01/2022 03:00 | 0.0 | NE |
| 29/01/2022 04:00 | 0.0 | NE |
| 29/01/2022 05:00 | 0.3 | SE |
| 29/01/2022 06:00 | 0.0 | E |
| 29/01/2022 07:00 | 0.0 | E |
| 29/01/2022 08:00 | 0.0 | SEE |
| 29/01/2022 09:00 | 0.9 | S |
| 29/01/2022 10:00 | 0.0 | NEN |
| 29/01/2022 11:00 | 0.0 | E |
| 29/01/2022 12:00 | 0.7 | NEN |
| 29/01/2022 13:00 | 0.0 | N |
| 29/01/2022 14:00 | 0.1 | NEE |
| 29/01/2022 15:00 | 1.1 | N |
| 29/01/2022 16:00 | 0.3 | SWW |
| 29/01/2022 17:00 | 1.2 | NWW |
| 29/01/2022 18:00 | 0.0 | NWW |
| 29/01/2022 19:00 | 0.0 | N |
| 29/01/2022 20:00 | 0.0 | SWW |
| 29/01/2022 21:00 | 0.0 | SWW |
| 29/01/2022 22:00 | 0.1 | SWS |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 29/01/2022 23:00 | 0.2 | NWW |
| 30/01/2022 00:00 | 0.1 | W |
| 30/01/2022 01:00 | 0.4 | W |
| 30/01/2022 02:00 | 1.7 | NWW |
| 30/01/2022 03:00 | 0.0 | SE |
| 30/01/2022 04:00 | 0.1 | NEN |
| 30/01/2022 05:00 | 0.2 | SWS |
| 30/01/2022 06:00 | 0.8 | NWW |
| 30/01/2022 07:00 | 0.0 | N |
| 30/01/2022 08:00 | 0.1 | SEE |
| 30/01/2022 09:00 | 0.2 | NEE |
| 30/01/2022 10:00 | 0.1 | SEE |
| 30/01/2022 11:00 | 0.0 | NE |
| 30/01/2022 12:00 | 0.0 | NEE |
| 30/01/2022 13:00 | 0.1 | N |
| 30/01/2022 14:00 | 0.3 | N |
| 30/01/2022 15:00 | 0.0 | NW |
| 30/01/2022 16:00 | 0.3 | SWS |
| 30/01/2022 17:00 | 1.1 | N |
| 30/01/2022 18:00 | 0.1 | NE |
| 30/01/2022 19:00 | 1.3 | SE |
| 30/01/2022 20:00 | 0.0 | NEN |
| 30/01/2022 21:00 | 1.1 | NEE |
| 30/01/2022 22:00 | 0.0 | SWS |
| 30/01/2022 23:00 | 0.2 | SEE |
| 31/01/2022 00:00 | 0.0 | E |
| 31/01/2022 01:00 | 0.0 | NEN |
| 31/01/2022 02:00 | 0.7 | E |
| 31/01/2022 03:00 | 0.1 | NEN |
| 31/01/2022 04:00 | 0.0 | NE |
| 31/01/2022 05:00 | 0.0 | NEN |
| 31/01/2022 06:00 | 0.1 | NE |
| 31/01/2022 07:00 | 0.3 | NE |
| 31/01/2022 08:00 | 0.4 | NE |
| 31/01/2022 09:00 | 0.0 | SES |
| 31/01/2022 10:00 | 1.6 | SEE |
| 31/01/2022 11:00 | 0.2 | SEE |
| 31/01/2022 12:00 | 0.6 | NEE |
| 31/01/2022 13:00 | 0.9 | NEN |
| 31/01/2022 14:00 | 0.0 | NEN |
| 31/01/2022 15:00 | 0.1 | NEE |

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

| Date | Wind Speed | Wind Direction |
|---|---|---|
| 31/01/2022 16:00 | 0.0 | NE |
| 31/01/2022 17:00 | 0.3 | NEN |
| 31/01/2022 18:00 | 0.0 | NEE |
| 31/01/2022 19:00 | 0.0 | NEE |
| 31/01/2022 20:00 | 0.6 | E |
| 31/01/2022 21:00 | 0.0 | SES |
| 31/01/2022 22:00 | 0.1 | NW |
| 31/01/2022 23:00 | 0.3 | SWS |
| 01/02/2022 00:00 | 0.4 | SWS |

# 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 | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform IEC and ER;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method. | 1. Notify Contractor. | 1. Rectify any unacceptable practice;<br>2. Amend working methods if appropriate. |
| 2. Exceedance for two or more consecutive samples | 1. Identify source;<br>2. Inform IEC and ER;<br>3. Advise the ER on the effectiveness of the proposed remedial measures;<br>4. Repeat measurements to confirm findings;<br>5. Increase monitoring frequency to daily;<br>6. Discuss with IEC and Contractor on remedial actions required;<br>7. If exceedance continues, arrange meeting with IEC and ER;<br>8. If exceedance stops, cease additional monitoring. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise the ET on the effectiveness of the proposed remedial measures;<br>5. Supervise Implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor; | 1. Submit proposals for remedial to ER within 3 working days of notification;<br>2. Implement the agreed proposals;<br>3. Amend proposal if appropriate. |

| EVENT | ACTION | | | |
|---|---|---|---|---|
| | ET | IEC | ER | CONTRACTOR |
| | LIMIT LEVEL | | | |
| 1. Exceedance for one sample | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform ER, Contractor and EPD;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily;<br>5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise the ER on the effectiveness of the proposed remedial measures;<br>5. Supervise implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Ensure remedial measures properly implemented. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within 3 working days of notification;<br>3. Implement the agreed proposals;<br>4. Amend proposal if appropriate. |
| 2. Exceedance for two or more consecutive samples | 1. Notify IEC, ER, Contractor and EPD;<br>2. Identify source;<br>3. Repeat measurement to confirm findings;<br>4. Increase monitoring frequency to daily;<br>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;<br>6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken;<br>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;<br>8. If exceedance stops, cease additional monitoring. | 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;<br>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented;<br>4. Ensure remedial measures properly implemented;<br>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within 3 working days of notification;<br>3. Implement the agreed proposals;<br>4. Resubmit proposals if problem still not under control;<br>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 | 1. Notify IEC and Contractor;<br>2. Identify source, investigate the causes of exceedance and propose remedial measures;<br>3. Report the results of investigation to the IEC, ER and Contractor;<br>4. Discuss with the Contractor and formulate remedial measures;<br>5. Increase monitoring frequency to check mitigation effectiveness. | 1. Review the analysed results submitted by the ET;<br>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly;<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Require Contractor to propose remedial measures for the analysed noise problem;<br>4. Ensure remedial measures are properly implemented | 1. Submit noise mitigation proposals to IEC;<br>2. Implement noise mitigation proposals. |
| Limit Level | 1. Inform IEC, ER, EPD and Contractor;<br>2. Identify source;<br>3. Repeat measurements to confirm findings;<br>4. Increase monitoring frequency;<br>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;<br>6. Inform IEC, ER and EPD the causes and actions taken for the exceedances;<br>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;<br>8. If exceedance stops, cease additional monitoring. | 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;<br>2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Require Contractor to propose<br>4. remedial<br>5. measures for the analysed noise problem;<br>6. Ensure remedial measures properly implemented;<br>7. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within 3 working days of notification;<br>3. Implement the agreed proposals;<br>4. Resubmit proposals if problem still not under control;<br>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 '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) |
| 2020 Jan | Nil | Nil | Nil | Nil | Nil | Nil | Nil | Nil | Nil | Nil |
| 2020 Feb | 720.34 | Nil | 720.34 | Nil | Nil | Nil | 0.335 | Nil | Nil | 2.23 |
| 2020 Mar | 11344.57 | Nil | 10218.92 | Nil | 1125.65 | Nil | 0.669 | Nil | Nil | 8.05 |
| 2020 Apr | 19649.37 | Nil | 18670.3 | Nil | 979.07 | Nil | Nil | Nil | Nil | 21.64 |
| 2020 May | 26767.55 | Nil | 26692.04 | Nil | 75.51 | Nil | 2.42 | Nil | Nil | 196.64 |
| 2020 Jun | 4628.13 | Nil | 4198.52 | Nil | 429.61 | Nil | Nil | Nil | Nil | 117.19 |
| 2020 Jul | 4895.66 | Nil | 3398.41 | Nil | 1497.25 | Nil | Nil | Nil | Nil | 30.33 |
| 2020 Aug | 4971.00 | Nil | 4774.49 | Nil | 196.51 | Nil | 0.418 | Nil | Nil | 36.91 |
| 2020 Sep | 1175.26 | Nil | 736.1 | Nil | 439.16 | Nil | Nil | Nil | Nil | 36.16 |
| 2020 Oct | 3433.83 | Nil | Nil | 2262.7 | 1171.13 | Nil | Nil | Nil | Nil | 32.25 |
| 2020 Nov | 26481.72 | Nil | Nil | 24393.64 | 2088.08 | Nil | Nil | Nil | Nil | 40.09 |
| 2020 Dec | 14361.90 | Nil | Nil | 13468.00 | 893.90 | Nil | Nil | Nil | Nil | 39.56 |
| Total | 118429.33 | 0 | 69409.12 | 40124.34 | 8895.87 | 0 | 3.842 | 0 | 0 | 561.05 |

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

**Waste Flow Table for Year 2021**

| 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 '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) |
| 2021 Jan | 787.6 | 0 | 0 | 0 | 787.6 | 0 | 0 | 0 | 0 | 18.19 |
| 2021 Feb | 254.95 | 0 | 0 | 0 | 254.95 | 0 | 0 | 0 | 0 | 154.94 |
| 2021 Mar | 1899.61 | 0 | 0 | 1720.5 | 179.11 | 0 | 0 | 0 | 0 | 371.73 |
| 2021 Apr | 4056.27 | 0 | 0 | 0 | 4056.27 | 2.13 | 8.17 | 0 | 0 | 144.08 |
| 2021 May | 2738.81 | 0 | 0 | 0 | 2738.81 | 0.495 | 0 | 0 | 0 | 31.63 |
| 2021 Jun | 1009.53 | 0 | 0 | 0 | 1009.53 | 0 | 0 | 0 | 0 | 90.91 |
| 2021 Jul | 1384.29 | 0 | 0 | 0 | 1384.29 | 0 | 0 | 0 | 0 | 51.69 |
| 2021 Aug | 340.46 | 0 | 0 | 0 | 340.46 | 5.85 | 0 | 0 | 0 | 42.99 |
| 2021 Sep | 732.9 | 0 | 0 | 0 | 732.9 | 0 | 0 | 0 | 0 | 70.11 |
| 2021 Oct | 1023.81 | 0 | 0 | 0 | 1023.81 | 0 | 0 | 0 | 0 | 74.68 |
| 2021 Nov | 1155.56 | 0 | 0 | 0 | 1155.56 | 3.195 | 0 | 0 | 0 | 121.99 |
| 2021 Dec | 271.67 | 0 | 0 | 0.00 | 271.67 | 0 | 0 | 0 | 0 | 70.97 |
| Total | 15655.46 | 0 | 0 | 1720.5 | 13934.96 | 11.665 | 8.17 | 0 | 0 | 1243.91 |

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

**Waste Flow Table for Year 2022**

| 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 '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) | (in '000 Kg) |
| 2022 Jan | 167.72 | 0 | 0 | 0 | 167.72 | 0 | 0 | 0 | 0 | 58.92 |
| 2022 Feb | | | | | | | | | | |
| 2022 Mar | | | | | | | | | | |
| 2022 Apr | | | | | | | | | | |
| 2022 May | | | | | | | | | | |
| 2022 Jun | | | | | | | | | | |
| 2022 Jul | | | | | | | | | | |
| 2022 Aug | | | | | | | | | | |
| 2022 Sep | | | | | | | | | | |
| 2022 Oct | | | | | | | | | | |
| 2022 Nov | | | | | | | | | | |
| 2022 Dec | | | | | | | | | | |
| Total | 167.72 | 0 | 0 | 0 | 167.72 | 0 | 0 | 0 | 0 | 58.92 |

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)

| 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:<br>•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;<br>•Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;<br>•A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones.<br>•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;<br>•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 | •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;<br>•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,<br>•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;<br>•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;<br>•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;<br>•Any skip hoist for material transport should be totally enclosed by impervious sheeting;<br>•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 |

| EIA Ref. | EM&A Log Ref. | Recommended Mitigation Measures | Location of the measures | Implementation Status |
|---|---|---|---|---|
| S5.5.6.2 | A2 | • 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;<br>• 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<br>• 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 r 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 | The following mitigation measures should be adopted to prevent fugitive dust emissions for concrete batching plant;<br>•Loading, unloading, handling, transfer or storage of any dusty materials should be carried out in totally enclosed system;<br>•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;<br>•Vents for all silos and cement/pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system;<br>•The materials which may generate airborne dusty emissions should be wetted by water spray system;<br>•All receiving hoppers should be enclosed on three sides up to 3m above unloading point;<br>•All conveyor transfer points should be totally enclosed;<br>•All access and route roads within the premises should be paved and wetted; and<br>•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 | The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point:<br>• All road surface within the barging facilities will be paved;<br>• Dust enclosures will be provided for the loading ramp;<br>•Vehicles will be required to pass through designated wheels wash facilities; and<br>• Continuous water spray at the loading points. | All construction sites | Implemented |
| Construction Noise (Air borne) | | | | |
| S6.4.10 | N1 | 1) Use of good site practices to limit noise emissions by considering the following:<br>•only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme;<br>•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;<br>•plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs;<br>•silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; | All construction sites | Implemented |

| EIA Ref. | EM&A Log Ref. | Recommended Mitigation Measures | Location of the measures | Implementation Status |
|---|---|---|---|---|
| | | •mobile plant should be sited as far away from NSRs as possible and practicable;<br>•material stockpiles, mobile container site officer 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 | Construction and Demolition Material<br>The following mitigation measures should be implemented in handling the waste:<br>•Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement;<br>•Carry out on-site sorting;<br>•Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate;<br>•Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; and<br>•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.<br>•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 | C&D Waste<br>•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.<br>•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 |

| EIA Ref. | EM&A Log Ref. | Recommended Mitigation Measures | Location of the measures | Implementation Status |
|---|---|---|---|---|
| S8.2.12-S8.3.15 | WM3 | Chemical Waste<br>•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.<br>•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.<br>•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.<br>•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 | Implemented |
| S8.3.16 | WM4 | Sewage<br>•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 | General Refuse<br>•General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes.<br>•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.<br>•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.<br>•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.<br>•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 | Partially Implemented |

| EIA Ref. | EM&A Log Ref. | Recommended Mitigation Measures | Location of the measures | Implementation Status |
|---|---|---|---|---|
| Water Quality (Construction Phase) | | | | |
| S9.11.1.7 | W2 | Land Works<br>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:<br>•wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters;<br>•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;<br>•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;<br>•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;<br>•temporary access roads should be surfaced with crushed stone or gravel;<br>•rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities;<br>•measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system;<br>•open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms;<br>•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;<br>•discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system;<br>•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;<br>•wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain;<br>•the section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel;<br>•wastewater generated from concreting, plastering, Internal decoration, cleaning work and other similar activities, shall be screened to remove large objects;<br>•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;<br>•the contractors shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately;<br>•waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance;<br>•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<br>•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 |

| 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 |
| | E9 | •Dolphin vessel monitoring | North Lantau and West Lantau | N/A<br>Completed on 1 March 2021 |
| Landscape & Visual (Construction Phase) | | | | |
| S14.3.3.3 | LV2 | Mitigate both Landscape and Visual Impacts<br>G1. Grass-hydroseed bare soil surface and stock pile areas;<br>G2. Add planting strip and automatic irrigation system if appropriate at some portions of bridge or footbridge to screen bridge and traffic.<br>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.<br>G4. Vegetation reinstatement and upgrading to disturbed areas;<br>G5. Maximizing new tree, shrub and other vegetation planting to compensate tree felled and vegetation removed;<br>G6. Providing planting area around peripheral of HKBCF for tree planting screening effect;<br>G7. Providing salt-tolerant native trees along the planter strip at affected seawall and newly reclaimed coastline; and<br>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 | G6, G8, G9 and V1 were Implemented |
| S14.3.3.3 | LV3 | Mitigate Visual Impacts<br>V1. Minimize time for construction activities during construction period. | All construction site areas | Implemented |
| | | | | |
| S15.2.2 | EM1 | An Independent Environmental Checker needs to be employed as per the EM&A Manual. | All construction sites | Implemented |
| S15.5 – | EM2 | 1) An Environmental Team needs to be employed as per the EM&A Manual. | All construction sites | Implemented |

| EIA Ref. | EM&A Log Ref. | Recommended Mitigation Measures | Location of the measures | Implementation Status |
|---|---|---|---|---|
| S15.6 | | 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures.<br>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. | | |

# 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) | | |
| January 2022 | | | | | | |
| 1 | 1024.4 | 19.3 | 17.6 | 16.4 | 76 | 0 |
| 2 | 1022.5 | 22 | 18.4 | 16 | 77 | 0 |
| 3 | 1021.1 | 20.5 | 18.3 | 17 | 79 | 0 |
| 4 | 1019.6 | 21.5 | 19.1 | 17.4 | 75 | 0 |
| 5 | 1017.3 | 23.6 | 20.4 | 18.3 | 75 | Trace |
| 6 | 1019.2 | 23.6 | 20.3 | 18.3 | 80 | 0 |
| 7 | 1021.6 | 21.1 | 18.6 | 17.2 | 79 | 0 |
| 8 | 1020.5 | 20.2 | 17.8 | 16 | 75 | 0 |
| 9 | 1018.2 | 20.1 | 18 | 16.7 | 79 | 0 |
| 10 | 1017.5 | 20.9 | 18.4 | 16.5 | 76 | 0 |
| 11 | 1020.2 | 18.8 | 15.8 | 13.7 | 70 | 1.2 |
| 12 | 1020.9 | 17.9 | 16.1 | 14.7 | 72 | 0 |
| 13 | 1021.5 | 18.9 | 17 | 15.6 | 64 | Trace |
| 14 | 1020.7 | 17.3 | 16.6 | 15.4 | 75 | 0 |
| 15 | 1020.1 | 19.8 | 17.9 | 16.5 | 82 | 0 |
| 16 | 1020.4 | 21.1 | 18.8 | 17.4 | 82 | 0 |
| 17 | 1020.7 | 18.4 | 17.8 | 17.1 | 84 | 0 |
| 18 | 1020.9 | 18.3 | 17.3 | 15.8 | 82 | 0.2 |
| 19 | 1019.3 | 20.3 | 17.1 | 14.9 | 70 | 0 |
| 20 | 1018.4 | 20.8 | 17.6 | 15.4 | 73 | 0 |
| 21 | 1017.6 | 19.7 | 17.9 | 16.5 | 80 | 0 |
| 22 | 1014.3 | 17.8 | 17.3 | 16.8 | 91 | 1.5 |
| 23 | 1013.1 | 21.8 | 19.4 | 17.5 | 84 | 0.1 |
| 24 | 1014.3 | 21.8 | 19.7 | 18.8 | 88 | 1 |
| 25 | 1016.7 | 20.9 | 18.6 | 17.5 | 82 | 0 |
| 26 | 1017.1 | 21.1 | 19.2 | 17.7 | 83 | Trace |
| 27 | 1016.8 | 22.1 | 19.8 | 18.4 | 84 | Trace |
| 28 | 1016.3 | 19.9 | 18.8 | 18.1 | 86 | Trace |
| 29 | 1014.4 | 20.2 | 18.1 | 16.3 | 81 | 0.1 |
| 30 | 1017.5 | 20 | 16 | 13.2 | 64 | 0 |
| 31 | 1019.2 | 15.5 | 14.6 | 13.6 | 70 | Trace |

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 | NA | | |
| Chemical and Waste Management | 19 Jan 2022 | Reminder:<br>Waste generated at the site should be removed as soon as possible. (SPTI) | NA |
| | 26 Jan 2022 | Observation:<br>Provide mitigation measure for the generator to prevent spillage of oil. (VCP) | 26 Jan 2022 |
| Land Contamination | NA | | |
| Landscape and Visual Impact | NA | | |
| Permit / Licenses | NA | | |
| Others | 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 | |