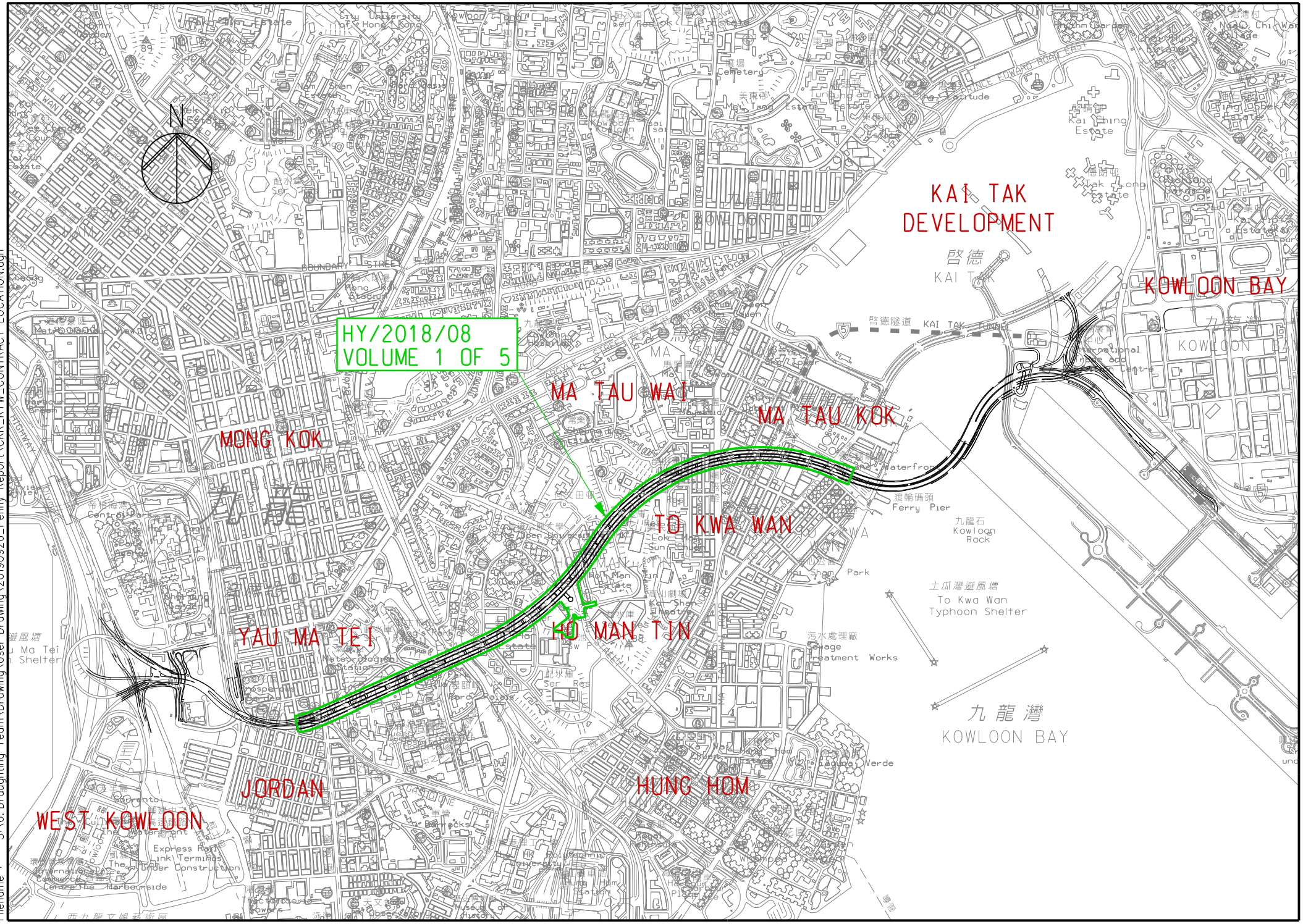


Printed on : 03-Oct-19 9:42:00 AM by mh.leung
Filename : S:\6. Draughting Team\Drawing\User Drawing\20190926_Penny Report\CKR_KTW_CONTRACT LOCATION.dgn

Monthly EM&A Report No. 27 (November 2021)

0097/19/ED/0657 02 | 09 Dec 2021
Verified
Bouygues Travaux Publics – Contract No. HY/2018/08

路政署
HIGHWAYS DEPARTMENT
主要工程管理處
MAJOR WORKS PROJECT MANAGEMENT OFFICE

ERM

Environmental Permit No. EP-457/2013/D

Central Kowloon Route

Independent Environmental Checker Verification

Works Contract:	**Central Tunnel (HY/2018/08)**

Reference Document/Plan

Document/~~Plan~~ to be ~~Certified~~/ Verified:	Monthly EM&A Report No.27
Date of Report:	9 December 2021 (Rev. 02)
Date received by IEC:	10 December 2021

Reference EP Condition

Environmental Permit Condition: 3.4

Submission of Monthly EM&A Report of the Project

3.4 Four hard copies and one electronic copy of monthly EM&A Report shall be submitted to the Director within 2 weeks after the end of each reporting month throughout the entire construction period. The EM&A Reports shall include a summary of all non-compliance. The submissions shall be certified by the ET Leader and verified by the IEC as complying with the requirements as set out in the EM&A Manual before submission to the Director. Additional copies of the submission shall be provided to the Director upon request by the Director.

IEC Verification

I hereby verify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-457/2013/D.

Ms Mandy To

Date: 10 December 2021

Independent Environmental Checker

Our ref: 0436942_IEC Verification Cert_CT_Monthly EM&A Rpt No.27_20211210.docx

Document Control

Document Information

Project Title	Contract No. HY/2018/08 Central Kowloon Route – Central Tunnel
Document Title	Monthly EM&A Report No. 27 (November 2021)
Fugro Project No.	0097/19
Fugro Document No.	0097/19/ED/0657
Issue Number	02
Issue Status	Verified

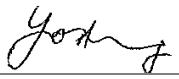
Client Information

Client	Bouygues Travaux Publics – Contract No. HY/2018/08
Client Address	Bouygues Travaux Publics, 3/F, Island Place Tower, 510 King's Road, North Point, Hong Kong
Client Contact	Mr. KAM Hing Lam, Alan
Client Document No.	Consultancy Agreement No. CA0001

Revision History

Issue	Date	Status	Comments on Content	Prepared By	Checked By	Review and certified By
02	09 Dec 2021	Verified	No adverse comment from IEC	VK	CL	DH
01	09 Dec 2021	Amened	IEC Comment Released	VK	CL	DH

Environmental Team

Initials	Name	Role	Signature
VK	**Vanoss C.P. KAM**	**Assistant Environmental Consultant**	
CL	**Cyrus C.Y. LAI**	**Senior Environmental Consultant**	
DH	**David Y.O. HUNG**	**Environmental Team Leader**	

EXECUTIVE SUMMARY

I. Introduction

This is the 27th Monthly EM&A Report prepared by Fugro Technical Services Limited for the Contract No. HY/2018/08 Central Kowloon Route – Central Tunnel. The Contract No. HY/2018/08 commenced on 19 September 2019. This report summarized the monitoring results and audits findings of the EM&A programme under the issued EP (EP No.: EP-457/2013/D) and in accordance with the EM&A Manual during the reporting period from 01/11/2021 to 30/11/2021.

II. Summary of Main Works Undertaken and Key Measures Implemented

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

Ho Man Tin

- Drill and blast excavation;
- Mucking out from tunnel;
- Site and shaft Installation;
- Pilot tunnel exaction by Tunnel Boring Machine (TBM).

Yau Ma Tei

- Drill and break excavation;
- Mucking out from tunnel;
- Arch-rib installation;
- Erection of noise enclosure;
- Site and shaft installation.

Ma Tau Kok

- Drill and blast excavation;
- Mucking out from tunnel;
- Tunnel Boring Machine (TBM) break- out face civil work;
- Site and shaft installation;
- Erection of noise enclosure.

Princess Margaret Road

- Reinstatement of working area.

Ka Tak Barging Point

- Spoil handling and disposal.

III. Summary of Exceedances, Investigation and Follow-up

No Action and Limit Level exceedance was recorded for construction dust monitoring in the reporting month.

Five (5) Action Level exceedances were recorded for construction noise due to the noise-related complaints received in the reporting month. No Limit Level exceedance was recorded for construction noise monitoring in the reporting month.

IV. Complaint Handling, Prosecution and Public Engagement.

Two (2) noise-related complaints were received in the last reporting month (i.e. 22 and 30 October 2021). The investigation reports for the complaints were finalized on 3 December 2021.

Six (6) air and noise-related complaints (i.e. 9, 12, 13, 23, 24, and 25 November 2021) were received in the reporting month.

The complaint cases in October and November 2021 are summarized in **Table I**.

Table I Environmental Complaints Log

Complaint Log No.	Date of Complaint	Received From	Nature of Complaint	Status
EC087_CKRCT202122_335	22th October 2021	Contract Complaint Hotline	Construction Noise	Investigation report was finalized on 3 Dec 2021.
EC088_CKRCT20211030_338	30th October 2021	Contract Complaint Hotline	Construction Noise	Investigation report was finalized on 3 Dec 2021.
EC089_CKRCT20211109_342	9th November 2021	Contract Complaint Hotline	Air	Investigation report was finalized on 3 Dec 2021.
EC90_CKRCT20211112_346	12th November 2021	Contract Complaint Hotline	Construction Noise	Investigation report was finalized on 3 Dec 2021.
EC091_CKRCT20211113_347	13th November 2021	1823, E-mail & Contract Complaint Hotline	Construction Noise	Under investigation and the investigation results will be reported in the subsequent Monthly EM&A Report.
EC092_CKRCT20211123_351	23th November 2021	Contract Complaint Hotline	Construction Noise	Under investigation and the investigation results will be reported in the subsequent Monthly EM&A Report.
EC093_CKRCT20211124_352	24th November 2021	Contract Complaint Hotline	Air & Construction Noise	Under investigation and the investigation results will be reported in the subsequent Monthly EM&A Report.
EC094_CKRCT20211125_353	25th November 2021	Contract Complaint Hotline	Construction Noise	Under investigation and the investigation results will be reported in the subsequent Monthly EM&A Report.

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

No public engagement activities were conducted in the reporting period.

V. Reporting Change

There were no reporting changes during the reporting month.

VI. Future Key Issues

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

Ho Man Tin

- Drill and blast excavation;
- Mucking out from tunnel;
- Site and shaft Installation;
- Pilot tunnel exaction by Tunnel Boring Machine (TBM).

Yau Ma Tei

- Drill and break excavation;
- Mucking out from tunnel;
- Arch-rib installation;
- Erection of noise enclosure;
- Site and shaft installation.

Ma Tau Kok

- Drill and blast excavation;
- Mucking out from tunnel;
- Tunnel Boring Machine (TBM) break- out face civil work;
- Site and shaft installation;
- Erection of noise enclosure.

Princess Margaret Road

Reinstatement of working area.

Ka Tak Barging Point

- Spoil handling and disposal.

The recommended mitigation measures corresponding to the main works in the next reporting period are listed as follow:

- Good relationship shall be maintained with the nearby sensitive receivers/ stakeholders which may be affected by the construction works such as providing better/ more detail information of the work nature and inform in advance of the works to the nearby residents;
- Any excavated, stockpile of dusty material or load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting;
- All construction plants / machineries should be checked / serviced on a regular basis during the courses of construction to minimize the emission of noise generation and eliminate dark smoke emission;
- All C&D materials generated should be transported and stored at temporary storage area. Suitable materials should be sorted for reuse on-site;
- Every vehicle shall be cleaned thorough at the designated wheel washing area onsite;

- Wastewater generated from drilling shall be properly collected for reuse or treated by wastewater treatment facilities before discharge;
- Provision of drip trays for equipment likely cause spillage of chemical / fuel, and provide routine maintenance;
- Erecting temporary noise barrier for noisy Powered Mechanical Equipment (PME) and deployment of Quality Powered Mechanical Equipment (QPME) as many as practicable;
- Conditions in the Environmental Permit and License should be followed;
- All recommended mitigation measures specified in the approved EIA Report and EM&A Manual shall be implemented;
- All vehicles should be cleaned before leaving the construction site to ensure no muddy deposited by them on roads.

The following EP submissions were submitted during the reporting month:

Table II Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
3.4	Monthly EM&A Report (October 2021)	12 November 2021

Contents

EXECUTIVE SUMMARY		**iii**
1.	**INTRODUCTION**	**1**
1.1	Background	1
1.2	Project Organization	2
1.3	Construction Programme and Activities	2
1.4	Works undertaken during the month	2
1.5	Status of Environmental Licences, Notification and Permits	2
2.	**ENVIRONMENTAL MONITORING REQUIREMENTS**	**5**
2.1	Construction Dust and Noise Monitoring Location	5
2.2	Construction Dust Monitoring	6
2.3	Construction Noise Monitoring	8
2.4	Construction Dust and Noise Monitoring Schedule	9
2.5	The Action and Limit Levels	9
2.6	Landscape and Visual	9
3.	**ENVIRONMENTAL MONITORING RESULTS**	**10**
3.1	Construction Dust Monitoring	10
3.2	Construction Noise Monitoring	10
3.3	Waste Management	12
3.4	Landscape and Visual	12
4.	**ENVIRONMENTAL SITE INSPECTION AND AUDIT**	**13**
5.	**ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE**	**14**
5.1	Complaint Handling, Prosecution and Public Engagement	14
5.2	Summary of Environmental Non-Compliance	15
5.3	Summary of Monitoring Exceedance	15
6.	**IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURE**	**16**
7.	**FUTURE KEY ISSUES**	**17**
8.	**CONCLUSION AND RECOMMENDATIONS**	**19**

Tables

Table I – Environmental Complaints Log ii
Table II – Status of Required Submission under Environmental Permit iii
Table 1.1 – Contact Information of Key Personnel 2
Table 1.2 – Environmental Licenses, Notification and Permits Summary 2
Table 2.1 – Construction Dust and Noise Monitoring Location 3
Table 2.2 – Construction Dust Monitoring Equipment 3
Table 2.3 – Construction Noise Monitoring Parameters, Frequency and Duration 6
Table 2.4 – Construction Noise Monitoring Equipment 6
Table 3.1 – Summary of 1-hour TSP Monitoring Results in the Reporting Period 8
Table 3.2 – Summary of 24-hour TSP Monitoring Results in the Reporting Period 8
Table 3.3 – Summary of Construction Noise Monitoring Results in the Reporting Period 8
Table 4.1 – Observations and Recommendation of Site Inspection in the Reporting Period 10
Table 5.1 – Environmental Complaints Log 12
Table 6.1 – Status of Required Submission under Environmental Permit 14

Figures

Figure 1 The Site Layout Plan of the Contract
Figure 2.1 The Location of the Construction Dust and Noise Monitoring Stations (Ho Man Tin)
Figure 2.2 The Location of the Construction Dust and Noise Monitoring Stations (Ma Tau Kok)
Figure 2.3 The Location of the Construction Dust and Noise Monitoring Stations (Yau Ma Tei)

Appendices

Appendix A	Construction Programme
Appendix B	Project Organization Chart
Appendix C	Calibration Certificate for Construction Dust Monitoring Equipment
Appendix D	Calibration Certificate for Construction Noise Monitoring Equipment
Appendix E	Environmental Monitoring Schedule
Appendix F	Action and Limit Levels for Construction Dust and Noise Monitoring
Appendix G	Construction Dust Monitoring Results and Meteorological Observations
Appendix H	Construction Noise Monitoring Results
Appendix I	Event and Action Plan
Appendix J	Implementation Status of Environment Mitigation Measures (Construction Phase)
Appendix K	Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions
Appendix L	Waste Flow Table

1 INTRODUCTION

1.1 Background

1.1.1 In order to meet the traffic demand and relieve traffic congestion on the existing east-west roads across Central Kowloon, Central Kowloon Route (CKR) (hereinafter referred to as "the Project") is proposed which is a 4.7 km long dual 3-lane trunk road in Central Kowloon linking Yau Ma Tei Interchange in West Kowloon with the road network on Kai Tak Development and Kowloon Bay in East Kowloon.

1.1.2 The Central Kowloon Route – Design and Construction Environmental Impact Assessment Report (Register No.: AEIAR-171/2013) was approved with conditions by the Environmental Protection Department (EPD) on 11 July 2013. An Environmental Permit (EP-457/2013) was issued on 9 August 2013. A variations of EP (VEP-594/2021) was applied on 26 May 2021 and the latest EP (EP-457/2013/D) was issued by EPD on 15 June 2021.

1.1.3 Contract No. HY/2018/08 Central Kowloon Route – Central Tunnel (hereinafter referred to as "the Contract"), is one of the contracts of CKR which included the construction of the central tunnel, cut-and-cover tunnels at Yau Ma Tei and Ma Tau Kok and construction of piles and diaphragm walls for Ho Man Tin ventilation building.

1.1.4 Fugro Technical Services Limited (FTS) was appointed by Bouygues Travaux Publics (BTP) as the Environmental Team (ET) under the Contract no. HY/2018/08) to execute the environmental monitoring and audit (EM&A) programme under the issued EP (EP No.: EP-457/2013/D) and in accordance with the EM&A Manual.

1.1.5 This is the 27th Monthly EM&A Report prepared by FTS for the Contract No. HY/2018/08 Central Kowloon Route – Central Tunnel. The Contract No. HY/2018/08 commenced on 19 September 2019. This report summarized the monitoring results and audits findings of the EM&A programme under the issued EP (EP No.: EP-457/2013/D) and in accordance with the EM&A Manual during the reporting period from 01/11/2021 to 30/11/2021.

1.2 Project Organization

1.2.1 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
Highways Department (HyD)	E13/CKR	Mr. Joe Lam	2762 3380
Arup-Mott MacDonald Joint Venture (AMMJV)	Senior Resident Engineer	Mr. Ben Poon	3619 5967
ERM-Hong Kong, Limited (ERM)	Independent Environmental Checker (IEC)	Ms. Mandy To	2271 3000
Bouygues Travaux Publics (BTP)	Environmental Manager	Mr. Simon Wong	9281 4346
Fugro Technical Services Limited	ET Leader	Mr. David Hung	3565 4371

1.3 Construction Programme and Activities

1.3.1 The construction phase of this Contract under the EP commenced in October 2019. The site layout plan of the Contract is shown in **Figure 1**.

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

1.4 Works undertaken during the month

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

Ho Man Tin

- Drill and blast excavation;
- Mucking out from tunnel;
- Site and shaft Installation;
- Pilot tunnel exaction by Tunnel Boring Machine (TBM).

Yau Ma Tei

- Drill and break excavation;
- Mucking out from tunnel;
- Arch-rib installation;
- Erection of noise enclosure;
- Site and shaft installation.

Ma Tau Kok

- Drill and blast excavation;
- Mucking out from tunnel;
- Tunnel Boring Machine (TBM) break- out face civil work;
- Site and shaft installation;
- Erection of noise enclosure.

Princess Margaret Road

- Reinstatement of working area.

Ka Tak Barging Point

- Spoil handling and disposal.

1.5 Status of Environmental Licences, Notification and Permits

1.5.1 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
Form NB	448930, 448970, 448971	Mid-Sep 2019	NA
Billing Account for Disposal of C&D waste	Account no. 7034790	6 Aug 2019	NA
Chemical Waste Producer Registration (Ho Man Tin Construction site)	5111-236-B2557-02	25 Sep 2019	NA
Chemical Waste Producer Registration (Yau Ma Tei Construction site)	5213-225-B2557-05	19 Apr 2021	NA
Chemical Waste Producer Registration (Ma Tau Kok Construction site)	5213-247-B2557-06	19 Apr 2021	NA
Construction Noise Permit			
Construction Noise Permit (Ho Man Tin Construction site)	GW-RE0903-21	14 Sep 2021	13 Jan 2022
Construction Noise Permit (Yau Ma Tei Construction site)	GW-RE1026-21	17 Oct 2021	16 Dec 2021
Construction Noise Permit (Ma Tau Kok Construction site)	GW-RE0818-21	26 Aug 2021	16 Feb 2022
Construction Noise Permit (Kai Tak Barging Point)	GW_RE0854_21	7 Sep 2021	2 Mar 2022
Construction Noise Permit (Extensive Grouting at Chi Man Street – 23:00-07:00)	GW-RE0866-21	7 Sep 2021	6 Nov 2021
Construction Noise Permit (Drilling & Grouting at Chi Man Street – 19:00-23:00)	GW-RE0968-21	6 Oct 2021	5 Apr 2022

Water Discharge License			
Water Discharge License	WT00034873-2019 (Ho Man Tin Construction site)	22 Nov 2019	30 Nov 2024
	WT00035436-2019 (Portion 18)	2 Apr 2020	30 Apr 2025
	WT00037723-2021 (Yau Ma Tei Construction site)	7 Apr 2021	30 Apr 2026
	WT00037883-2021 (Ma Tau Kok Construction site)	30 Apr 2021	30 Apr 2026

2 ENVIRONMENTAL MONITORING REQUIREMENTS

2.1 Construction Dust and Noise Monitoring Locations

2.1.1 Three construction dust monitoring locations and five construction noise monitoring locations pertinent to the Project have been identified based on the approved EM&A Manual for the Project. The locations of the construction dust and noise monitoring stations are summarized in **Table 2.1** as displayed in **Figures 2.1 - 2.3**.

Table 2.1 Construction Dust and Noise Monitoring Locations

Dust Monitoring Station ID	Noise Monitoring Station ID	Monitoring Location
M-A3	M-N3	SKH Tsoi Kung Po Secondary School
/	E-N12a	19 Hing Yan Street
E-A14a	E-N21a	Block B of Merit Industrial Centre
W-A6	/	Man Cheong building
/	W-N18	Hydan Place
/	W-N25A	Prosperous Garden Block 1

Notes:

1. The dust and noise monitoring stations proposed in the EM&A Manual for M-A6/ M-N6 (i.e. Ko Fai House, Kwun Fai Court) was not available for impact dust and noise monitoring, therefore impact monitoring was conducted at M-A3/ M-N3 as an alternative which was agreed by the ER, IEC and EPD;
2. The noise monitoring station proposed in the EM&A Manual for E-N12 (i.e. Grand Waterfront Tower 3) was not available for impact dust and noise monitoring, therefore impact monitoring was conducted at E-N12a as an alternative which was agreed by the ER, IEC and EPD;
3. The dust and noise monitoring stations proposed in the EM&A Manual for E-A14 (i.e. Wyler Gardens) and E-N21 (i.e Hang Chien Court Block J) was not available for impact dust and noise monitoring, therefore impact monitoring was conducted at E-A14a/ E-N21a as an alternative which was agreed by the ER, IEC and EPD;
4. The dust monitoring stations proposed in the EM&A Manual for W-A5 (i.e. The Coronation) was not available for impact dust monitoring, therefore impact monitoring was conducted at W-A6 as an alternative which was agreed by the ER, IEC and EPD.

2.1.2 The construction dust and noise monitoring locations at M-A3 and M-N3 are covered by Contract No. HY/2018/08 Central Kowloon Route – Central Tunnel whereas the construction dust and noise monitoring locations at E-A14a, E-N12a and E-N21a are now covered by Contract No. HY/2014/07 Central Kowloon Route – Kai Tak West. The monitoring results at E-A14a, E-N12a and E-N21a in the reporting month are presented in the monthly EM&A Report prepared by Contract No. HY/2014/07.

2.1.3 The construction dust and noise monitoring locations at W-A6, W-N18 and W-N25A are now covered by Contract No. HY/2014/08 Central Kowloon Route –Yau Ma Tei East. The monitoring results at W-A6, W-N18 and W-N25A in the reporting month are presented in the monthly EM&A Report prepared by Contract No. HY/2014/08.

2.2 Construction Dust Monitoring

Monitoring Requirement

2.2.1 In accordance with the approved 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. Regular Impact 24-hour TSP monitoring should be carried out for at least once every 6 days, and 1-hour TSP monitoring should be done at least 3 times every 6 days when the highest dust impact occurs.

Monitoring Equipment

2.2.2 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) deployed at the designated monitoring station. The HVS shall meet all the requirements of the EM&A Manual.

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

2.2.4 The model of the dust monitoring equipment used is summarized in **Table 2.2**.

Table 2.2 Construction Dust Monitoring Equipment

Equipment	Brand	Model	Serial No.
High Volume Sampler (24-hour TSP)	Tisch	TE-5170	4388
Calibrator	Tisch	TE-5025A	2154
Portable direct reading dust meter (1-hour TSP)	Sibata	LD-5R	620480/155717

Notes:
1. Model LD-5R (155717) Portable direct reading dust meter (1-hour TSP) was used on 22 Nov 2021 for dust monitoring.

Monitoring Methodology for HVS

2.2.5 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.

2.2.6 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.

2.2.7 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.

2.2.8 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.

2.2.9 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.

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

2.2.11 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%.

Maintenance and Calibration for HVS

2.2.12 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.

2.2.13 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 C**.

Monitoring Methodology for Direct Reading Dust Meter

2.2.14 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

Maintenance and Calibration for Direct Reading Dust Meter

2.2.15 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 C**.

2.3 Construction Noise Monitoring

Monitoring Requirement

2.3.1 In accordance with the EM&A Manual, impact noise monitoring should be conducted at the designated noise monitoring stations for at least once a week during the construction phase of the Project. The parameters, frequency and duration of impact noise monitoring is summarized in **Table 2.3**.

Table 2.3 Construction Noise Monitoring Parameters, Frequency and Duration

Parameter	Duration	Frequency
A-weighted equivalent continuous sound pressure level (Leq). L10 and L90 were also recorded	30 minutes	At least once per week

Monitoring Equipment

2.3.2 Noise monitoring was performed using sound level meter at the designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level.

2.3.3 The model of the noise monitoring equipment used is summarized in **Table 2.4**.

Table 2.4 Construction Noise Monitoring Equipment

Equipment	Brand	Model	Serial No.
Acoustic Calibrator	Casella	CEL-120/1	5230758
Sound Level Meter	Casella	CEL-63X	1488293

Monitoring Methodology

2.3.4 Noise measurement should be conducted as the following procedures:

a) Free field measurements was made at monitoring location M-N3. A correction of +3 dB(A) shall be made to the free field measurements.
b) The battery condition should be checked to ensure good functioning of the meter.
c) 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: 30 minutes

d) Prior to and after noise measurement, the meter shall be calibrated using the calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB, the measurement will be considered invalid and repeat of noise measurement is required after re-calibration or repair of the equipment.
e) 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.
f) Noise measurement should be paused during periods of high intrusive noise if possible and observation shall be recorded when intrusive noise is not avoided.
g) At the end of the monitoring period, the Leq, L10 and L90 should be recorded. In addition, site conditions and noise sources should also be recorded on a standard record sheet.

Maintenance and Calibration

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

a) The microphone head of the sound level meter and calibrator should be cleaned with a soft cloth at quarterly intervals.

b) 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**

2.4 Construction Dust and Noise Monitoring Schedule

2.4.1 The environmental monitoring schedule for the reporting period is provided in **Appendix E**.

2.5 The Action and Limit Levels

2.5.1 The Action and Limit Levels for construction dust and noise monitoring are provided in **Appendix F**.

2.6 Landscape and Visual

2.6.1 As per the EM&A Manual, the landscape and visual mitigation measures shall be implemented and site inspections should be undertaken once every two weeks during the construction period. A summary of the implementation status is presented in **Section 4**.

3 ENVIRONMENTAL MONITORING RESULTS

3.1 Construction Dust Monitoring

3.1.1 The monitoring results for 1-hour TSP and 24-hour TSP are summarized in **Table 3.1** and **Table 3.2** respectively. Detailed construction dust monitoring results and daily extract of meteorological observations are presented in **Appendix G**.

3.1.2 The monitoring results at E-A14a and W-A6 are reported in the monthly EM&A Reports prepared by Contract No. HY/2014/07 and Contract No. HY/2014/08 respectively.

Table 3.1 Summary of 1-hour TSP Monitoring Results in the Reporting Period

Station ID	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
M-A3	67	54-78	333	500

Table 3.2 Summary of 24-hour TSP Monitoring Results in the Reporting Period

Station ID	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
M-A3	63	45-91	153	260

3.1.3 No Action and Limit Level exceedance was recorded for 1-hour TSP monitoring and 24-hour TSP monitoring at the monitoring location in the reporting month.

3.1.4 Major dust sources during the monitoring included nearby traffic emission.

3.1.5 The Event and Action Plan for the construction dust monitoring is given in **Appendix I**.

3.2 Construction Noise Monitoring

3.2.1 The monitoring results for noise are summarized in **Table 3.3** and the monitoring data is given in **Appendix H**.

3.2.2 The monitoring results at E-N12a, E-N21a, W-N18 and W-N25A are reported in the monthly EM&A Reports prepared by Contract No. HY/2014/07 and Contract No. HY/2014/08 respectively.

Table 3.3 Summary of Construction Noise Monitoring Results in the Reporting Period

Station ID	[1]Measured Noise Level, dB(A), Leq (30 mins)	[1 2]Corrected Noise Level, dB(A), Leq (30 mins)	Action Level	[3]Limit Level dB(A), Leq (30 mins)
M-N3	64.3-69.5	N.A.	When one documented compliant is received	For Schools: 70dB(A) during normal teaching period and 65 dB(A) during examination periods

Notes:

1. Free field noise levels were adjusted with a correlation of +3 dB(A);
2. Corrected Noise Level =10* log (10^ (Measured Noise Level/10) – 10^ (Baseline Noise Level/10)), where the Baseline Noise Level = 67.7 dB(A);

3.2.3 No Limit Level exceedance was recorded for construction noise monitoring at the monitoring location in the reporting month.

3.2.4 Five (5) Action Level exceedances were recorded for construction noise due to the noise-related complaints received in the reporting month.

3.2.5 Major noise sources during the monitoring included nearby traffic emission.

3.2.6 The Event and Action Plan for the construction noise monitoring is given in **Appendix I.**

3.3 Waste Management

3.3.1 Auditing of waste management practices during regular site inspections confirmed that the waste generated during construction were properly, stored, handled and disposed of in general. The Contractor was responsible for the implementation of any mitigation measures to reduce waste or redress issues arising from the waste materials.

3.3.2 The implemented environmental mitigation measures for the waste management in the reporting period are summarized in **Appendix J**. The summary of observations and recommendations made for waste management during the site inspections are presented in **Table 4.1**

3.3.3 Monthly summary of waste flow table is detailed in **Appendix L**.

3.4 Landscape and Visual

3.4.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures were conducted on 9 and 23 November 2021. The implementation the landscape and visual mitigation measures in the reporting period are summarized in **Appendix J**. The summary of observations and recommendations made for landscape and visual mitigation measures during the site inspections are presented in **Table 4.1**.

3.4.2 The Event and Action Plan for landscape and visual during construction phase is given in **Appendix I**.

4 ENVIRONMENTAL SITE INSPECTION AND AUDIT

4.1.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. A summary of the mitigation measures implementation status is provided in **Appendix J**.

4.1.2 In the reporting month, five site inspections were carried out on 2, 9, 16 (With IEC), 23 and 30 November 2021. Details of observations recorded during the site inspections are presented in **Table 4.1**.

Table 4.1 Observations and Recommendation of Site Inspection in the Reporting Period

Environmental Aspect	Date	Observations and Recommendations	Follow-up Actions
Air Quality	2th November 2021	The Contractor was reminded to provide wheel washing with high pressure jet to minimize the air impact.	The item was rectified by the Contractor on 9th November 2021.
Noise	Nil	Nil	Nil
Water Quality	Nil	Nil	Nil
Waste Management	Nil	Nil	Nil
Landscape and Visual	Nil	Nil	Nil
Permit/ Licenses	Nil	Nil	Nil

5 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

5.1 Complaint Handling, Prosecution and Public Engagement

5.1.1 Two (2) noise-related complaints were received in the last reporting month (i.e. 22 and 30 October 2021). The investigation reports for the complaints were finalized on 3 December 2021.

5.1.2 Six (6) air and noise-related complaints (i.e. 9, 12, 13, 23, 24, and 25 November 2021) were received in the reporting month.

5.1.3 The complaint cases in October and November 2021 are summarized in **Table 5.1**.

Table 5.1 Environmental Complaints Log

Complaint Log No.	Date of Complaint	Received From	Nature of Complaint	Status
EC087_CKRCT202122_335	22th October 2021	Contract Complaint Hotline	Construction Noise	Investigation report was finalized on 3 Dec 2021.
EC088_CKRCT20211030_338	30th October 2021	Contract Complaint Hotline	Construction Noise	Investigation report was finalized on 3 Dec 2021.
EC089_CKRCT20211109_342	9th November 2021	Contract Complaint Hotline	Air	Investigation report was finalized on 3 Dec 2021.
EC90_CKRCT20211112_346	12th November 2021	Contract Complaint Hotline	Construction Noise	Investigation report was finalized on 3 Dec 2021.
EC091_CKRCT20211113_347	13th November 2021	1823, E-mail & Contract Complaint Hotline	Construction Noise	Under investigation and the investigation results will be reported in the subsequent Monthly EM&A Report.
EC092_CKRCT20211123_351	23th November 2021	Contract Complaint Hotline	Construction Noise	Under investigation and the investigation results will be reported in the subsequent Monthly EM&A Report.
EC093_CKRCT20211124_352	24th November 2021	Contract Complaint Hotline	Air & Construction Noise	Under investigation and the investigation results will be reported in the subsequent Monthly EM&A Report.
EC094_CKRCT20211125_353	25th November 2021	Contract Complaint Hotline	Construction Noise	Under investigation and the investigation results will be reported in the subsequent Monthly EM&A Report.

5.1.4 Cumulative complaint log, summaries of complaints, notification of summons and successful prosecutions are presented in **Appendix K**.

5.1.5 No public engagement activities were conducted in the reporting period.

5.2 Summary of Environmental Non-Compliance

5.2.1 No environmental non-compliance was recorded in the reporting period

5.3 Summary of Monitoring Exceedance

5.3.1 Five (5) Action Level exceedances were recorded for construction noise due to the noise-related complaints received in the reporting month. No Limit Level exceedance was recorded for construction noise monitoring in the reporting month.

5.3.2 No Action and Limit Level exceedance was recorded for construction dust monitoring in the reporting month.

6 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURE

6.1.1 The Contractor had implemented environmental mitigation measures and requirements as stated in the EIA Report, the EP and EM&A Manual. The implementation status of the environmental mitigation measures during the reporting period is summarized in **Appendix J**. Status of required submissions under the EP during the reporting period is summarised in **Table 6.1**.

Table 6.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
3.4	Monthly EM&A Report (October 2021)	12 November 2021

7 FUTURE KEY ISSUES

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

Ho Man Tin

- Drill and blast excavation;
- Mucking out from tunnel;
- Site and shaft Installation;
- Pilot tunnel exaction by Tunnel Boring Machine (TBM).

Yau Ma Tei

- Drill and break excavation;
- Mucking out from tunnel;
- Arch-rib installation;
- Erection of noise enclosure;
- Site and shaft installation.

Ma Tau Kok

- Drill and blast excavation;
- Mucking out from tunnel;
- Tunnel Boring Machine (TBM) break- out face civil work;
- Site and shaft installation;
- Erection of noise enclosure.

Princess Margaret Road

- Reinstatement of working area.

Ka Tak Barging Point

- Spoil handling and disposal.

7.1.2 The recommended mitigation measures corresponding to the main works in the next reporting period are listed as follow:

- Good relationship shall be maintained with the nearby sensitive receivers/ stakeholders which may be affected by the construction works such as providing better/ more detail information of the work nature and inform in advance of the works to the nearby residents;
- Any excavated, stockpile of dusty material or load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting;
- All construction plants / machineries should be checked / serviced on a regular basis during the courses of construction to minimize the emission of noise generation and eliminate dark smoke emission;
- All C&D materials generated should be transported and stored at temporary storage area. Suitable materials should be sorted for reuse on-site;

- Every vehicle shall be cleaned thorough at the designated wheel washing area onsite;
- Wastewater generated from drilling shall be properly collected for reuse or treated by wastewater treatment facilities before discharge;
- Provision of drip trays for equipment likely cause spillage of chemical / fuel, and provide routine maintenance;
- Erecting temporary noise barrier for noisy Powered Mechanical Equipment (PME) and deployment of Quality Powered Mechanical Equipment (QPME) as many as practicable;
- Conditions in the Environmental Permit and License should be followed;
- All recommended mitigation measures specified in the approved EIA Report and EM&A Manual shall be implemented.
- All vehicles should be cleaned before leaving the construction site to ensure no muddy deposited by them on roads.

7.1.3 The environmental monitoring schedule for the next reporting month is provided in **Appendix E**.

8 CONCLUSION AND RECOMMENDATIONS

8.1.1 The 27th Monthly EM&A Report for the Contract No. HY/2018/08 Central Kowloon Route – Central Tunnel summarized the monitoring results and audits findings of the EM&A programme under the issued EP (EP No.: EP-457/2013/D) and in accordance with the EM&A Manual during the reporting period from 01/11/2021 to 30/11/2021.

8.1.2 Construction dust (including 1-hour and 24-hour TSP) and noise monitoring were carried out in the reporting period.

8.1.3 Five (5) Action Level exceedances were recorded for construction noise due to the noise-related complaints received in the reporting month. No Limit Level exceedance was recorded for construction noise monitoring in the reporting month. No Action and Limit Level exceedance was recorded for construction dust monitoring in the reporting month.

8.1.4 Weekly environmental site inspections were conducted during the reporting period. In general, the Contractor had implemented environmental mitigation measures and requirements as stated in the EIA Report, the EP and EM&A Manual.

8.1.5 Two (2) noise-related complaints were received in the last reporting month (i.e. 22 and 30 October 2021). The investigation reports for the complaints were finalized on 3 December 2021.

8.1.6 Six (6) air and noise-related complaints were received on 9, 12, 13, 23, 24, and 25 November 2021 via the complaint hotline of the contractor, email and 1823 respectively. The investigation reports for the complaints on 9 and 12 November 2021 were finalized on 3 December 2021. The investigation reports of 13, 23, 24, and 25 November 2021 were under investigation and the investigation results will be reported in the subsequent Monthly EM&A Report.

8.1.7 No environmental related prosecutions or notification of summons were received in the reporting period.

8.1.8 No environmental non-compliance was recorded in the reporting period.

8.1.9 According to the environmental site inspections performed in the reporting month, the following recommendations were provided:

Air Quality Impact

- The Contractor was reminded to provide wheel washing with high pressure jet to minimize the air impact.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- No specific observation was identified in the reporting month.

Waste Management

- No specific observation was identified in the reporting month.

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

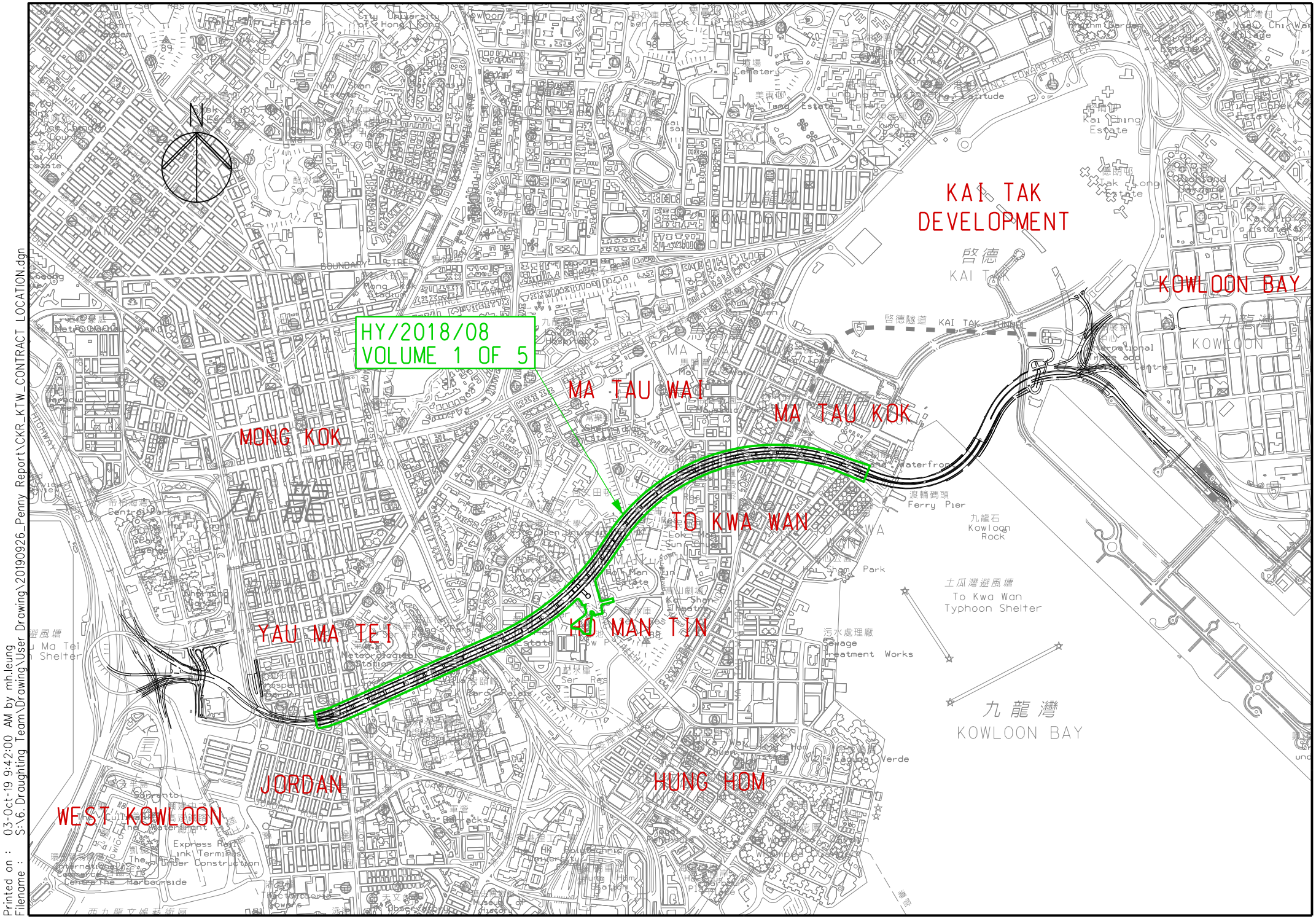
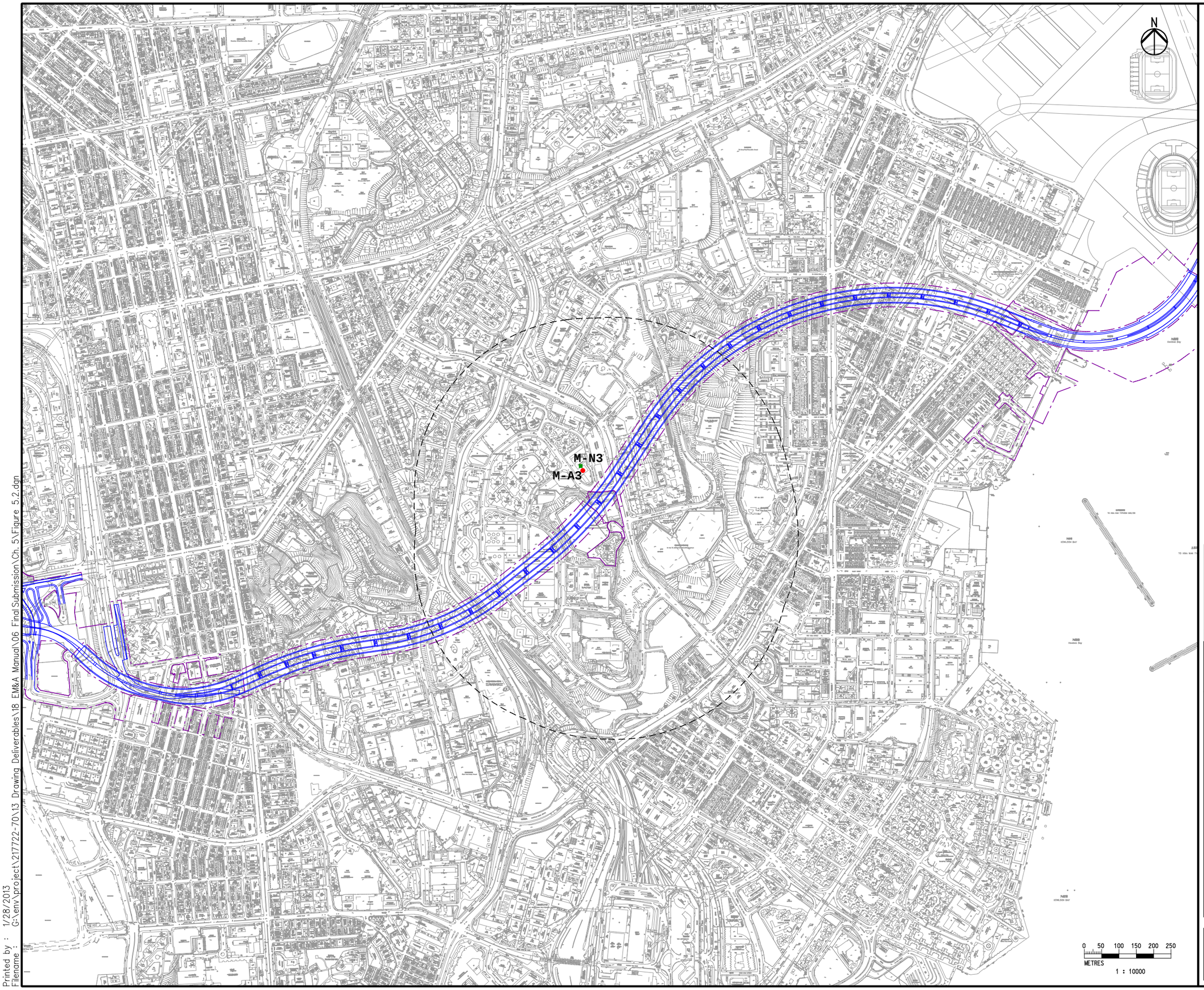


Figure 1 - Site Layout Plan of the Contract

Figure 2.1

The Location of the Construction Dust and Noise Monitoring Stations (Ho Man Tin)



Legend

- Construction Dust Monitoring Station
- CKR Alignment
- CKR Works Limit
- 500 m Study Boundary in the EIA Report
- Construction Noise Monitoring Station

Rev	Description	By	Date
E	FIFTH ISSUE	GL	01/13
D	FOURTH ISSUE	GL	12/12
C	THIRD ISSUE	GL	09/12
B	SECOND ISSUE	GL	01/12
A	FIRST ISSUE	GL	12/11

Consultant

ARUP Mott MacDonald

Project title

Agreement No. CE 43/2010 (HY)

Central Kowloon Route - Design and Construction

Drawing title

Location of Construction Dust and Noise Monitoring Stations (Central Portion)

Figure 2.1 Rev. E

Drawn	Date	Checked	Approved
GL	01/13	FC	ST

Scale 1:10000 ON A3 Status PRELIMINARY

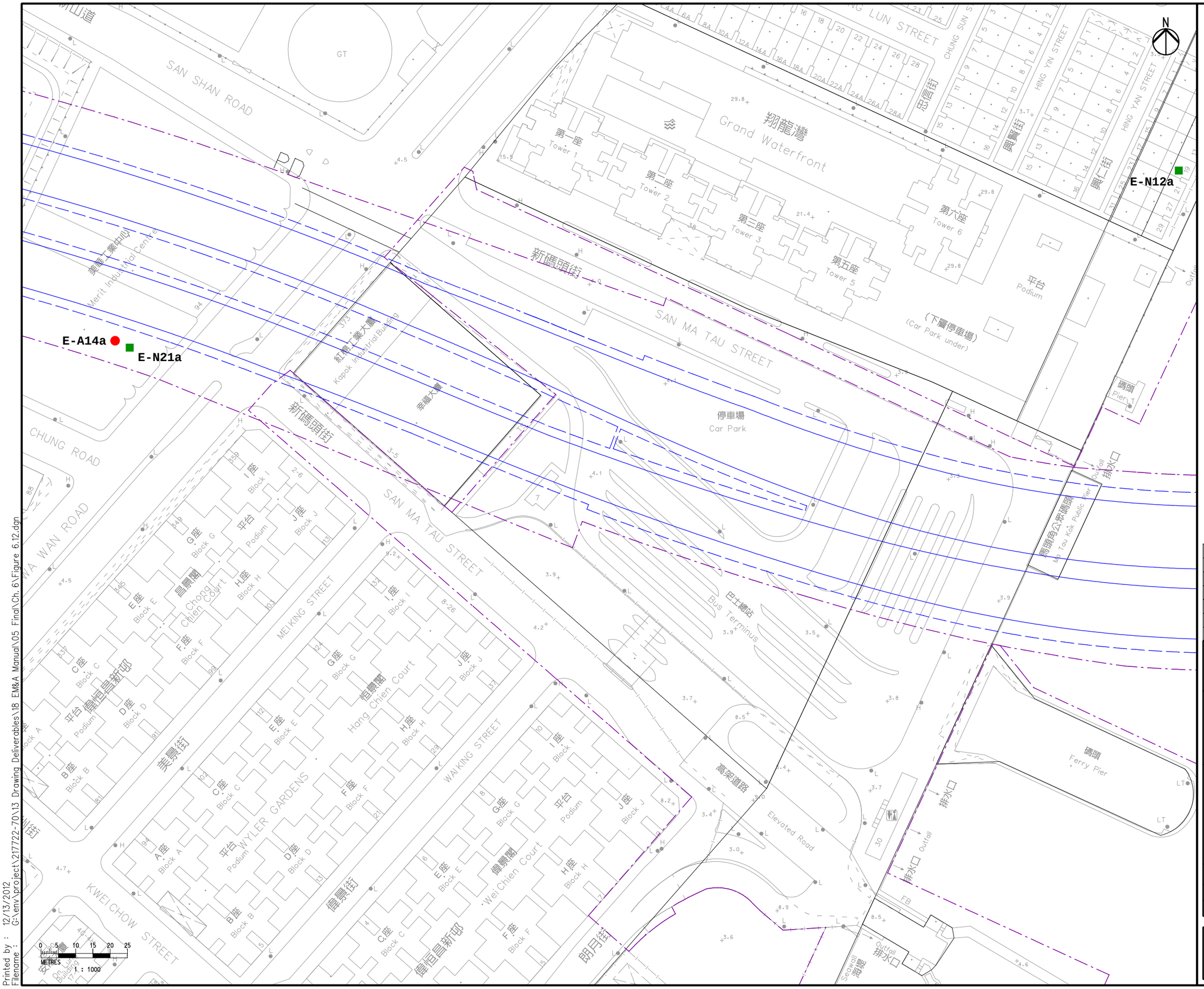
COPYRIGHT RESERVED

路政署 HIGHWAYS DEPARTMENT
主要工程管理處 MAJOR WORKS PROJECT MANAGEMENT OFFICE

Printed by : 1/28/2013
Filename : G:\env\project\217722-70\13 Drawing Deliverables\18 EM&A Manual\06 Final Submission\Ch. 5\Figure 5.2.dgn

Figure 2.2

The Location of the Construction Dust and Noise Monitoring Stations (Ma Tau Kok)



Printed by : 12/13/2012
Filename : G:\env\project\217722-70\13 Drawing Deliverables\18 EM&A Manual\05 Final\Ch. 6\Figure 6.12.dgn

Legend

CKR Alignment

Works Limit

● **Construction Dust Monitoring Station**

■ **Construction Noise Monitoring Station**

Rev	Description	By	Date
D	FOUTH ISSUE	GL	12/12
C	THIRD ISSUE	GL	09/12
B	SECOND ISSUE	GL	06/12
A	FIRST ISSUE	GL	02/12

Consultant

ARUP Mott MacDonald

Project title

Agreement No. CE 43/2010 (HY)

Central Kowloon Route - Design and Construction

Drawing title

Location of Construction Dust and Noise Monitoring Stations (East Portion)

Figure 2.2 Rev. D

Drawn	Date	Checked	Approved
GL	12/12	FC	ST

Scale 1:1000 ON A3

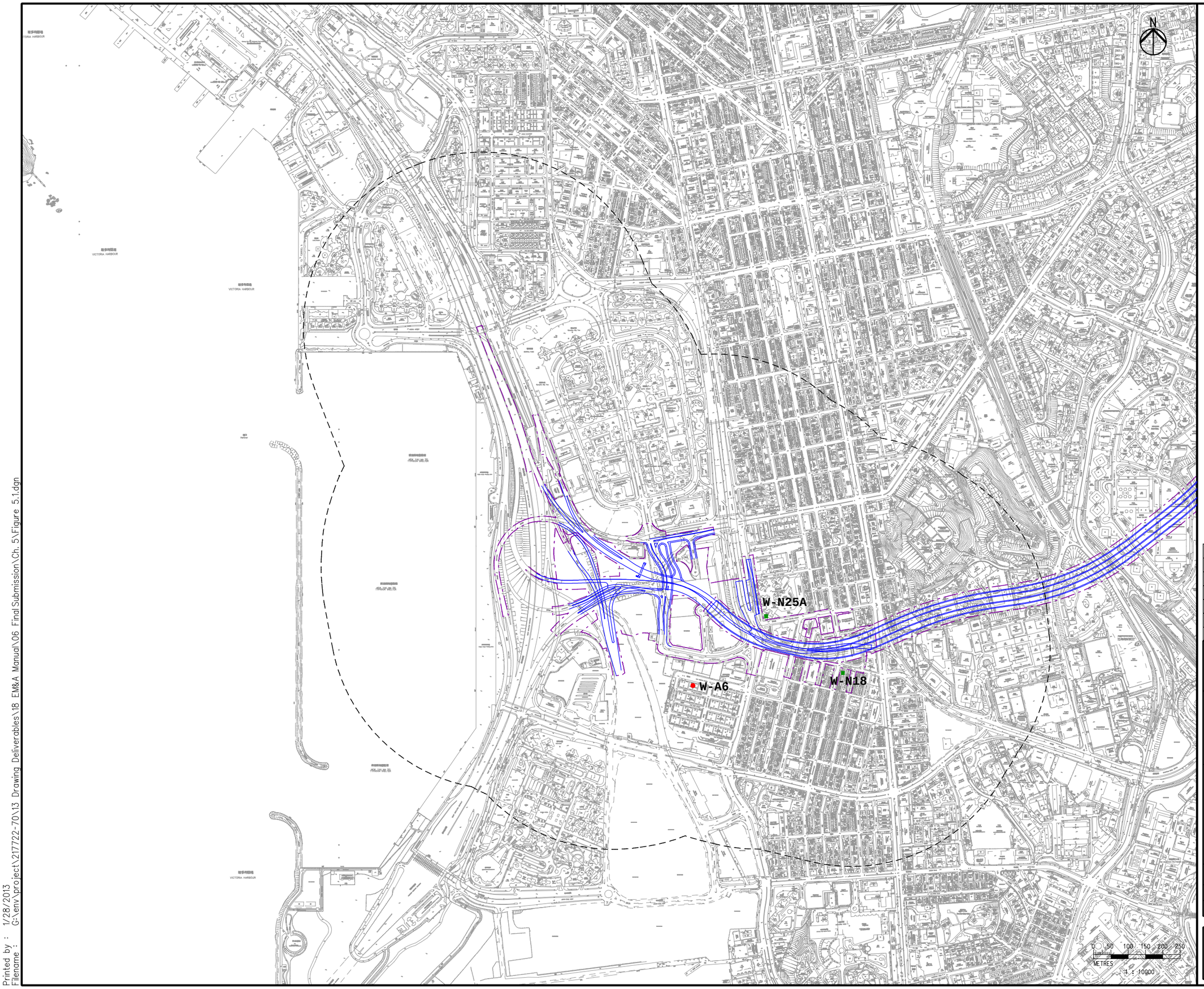
Status PRELIMINARY

COPYRIGHT RESERVED

路政署 HIGHWAYS DEPARTMENT
主要工程管理處 MAJOR WORKS PROJECT MANAGEMENT OFFICE

Figure 2.3

The Location of the Construction Dust and Noise Monitoring Stations (Yau Ma Tei)



Legend

- Construction Dust Monitoring Station
- CKR Alignment
- CKR Works Limit
- 500m Study Boundary in the EIA Report
- Construction Noise Monitoring Station

Rev	Description	By	Date
E	FIFTH ISSUE	GL	01/13
D	FOURTH ISSUE	GL	12/12
C	THIRD ISSUE	GL	09/12
B	SECOND ISSUE	GL	01/12
A	FIRST ISSUE	GL	12/11

Consultant

ARUP Mott MacDonald

Project title

Agreement No. CE 43/2010 (HY)

Central Kowloon Route - Design and Construction

Drawing title

Location of Construction Dust and Noise Monitoring Stations (West Portion)

Figure 5 Rev. E

Drawn	Date	Checked	Approved
GL	01/13	FC	ST

Scale 1:10000 ON A3 Status PRELIMINARY

COPYRIGHT RESERVED

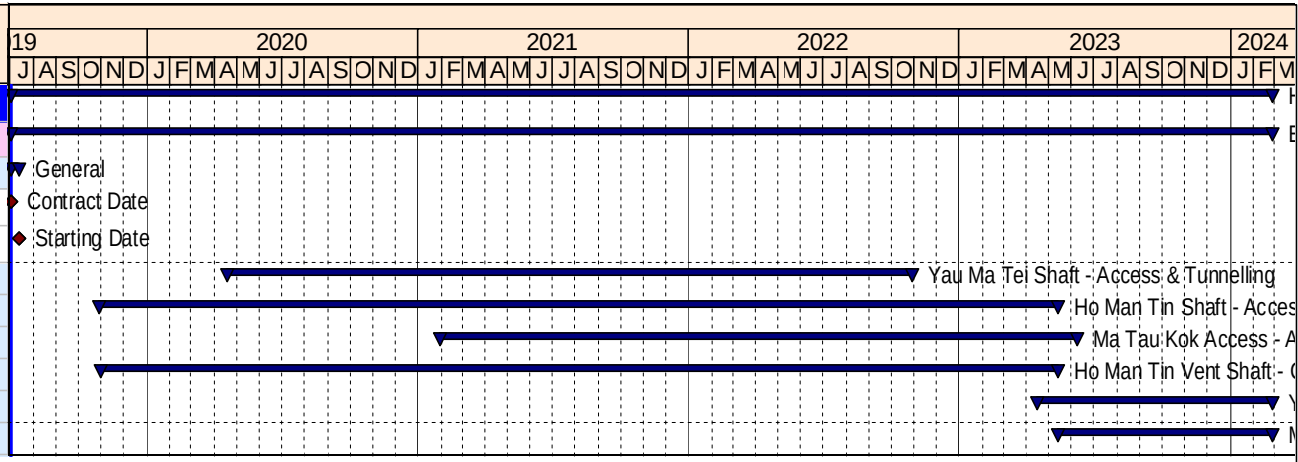
路政署 HIGHWAYS DEPARTMENT
主要工程管理處 MAJOR WORKS PROJECT MANAGEMENT OFFICE

Printed by : 1/28/2013
Filename : G:\env\project\217722-70\13 Drawing Deliverables\18 EM&A Manual\06 Final Submission\Ch. 5\Figure 5.1.dgn

Appendix A

Construction Programme

#	Activity Name	Orig Dur	Start	Finish
1	**HY/2018/08 Central Kowloon Route**	1379	03-Jul-19	26-Feb-24
2	**Executive Summary**	1379	03-Jul-19	26-Feb-24
3	**General**	9	03-Jul-19	12-Jul-19
4	Contract Date	0	03-Jul-19	
5	Starting Date	0	12-Jul-19	
6	**Yau Ma Tei Shaft - Access & Tunnelling**	749	18-Apr-20	28-Oct-22
7	**Ho Man Tin Shaft - Access & Tunnelling**	1046	28-Oct-19	12-May-23
8	**Ma Tau Kok Access - Access & Tunnelling**	693	31-Jan-21	08-Jun-23
9	**Ho Man Tin Vent Shaft - Civil works**	1044	30-Oct-19	12-May-23
10	**Yau Ma Tei Shaft - Civil works**	258	16-Apr-23	26-Feb-24
11	**Ma Tau Kok Shaft - Civil works**	236	13-May-23	26-Feb-24



Summary

Milestone

HY/2018/08 Central Kowloon Route Central Tunnel

Executive Summary

BOUYGUES TRAVAUX PUBLICS

Date	Revision	Checked	Approved
16-Jul-19	00V0	CLa	WYu
20-Aug-19	00V1	CLa	WYu

Major Construction Activities (Nov 2021)

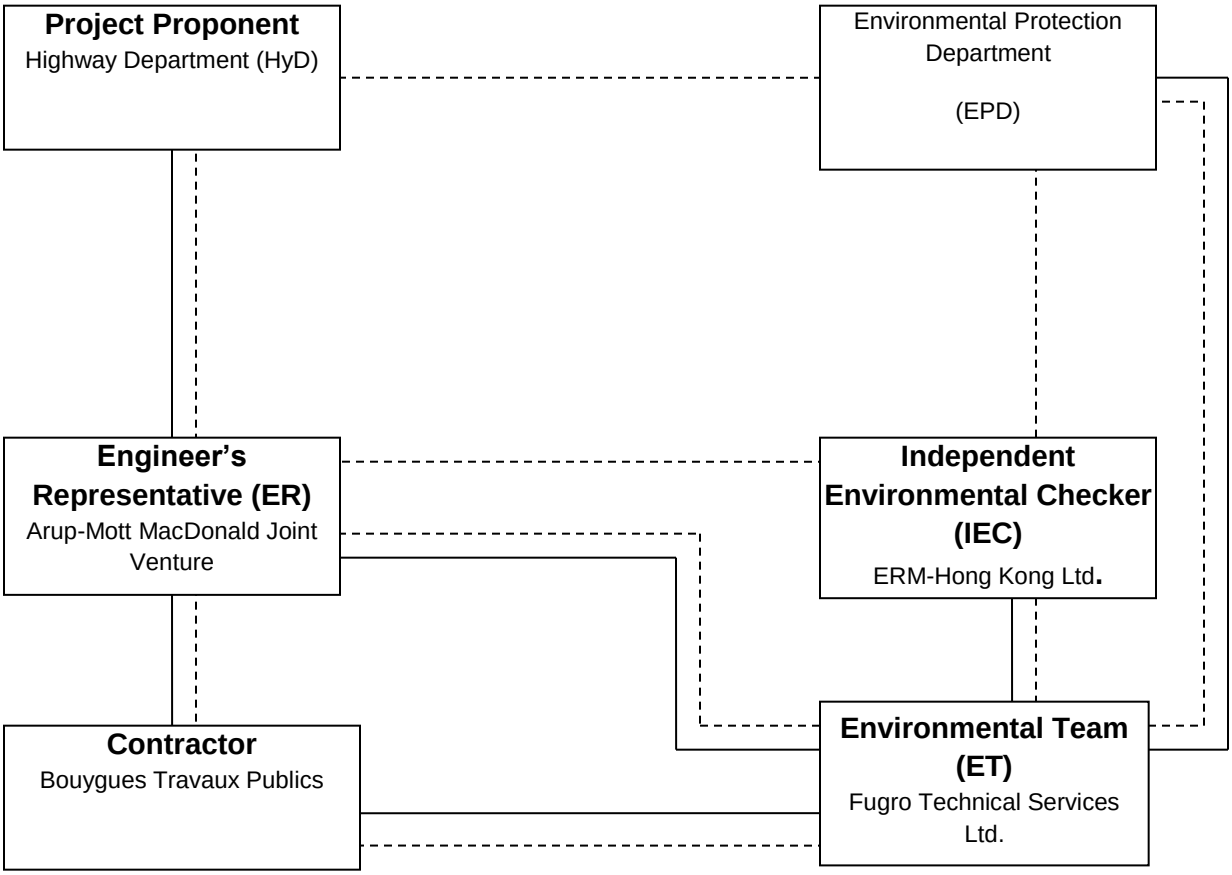
Item	Major Construction Activites	Location
1	Drill and blast excavation	HMT
2	Mucking out from tunnel	
3	Site and shaft installation	
4	Pilot tunnel excavation by TBM	
5	Drill and break excavation	YMT
6	Mucking out from tunnel	
7	Arch-rib installation	
8	Erection of noise enclosure	
9	Site and shaft installation	
10	Drill and blast excavation	MTK
11	Mucking out from tunnel	
12	TBM break-out face civil work	
13	Site and shaft installation	
14	Erection of noise enclosure	
15	Reinstatement of working area	Chi Man Street
16	Spoil handing and disposal	KTBF

Major Construction Activities (Dec 2021)

Item	Major Construction Activites	Location
1	Drill and blast excavation	HMT
2	Mucking out from tunnel	
3	Site and shaft installation	
4	Pilot tunnel excavation by TBM	
5	Drill and break excavation	YMT
6	Mucking out from tunnel	
7	Arch-rib installation	
8	Erection of noise enclosure	
9	Site and shaft installation	
10	Drill and blast excavation	MTK
11	Mucking out from tunnel	
12	TBM break-out face civil work	
13	Site and shaft installation	
14	Erection of noise enclosure	
15	Reinstatement of working area	Chi Man Street
16	Spoil handing and disposal	KTBF

Appendix B

Project Organization Chart


Project Proponent
Highway Department (HyD)
Environmental Protection Department
(EPD)
Engineer's Representative (ER)
Arup-Mott MacDonald Joint Venture
Independent Environmental Checker (IEC)
ERM-Hong Kong Ltd.
Contractor
Bouygues Travaux Publics
Environmental Team (ET)
Fugro Technical Services Ltd.
Legend:
Line of Reporting
Line of Communication

Appendix C

Calibration Certificate for

Construction Dust Monitoring

Equipment

FUGRO TECHNICAL SERVICES LIMITED
Room 723 - 726, 7/F, Block B,
Profit Industrial Building,
1-15 Kwai Fung Crescent, Kwai Fong,
Hong Kong.
Tel : (852)-24508238
Fax : (852)-24508032
Email : mcl@fugro.com.hk

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : M-A3
Location : S.K.H Tsoi Kung Po Secondary School
Make: Tisch
Model: TE-5170 S/N: 4388

Date of Calibration: 4-Oct-21
Next Calibration Date: 3-Jan-22
Technician: Felix Fong

CONDITIONS

Sea Level Pressure (hPa):	1012.5	Corrected Pressure (mm Hg):	765
Temperature (℃):	29.8	Temperature (K):	303

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		

CALIBRATIONS

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m^3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION	
18	8.90	-7.30	16.200	1.954	62.00	61.71	Slope =	29.9907
13	7.60	-6.80	14.400	1.842	57.00	56.74	Intercept =	2.3439
10	5.30	-4.80	10.100	1.542	49.00	48.77	Corr. coeff.=	0.9983
7	4.20	-3.30	7.500	1.329	42.00	41.81		
5	2.90	-2.00	4.900	1.073	35.00	34.84		

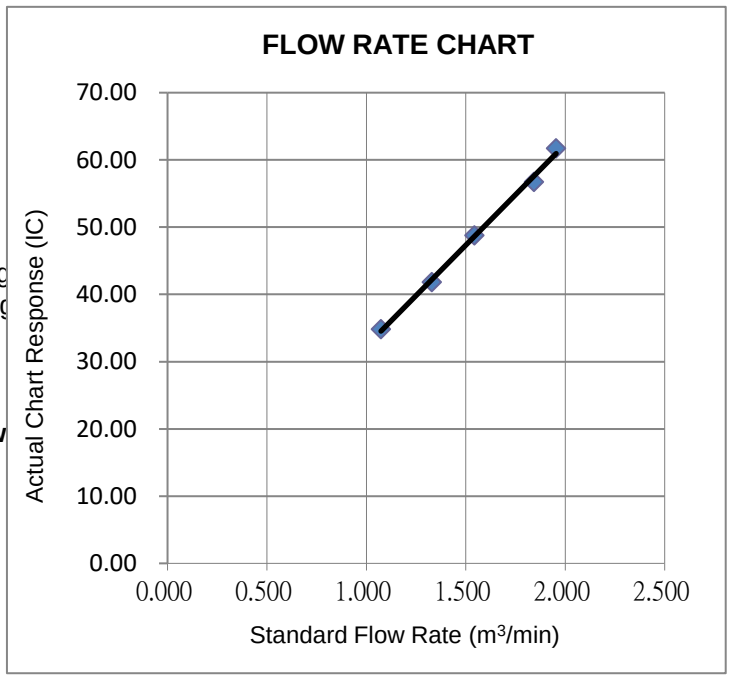
Calculations:

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
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



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

Report no. : 940891CA202730(3)

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.	: 620480
Specification Limit	: NA
Next Calibration Date	: 22-Nov-2021

Laboratory Information

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

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

Date of Calibration : 23-Nov-2020 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)
0.0915	3211	53.52
0.0469	2732	45.53
0.1172	3659	60.98

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 = 0.001597
3. Correlation coefficient (r) : 0.9909

Checked by : Date : 15-12-2020 Certified by : Date : 15-12-2020

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

Leung Kwok Tai (Assistant Manager)

** End of Report **

The copyright of this report is owned by Fugro Technical Services Limited. This report shall not be reproduced except in full.

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

Report no. : 940891CA212394

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.	: 155717
Specification Limit	: NA
Next Calibration Date	: 02-Sep-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-Sep-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)
0.0416	672	11.20
0.0388	650	10.83
0.0266	597	9.95

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 = 0.003345
3. Correlation coefficient (r) : 0.9940

Checked by : Date : 28-9-2021 Certified by : Date : 28.9.2021

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

Chan Chun Wai (Manager)

** End of Report **

The copyright of this report is owned by Fugro Technical Services Limited. This report shall not be reproduced except in full.

Appendix D

Calibration Certificate for Construction Noise Monitoring Equipment

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

Report no.: 212769CA211755

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. :	1488293	04064	004061

Equipment ID : N/A
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	1.0	2.6 to -0.6
	2000Hz	1.2	2.8 to -0.4
	1000Hz	0.0	1.1 to -1.1
	500Hz	-3.4	-1.8 to -4.6
	250Hz	-8.7	-7.2 to -10.0
	125Hz	-16.2	-14.6 to -17.6
	63Hz	-26.1	-24.7 to -27.7
	31.5Hz	-38.9	-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 **

The copyright of this report is owned by Fugro Technical Services Limited. This report shall not be reproduced except in full.

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

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)

** End of Report **

The copyright of this report is owned by Fugro Technical Services Limited. This report shall not be reproduced except in full.

Appendix E

Environmental Monitoring Schedule

Project: **Contract No. HY/2018/08 Central Kowloon Route – Central Tunnel**

Impact Monitoring Schedule for the Reporting Period (November 2021)

Sun	Mon	Tue	Wed	Thur	Fri	Sat
	1	2	3	4 Dust Monitoring Noise Monitoring (08:30-12:30)	5	6
7	8	9	10 Dust Monitoring Noise Monitoring (08:30-12:30)	11	12	13
14	15	16 Dust Monitoring Noise Monitoring (08:30-12:30)	17	18	19	20
21	22 Dust Monitoring Noise Monitoring (12:30-17:30)	23	24	25	26 Dust Monitoring	27
28	29	30				

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. Monitoring Location: M-A3 and M-N3: SKH Tsoi Kung Po Secondary School.

Project: **Contract No. HY/2018/08 Central Kowloon Route – Central Tunnel**

Impact Monitoring Schedule for the Next Reporting Period (December 2021)

Sun	Mon	Tue	Wed	Thur	Fri	Sat
			1	2 Dust Monitoring Noise Monitoring (08:30-12:30)	3	4
5	6	7	8 Dust Monitoring Noise Monitoring (08:30-12:30)	9	10	11
12	13	14 Dust Monitoring Noise Monitoring (08:30-12:30)	15	16	17	18
19	20 Dust Monitoring Noise Monitoring (12:30-17:30)	21	22	23	24 Dust Monitoring (12:30-17:30)	25
26	27	28	29	30 Dust Monitoring Noise Monitoring (12:30-17:30)	31	

Remarks

1. Actual monitoring may be subjected to change due to any safety concern or adverse weather condition;
2. Dust Monitoring: 24-hours TSP Monitoring per 6 days, and 3 x 1-hour TSP Monitoring per 6 days;
3. Noise Monitoring: Leq (30 min) between 0700 and 1900 hours;
4. Monitoring Location: M-A3 and M-N3: SKH Tsoi Kung Po Secondary School.

Appendix F

Action and Limit Levels for Construction Dust and Noise Monitoring

Table F-1 Action and Limit Levels for 1-hour TSP

Station ID	Location	Action Level	Limit Level
M-A3	SKH Tsoi Kung Po Secondary School	333 μg/m^3	500 μg/m^3

Table F-2 Action and Limit Levels for 24-hour TSP

Station ID	Location	Action Level	Limit Level
M-A3	SKH Tsoi Kung Po Secondary School	153 μg/m^3	260 μg/m^3

Table F-3 Action and Limit Levels for Construction Noise (0700 – 1900 hour of normal weekdays)

Station ID	Location	Action Level	Limit Level
M-N3	SKH Tsoi Kung Po Secondary School	When one documented compliant is received	For Schools: 70dB(A) during normal teaching period and 65 dB(A) during examination periods

Appendix G

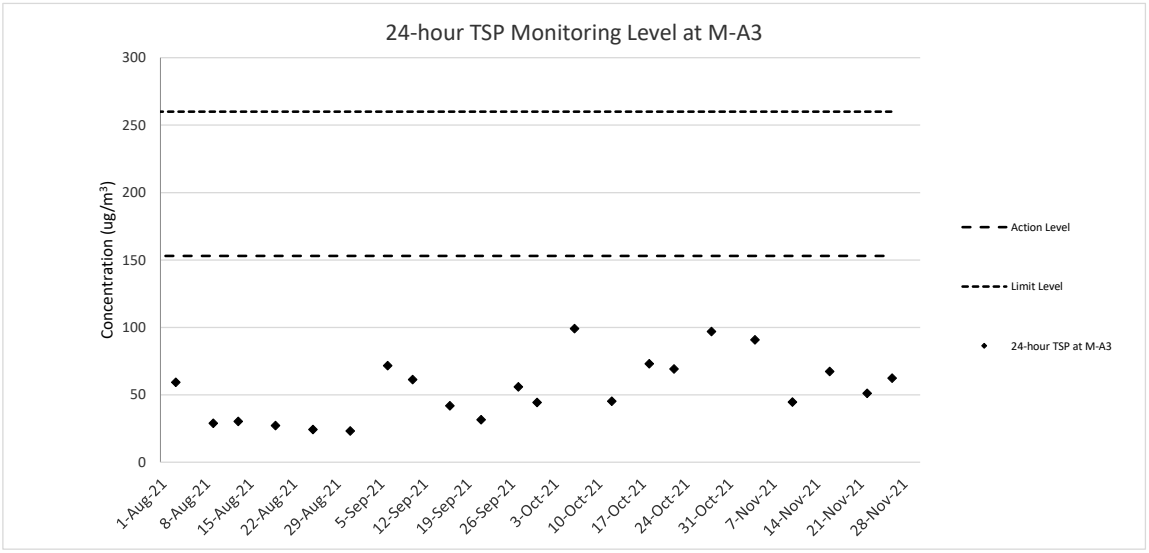
Construction Dust Monitoring Results and Meteorological Observations

24-hour TSP Monitoring Result for
Contract No. HY/2018/08 Central Kowloon Route – Central Tunnel

M-A3 - SKH Tsoi Kung Po Secondary School

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	Limit Level
				Initial	Final			Initial	Final				(ug/m^3)	(ug/m^3)
4-Nov-21	Sunny	298.5	761.2	2.7043	2.8683	0.1640	24	1.26	1.26	1.26	1808.0	91	153	260
10-Nov-21	Fine	293.5	764.1	2.6573	2.7383	0.0810	24	1.27	1.26	1.26	1818.0	45		
16-Nov-21	Fine	296.2	762.8	2.7224	2.8474	0.1250	24	1.26	1.32	1.29	1860.8	67		
22-Nov-21	Fine	292.6	762.8	2.6763	2.7690	0.0927	24	1.27	1.26	1.26	1818.7	51		
26-Nov-21	Sunny	294.6	763.9	2.7635	2.8765	0.1130	24	1.27	1.26	1.26	1816.0	62		
											Min	45		
											Max	91		
											Average	63		

Note:
Underline: Exceedance of Action Level
Underline and Bold: Exceedance of Limit Level

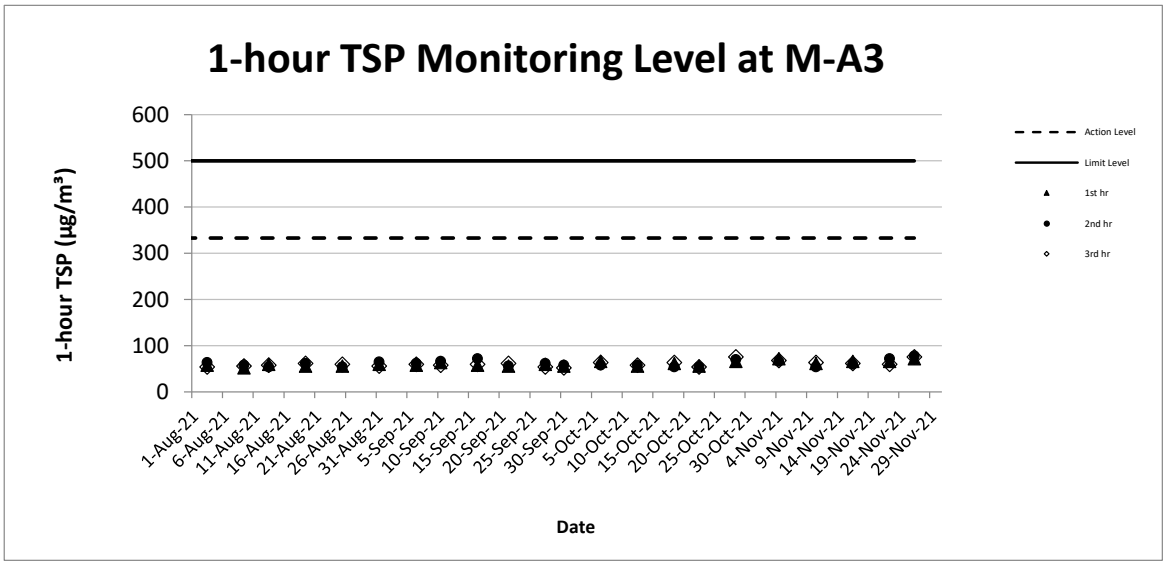


1-hour TSP Monitoring Result for
Contract No. HY/2018/08 Central Kowloon Route – Central Tunnel

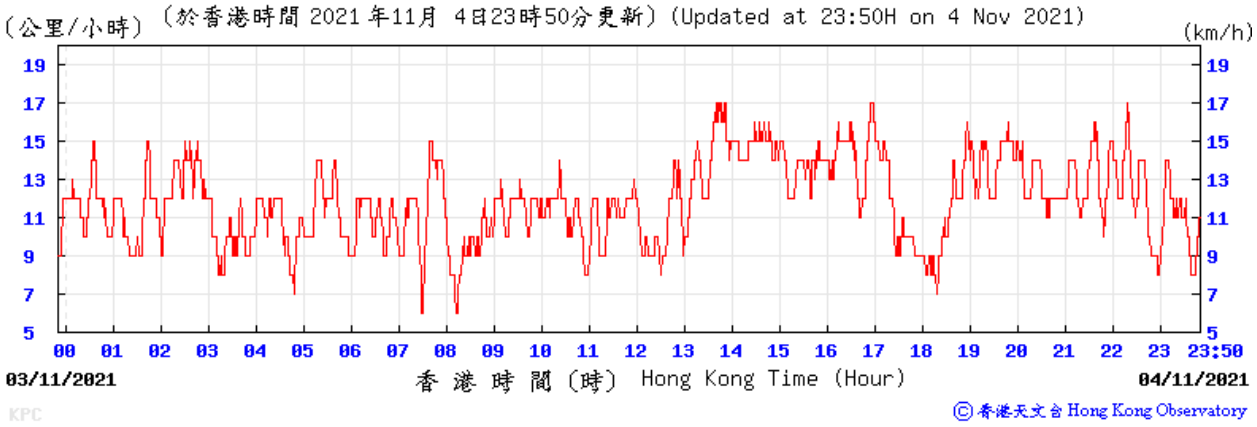
M-A3 - SKH Tsoi Kung Po Secondary School

1-hour TSP (µg/m³)								
Date	Start Time	1st hr	2nd hr	3rd hr	Average	Action Level	Limit Level	Weather
4-Nov-21	09:11	72	66	68	69	333	500	Sunny
10-Nov-21	08:46	62	54	64	60			Fine
16-Nov-21	09:00	66	60	62	63			Fine
22-Nov-21	13:15	66	72	60	66			Fine
26-Nov-21	13:07	72	78	76	75			Sunny

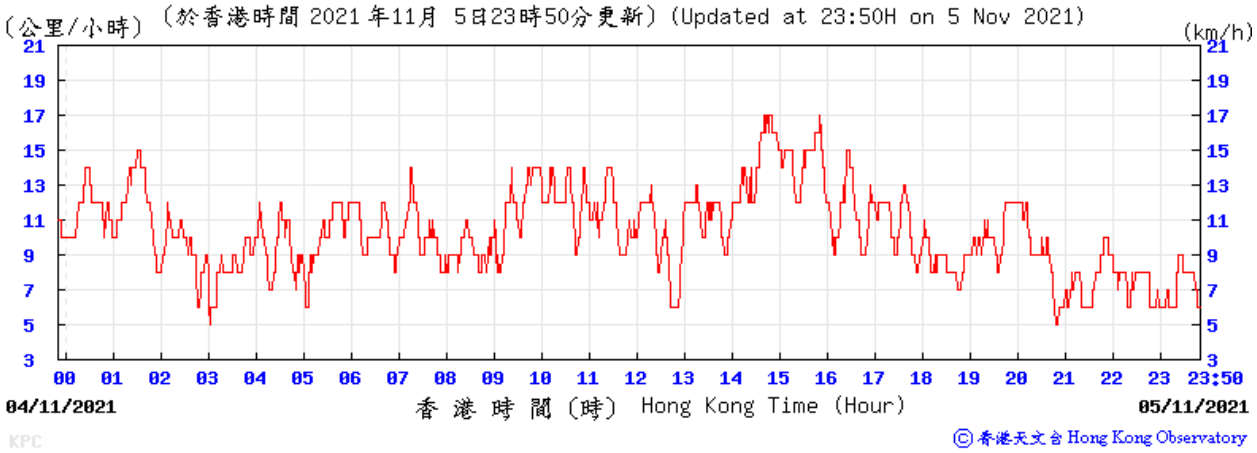
Average	67
Max	78
Min	54



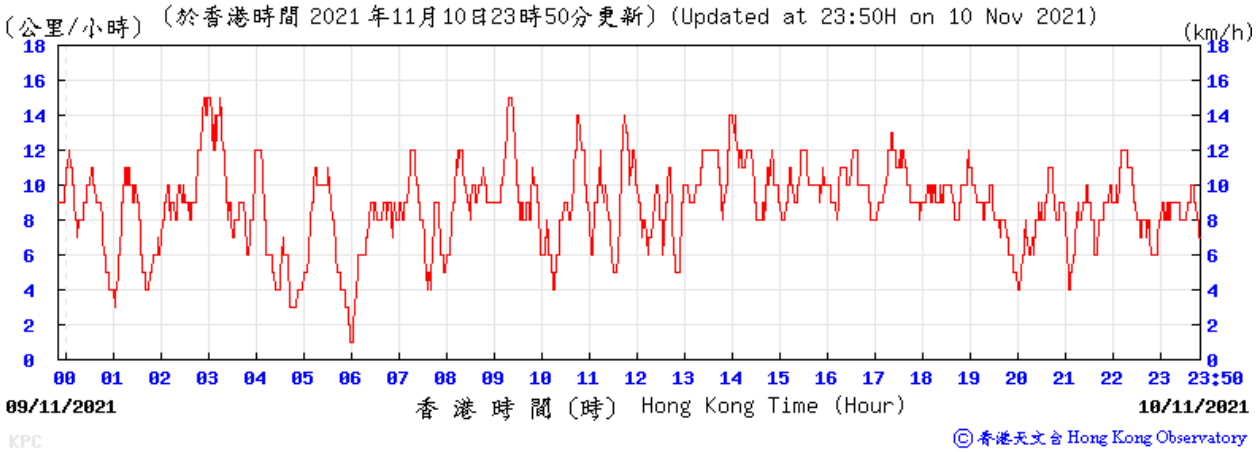
Wind Speed recorded at King's Park Meteorological Station on 4 November 2021



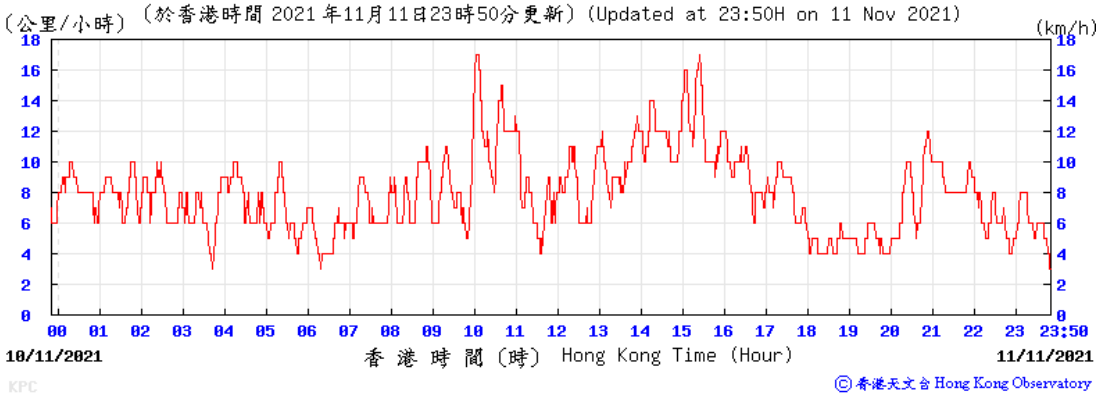
Wind Speed recorded at King's Park Meteorological Station on 5 November 2021



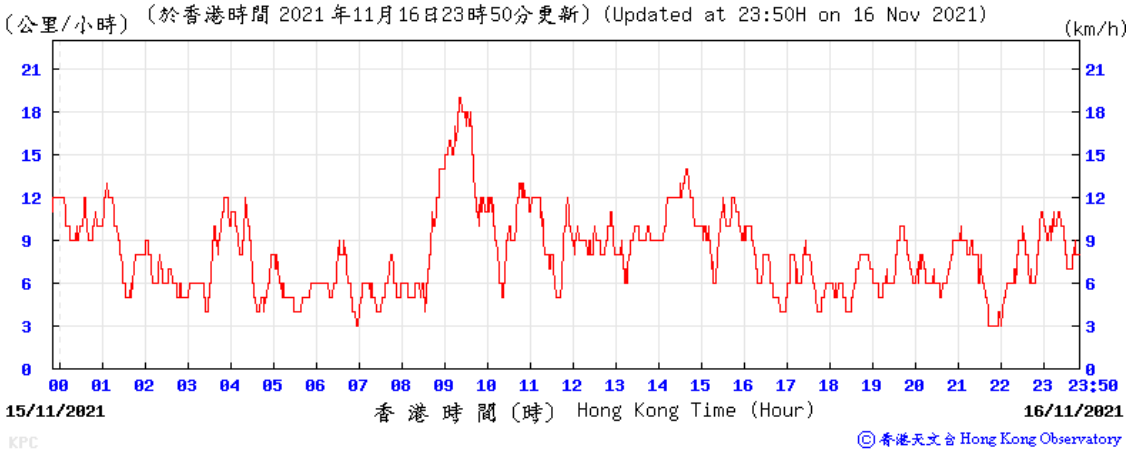
Wind Speed recorded at King's Park Meteorological Station on 10 November 2021



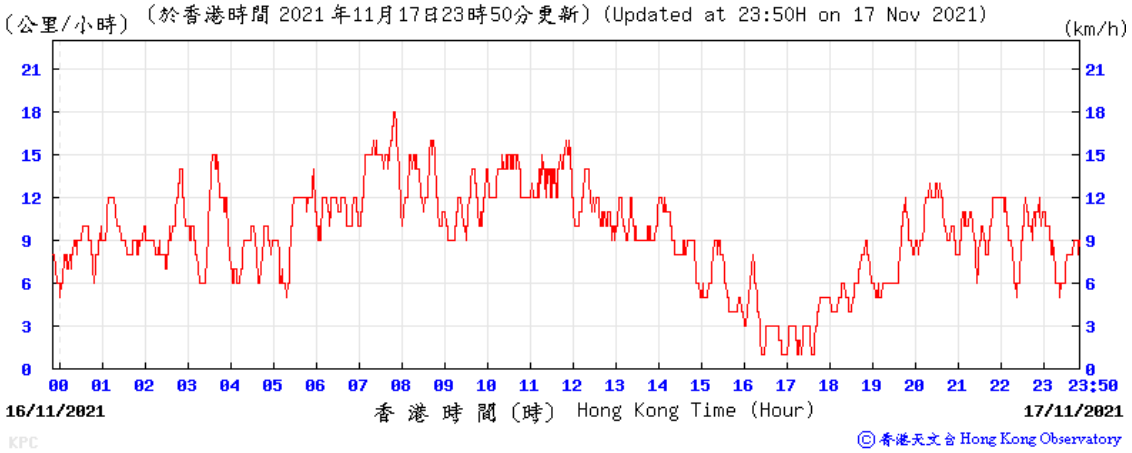
Wind Speed recorded at King's Park Meteorological Station on 11 November 2021



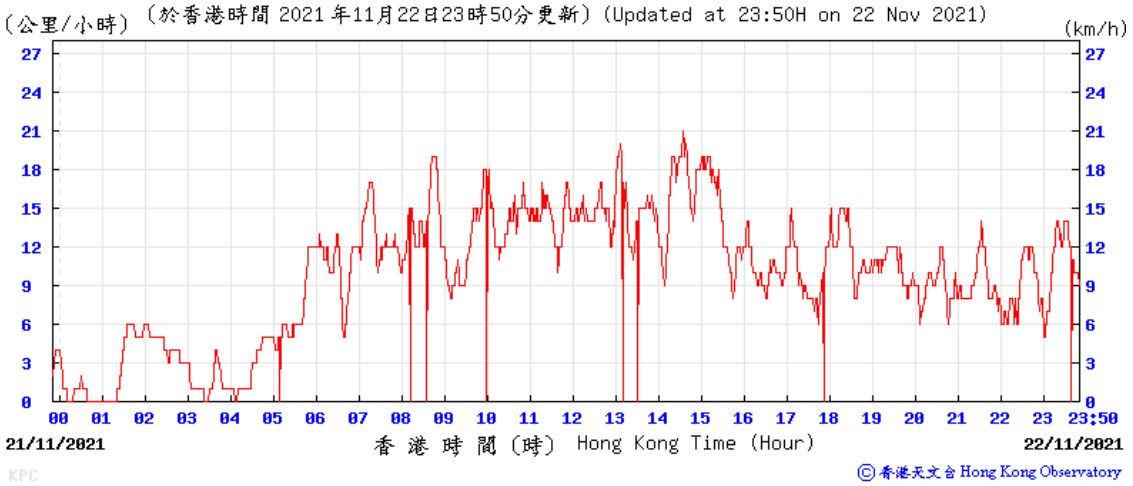
Wind Speed recorded at King's Park Meteorological Station on 16 November 2021



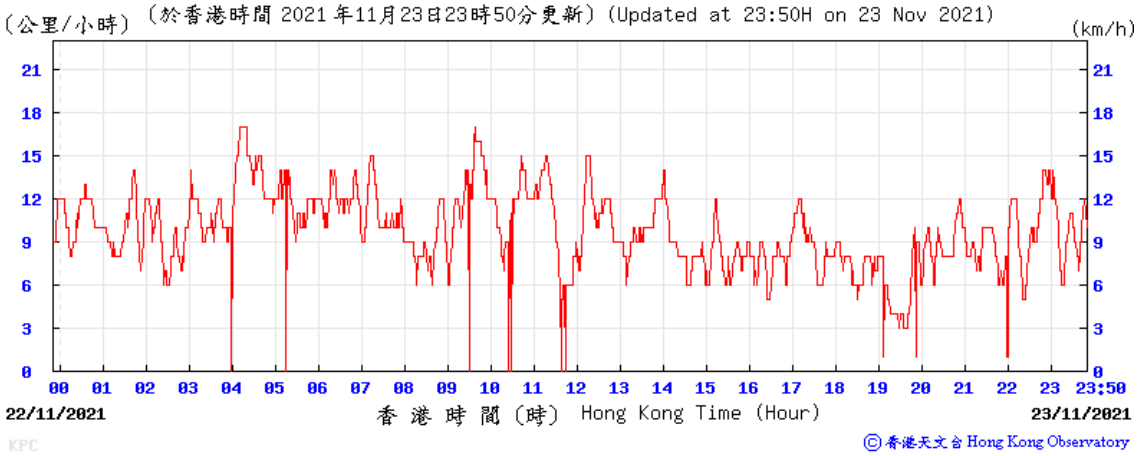
Wind Speed recorded at King's Park Meteorological Station on 17 November 2021



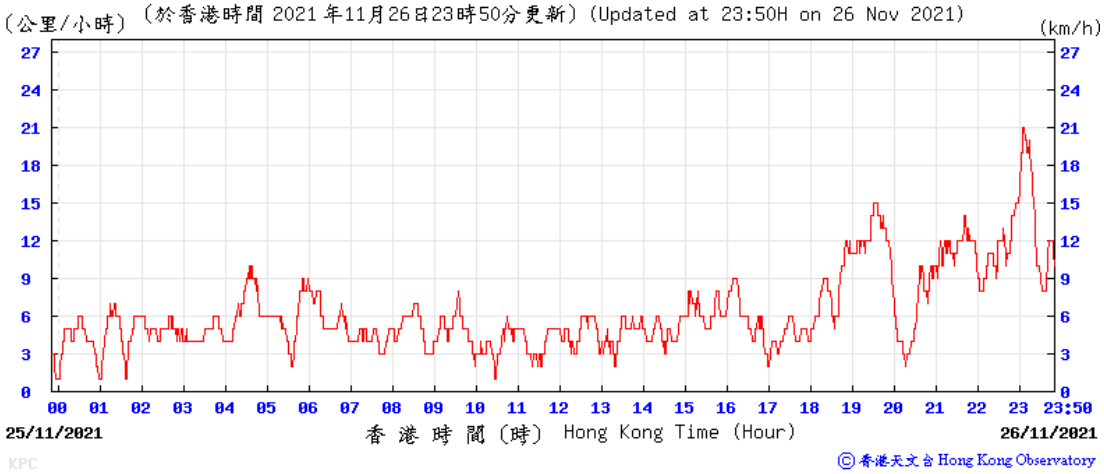
Wind Speed recorded at King's Park Meteorological Station on 22 November 2021



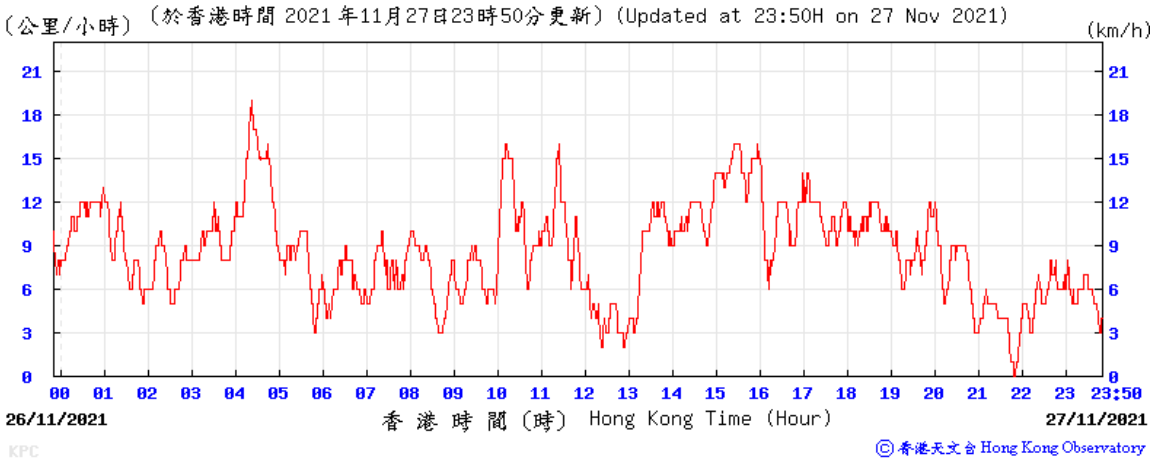
Wind Speed recorded at King's Park Meteorological Station on 23 November 2021



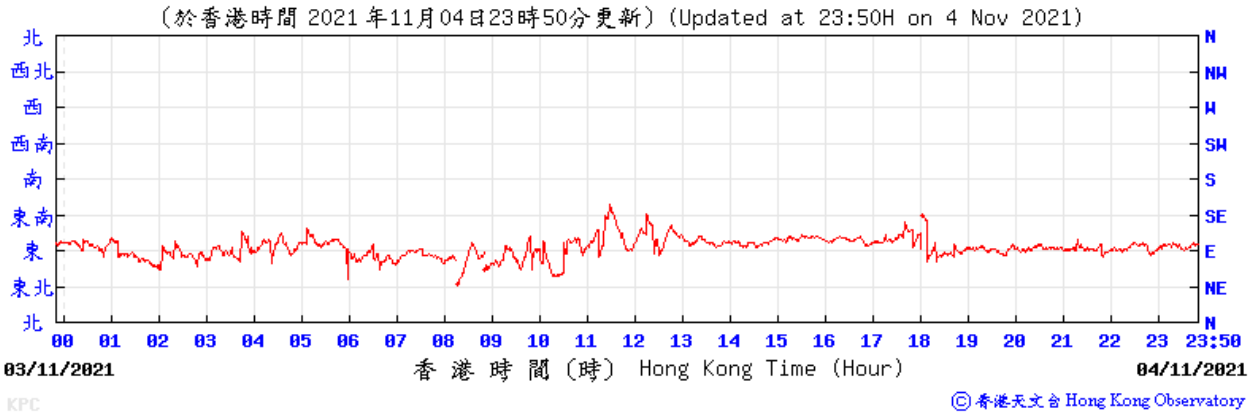
Wind Speed recorded at King's Park Meteorological Station on 26 November 2021



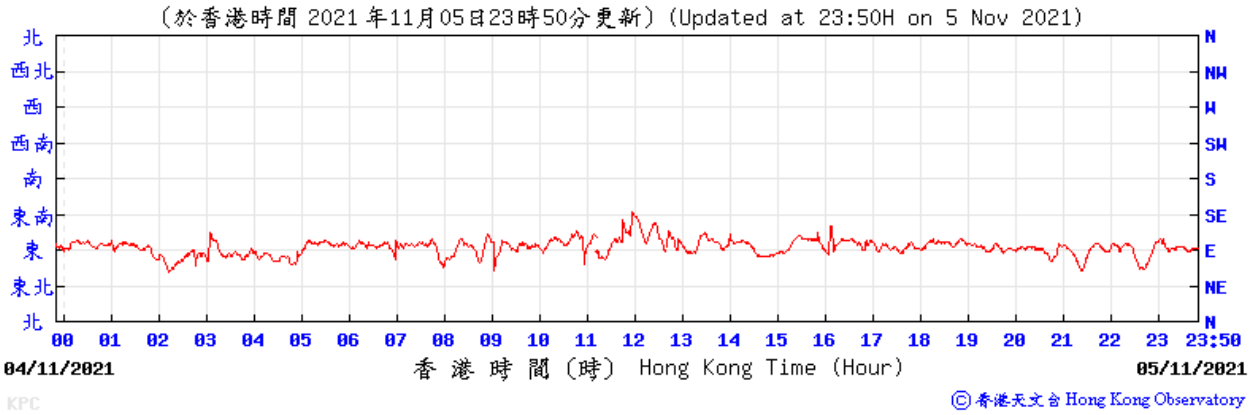
Wind Speed recorded at King's Park Meteorological Station on 27 November 2021



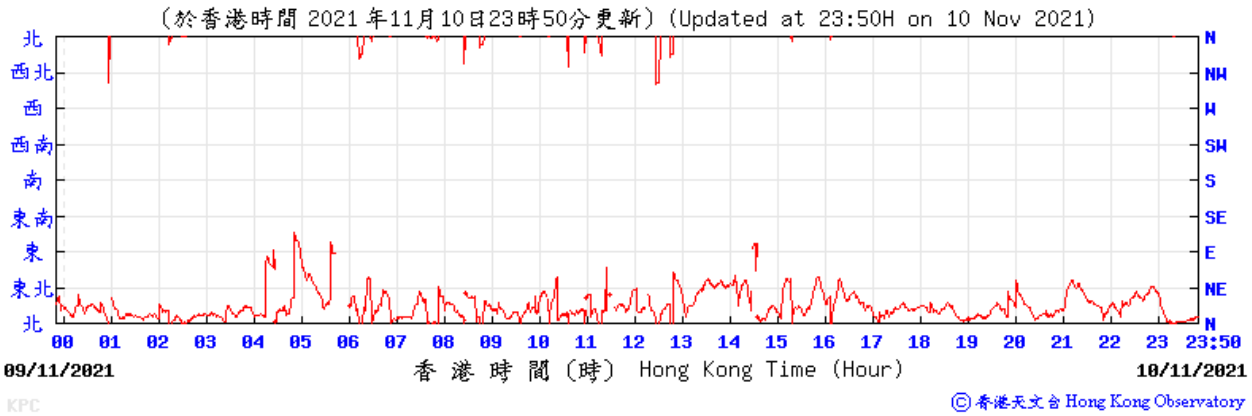
Wind Direction recorded at King's Park Meteorological Station on 4 November 2021



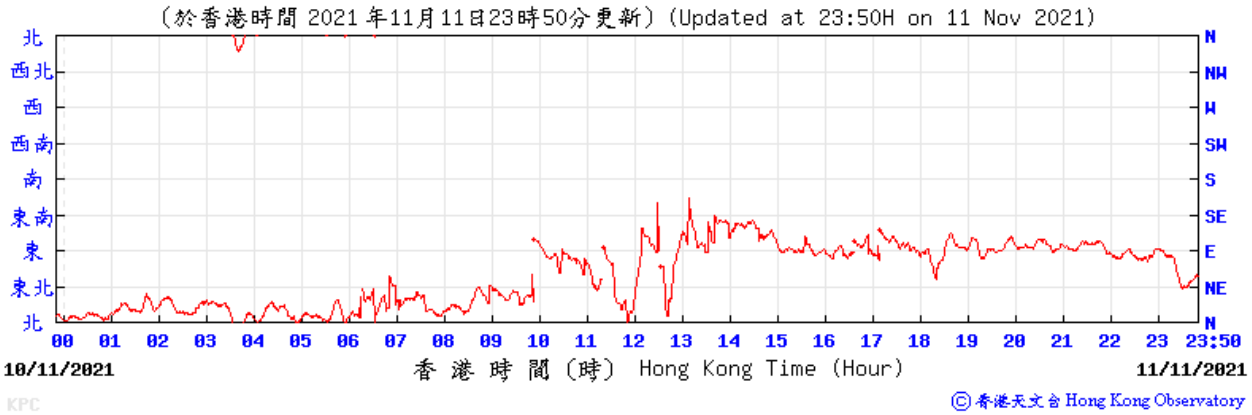
Wind Direction recorded at King's Park Meteorological Station on 5 November 2021



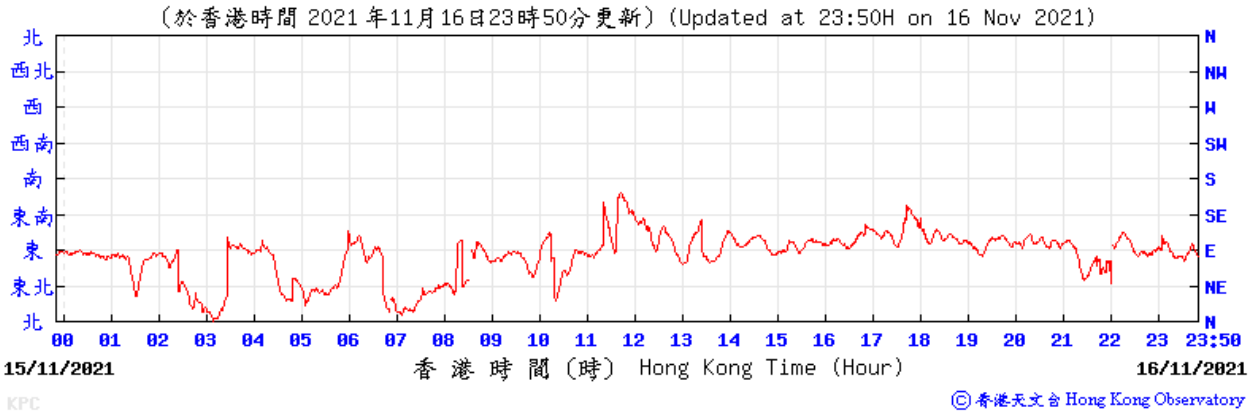
Wind Direction recorded at King's Park Meteorological Station on 10 November 2021



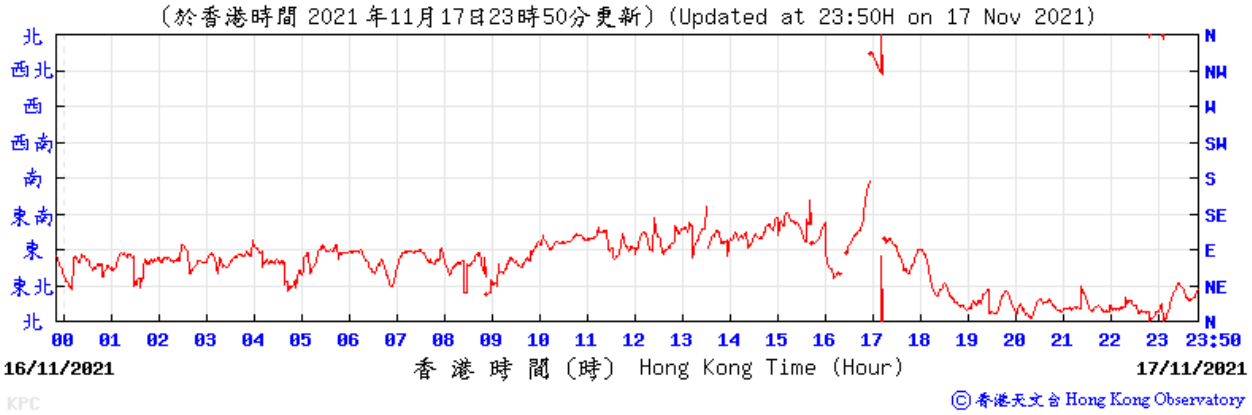
Wind Direction recorded at King's Park Meteorological Station on 11 November 2021



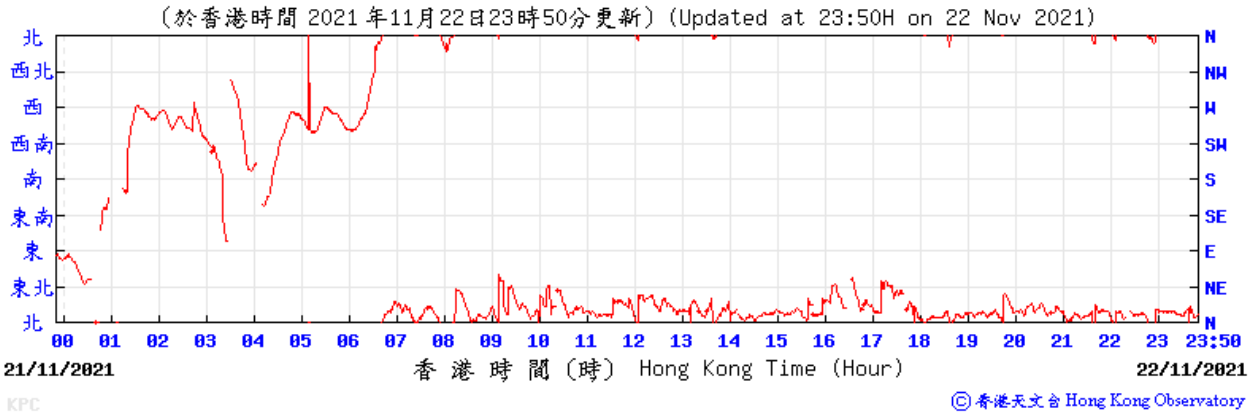
Wind Direction recorded at King's Park Meteorological Station on 16 November 2021



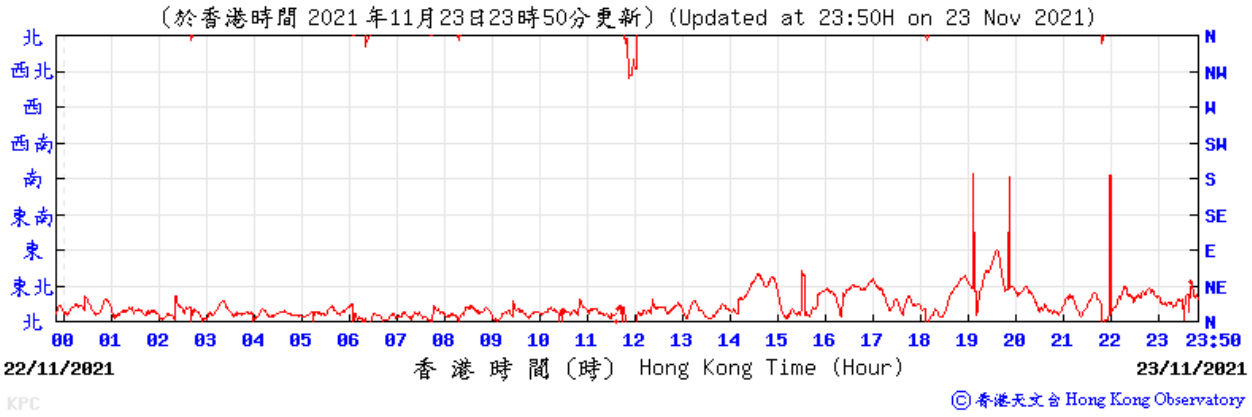
Wind Direction recorded at King's Park Meteorological Station on 17 November 2021



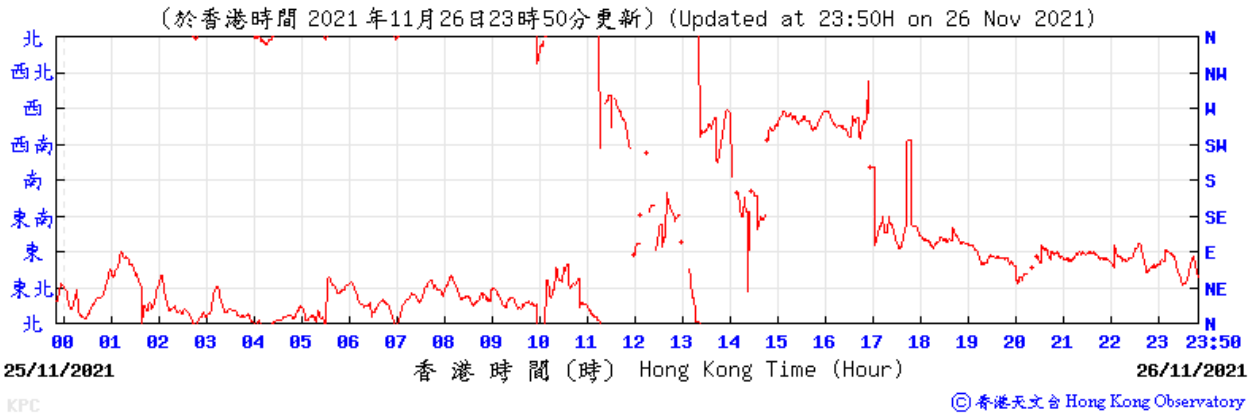
Wind Direction recorded at King's Park Meteorological Station on 22 November 2021



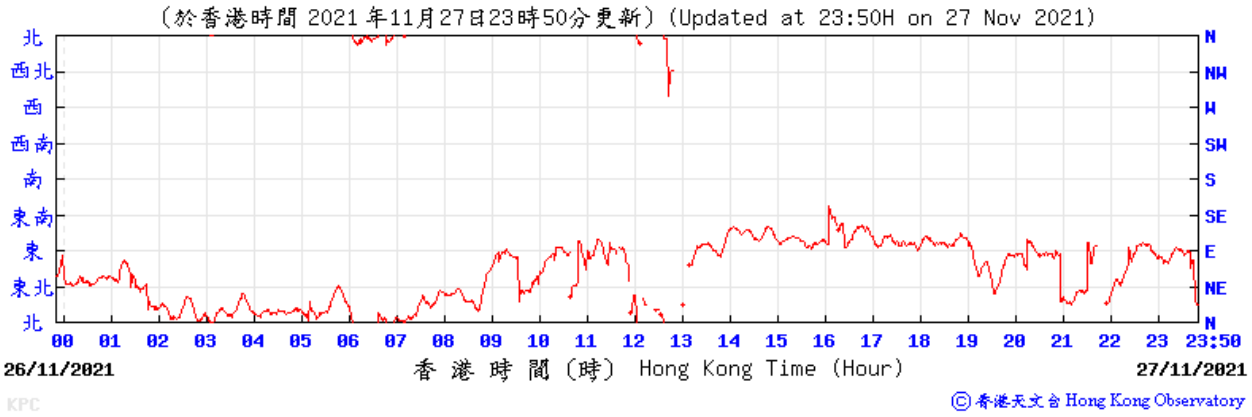
Wind Direction recorded at King's Park Meteorological Station on 23 November 2021



Wind Direction recorded at King's Park Meteorological Station on 26 November 2021



Wind Direction recorded at King's Park Meteorological Station on 27 November 2021



Appendix H

Construction Noise Monitoring Results

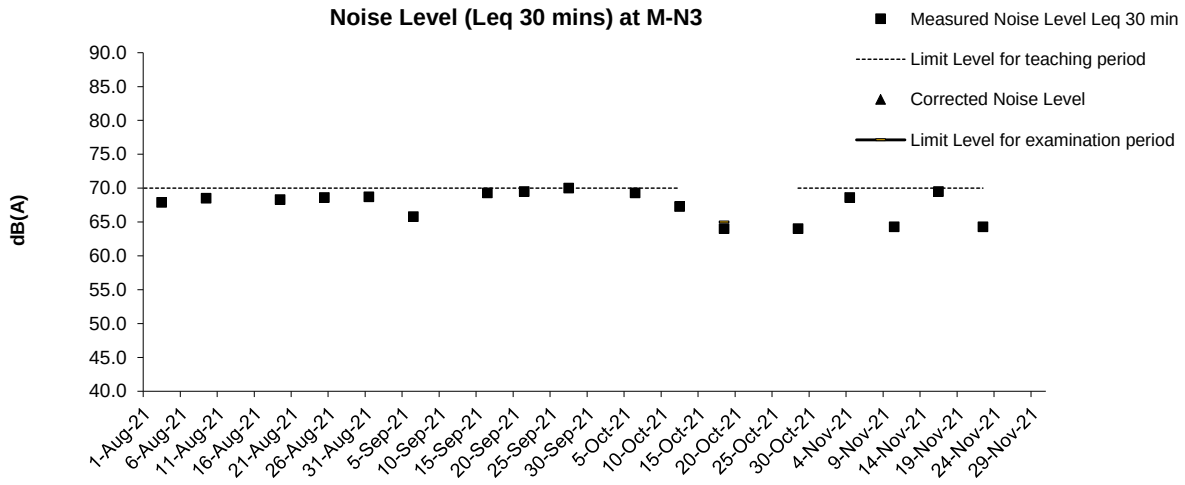
Noise Impact Monitoring Result for
Contract No. HY/2018/08 Central Kowloon Route – Central Tunnel

M-N3 - SKH Tsoi Kung Po Secondary School

Date	Start Time	Measured Noise Level Leq 30min dB(A)	Corrected Noise Level* dB(A)	Limit Level^	L10 dB(A)	L90 dB(A)	Wind Speed (m/s)	Weather
4-Nov-21	09:32	68.6	NA	70	71.0	62.0	3.3	Sunny
10-Nov-21	09:16	64.3	NA	70	67.5	55.5	2.5	Fine
16-Nov-21	13:24	69.5	NA	70	71.0	62.0	2.8	Fine
22-Nov-21	13:30	64.3	NA	70	64.5	56.5	0.0	Fine
	Max	69.5	NA					
	Min	64.3	NA					

Note:
Free field noise levels were adjusted with a correlation of +3 dB(A).

* Corrected Noise Level = 10* log(10^(Measured Noise Level/10) – 10^(Baseline Noise Level/10)); NA refers to Not Applied as the Measured Noise Level < Limit Level.



Remark: Corrected Noise Level = Measured Noise Level - Baseline Noise Level (i.e. 67.7 dB(A))

Appendix I

Event and Action Plan

Table I-1 Event and Action Plan for Construction Dust Monitoring

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

Table I-1 Event and Action Plan for Construction Dust Monitoring (Continued)

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

Table I-2 Event and Action Plan for Construction Noise Monitoring

EVENT	Action			
	ET	IEC	ER	Contractor
Exceedance of Action Level	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Notify IEC and Contractor; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness.	1.Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Exceedance of Limit Level	1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Table I-3 Event and Action Plan for Landscape and Visual during construction phase

EVENT	Action			
	ET	IEC	ER	Contractor
Non-conformity on one occasion	1. Identify source(s); 2. Inform the Contractor, IEC and ER; 3. Discuss remedial actions and preventive measures with IEC, ER and Contractor; 4. Monitor remedial action(s) and preventive measures until rectification has been completed.	1. Check inspection report; 2. Check Contractor's working method; 3. Discuss with ET, ER and Contractor on possible remedial measure(s) and preventive measure(s); 4. Advise ER on effectiveness of proposed remedial measure(s) and preventive measure(s); 5. Check implementation of proposed remedial measure(s) and preventive measure(s).	1. Confirm receipt of notification of non-conformity in writing; 2. Notify the Contractor; 3. Review and agree on the remedial measure(s) and preventive measures proposed by the Contractor; 4. Check implementation of remedial measure(s) and preventive measures.	1. Identify source and investigate the non-conformity; 2. Implement remedial measure(s) and preventive measure(s); 3. Amend working methods agreed with ER as appropriate; 4. Rectify damage and undertake any necessary replacement.
Repeat Non-conformity	1. Identify source(s); 2. Inform Contractor, IEC and ER; 3. Discuss inspection frequency; 4. Discuss remedial action(s) and preventive measures with IEC, ER and Contractor; 5. Monitor remedial action(s) and preventive measure(s) until rectification has been completed; 6. If non-conformity stops, cease any additional monitoring.	1. Check inspection report; 2. Check Contractor's working method; 3. Discuss with ET, ER and Contractor on possible remedial measure(s) and preventive measure(s) 4. Advise ER on effectiveness of proposed remedial measure(s) and preventive measures; 5. Supervise implementation of proposed remedial measure(s) and preventive measure(s).	1. Notify the Contractor; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measure(s) and preventive; measure(s) to be implemented; 3. Supervise implementation of remedial measure(s) and preventive measure(s).	1. Identify source and investigate the non-conformity; 2. Implement remedial measure(s) and preventive measure(s); 3. Amend working methods agreed with ER as appropriate; 4. Rectify damage and undertake any necessary replacement. Stop relevant portion of works as determined by ER until the non-conformity is abated.

Appendix J

Implementation Status of Environment Mitigation Measures (Construction Phase)

Implement Status of Environment Mitigation Measures (Construction Phase)

EIA Ref	EM&A Log Ref	Recommended Environmental Protection Measures/ Mitigation Measures	Implementation Status
Air Quality			
S4.3.10	D1	- The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Implemented
S4.3.10	D2	- Mitigation measures in form of regular watering under a good site practice should be adopted. Watering once per hour on exposed worksites and haul road should be conducted to achieve dust removal efficiencies of 91.7%. While the above watering frequencies are to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.3 L/m^2 to achieve the dust removal efficiency.	Implemented
S4.3.10	D3	- 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;	Implemented
		- Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;	Implemented
		- A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones;	Implemented
		- 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;	Implemented
		- 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;	Partially Implemented
		- When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided and properly maintained as far as practicable along the site boundary with provision for public crossing;	Implemented
		- 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;	Implemented
		- 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;	Implemented

EIA Ref	EM&A Log Ref	Recommended Environmental Protection Measures/ Mitigation Measures	Implementation Status
		- 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	Implemented
S4.3.10	D3	- 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;	N.O.
		- Any skip hoist for material transport should be totally enclosed by impervious sheeting;	Implemented
		- 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 and the 3 sides;	Implemented
		- 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;	N.O.
		- 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	N.O.
		- Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.	N.O.
Noise (Airborne)			
S5.4.1	N1	- Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme;	Implemented
		- 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;	Implemented
		- Plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs;	Implemented
		- Silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works;	N.O.
		- Mobile plant should be sited as far away from NSRs as possible and practicable;	Implemented