<u>Vol. 2 of 5</u>

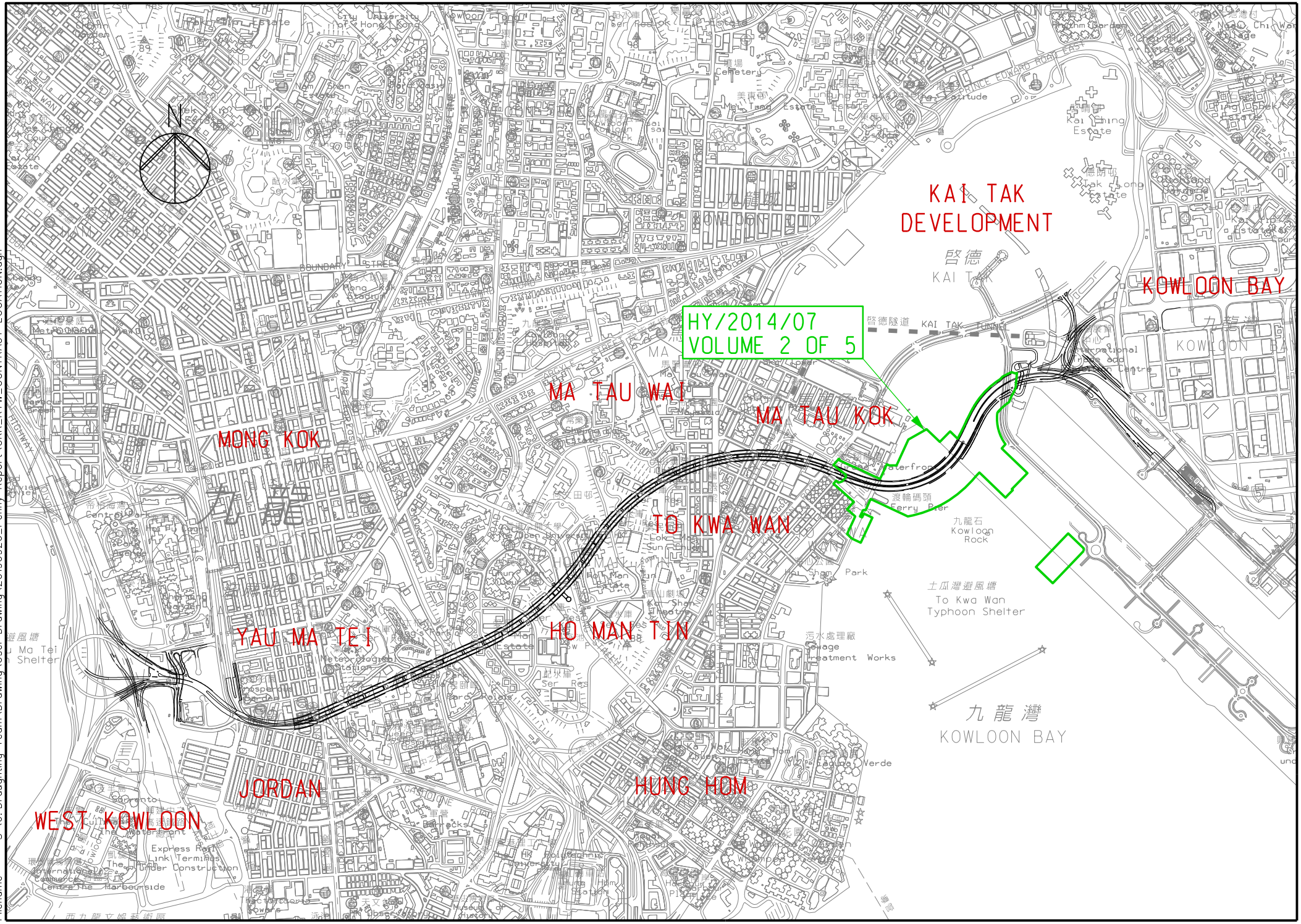
FEP-01/457/2013/C

Central Kowloon Route

Kai Tak West

Contract No. HY/2014/07

January 2020



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

ERM

Environmental Permit No. EP-457/2013/C

Central Kowloon Route

Independent Environmental Checker Verification

Works Contract:	**Kai Tak West (HY/2014/07)**

Reference Document/Plan

Document/~~Plan~~ to be ~~Certified~~/ Verified:	Monthly EM&A Report No.22 (January 2020)
Date of Report:	11 February 2020 (Rev. 1)
Date received by IEC:	11 February 2020

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/C and FEP-01/457/2013/C.

Mandy To

Ms Mandy To Date: 11 February 2020

Independent Environmental Checker

Our ref: 0436942_IEC Verification Cert_KTW_Monthly EM&A Rpt No.22.docx

AECOM

Gammon Construction Limited

Central Kowloon Route

Works Contract HY/2014/07 – Central Kowloon Route – Kai Tak West

Monthly EM&A Report for January 2020

[February 2020]

	Name	Signature
Prepared & Checked:	Ray Cheng	
Reviewed, Approved & Certified:	Y T Tang	

Version: 0	Date: 11 February 2020

Disclaimer

This Environmental Monitoring and Audit Report is prepared for Gammon Construction Limited and is given for its sole benefit in relation to and pursuant to Contract HY/2014/07 and may not be disclosed to, quoted to or relied upon by any person other than Gammon Construction Limited without our prior written consent. No person (other than Gammon Construction Limited into whose possession a copy of this report comes may rely on this plan without our express written consent and Gammon Construction Limited may not rely on it for any purpose other than as described above.

AECOM Asia Co. Ltd.
15/F, Grand Central Plaza, Tower 1, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong
Tel: (852) 3922 9000 Fax: (852) 2317 7609 www.aecom.com

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EXECUTIVE SUMMARY

Central Kowloon Route – Kai Tak West (CKR-KTW; Contract No. HY/2014/07) (hereafter called "the Project") covers part of the construction of the Central Kowloon Route (CKR).

The Project comprises the follow works:

- 50x30m access shaft with noise enclosure at Ma Tau Kok (MTK);
- 100m long cut-and-cover (C&C) tunnel at MTK;
- Demolition and re-provisioning of MTK Public Pier;
- 160m long underwater tunnel (UWT) (Stage 1);
- 210m long UWT (Stage 2);
- 60m long C&C tunnel at Kai Tak;
- 130m long depressed road and 200m long underpass at Kai Tak;
- 390m long underground tunnel ventilation adit at Kai Tak;
- Seawall demolition and construction of new landing steps; and
- Barging Point enclosure and conveyor system.

The EM&A programme commenced on 4 April 2018.The impact EM&A for the Project includes air quality and noise monitoring.

This is the twenty-second monthly EM&A Report presenting the EM&A works carried out during the period between 1 and 31 January 2020. As informed by the Contractor, major activities in the reporting period were:

Locations	Site Activities
Kai Tak	• Excavation and ELS installation at cut & cover tunnel, depressed road and underpass; • Temporary working platform installation at underpass and depress road; • Construction of New Right of Way; • Temporary Grouting
Ma Tau Kok	• TTM implementation; • Pipe piling works for cut and cover tunnel; • Soft Excavation and Rock Excavation; • ELS installation & decking works for access shaft; • Existing drainage diversion works; • Caping Construction at Landing Step
Kowloon Bay	• Excavation for Stage 1 underwater tunnel; • Dewatering well and observation well installation; • S1 Truss fabrication and installation; • Temporary Grouting; • Pumping Test
Barging Point	• Barging point operation (Spoil Disposal)

Breaches of Action and Limit Levels for Air Quality

All 24-hour TSP result was below the Action and Limit Levels at all monitoring locations in the reporting month.

All 1-hour TSP result was below the Action and Limit Levels at all monitoring locations in the reporting month.

Breaches of Action and Limit Levels for Noise

Regular Noise Monitoring

One (1) noise and air related complaint was received in the reporting month. Based on the investigation result, the noise nuisance from the construction site was minimized with the proper implementation of mitigation measures. Therefore, one action level of noise was triggered, and the investigation report was finalized on 22 January 2020.

No exceedance of Limit Level of noise was recorded in the reporting month.

Complaint, Notification of Summons and Successful Prosecution

One (1) complaints (received by Gammon Construction Limited on 9 January 2020) were referred by the Contractor on 10 January 2020, the investigation report was finalized on 22 January 2020.

No notification of summons and successful prosecution were received in the reporting month.

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

Key issues to be considered in the next three months included:

Locations	Site Activities
Kai Tak	• Base slab and wall construction at underpass, • Excavation and ELS installation at cut & cover tunnel, depressed road and underpass • Temporary Grouting • Backfilling works and ELS removal at Underpass
Ma Tau Kok	• TTM implementation, • Soft and rock excavation, • ELS installation for access shaft • Pipe piling works for cut and cover tunnel • Existing drainage diversion works, • Fresh water pipe installation works, • Caping construction at Landing Step • Cover walkway construction at Landing Step
Kowloon Bay	• Excavation for stage 1 underwater tunnel, • ELS installation, • Dewatering well and observation well installation • Temporary Grouting • Pumping Test
Barging Point	• Barging point operation (Spoil Disposal)

Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, water pollution control, and waste management.

1 INTRODUCTION

Gammon Construction Limited was commissioned by the Highways Department as the Civil Contractor for Works Contract HY/2014/07. AECOM Asia Company Limited (AECOM) was appointed by Gammon Construction Limited as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Project.

1.1 Purpose of the Report

1.1.1 This is the twenty-second monthly EM&A Report which summarizes the impact monitoring results and audit findings for the Project during the reporting period between 1 and 31 January 2020.

1.2 Report Structure

1.2.1 This monthly EM&A Report is organized as follows:

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Environmental Monitoring Requirement
- Section 4: Implementation Status of Environmental Mitigation Measures
- Section 5: Monitoring Results
- Section 6: Environmental Site Inspection and Audit
- Section 7: Environmental Non-conformance
- Section 8: Future Key Issues
- Section 9: Conclusions and Recommendations

2 PROJECT INFORMATION

2.1 Background

2.1.1 CKR is a dual 3-lane trunk road across central Kowloon linking the West Kowloon in the west and the Kai Tak Development (KTD) in the east. The CKR will be about 4.7 km long with an underground tunnel section of about 3.9 km long, in particular, there will be an underwater tunnel of about 370 m long in Kowloon Bay to the north of the To Kwa Wan Typhoon Shelter. It will connect the West Kowloon Highway at Yau Ma Tei Interchange with the road network at Kowloon Bay and the future Trunk Road T2 at KTD which will connect to the future Tseung Kwan O – Lam Tin Tunnel (TKO-LTT) and Cross Bay Link (CBL). CKR, Trunk Road T2 and TKO-LTT will form a strategic highway link, namely Route 6, connecting West Kowloon and Tseung Kwan O. In addition, 3 ventilation buildings, which will be located in Ya Ma Tei, Ho Man Tin and ex-Kai Tak airport area, are proposed to ensure acceptable air quality within the tunnel.

2.1.2 The Environmental Impact Assessment (EIA) Report for Central Kowloon Route (Register No.: AEIAR-171/2013) was approved on 11 July 2013 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) for CKR was granted on 9 August 2013 (EP No.: EP- 457/2013) for the construction and operation. Variation of EP (VEP) was subsequently applied and the latest EP (EP No. EP-457/2013/C) was issued by the Director of Environmental Protection (DEP) on 16 January 2017. Further Environmental Permit (EP No. FEP-01/457/2013/C) for CKR – Kai Tak West was issued on 28 February 2018.

2.1.3 The construction of the CKR had been divided into different sections. This Work Contract HY/2014/07 – Kai Tak West (KTW) ("The Project") will include a road which is a trunk road, including new roads, and major extensions or improvements to existing roads; a road fully enclosed by decking above and by structure on the sides for more than 100 m; and reclamation works (including associated dredging works) more than 1 ha in size and a boundary of which is less than 100 m from an existing residential area.

2.1.4 The site layout plan of the Project is shown in **Figure 1.1**.

2.2 Site Description

2.2.1 The major construction activities under this Project include:

(a) construction of approximately 160m long cut-and-cover tunnel and 370m long underwater tunnel between the tunnel section at Ma Tau Kok and the depressed road of the CKR within Kai Tak Development;
(b) reconstruction of the seawall at Ma Tau Kok public pier, and the sloping seawall at the Former Kai Tak Airport Runway;
(c) construction of approximately 125m long depressed road and 200m long underpass of the CKR within Kai Tak Development;
(d) construction of approximately 360m long underground tunnel ventilation adit of the CKR;
(e) reconstruction of Kowloon City Ferry Pier Public Transport Interchange; and
(f) other associated works.

2.3 Construction Programme and Activities

2.3.1 The major construction activities undertaken in the reporting month are summarized in **Table 2.1**.

Table 2.1 Construction Activities in the reporting month

Locations	Site Activities
Kai Tak	• Excavation and ELS installation at cut & cover tunnel, depressed road and underpass; • Temporary working platform installation at underpass and depress road; • Construction of New Right of Way; • Temporary Grouting
Ma Tau Kok	• TTM implementation; • Pipe piling works for cut and cover tunnel; • Soft Excavation and Rock Excavation; • ELS installation & decking works for access shaft; • Existing drainage diversion works; • Caping Construction at Landing Step
Kowloon Bay	• Excavation for Stage 1 underwater tunnel; • Dewatering well and observation well installation; • S1 Truss fabrication and installation; • Temporary Grouting; • Pumping Test
Barging Point	• Barging point operation (Spoil Disposal)

2.3.2 The construction programme is presented in **Appendix A**.

2.4 Project Organization

2.4.1 The project organization structure is shown in **Appendix B**. The key personnel contact names and numbers for the Project are summarized in **Table 2.2.**

Table 2.2 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
Arup-Mott MacDonald Joint Venture	Residential Engineer (ER)	Engineer's Representative	Mr. Jeffrey Lau	2268 3640	2268 3954
ERM	Independent Environmental Checker (IEC)	Independent Environmental Checker	Ms. Mandy To	2271 3313	2723 5660
Gammon	Contractor	Contracts Manager	Mr. Alan Yan	2516 8823	2516 6260
		Environmental Manager	Ms Michelle Tang	9267 8866	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y T Tang	3922 9392	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

2.5.1 Relevant environmental licenses, permits and/or notifications on environmental protection for this Project and valid in the reporting month are summarized in **Table 2.3**.

Table 2.3 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Further Environmental Permit				
FEP-01/457/2013/C	28 Feb 2018	End of Project	Valid	--
Wastewater Discharge License				
WT00030290-2018	22 Mar 2018	31 May 2023	Valid	Ma Tau Kok
WT00030668-2018	27 Apr 2018	30 Apr 2023	Valid	Site Office at Kai Tak West
WT00030358-2018	27 Apr 2018	30 Apr 2023	Valid	Kai Tak West
WT00030333-2018	27 Apr 2018	30 Apr 2023	Valid	Barging Point at Portions 4B & 4C
WT00030330-2018	27 Apr 2018	30 Apr 2023	Valid	Kowloon Bay
Construction Noise Permit				
GW-RE0632-19	27 Aug 2019	26 Feb 2020	Valid	Barging Point Operation at Kai Tak Barging Point
GW-RE1013-19	17 Dec 2019	14 Apr 2020	Valid	Rock Breaking at Ma Tau Kok
GW-RE0986-19	6 Dec 2019	1 Jun 2020	Valid	General Works at Kai Tak
GW-RE1012-19	17 Dec 2019	12 Jun 2020	Valid	Welding and backfilling at Stage 1 Underwater Tunnel
Chemical Waste Producer Registration				
5118-247-G2347-47	30 Jan 2018	End of Project	Valid	--
5118-247-G2347-48	30 Jan 2018	End of Project	Valid	--
Marine Dumping Permit				
EP/MD/20-048	16 Oct 2019	15 Apr 2020	Valid	Sediments requiring Type 1 - Open Sea Disposal
EP/MD/20-092	3 Jan 2020	2 Feb 2020	Valid on 3 Jan 2020	Sediments requiring Type 1 (Dedicated Site) and Type 2 Confined Marine Disposal
Billing Account for Construction Waste Disposal				
7029909	22 Jan 2018	End of Project	Account Active	--
7031949	14 Oct 2019	14 Jan 2020	Account Active	Billing Account for Disposal of Construction Waste (by vessels)
Notification Under Air Pollution Control (Construction Dust) Regulation				
429442	5 Jan 2018	5 Jul 2025	Notified	--

3 ENVIRONMENTAL MONITORING REQUIREMENTS

3.1 Construction Dust Monitoring

Monitoring Requirements

3.1.1 In accordance with the approved EM&A Manual, measurement of 24-hour and 1-hour Total Suspended Particulates (TSP) level at the designated air quality monitoring station is required. 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 while the highest dust impact is expected. The Action and Limit Levels of the air quality monitoring is provided in **Appendix D**.

Monitoring Equipment

3.1.2 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at the designated monitoring station. The HVS meets all the requirements of the EM&A Manual.

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

3.1.4 Brand and model of the equipment is given in **Table 3.1**.

Table 3.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
High Volume Sampler (24-hour TSP)	Tisch Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. TE-5170)
Portable direct reading dust meter (1-hour TSP)	Sibata Digital Dust Monitor (Model No. LD-3)

Monitoring Locations

3.1.5 The monitoring station for construction dust monitoring pertinent to the Project has been identified based on the approved EM&A Manual for the Project. The location of the construction dust monitoring station is summarized in **Table 3.2** and shown in **Figure 3.1**.

Table 3.2 Location of Construction Dust Monitoring Station

Location	Monitoring Station	Description
E-A14a [1]	Block B of Merit Industrial Centre	Rooftop (13/F)

Note:
[1] The air monitoring station proposed in the EM&A Manual (i.e. Wyler Gardens with ID: E-A14) was not available for impact dust monitoring, therefore impact monitoring was conducted at E-A14a as an alternative which was agreed by the ER, IEC and EPD.

Monitoring Methodology

3.1.6 24-hour TSP Monitoring

(a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS as far as practicable: -

(i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
(ii) Two samplers should not be placed less than 2m apart from each other;
(iii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
(iv) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
(v) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
(vi) No furnace or incinerator flues nearby.
(vii) Airflow around the sampler was unrestricted.
(viii) The sampler was located more than 20 meters from any dripline.

(ix) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
(x) Permission was obtained to set up the samplers and access to the monitoring station.
(xi) A secured supply of electricity was obtained to operate the sampler.

(b) Preparation of Filter Papers

(i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
(ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±5%. A convenient working RH was 40%.
(iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.

(c) Field Monitoring

(i) The power supply was checked to ensure the HVS works properly.
(ii) The filter holder and the area surrounding the filter were cleaned.
(iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
(iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
(v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
(vi) Then the shelter lid was closed and was secured with the aluminium strip.
(vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
(viii) A new flow rate record sheet was set into the flow recorder.
(ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.3 m^3/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m^3/min).
(x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
(xi) The initial elapsed time was recorded.
(xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
(xiii) The final elapsed time was recorded.
(xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
(xv) It was then placed in a clean envelope and sealed.
(xvi) All monitoring information was recorded on a standard data sheet.
(xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.

(d) Maintenance and Calibration

(i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
(ii) HVSs were calibrated using TE-5025A Calibration Kit upon installation and thereafter at bi-monthly intervals.
(iii) Calibration certificate of the TE-5025A Calibration Kit and the HVSs are provided in **Appendix E**.

3.1.7 1-hour TSP Monitoring

(a) Measuring Procedures

The measuring procedures of the 1-hour dust meter are in accordance with the Manufacturer's Instruction Manual as follows:

(i) Turn the power on.
(ii) Close the air collecting opening cover.

(iii) Push the “TIME SETTING” switch to [BG]
(iv) Push “START/STOP” switch to perform background measurement for 6 seconds.
(v) Turn the knob at SENSI ADJ position to insert the light scattering plate.
(vi) Leave the equipment for 1 minute upon “SPAN CHECK” is indicated in the display.
(vii) Push “START/STOP” switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
(viii) Pull out the knob and return it to MEASURE position.
(ix) Push the “TIME SETTING” switch the time set in the display to 3 hours.
(x) Lower down the air collection opening cover.
(xi) Push “START/STOP” switch to start measurement.

(b) Maintenance and Calibration

(i) The 1-hour TSP meter was calibrated at 1-year intervals against a continuous particulate TEOM Monitor, Series 1400ab. Calibration certificates of the Laser Dust Monitors are provided in **Appendix E**.

Monitoring Schedule for the Reporting Month

3.1.8 The schedule for environmental monitoring in January 2020 is provided in **Appendix F**.

3.2 Construction Noise Monitoring

Monitoring Requirements

3.2.1 In accordance with the EM&A Manual, impact noise monitoring should be conducted for at least once a week during the construction phase of the Project. **Table 3.3** summarizes the monitoring parameters, frequency and duration of impact noise monitoring. The Action and Limit Levels of the noise monitoring is provided in **Appendix D**.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Parameter and Duration	Frequency
30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays. L_{eq}, L_{10} and L_{90} would be recorded.	At least once per week

Monitoring Equipment

3.2.2 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 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. Brand and model of the equipment is given in **Table 3.4**.

Table 3.4 Noise Monitoring Equipment for Regular Noise Monitoring

Equipment	Brand and Model
Integrated Sound Level Meter	B&K (Model No. 2238)
Acoustic Calibrator	B&K (Model No. 4231)

Monitoring Locations

3.2.3 The monitoring stations for construction noise monitoring pertinent to the Project have been identified based on the approved EM&A Manual for the Project. Locations of the noise monitoring stations are summarized in **Table 3.5** and shown in **Figure 3.2**.

Table 3.5 Noise Monitoring Stations during Construction Phase

Location	Monitoring Station	Description	Measurement
E-N12a [1]	19 Hing Yan Street	Rooftop (9/F)	Façade
E-N21a [1]	Block B of Merit Industrial Centre	Rooftop (13/F)	Free field [2]

Notes:
[1] The noise monitoring stations proposed in the EM&A Manual (i.e. Grand Waterfront Tower 3 with ID: E-N12 and Hang Chien Court Block J with ID: E-N21) were not available for impact noise monitoring, therefore impact monitoring was conducted at E-N12a and E-N21a as an alternative which was agreed by the ER, IEC and EPD.
[2] A correction of +3 dB(A) was made to the free field measurements.

Monitoring Parameters, Frequency and Duration

3.2.4 **Table 3.6** summarizes the monitoring parameters, frequency and duration of impact noise monitoring.

Table 3.6 Noise Monitoring Parameters, Frequency and Duration

Location	Parameter and Duration	Frequency
E-N12a and E-N21a	30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays. L_{eq}, L_{10} and L_{90} would be recorded.	At least once per week

Monitoring Methodology

3.2.5 Monitoring Procedure

(a) The sound level meter was set on a tripod at a height of 1.2 m above the ground.
(b) Façade measurement was made at E-N12a.
(c) Free field measurements was made at monitoring location E-N21a. A correction of +3 dB(A) shall be made to the free field measurements.
(d) The battery condition was checked to ensure the correct functioning of the meter.
(e) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  (i) frequency weighting: A
  (ii) time weighting: Fast
  (iii) time measurement: $L_{eq(30\text{-}minutes)}$ during non-restricted hours i.e. 0700 – 1900 on normal weekdays.
(f) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94 dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
(g) During the monitoring period, the L_{eq}, L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
(h) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.
(i) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s.

3.2.6 Maintenance and Calibration

(a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.
(b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
(c) Calibration certificates of the sound level meters and acoustic calibrators are provided in **Appendix E**.

Monitoring Schedule for the Reporting Month

3.2.7 The schedule for environmental monitoring in January 2020 is provided in **Appendix F**.

3.3 Landscape and Visual

3.3.1 As per the EM&A Manuals, 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 6.**

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

4.1.1 The Contractor has 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 C.** Status of required submissions under the EP during the reporting period is summarised in **Table 4.1**.

Table 4.1 Status of Required Submission under Environmental Permit

EP Condition	Submission	Submission Date
Condition 3.4 of EP- 457/2013/C and Condition 3.4 of FEP-01/457/2013/C	Monthly EM&A Report for December 2019	14 January 2020

5 MONITORING RESULTS

5.1 Construction Dust Monitoring

5.1.1 The monitoring results for 24-hour TSP and 1-hour TSP are summarized in **Table 5.1** and **Table 5.2** respectively. Detailed air quality monitoring results and daily extract of meteorological observations are presented in **Appendix G**.

Table 5.1 Summary of 24-hour TSP Monitoring Result in the Reporting Period

ID	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
E-A14a	46.4	23.7 – 65.9	197.3	260

Table 5.2 Summary of 1-hour TSP Monitoring Result in the Reporting Period

ID	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
E-A14a	63.0	58.5 – 67.9	302.4	500

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

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

5.1.4 The event and action plan is annexed in **Appendix I**.

5.1.5 Major dust sources during the monitoring included construction dust and nearby traffic emission.

5.2 Regular Construction Noise Monitoring

5.2.1 The monitoring results for noise are summarized in **Table 5.3** and the monitoring data is provided in **Appendix H**.

Table 5.3 Summary of Construction Noise Monitoring Results in the Reporting Period

ID	Range, dB(A), $L_{eq\ (30\ mins)}$	Limit Level, dB(A), $L_{eq\ (30\ mins)}$
E-N12a	61.5 – 65.8	75
E-N21a	62.3 – 63.9	75

5.2.2 One (1) noise and air related complaint was received in the reporting month. Based on the investigation result, the noise nuisance from the construction site was minimized with the proper implementation of mitigation measures. Therefore, one action level of noise was triggered, and the investigation report was finalized on 22 January 2020.

5.2.3 No Limit Level exceedance of noise was recorded at the monitoring station in the reporting month.

5.2.4 The event and action plan is annexed in **Appendix I**.

5.2.5 Major noise sources during the monitoring included construction noise from the Project site and nearby traffic noise.

5.3 Waste Management

5.3.1 C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.

5.3.2 According to the Contractor's information, the concerned soil, which assessed under the updated Supplementary Contamination Assessment Report, had been excavated in August 2019. In order to minimize the potentially adverse environmental impacts arising for the handling of potentially contaminated materials, the following environmental mitigation measures are proposed during the course soil excavation, stockpiling and backfilling works:

- Excavation profiles must be properly designed and executed.
- Stockpiling site(s) shall be lined with impermeable sheeting and bunded. Stockpiles shall be fully covered by impermeable sheeting to reduce dust emission.
- Excavation and stockpiling should be carried out during dry season as far as possible to minimise potentially contaminated runoffs from the Concerned Soil.
- Regular site audit will be conducted under the Environmental Monitoring and Audit (EM&A) programme to ensure the soil excavation, stockpiling and backfilling works are carried out in accordance with this report. Findings of the site audit will be presented in **Table 6.1**.
- The truck transferring Concerned Soil shall be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the truck.

5.3.3 As advised by the Contractor, Total 35,402 m^3 of inert C&D material was generated, 31 m^3 inert C&D material was disposed at the Public Fills, 35,371 m^3 was reused in other contract in the reporting month. 21,510 kg general refuse was generated and sent to NENT Landfill in the reporting month. 180 kg of paper/cardboard packaging, no metals, plastics were collected by recycle contractor in the reporting month. No chemical waste was collected by licensed contractor in the reporting period. 309 m^3 of Type 2, no Type 1 and Type 3 Marine sediment were disposed at Confined Marine Disposal Facility to the East of Sha Chau. The waste flow table is annexed in **Appendix K**.

5.3.4 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

5.3.5 The Contractor is 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 Practise on the Packaging, Labelling and Storage of Chemical Wastes.

5.4 Landscape and Visual

5.4.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 2, 15 and 29 January 2020. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

6.1.1 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 schedule is provided in **Appendix C**.

6.1.2 In the reporting month, 5 site inspections were carried out on 2, 8, 15, 22 and 29 January 2020. Joint inspections with the IEC, ER, the Contractor and the ET were conducted on 15 January 2020. In addition, no joint inspection with EPD, ER and the Contractor was conducted in January 2020 to check the compliance of the dumping permit condition. No non-compliance was recorded during the site inspection. Details of observations recorded during the site inspections are presented in **Table 6.1.**

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	2 January 2020	Reminder: • The Contractor was reminded to improve the coverage of the stockpile at Kai Tak for dust suppression.	The item was rectified by the Contractor on 6 Jan 2020.
	15 January 2020	Reminder: • The Contractor was reminded to affix the proper NRMM label for drill rig after the routine check at Ma Tau Kok.	The item was rectified by the Contractor on 16 Jan 2020.
Noise	Nil	Nil	Nil
Water Quality	2 January 2020	Reminder: • The Contractor was reminded to erect the bunding along site boundary of Landing Step Area to prevent muddy water seepage run out from site.	The item was rectified by the Contractor on 6 Jan 2020.
	22 January 2020	• Chemicals were observed stored without drip tray at Ma Tau Kok and underpass of the Kai Tak. The Contractor was reminded to provide the drip tray for chemicals to prevent accidental spillage.	The item was rectified by the Contractor on 29 Jan 2020.
	29 January 2020	• Oil stain was observed near the uninstall breaker's head at Ma Tau Kok. The Contractor was reminded to clean up the oil stain in timely manner.	This item will be followed up in next reporting period.
		• Oil drum was observed stored without secondary containment for accidental spillage prevention at Access Shaft of Kai Tak. The Contractor was reminded to provide the secondary containment for oil drum.	This item will be followed up in next reporting period.
Waste/ Chemical Management	22 January 2020	• General refuse was accumulated at Landing Step. The Contractor was reminded to remove the general refuse regularly to avoid accumulation.	The item was rectified by the Contractor on 24 January 2020.
Land Contamination	Nil	Nil	Nil
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	Nil	Nil	Nil

6.1.3 No follow up action was requested by ET during the site inspection on 8 January 2020.

6.1.4 Most of follow-up actions requested by Contractor's ET and IEC during the site inspection were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period. No follow-up action requested by EPD during the site inspection in the reporting month.

6.2 Summary of Monitoring Exceedances

6.2.1 All 24-hour TSP result was below the Action and Limit Levels at all monitoring locations in the reporting month.

6.2.2 All 1-hour TSP result was below the Action and Limit Levels at all monitoring locations in the reporting month.

6.2.3 One (1) noise and air related complaint was received in the reporting month. Based on the investigation result, the noise nuisance from the construction site was minimized with the proper implementation of mitigation measures. Therefore, one action level of noise was triggered, and the investigation report was finalized on 22 January 2020.

6.2.4 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

6.3 Summary of Environmental Non-Compliance

6.3.1 No environmental non-compliance was recorded in the reporting month.

6.4 Summary of Environmental Complaints

6.4.1 One (1) complaints (received by Gammon Construction Limited on 9 January 2020) were referred by the Contractor on 10 January 2020, the investigation report was finalized on 22 January 2020. Cumulative statistics on notification of summons and successful prosecutions is provided in **Appendix J.**

6.5 Summary of Environmental Summon and Successful Prosecutions

6.5.1 No environmental related prosecution or notification of summons was received in the reporting month. Cumulative statistics on notification of summons and successful prosecutions is provided in **Appendix J**.

7 FUTURE KEY ISSUES

7.1 Construction Programme for the Next Three Month

7.1.1 The major construction works between February and April 2020 is provided in **Table 7.1**.

Table 7.1 Construction Activities in the coming three months

Locations	Site Activities
Kai Tak	• Base slab and wall construction at underpass, • Excavation and ELS installation at cut & cover tunnel, depressed road and underpass • Temporary Grouting • Backfilling works and ELS removal at Underpass
Ma Tau Kok	• TTM implementation, • Soft and rock excavation, • ELS installation for access shaft • Pipe piling works for cut and cover tunnel • Existing drainage diversion works, • Fresh water pipe installation works, • Caping construction at Landing Step • Cover walkway construction at Landing Step
Kowloon Bay	• Excavation for stage 1 underwater tunnel, • ELS installation, • Dewatering well and observation well installation • Temporary Grouting • Pumping Test
Barging Point	• Barging point operation (Spoil Disposal)

7.2 Key Issues for the Coming Month

7.2.1 Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, and waste management.

7.3 Monitoring Schedule for the Coming Month

7.3.1 The tentative schedule for environmental monitoring in February 2020 is provided in **Appendix F**.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

8.1.1 24-hour TSP and noise monitoring were carried out in the reporting month.

8.1.2 All 24-hour TSP monitoring results complied with the Action / Limit Level at in the reporting month.

8.1.3 All 1-hour TSP result was below the Action and Limit Levels at all monitoring locations in the reporting month.

8.1.4 One (1) noise and air related complaint was received in the reporting month. Based on the investigation result, the noise nuisance from the construction site was minimized with the proper implementation of mitigation measures. Therefore, one action level of noise was triggered, and the investigation report was finalized on 22 January 2020.

8.1.5 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

8.1.6 5 nos. of environmental site inspections and no site inspections with EPD were carried out in January 2020. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.

8.1.7 One (1) complaints (received by Gammon Construction Limited on 9 January 2020) were referred by the Contractor on 10 January 2020, the investigation report was finalized on 22 January 2020.

8.1.8 No notification of summons and successful prosecution were received in the reporting month.

8.2 Recommendations

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

<u>Air Quality Impact</u>

- The Contractor was reminded to improve the coverage of the stockpile for dust suppression .
- The Contractor was reminded to affix the proper NRMM label for drill rig after the routine check .

<u>Construction Noise Impact</u>

- No specific observation was identified in the reporting month.

<u>Water Quality Impact</u>

- The Contractor was reminded to erect the bunding along site boundary to prevent muddy water seepage run out from site.
- The Contractor was reminded to provide the drip tray for chemicals and oil drum to prevent accidental spillage.
- The Contractor was reminded to clean up the oil stain in timely manner.

<u>Chemical and Waste Management</u>

- The Contractor was reminded to remove the general refuse regularly to avoid accumulation.

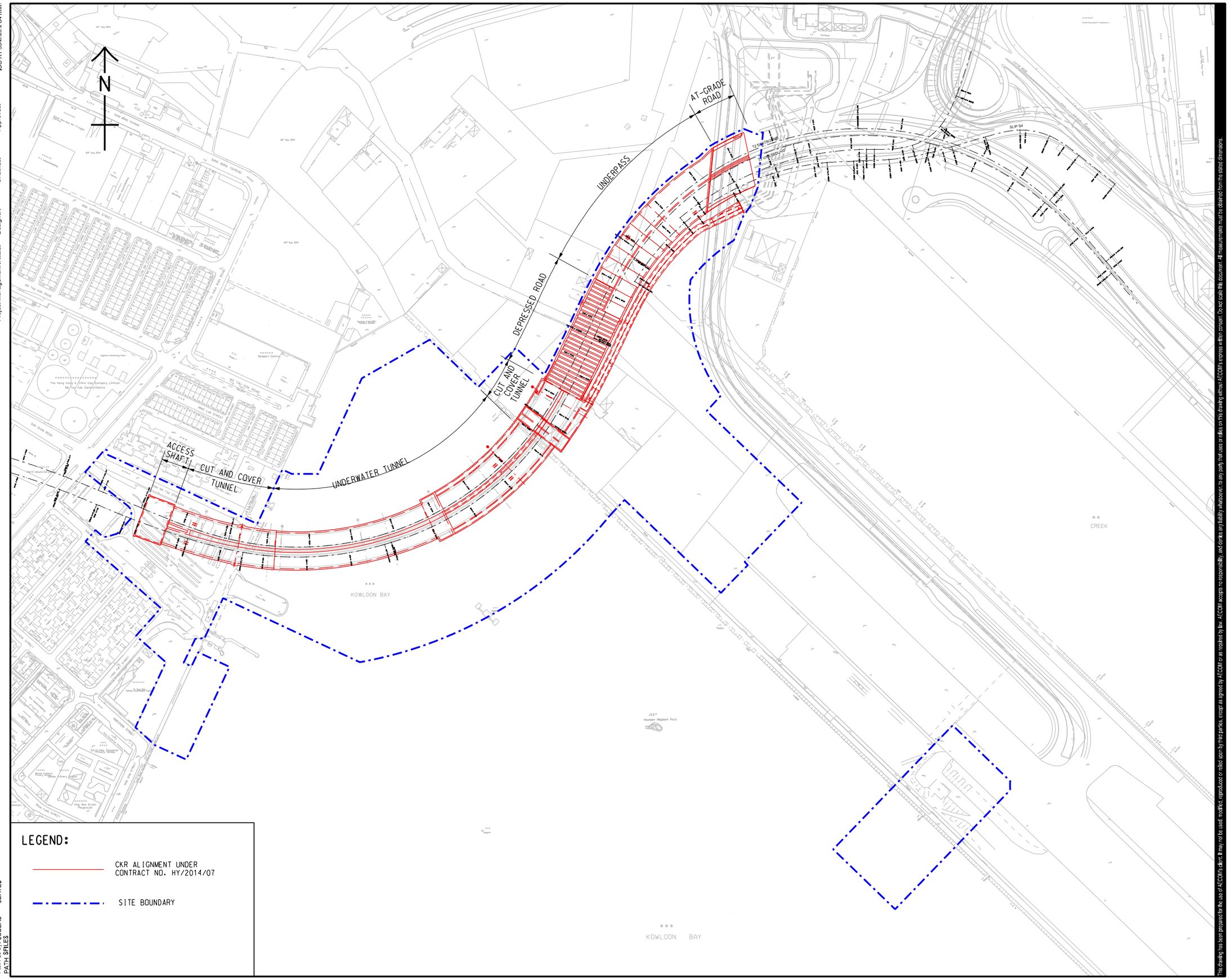
<u>Landscape & Visual Impact</u>

- No specific observation was identified in the reporting month.

Permits/licenses

- No specific observation was identified in the reporting month.

FIGURES



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CONTRACT NO. HY/2014/07 CENTRAL KOWLOON ROUTE - KAI TAK WEST

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業主

GAMMON CONSTRUCTION LIMITED

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
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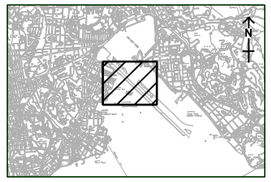
I/R 修訂	DATE 日期	DESCRIPTION 內容概述	CHK. 審核

STATUS
狀況

SCALE 比例: A3 1 : 4000

DIMENSION UNIT 尺寸單位: METRES 米

KEY PLAN
索引圖



PROJECT NO. 項目編號

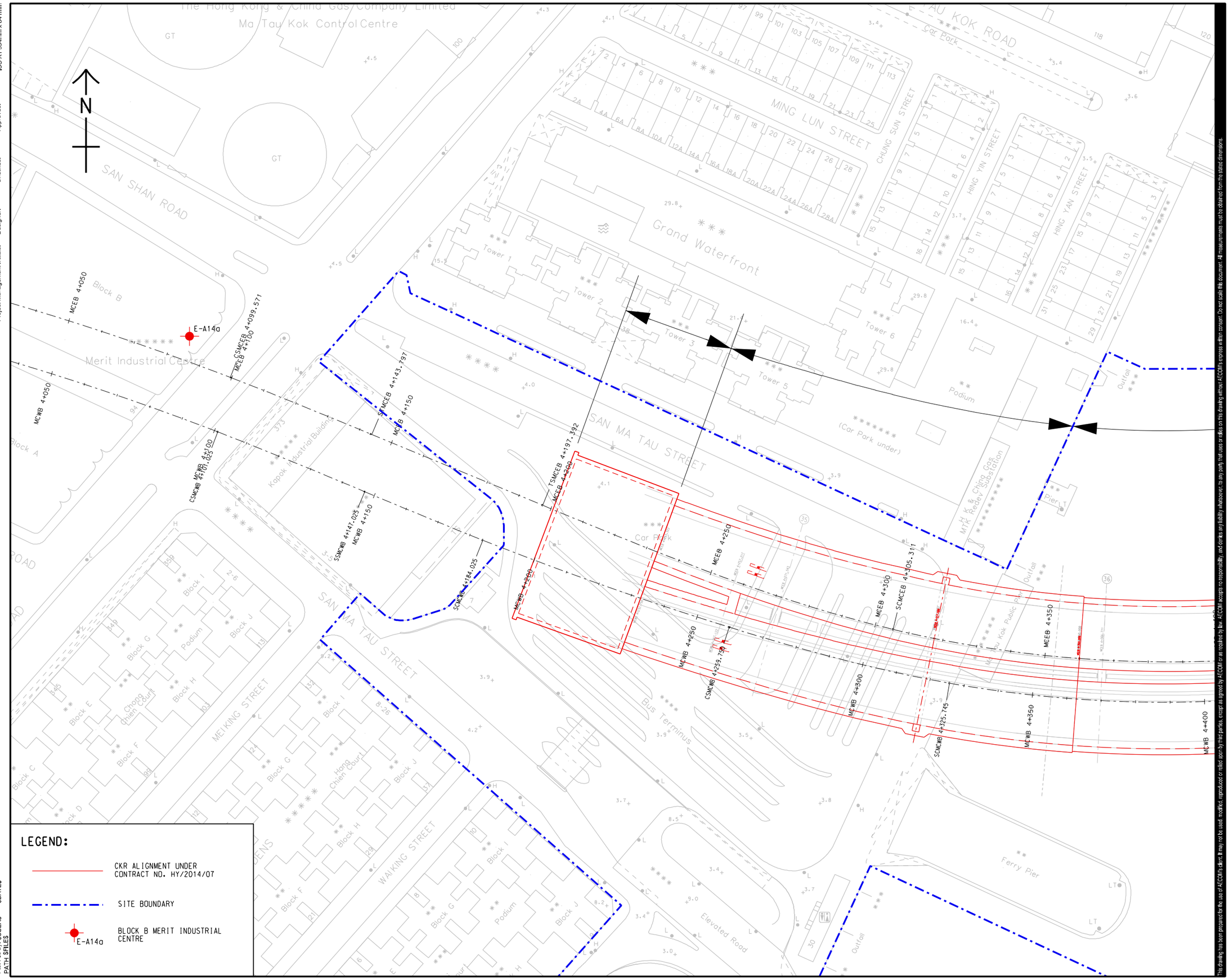
AGREEMENT NO. 協議書編號

SHEET TITLE
圖紙名稱

SITE LAYOUT PLAN

SHEET NUMBER
圖紙編號

FIGURE 1.1



LEGEND:

- CKR ALIGNMENT UNDER CONTRACT NO. HY/2014/07
- SITE BOUNDARY
- E-A14a BLOCK B MERIT INDUSTRIAL CENTRE

ISO A1 594mm x 841mm

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KEY PLAN
索引圖

PROJECT NO. 項目編號

AGREEMENT NO. 協議編號

SHEET TITLE
圖紙名稱

LOCATION OF AIR QUALITY MONITORING STATION

SHEET NUMBER
圖紙編號

FIGURE 3.1

ISO A1 594mm x 841mm

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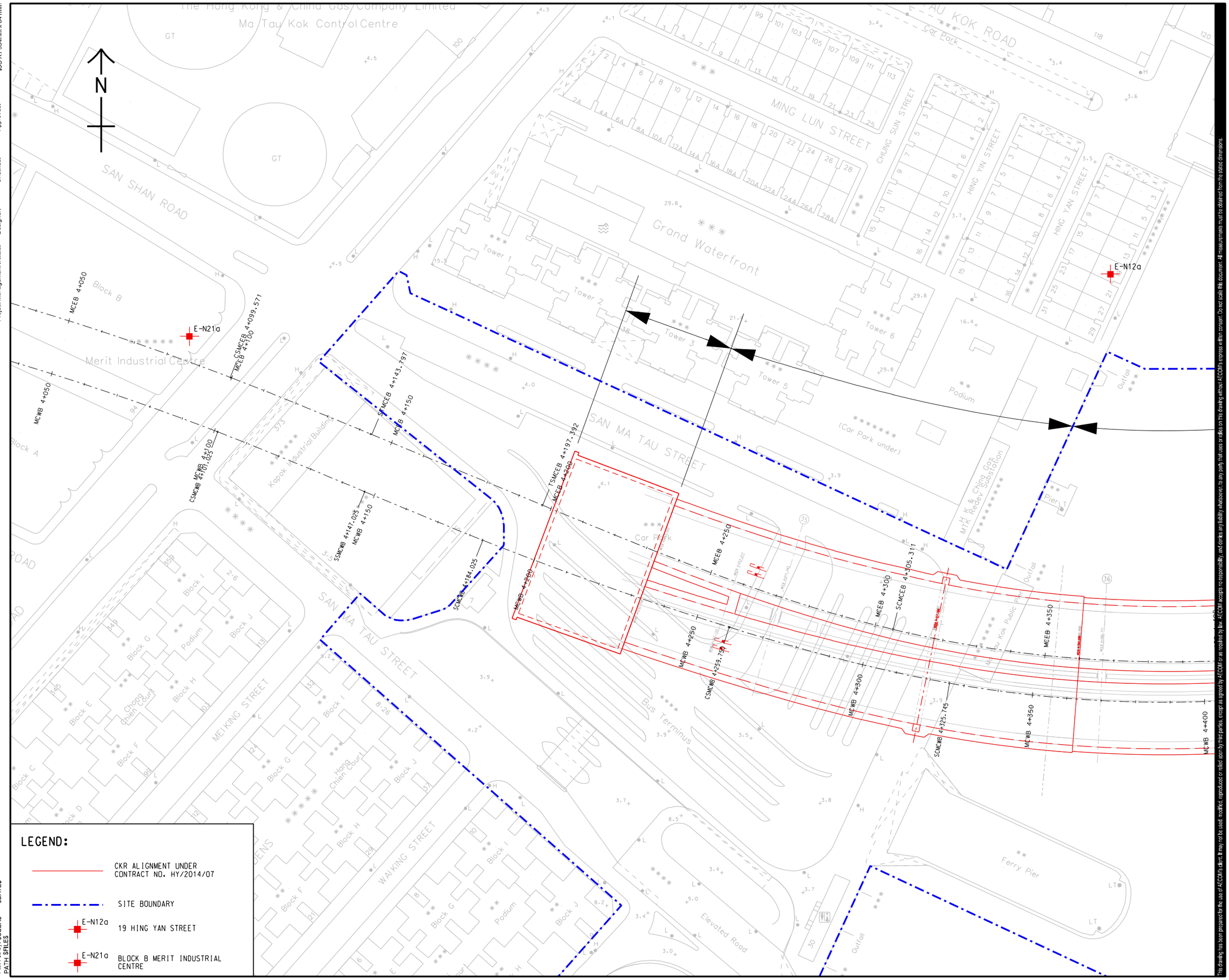
Checked:

Designer:

Project Management Initials:



LEGEND:

- CKR ALIGNMENT UNDER CONTRACT NO. HY/2014/07
- SITE BOUNDARY
- E-N12a — 19 HING YAN STREET
- E-N21a — BLOCK B MERIT INDUSTRIAL CENTRE

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SCALE 比例: A3 1 : 1000

DIMENSION UNIT 尺寸單位: METRES 米

KEY PLAN
索引圖

PROJECT NO. 項目編號

AGREEMENT NO. 協議編號

SHEET TITLE
圖紙名稱

LOCATION OF NOISE MONITORING STATION

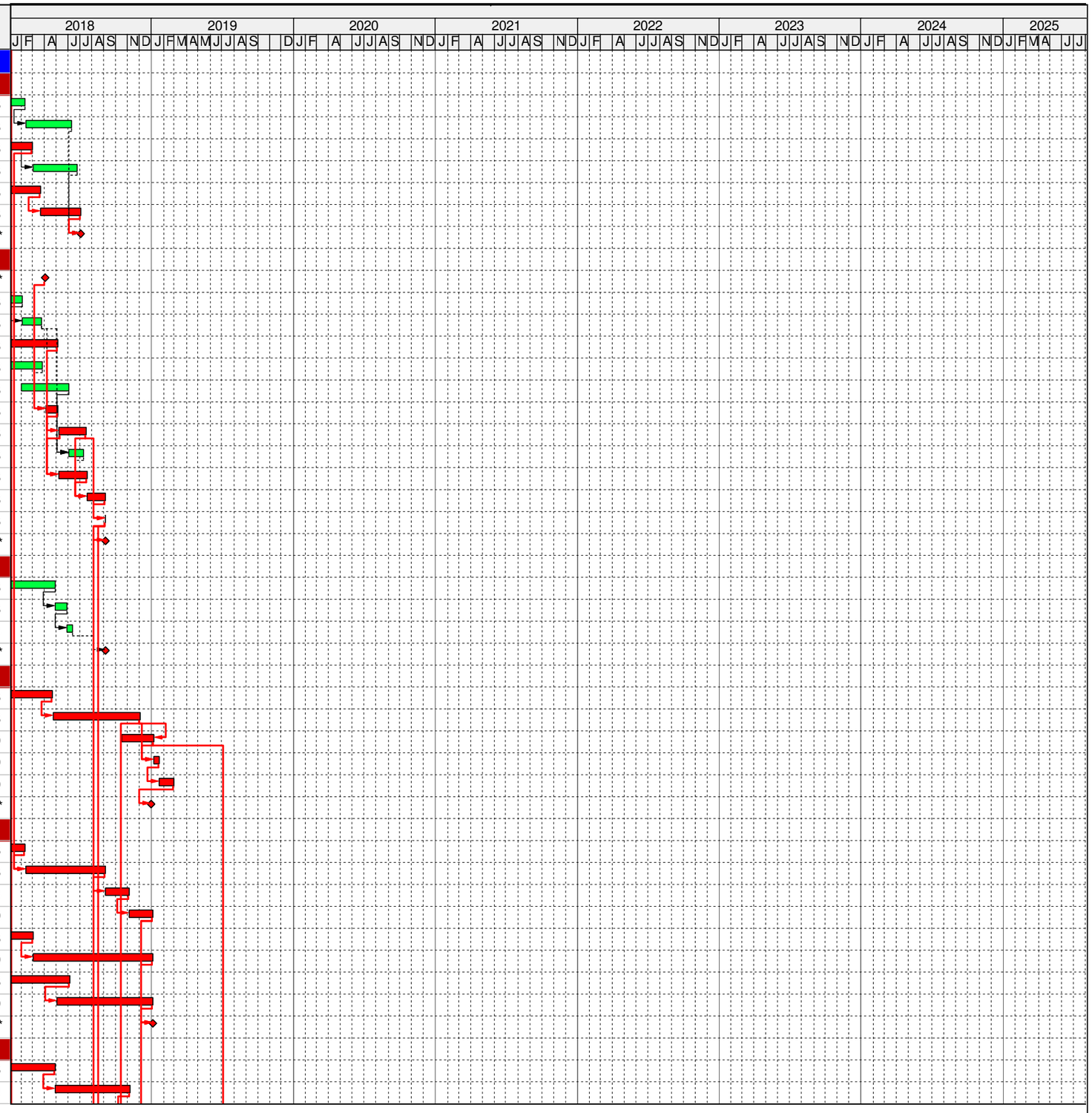
SHEET NUMBER
圖紙編號

FIGURE 3.2

APPENDIX A

Construction Programme

ID	Activity	Days	Start	Finish
Kai Tak West Initial Works Programme				
All Landside and Marine Side Geotechnical Investigation (KD4A)				
S005	Method Statement & Approval	32	05/01/18	10/02/18
S100	Kai Tak Side Geotechnical Investigation & Report	93	12/02/18	09/06/18
S103	Notice to Mariner, Sediment Proposal, Preparation Works, etc	45	05/01/18	01/03/18
S105	Marine Geotechnical Investigation & Report	90	02/03/18	22/06/18
S108	TTM Preparation & Approval and Preparation Works	62	05/01/18	21/03/18
S110	Ma Tau Kok Side Geotechnical Investigation & Report	81	22/03/18	03/07/18
S120	KD 4A	0		03/07/18*
Demolition of Landside Structures of KCFP and Carpark Reprovisioning (KD01)				
S123	Possess Portion 1B	0		03/04/18*
S125	Preparation & Approval of Ramp & Carpark Buildings	24	05/01/18	01/02/18
S126	Portion 1B Building Survey Report & Approval	40	02/02/18	23/03/18
S127	Preparation & Approval of TTA Schemes	96	05/01/18	05/05/18
S128	Preparation & Approval of Temp Work Design	66	05/01/18	26/03/18
S129	Asbestos Inspection and Submit Report to EPD	96	31/01/18*	01/06/18
S130	Site Hoarding and Remove Existing Furniture	26	05/04/18	05/05/18
S132	Public Interchange Modification Works (TTM Stage 1-4)	58	07/05/18	16/07/18
S135	Protection Work and Demolish Carpark Building	30	02/06/18	09/07/18
S136	Protection Work and Demolish Carpark Ramp Structure	60	07/05/18	18/07/18
S150	Roadwork to Provide New Parking Facilities in Portion 1B	40	19/07/18	03/09/18
S155	Implement TTM Stage 5	1	04/09/18	04/09/18
S160	KD 01	0		04/09/18*
Trees Felling and Protection in Portion 1B (San Ma Tau St) (KD12)				
S165	Trees Proposal & Preparation Works	90	05/01/18	27/04/18
S170	Tree Felling, T483-T485, T532-T533	24	28/04/18	28/05/18
S180	Tree Protection, T486	12	29/05/18	11/06/18
S190	KD 12	0		04/09/18*
Vertical Wall in Portion 3B CH 4759-CH 5085 (KD7A)				
S195	Submission & Approval and Preparation Works	85	05/01/18	21/04/18
S200	Pipe Piles along North Wall	186	23/04/18	03/12/18
S222	Type IV Sheetpile	68	16/10/18	07/01/19
S225	Demobilisation	12	08/01/19	21/01/19
S226	Fencing and Site Clearance for Handover Area	30	22/01/19	28/02/19
S230	KD 7A (Handover Portion 3B)	0		31/12/18*
Dumping Permit, Barging Point, Structural Assessment of Marine Side KCFP (KD4B)				
S235	Submission and Approval of Sampling Plan	32	05/01/18	10/02/18
S240	Field Sampling and Testing	164	12/02/18	03/09/18
S250	Preparation and Approval for Sediment Quality Report	50	04/09/18	03/11/18
S260	Application for Dumping Permit	50	05/11/18	04/01/19
S265	Submission & Approval and Preparation Works	46	05/01/18	02/03/18
S270	Carry Out Structural assessment of KCFP (Marine Portion)	250	03/03/18	04/01/19
S275	Design & Procurement	120	05/01/18	04/06/18
S280	Construct Barging Point	204	02/05/18	04/01/19
S290	KD 4B	0		04/01/19*
Ventilation Adit at Eastern Interface CH 5020-5082 (KD4C)				
S295	Submission & Approval and Preparation Works	90	05/01/18	27/04/18
S300	Piling & Pumping Test	159	28/04/18	07/11/18



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CONTRACT NO. HY2014/07

CENTRAL KOWLOON ROUTE - KAI TAK WEST

INITIAL WORKS PROGRAMME (IWP)

Date	Revision	Checked	Approved
05 Jan 18	IWP		

ID	Activity	Days	Start	Finish
S310	ELS	70	08/11/18	31/01/19
S320	Ventilation Adit Structure	150	01/02/19	07/08/19
S325	Backfill	17	08/08/19	27/08/19
S326	Site Clearance for Handover Area	9	28/08/19	06/09/19
S330	KD 4C (Handover Portion 3D)	0		06/09/19*
Cofferdam 1.1 - Depressed Rd & Underpass at Kai Tak Side - 326m (KD7B)				
S210	Alternative Design Submission/Approval/Procurement	300	05/01/18	31/10/18
S340	SHP, Pipe Piles, Kingposts & Pumping Test	266	13/11/18	08/10/19
S345	Type IV Sheetpile Cut Off Wall	53	05/08/19	08/10/19
S350	ELS (Uncontaminated Sediment)	30	09/10/19	12/11/19
S351	ELS (Soil)	210	13/11/19	30/07/20
S360	Depressed Rd, Underpass, Adit Structures, and Backfill	228	30/07/20	07/05/21
S370	KD 7B	0		07/05/21*
Cofferdam 2.1 - Access Shaft (KD03) + 60m C&C Tunnel at Ma Tau Kok Side				
Access Shaft - 33m (KD03)				
S375	Preparation Works	20	05/09/18	28/09/18
S380	Piling & Kingposts & Pumping Test	143	29/09/18	23/03/19
S390	ELS (Contaminated Sediment))	3	25/03/19	27/03/19
S391	ELS (Uncontaminated Sediment)	3	28/03/19	30/03/19
S392	ELS (Soil)	122	01/04/19	29/08/19
S393	ELS (Rock)	246	30/08/19	30/06/20
S400	Construct RC Wall at East Side & Remaining Works	43	02/07/20	20/08/20
S405	Remaining Works for Handover Area	35	21/08/20	30/09/20
S410	KD 03	0		30/09/20*
Ma Tau Kok West C&C Tunnel - 60m				
S415	Preparation Works	10	05/09/18	15/09/18
S420	Piling & Kingposts	60	17/09/18	28/11/18
S426	Install Traffic Decking for TTM Stage 6	20	29/11/18	21/12/18
S427	Implement TTM Stage 6	1	22/12/18	22/12/18
S428	Remaining Piling	60	24/12/18	09/03/19
S430	ELS (Uncontaminated Sediment)	3	02/07/20	04/07/20
S431	ELS (Soil)	278	06/07/20	11/06/21
S432	ELS (Rock)	269	12/06/21	11/05/22
S440	C&C Tunnel Structure	108	12/05/22	17/09/22
S910	Backfill	97	19/09/22	14/01/23
Landing Steps and Covered Walkway at Ma Tau Kok Side (KD02 & KD10)				
Landing Steps and Covered Walkway				
S450	Design, ACABAS Endorsement, Procurement	225	03/04/18*	02/01/19
S460	Possess Areas	0	05/01/19*	
S470	Remove Existing Seawall	150	05/01/19	11/07/19
S480	Construct Landing Steps	150	12/07/19	09/01/20
S490	Construct Covered Walkway	200	10/01/20	11/09/20
S495	ABWF & E&M Works	60	12/09/20	24/11/20
S500	KD 02	0		03/01/21*
Establishment Works				
S520	Establishment Works in Portion 1E (Covered Walkway)	365	25/11/20	24/11/21
S530	KD 10	0		03/01/22*
Cofferdam 1.2 - Marine Tunnel Stage 1 (KD05) + 60m C&C Tunnel at Kai Tak Side (KD7B)				
Stage 1 Marine Tunnel - 179m (KD05)				

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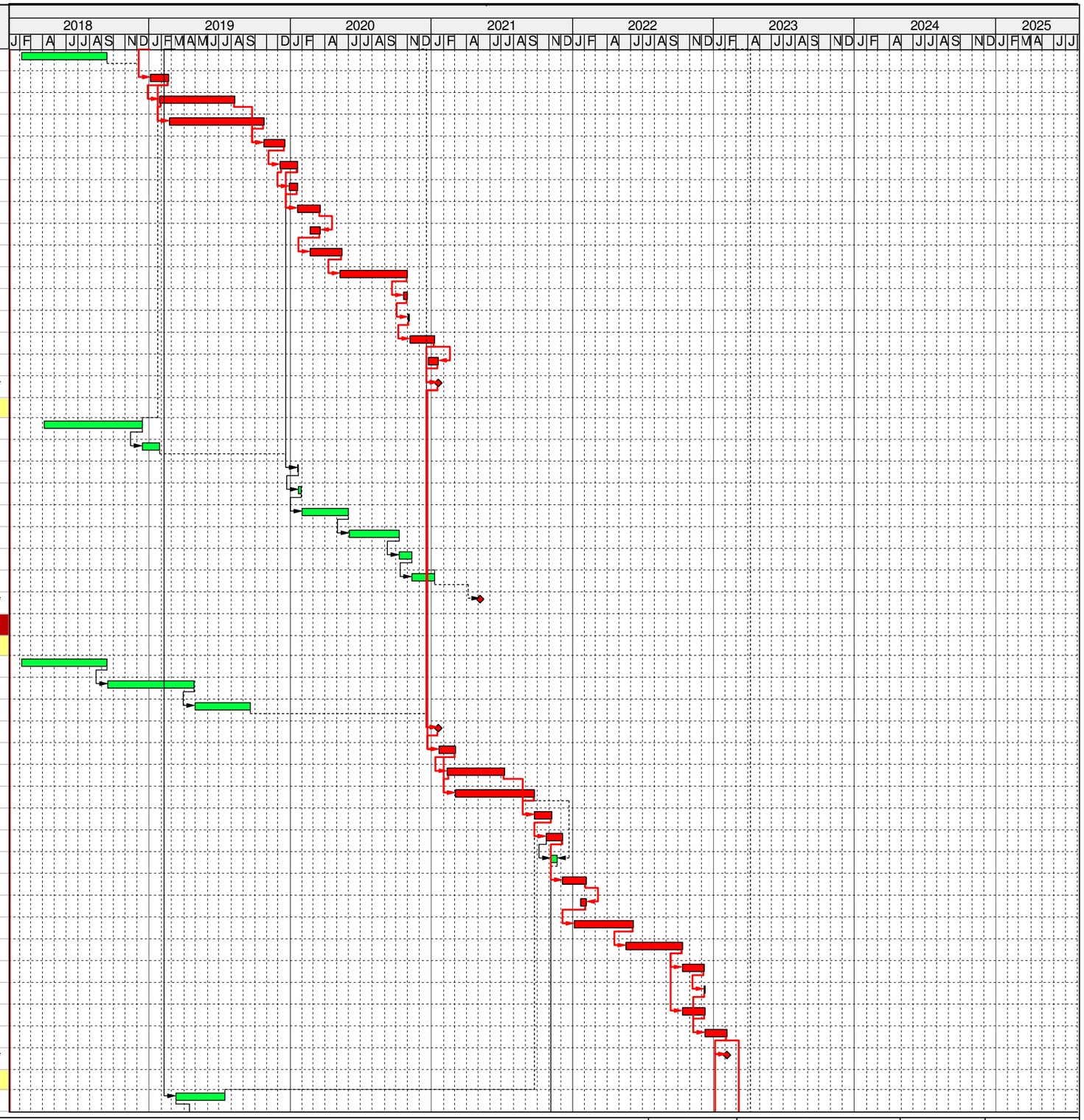
CONTRACT NO. HY2014/07

CENTRAL KOWLOON ROUTE - KAI TAK WEST

INITIAL WORKS PROGRAMME (IWP)

Date	Revision	Checked	Approved
05 Jan 18	IWP		

ID	Activity	Days	Start	Finish
S535	Notice to Mariners, MS/Temp Work/Materials Submissions & Approvals	180	05/02/18*	14/09/18
S540	Construct Working Platform Supported on 1.2m Casings	38	05/01/19	21/02/19
S545	FSP V Sheetpile (Outer Side)	157	28/01/19	10/08/19
S550	Pipe Piles (Inner Side)	200	22/02/19	25/10/19
S555	Reclamation between Pipe Piles & Sheetpile	47	26/10/19	19/12/19
S558	Install S1 & S2 and Pumping Test	36	06/12/19	20/01/20
S559	Kingposts	18	30/12/19	20/01/20
S560	ELS (Contaminated Sediment)	48	21/01/20	19/03/20
S561	ELS (Uncontaminated Sediment)	23	22/02/20	19/03/20
S562	ELS (Soil)	64	22/02/20	13/05/20
S570	Marine Tunnel Structure	144	09/05/20	29/10/20
S575	Backfill (Treated Sediment)	8	22/10/20	31/10/20
S576	Backfill (Rockfill)	4	02/11/20	05/11/20
S580	Remove Reclamation/Platform and Reinstate Seabed	52	06/11/20	08/01/21
S585	Dredging for Stage 2 Diversion	20	24/12/20	19/01/21
S600	KD 05	0		19/01/21*
Kai Tak Cut & Cover Tunnel - 60m (KD7B)				
S605	Pipe Piles & Kingposts	210	05/04/18*	13/12/18
S608	Install Decking	36	14/12/18	28/01/19
S610	ELS (Contaminated Sediment)	2	21/01/20	22/01/20
S611	ELS (Uncontaminated Sediment)	4	23/01/20	30/01/20
S612	ELS (Soil)	98	31/01/20	30/05/20
S620	C&C Tunnel Structure	108	01/06/20	08/10/20
S623	Backfill (Soil + Treated Sediment)	28	09/10/20	11/11/20
S625	Kai Tak Seawall Reinstatement	47	12/11/20	08/01/21
S630	KD 7B	0		07/05/21*
Cofferdam 2.2 - Marine Tunnel Stage 2 (KD06) + 30m C&C Tunnel at Ma Tau Kok Side (KD6A)				
Stage 2 Marine Tunnel - 197m (KD06)				
S635	Notice to Mariners, MS/Temp Work/Materials Submissions & Approvals	180	05/02/18*	14/09/18
S636	Modification of KCFP	180	15/09/18	27/04/19
S637	Provide Pontoon System	120	29/04/19	20/09/19
S638	Close North Berth of KCFP	0		19/01/21
S640	Construct Working Platform Supported on 1.2m Casings	35	20/01/21	04/03/21
S645	FSP V Sheetpile (Outer Side)	118	10/02/21	09/07/21
S650	Pipe Piles (Inner Side)	165	05/03/21	23/09/21
S655	Reclamation between Pipe Piles & Sheetpile	37	24/09/21	08/11/21
S657	Install S1 & S2, Pumping Test	36	26/10/21	06/12/21
S658	Kingposts	14	06/11/21	22/11/21
S660	ELS (Contaminated Sediment)	47	07/12/21	05/02/22
S661	ELS (Uncontaminated Sediment)	10	22/01/22	05/02/22
S662	ELS (Soil)	121	06/01/22	07/06/22
S670	Marine Tunnel Structure	120	19/05/22	11/10/22
S675	Backfill (Soft + Treated Sediment)	49	12/10/22	07/12/22
S676	Backfill (Rockfill)	2	08/12/22	09/12/22
S677	Reprovisioning of MTK Public Pier	51	12/10/22	09/12/22
S680	Remove Reclamation/Platform and Reinstate Seabed	43	10/12/22	04/02/23
S700	KD 06	0		04/02/23*
Ma Tau Kok East Cut & Cover Tunnel - 30m (KD6A)				
S705	Pipe Piles	102	11/03/19	16/07/19



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CONTRACT NO. HY2014/07

CENTRAL KOWLOON ROUTE - KAI TAK WEST

INITIAL WORKS PROGRAMME (IWP)

Date	Revision	Checked	Approved
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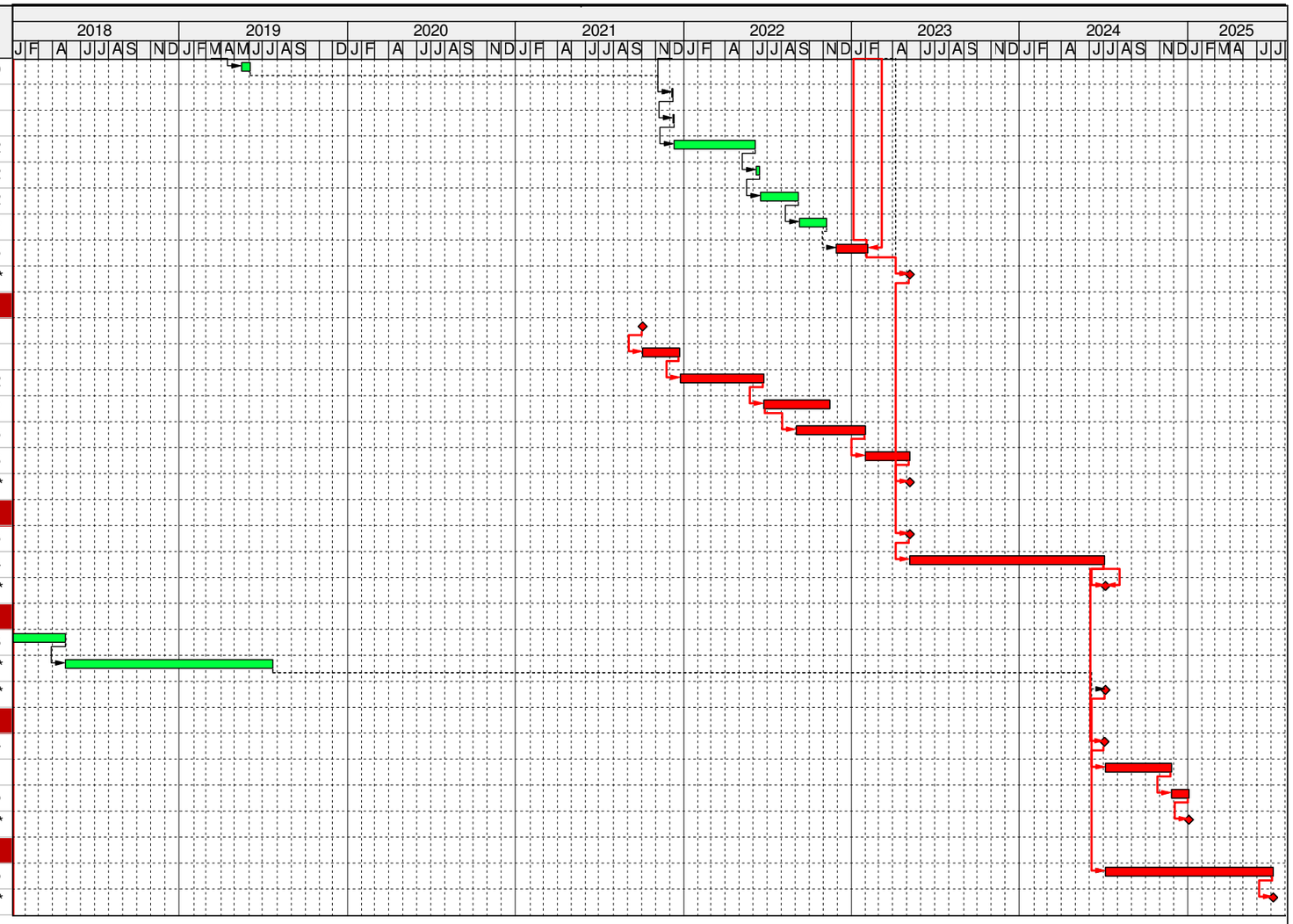
ID	Activity	Days	Start	Finish
S706	Kingposts	16	16/05/19	03/06/19
S710	ELS (Contaminated Sediment)	2	07/12/21	08/12/21
S711	ELS (Uncontaminated Sediment)	2	09/12/21	10/12/21
S712	ELS (Soil)	139	11/12/21	06/06/22
S713	ELS (Rock)	8	07/06/22	15/06/22
S720	C&C Tunnel Structure	72	16/06/22	08/09/22
S722	Backfill	49	09/09/22	08/11/22
S725	Ma Tau Kok Seawall Reinstatement	53	29/11/22	04/02/23
S730	KD 6A	0		06/05/23*
U Trough Structures and At-Grade Road Area (KD07)				
S740	Repossess Portion 3D	0	05/10/21*	
S745	Sheetpile & Pumping Test	68	05/10/21	23/12/21
S750	ELS (Soil)	143	24/12/21	23/06/22
S760	Construct Trough Structure	120	24/06/22	15/11/22
S770	Backfill & Remove Sheetpile	120	03/09/22	31/01/23
S775	Roadwork for At-Grade Road	77	01/02/23	06/05/23
S780	KD 07	0		06/05/23*
Kowloon City Ferry Pier Public Transport Interchange Reinstatement (KD09)				
S790	All works Completed at Ma Tau Kok Side	0		06/05/23
S800	Remove Decking, Roads and Drains (TTM Stages 7-10)	344	08/05/23	04/07/24
S810	KD 09	0		05/07/24*
Preservation and Protection of Trees (KD13)				
S820	Trees Survey, Proposal, and Approval	90	05/01/18	27/04/18
S830	Implement measures for Trees Protection/Preservation	365	28/04/18	22/07/19*
S840	KD 13	0		05/07/24*
All Remaining Works and Roadwork for Opening to the Public (KD08)				
S850	All works Completed at both Kai Tak & Ma Tau Kok Sides	0		04/07/24
S860	Reinstate Affected Road Areas & Traffic Diversions	120	05/07/24	25/11/24
S870	Reinstate Affected Areas	30	26/11/24	02/01/25
S880	KD 08	0		02/01/25*
Establishment Works (KD11)				
S890	Establishment Works (Except in Portion 1E) Period	365	06/07/24	05/07/25
S900	KD 11	0		05/07/25*



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CENTRAL KOWLOON ROUTE - KAI TAK WEST

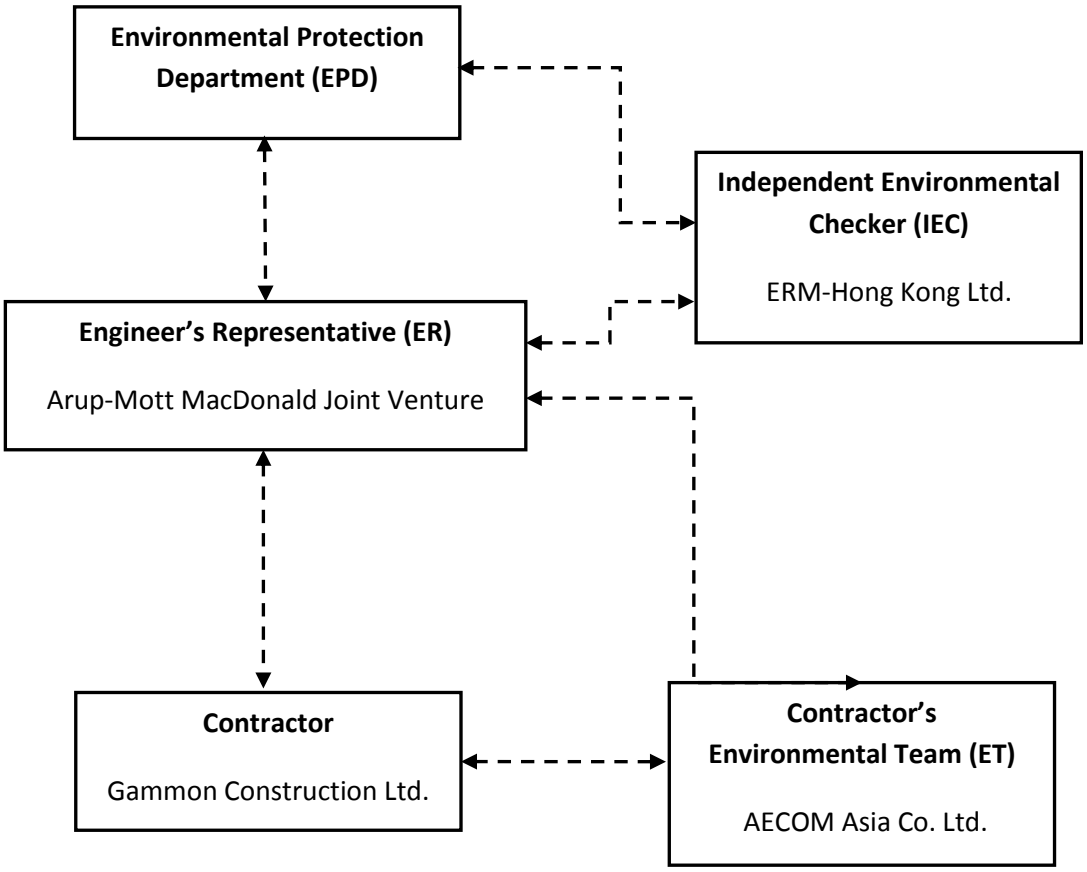
INITIAL WORKS PROGRAMME (IWP)

Date	Revision	Checked	Approved
05 Jan 18	IWP		

APPENDIX B

Project Organization Structure

Appendix B Project Organization Structure



APPENDIX C

Implementation Schedule of Environmental Mitigation Measures

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Air Quality (Construction Phase)							
S4.3.10	D1	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	@
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.	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	V
S4.3.10	D3	● Proper watering of exposed spoil should be undertaken throughout the construction phase: ● Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; ● Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; ● A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones. ● The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; ● Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; ● 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; Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period;	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	V @ V V V V V

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
		● The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; ● Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; ● Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; ● Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; ● Any skip hoist for material transport should be totally enclosed by impervious sheeting; ● Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; ● Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; ● Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and ● Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.					V V V V V V V V V
S4.3.10	D5	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected representative dust monitoring station	Construction stage	V

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Construction Noise (Airborne)							
S5.4.1	N1	Implement the following good site practices: ● only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; ● machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; ● plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; ● silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; ● mobile plant should be sited as far away from NSRs as possible and practicable; ● material stockpiles, mobile container site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	Control construction airborne noise	Contractor	All construction sites	Construction stage	V V V V V V
S5.4.1	N2	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.	Reduce the construction noise levels at low-level zone of NSRs through partial screening.	Contractor	All construction sites	Construction stage	V
S5.4.1	N3	Install movable noise barriers (typical design is wooden framed barrier with a small-cantilevered on a skid footing with 25mm thick internal sound absorptive lining), acoustic mat or full enclosure, screen the noisy plants including air compressors, generators and handheld breakers etc..	Screen the noisy plant items to be used at all construction sites	Contractor	All construction sites where practicable	Construction stage	V
S5.4.1	N4	Use “Quiet plants”	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	V
S5.4.1	N5	Loading/unloading activities should be carried out inside the full enclosure of mucking out points	Reduce the noise levels of loading/unloading activities	Contractor	Mucking out locations	Construction stage	V

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S5.4.1	N6	Sequencing operation of construction plants where practicable.	Operate sequentially within the same work site to reduce the construction airborne noise	Contractor	All construction sites where practicable	Construction stage	V
S5.4.1	N7	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected representative noise monitoring station	Construction stage	V
S5.5.2	N8	Install temporary noise barriers along the works area at temporary Kowloon City Ferry Pier Public Transport Interchange	Reduce temporary PTI noise	Contractor	Kowloon City Ferry Pier	Different construction stages	N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Water Quality (Construction Phase)							
S6.9.1.1	W1	In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), construction phase mitigation measures shall include the following: *Construction Runoff*	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where practicable	Construction stage	
		● At the start of site establishment (including the barging facilities), perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system will be undertaken by the contractor prior to the commencement of construction.					V
		● The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a site/sediment trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates.					@
		● The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94, which states that the retention time for silt/sand traps should be 5 minutes under maximum flow conditions. Sizes may vary depending upon the flow rate, but for a flow rate of 0.1 m3/s a sedimentation basin of 30m3 would be required and for a flow rate of 0.5 m3/s the basin would be 150 m3. The detailed design of the sand/silt traps shall be undertaken by the contractor prior to the commencement of construction.					V
		● All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable. Exposed slope surfaces should be covered by tarpaulin or other means.					V
		● The overall slope of the site should be kept to a minimum to reduce the erosive potential of surface water flows, and all traffic areas and access roads protected by coarse stone ballast. An additional advantage accruing from the use of crushed stone is the positive traction gained during prolonged periods of inclement weather					V

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
		and the reduction of surface sheet flows.					
		● All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas.					V
		● Measures should be taken to minimize the ingress of site drainage into excavations. If the excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.					V
		● Open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50m^3 should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.					V
		● Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers.					V
		● Precautions be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are funneling in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.					V
		● All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains.					V

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
		● Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain. ● Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts. ● All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive receivers nearby. ● Adopt best management practices ● All the earth works involving should be conducted sequentially to limit the amount of construction runoff generated from exposed areas during the wet season (April to September) as far as practicable.					V V @ V V
S6.9.1.2	W2	*Tunnelling Works and Underground Works* ● Cut-&-cover tunneling work should be conducted sequentially to limit the amount of construction runoff generated from exposed areas during the wet season (April to September) as far as practicable. ● Uncontaminated discharge should pass through sedimentation tanks prior to off-site discharge ● The wastewater with a high concentration of SS should be treated (e.g. by sedimentation tanks with sufficient retention time) before discharge. Oil interceptors would also be required to remove the oil, lubricants and grease from the wastewater. ● Direct discharge of the bentonite slurry (as a result of D-wall and bored tunneling construction) is not allowed. It should be reconditioned and reused wherever practicable. Temporary storage locations (typically a properly closed warehouse) should be provided on site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.	To minimize construction water quality impact from tunneling works	Contractor	All tunneling portion	Construction stage	N/A
S6.9.1.3	W3	*Sewage Effluent* ● Portable chemical toilets and sewage holding tanks are recommended for handling	To minimize water quality	Contractor	All construction sites	Construction stage	V

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
		the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.	from sewage effluent		where practicable		
S6.9.1.5	W4	*Groundwater from Potential Contaminated Area:* ● No direct discharge of groundwater from contaminated areas should be adopted. ● A discharge license under the WPCO through the Regional Office of EPD for groundwater discharge should be applied. Prior to the excavation works within these potentially contaminated areas, the groundwater quality should be reviewed during the process of discharge license application. The compliance to the Technical Memorandum on Standards for Effluents Discharged into Drainage on Sewerage Systems, Inland and Coastal Waters (TM-DSS) and the existence of prohibited substance should be confirmed. If the review results indicated that the groundwater to be generated from the excavation works would be contaminated, the contaminated groundwater should be either properly treated in compliance with the requirements of the TM-DSS or properly recharged into the ground. ● If wastewater treatment is deployed, the wastewater treatment unit shall deploy suitable treatment process (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (e.g. TPH) to undetectable range. All treated effluent from wastewater treatment plant shall meet the requirements as stated in TM-DSS and should be discharged into the foul sewers. ● If groundwater recharging wells are deployed, recharging wells should be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells should be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in the Section 2.3 of TM-DSS. The baseline groundwater quality shall be determined prior to the selection of the recharge wells, and submit a working plan (including the laboratory analytical results showing the quality of groundwater at the proposed recharge location(s) as well as the pollutant levels of groundwater to be recharged) to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substances such as TPH products should be removed as necessary by installing	To minimize groundwater quality impact from contaminated area	Contractor	Excavation areas where contamination is found.	Construction stage	V V V V

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
		the petrol interceptor.					
S6.7.2.1	W5	*Temporary Reclamation* ● During temporary reclamation, regular litter / rubbish clearance and avoidance of illegal discharges within the embayed marine water should be undertaken. ● During temporary reclamation, the perimeter silt curtain should be deployed.	To minimize water quality impact from temporary reclamation	Contractor	Temporary Reclamation	Construction stage	N/A
S6.9.1.6	W6	*Accidental spillage* In order to prevent accidental spillage of chemicals, the following is recommended: ● All the tanks, containers, storage area should be bunded and the locations should be locked as far as possible from the sensitive watercourse and stormwater drains. ● The Contractor should register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities should be stored with suitable labels and warnings. ● Disposal of chemical wastes should be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.	To minimize water quality impact from accidental spillage	Contractor	All construction sites where practicable	Construction stage	@ V V
S6.9.2.2	W7	*Dredging Works* The following good practice shall apply for the dredging works: ● Install efficient silt curtains, i.e. at least 75% SS reduction, at the point of seawall dredging to control the dispersion of SS; ● Implement water quality monitoring to ensure effective control of water pollution and recommend additional mitigation measures required; ● The decent speed of grabs should be controlled to minimize the seabed impact and to reduce the volume of over-dredging; ● All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; ● The dredging rates by closed grab dredgers for temporary marine channel outside pipepile wall shall be less than 1,500 m^3/day and 125 m^3/hour (without concurrent dredging with T2 in dry season only) or 750 m^3/day and 62.5 m^3/hour for other conditions respectively. ● Dredging works shall be only for the provision marine channel. No dredging work is	To minimize sediment suspension during dredging	Contractor	Kai Tak Barging Point during dredging works	Dredging period	V N/A N/A N/A N/A N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
		required for temporary reclamation; and ● The workfront of temporary reclamation shall be surrounded by cofferdams and the associated excavation and backfilling works for temporary reclamation shall have no contact with seawater.					N/A
S6.9.2.2	W8	● While WSR 2 (Planned Kai Tak Cooling Water Intake). is a planned receiver, the project proponent shall liaise with the project proponent of District Cooling System (DCS) for Kai Tak Development on the implementation programme prior to wet season dredging. In case the DCS would be operated during the dredging period of CKR, additional silt screen to the cooling water intake shall be provided to WSR 2. The following specific mitigation measures shall apply for the dredging works: ● In dry season, the dredging rate shall be less than 1500m^3/day if no concurrent projects. ● In all other scenario, the dredging rate shall be less than 750m^3/day ● Dredging works shall be only for the provision marine channel. No dredging work is required for temporary reclamation. ● The workfront of temporary reclamation shall be surrounded by cofferdams and the associated excavation and backfilling works for temporary reclamation shall have no contact with seawater. ● In case the DCS would be operated during the dredging period of CKR, silt screen shall be provided for WSR2.	To minimize sediment suspension during dredging if the District Cooling System for Kai Tak Development would be operated in the same period	Contractor	Kai Tak Barging Point during dredging works	Dredging period	N/A V V V N/A N/A
S6.9.2	W9	Handling of Dredged Sediment / Barging Operation: ● All barges should be fitted with tight bottom seals to prevent leakage of materials during transport; ● Barges or hoppers should not be filled to a level that will cause overflow of materials or polluted water during loading or transportation; ● All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and ● Loading of barges and hoppers should be controlled to prevent splashing of material into the surrounding water. ● Mitigation measures for land-based activities as outlined above should be applied to minimise water quality impacts from site runoff and open stockpile spoils at the	To minimize and mitigate the water disturbance during dredged sediment handling/barging operation	Contractor	All land- based site and proposed Kwai Chung barging point	Construction stage	N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
		proposed barging facilities where appropriate.					
S6.9	W10	Implement a marine water quality monitoring programme	Monitor marine water quality prior to and during dredging period	Contractor	At identified monitoring location	Prior to and during dredging period	V

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Waste Management (Construction Waste)							
S7.4.1	WM1	*On-site sorting of C&D material* ● Geological assessment should be carried out by competent persons on site during excavation to identify materials which are not suitable to use as aggregate in structural concrete (e.g. volcanic rock, Aplite dyke rock, etc). Volcanic rock and Aplite dyke rock should be separated at the source sites as far as practicable and stored at designated stockpile areas preventing them from delivering to crushing facilities. The crushing plant operator should also be reminded to set up measures to prevent unsuitable rock from ended up at concrete batching plants and be turned into concrete for structural use. Details regarding control measures at source site and crushing facilities should be submitted by the Contractors for the Engineer to review and agree. In addition, site records should also be kept for the types of rock materials excavated and the traceability of delivery will be ensured with the implementation of Trip Ticket System and enforced by site supervisory staff as stipulated under DEVB TC(W) No. 6/2010 for tracking of the correct delivery to the rock crushing facilities for processing into aggregates. Alternative disposal option for the reuse of volcanic rock and Aplite Dyke rock, etc should also be explored.	Separation of unsuitable rock from ending up at concrete batching plants and be turned into concrete for structural use	Contractor	All construction sites	Construction stage	V
S7.5.1	WM2	*Construction and Demolition Material* ● Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; ● Carry out on-site sorting; ● Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; ● Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; ● Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; and ● Implement an enhanced Waste Management Plan similar to ETWBTC (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.	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	V V V V V V
S7.5.1	WM3	*C&D Waste* ● Standard formwork or pre-fabrication should be used as far as practicable in order to	Good site practice to minimize the waste	Contractor	All construction	Construction stage	V

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
		minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. ● The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage.	generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal		sites		V
S7.5.1	WM5	*Land-based and Marine-based Sediment* ● All construction plant and equipment shall be designed and maintained to minimize the risk of silt, sediments, contaminants or other pollutants being released into the water column or deposited in the locations other than designated location; ● All vessels shall be sized such that adequate draft is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; ● Before moving the vessels which are used for transporting dredged material, excess material shall be cleaned from the decks and exposed fittings of vessels and the excess materials shall never be dumped into the sea except at the approved locations; ● Adequate freeboard shall be maintained on barges to ensure that decks are not washed by wave action. ● The Contractors shall monitor all vessels transporting material to ensure that no dumping outside the approved location takes place. The Contractor shall keep and produce logs and other records to demonstrate compliance and that journeys are consistent with designated locations and copies of such records shall be submitted to the engineers; ● The Contractors shall comply with the conditions in the dumping licence. ● All bottom dumping vessels (Hopper barges) shall be fitted with tight fittings seals to their bottom openings to prevent leakage of material; ● The material shall be placed into the disposal pit by bottom dumping; ● Contaminated marine mud shall be transported by spit barge of not less than 750m^3 capacity and capable of rapid opening and discharge at the disposal site;	To control pollution due to marine sediment	Contractor	Along CKR alignment	Construction Stage	N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
		● Discharge shall be undertaken rapidly and the hoppers shall be closed immediately. Material adhering to the sides of the hopper shall not be washed out of the hopper and the hopper shall remain closed until the barge returns to the disposal site. ● For Type 3 special disposal treatment, sealing of contaminant with geosynthetic containment before dropping into designated mud pit would be a possible arrangement. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping at the disposal site, thereby fulfilling the requirements for fully confined mud disposal.					
S7.5.1	WM6	*Chemical Waste* ● Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. ● Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. ● The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated. ● Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	V V V V

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S7.5.1	WM7	*General Refuse* ● General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. ● A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. ● Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. ● Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor.	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	@ V V V

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Land Contamination							
S8.10, S8.12 & Appendix 8.4	LC1	Land contamination investigation works (including field works and laboratory testing at the Kowloon City Ferry Pier Public Transport Interchange (KCFP-PTI) and the To Kwa Wan Vehicle Examination Centre (TKW-VEC) were carried out from 14 April 2018 to 2 January 2019. In order to minimise the potentially adverse environmental impacts arising from the handling of potentially contaminated materials, the following environmental mitigation measures are proposed during the course of soil excavation, stockpiling and backfilling works: ● Excavation profiles must be properly designed and executed. ● Stockpiling site(s) shall be lined with impermeable sheeting and bunded. Stockpiles shall be fully covered by impermeable sheeting to reduce dust emission. ● Excavation and stockpiling should be carried out during dry season as far as possible to minimise potentially contaminated runoffs from the Concerned Soil. ● The truck transferring Concerned Soil shall be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the truck. ● Temporary fencing or warning ribbons will be provided to the boundary of excavation, slope crest and temporarily stockpiled areas. Where necessary, the exposed areas should be temporarily covered with impermeable sheeting during heavy rainstorm.	Minimize the potentially adverse environmental impacts arising from the handling of potentially contaminated materials	Contractor	EBH1, EBH2 and EBH3	Commencement of construction works at the Kowloon City Ferry Pier Public Transport Interchange (PTI) (for EBH1 & EBH2) and the works area adjacent to the To Kwa Wan Vehicle Examination Centre (for EBH3)	V V V V V

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Landscape & Visual							
S10.10.1 Table 10.11	LV3	● Good Site Management Large temporary stockpiles of excavated material shall be covered with unobtrusive sheeting to prevent dust and dirt spreading to adjacent landscape areas and vegetation, and to create a neat and tidy visual appearance. Construction plant and building material shall be orderly and carefully stored in order to create a neat and tidy visual appearance.	Minimize visual impact	Contractor	Within Project Site	Construction Phase	V
S10.10.1 Table 10.11	LV4	● Screen Hoarding Decorative screen hoarding should be erected to screen the public from the construction area. It should be designed to be compatible with the existing urban context.	Minimize visual impact	Contractor	Within Project Site	Construction Phase	V
S10.10.1 Table 10.11	LV5	● Lighting Control during Construction All lighting in the construction site shall be carefully controlled to minimize light pollution and night-time glare to nearby residencies and GIC. The contractor shall consider other security measures, which shall minimize the visual impacts.	Minimize visual impact	Contractor	Within Project Site	Construction Phase	V
S10.10.1 Table 10.11	LV6	● Erosion Control The potential for soil erosion shall be reduced by minimizing the extent of vegetation disturbance on site and by providing a protective cover over newly exposed soil.	Minimize landscape impact	Contractor	Within Project Site	Construction Phase	V
S10.10.1 Table 10.11	LV7	● Tree Protection & Preservation Carefully protected during construction. Tree protection measures will be detailed at the Tree Removal Application stage and plans submitted to the relevant Government Department for approval in due course in accordance with ETWB TC no. 3/2006.	Minimize landscape and visual impact	Contractor	Within Project Site	Design and Construction Phase	V
S10.10.1 Table 10.11	LV9	● Compensatory Planting For trees unavoidably affected by the Project that have to be removed, where practical transplantation will be chosen as the top priority method of removal but if this is not possible or practical compensatory planting will be provided for trees unavoidably felled. All felled trees shall be compensated for by planting trees to the satisfaction of relevant Government departments. Required numbers and locations of compensatory trees shall be determined and agreed separately with Government during the Tree Felling Application process under ETWBTC 3/2006. Compensatory tree planting may be incorporated into public open spaces and along roadside amenity areas affected by the construction works and therefore be part of the bigger wider planting plans. Onsite compensation planting is preferred but if necessary,	Minimize landscape and visual impact	Contractor	Within Project Site and designated off-site locations	Construction Phase	N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
		additional receptor sites outside the Works Area shall be agreed separately with Government during the Tree Felling Application process.					
S10.10.1 Table 10.11	LV10	● Screen Planting Tall screen/buffer trees, shrubs and climbers should be planted, in so far as is possible, to soften and screen proposed structures such as roads and central strip, vertical edges and buildings and to enhance streetscape greening effect where appropriate. Indiscriminate use of trees for screening must be avoided and the principle of 'right tree for the right place' must be followed. This detail will be provided at the Detailed Design stage. This measure may additionally form part of the compensatory planting and will improve and create a pleasant pedestrian environment.	Minimize visual impact and also enhance landscape.	Contractor	Within Project Site	Construction Phase	N/A
S10.10.1 Table 10.11	LV11	● Green Roof Roof greening will be established on ventilation and administration buildings to reduce exposure to untreated concrete surfaces and particularly mitigate visual impact to VSRs at high levels.	Minimize landscape and visual impact	Contractor	Within Project Site	Construction Phase	N/A
S10.10.1 Table 10.11	LV12	● Reinstatement All works areas, excavated areas and disturbed areas for tunnel construction and temporary road diversion or any other proposed works shall be reinstated to former conditions or better, with reasonable landscape treatment and to the satisfaction of the relevant Government departments. (Specific mitigation for disturbance to public open space is detailed separately under LV14)	Minimize landscape impact	Contractor	Within Project Site	Construction Phase	N/A
S10.10.1 Table 10.11	LV14	● Landscape enhancement Implement a comprehensive landscape plan to maximize the greening opportunity and create a unique landscape for the project to blend in with the surrounding, including in re-provisioned areas. In particular: - landscape enhancement of re-provisioned Public Transport Interchange; - landscape deck on tunnel portals; - viaduct planters for trailer planting; - vertical greening of piers and walls with climbers or trailer planting; - roadside planting i.e. planting along central dividers and on road islands e.g. in the middle of roundabouts. (Roadside planting i.e. at the road edge and not in the central divider or road island, and vertical greening may be considered part of Screen Planting). - Purpose-built maintenance access without temporary traffic arrangement must be	Minimize landscape and visual impact	Contractor	Along tunnel alignment	Construction phase	N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
		provided and detailed design of landscape decks and planting, including details of maintenance access locations, will be sent to maintenance and management parties for endorsement and ensures these mitigation measures are feasible.					

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Cultural Heritage Impact (Construction and Operational Phase)							
S11.4.4	CH1	● The contractor should be alerted during the construction on the possibility of locating archaeological remains and as a precautionary measure, AMO shall be informed immediately in case of discovery of antiquities or supposed antiquities in the subject sites.	To preserve any cultural heritage items which may be removed and damaged by the excavation.	Contractor	During construction works for cut and cover tunnels	During the construction phase	N/A
S11.6 para 3	CH2	● The dredging contractor should be alerted during the construction on the possibility of locating archaeological remains, such as cannon and AMO shall be informed immediately in case of discovery of antiquities or supposed antiquities in the subject areas.	To preserve any cultural heritage items which may be removed and damaged by the dredging.	Contractor	During construction of underwater tunnel (north of To Kwa Wan Typhoon Shelter)	During the construction phase	N/A
S12.6.1, Table 12.2	CH8	● A monitoring system for settlement, vibration and tilting will be determined and implemented pending determination of the future grading. A monitoring proposal will be submitted to AMO before commencement of work if a historic building grade is accorded.	Protect the structure from damage from construction works	Contractor	Kowloon City Ferry Pier (CKR-13)	During the construction phase	N/A
S12.6.1, Table 12.2	CH9	● No mitigation is required at present. If the public pier is granted Grade 1, Grade 2 or Grade 3 status, the mitigation will be revised to adhere to the requirements for protective measures for Graded Historic Buildings	To be determined	Contractor	Ma Tau Kok Public Pier (CKR-16)	During the construction phase	N/A
S12.6.1, Table 12.2	CH10	● A monitoring system for settlement, vibration and tilting will be determined and implemented pending determination of the future grading. A monitoring proposal will be submitted to AMO before commencement of work if a historic building grade is accorded.	Protect the structure from damage from construction works	Contractor	The Kowloon City Vehicular Ferry Pier (CKR-17)	During the construction phase	N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
EM&A Project							
S13.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Highways Department	All construction sites	Construction stage	V
S13.2 –13.4	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Highways Department / Contractor	All construction sites	Construction stage	V V V

Legends:

V = implemented;

X = not implemented;

@ = partially implemented;

N/A = not applicable

APPENDIX D

Summary of Action and Limit Levels

Appendix D – Summary of Action and Limit Levels

Table 1 Action and Limit Levels for 24-hour TSP

ID	Location	Action Level	Limit Level
E-A14a	Block B of Merit Industrial Centre	197.3 $\mu g/m^3$	260 $\mu g/m^3$

Table 2 Action and Limit Levels for 1-hour TSP

ID	Location	Action Level	Limit Level
E-A14a	Block B of Merit Industrial Centre	302.4 $\mu g/m^3$	500 $\mu g/m^3$

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

ID	Location	Action Level	Limit Level
E-N12a	19 Hing Yan Street	When one documented complaint is received	75 dB(A)
E-N21a	Block B of Merit Industrial Centre	When one documented complaint is received	75 dB(A)

APPENDIX E

Calibration Certificates of Equipments

TISCH Environmental

RECALIBRATION DUE DATE:
June 6, 2020

Certificate of Calibration

Calibration Certification Information					
Cal. Date:	June 6, 2019	**Rootsmeter S/N:** 438320	**Ta:** 295	°K
Operator:	Jim Tisch		**Pa:** 748.0	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **0988**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3640	3.2	2.00
2	3	4	1	0.9680	6.3	4.00
3	5	6	1	0.8680	7.8	5.00
4	7	8	1	0.8250	8.7	5.50
5	9	10	1	0.6800	12.6	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9900	0.7258	1.4101	0.9957	0.7300	0.8881
0.9859	1.0185	1.9943	0.9916	1.0244	1.2560
0.9839	1.1335	2.2296	0.9896	1.1401	1.4042
0.9827	1.1911	2.3385	0.9884	1.1980	1.4728
0.9775	1.4375	2.8203	0.9832	1.4458	1.7762
QSTD	**m=**	**1.98356**	**QA**	**m=**	**1.24207**
	b=	**-0.02592**		**b=**	**-0.01633**
	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

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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

AECOM Asia Company Limited
Tisch TSP Mass Flow Controlled High Volume Air Sampler
Field Calibration Report

Station	Block B, Merit Industrial Centre (E-A14a)	Operator:	Choi Wing Ho
Cal. Date:	15-Nov-19	Next Due Date:	15-Jan-20
Model No.:	TE-5170	Serial No.	10380
Equipment No.:	A-001-15T		

Ambient Condition			
Temperature, Ta (K)	300	Pressure, Pa (mmHg)	754.5

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	1.98356	Intercept, bc	-0.02592
Last Calibration Date:	6-Jun-19	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	6-Jun-20				

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X-axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	7.2	2.66	1.36	46.0	45.68
13	6.2	2.47	1.26	41.0	40.71
10	5.1	2.24	1.14	36.0	35.75
7	3.5	1.86	0.95	28.0	27.81
5	2.6	1.60	0.82	22.0	21.85

By Linear Regression of Y on X

Slope , mw = **43.6714** **Intercept, bw =** **-13.9388**

Correlation Coefficient* = **0.9989**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/min

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2} =$ **43.13**

Remarks:

QC Reviewer: WS CHAN Signature: Date: 15/11/19

C:\Old data\HVS Calibration Certificate (Existing)\Cent

AECOM Asia Company Limited
Tisch TSP Mass Flow Controlled High Volume Air Sampler
Field Calibration Report

Station	Block B, Merit Industrial Centre (E-A14a)	Operator:	Choi Wing Ho
Cal. Date:	14-Jan-20	Next Due Date:	14-Mar-20
Model No.:	TE-5170	Serial No.	10380
Equipment No.:	A-001-15T		

Ambient Condition			
Temperature, Ta (K)	294	Pressure, Pa (mmHg)	762.0

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	1.98356	Intercept, bc	-0.02592
Last Calibration Date:	6-Jun-19	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	6-Jun-20				

Calibration of TSP Sampler

Resistance Plate No.	Orfice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X axis**	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) **Y-axis**
18	7.1	2.69	1.37	46.0	46.37
13	6.1	2.49	1.27	41.0	41.33
10	5.1	2.28	1.16	36.0	36.29
7	3.5	1.89	0.96	28.0	28.23
5	2.5	1.59	0.82	21.0	21.17

By Linear Regression of Y on X

Slope , mw = **44.9999** **Intercept, bw =** **-15.5134**

Correlation Coefficient* = **0.9988**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m^3/min

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = IC \times [(Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $IC = (mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2}$= **42.64**

Remarks:

QC Reviewer: WS CHAN Signature: Date: 14/01/20

C:\Old data\HVS Calibration Certificate (Existing)\Cen

EQUIPMENT CALIBRATION RECORD

Type:	***Laser Dust Monitor***
Manufacturer/Brand:	***SIBATA***
Model No.:	***LD-3***
Equipment No.:	***A.005.07a***
Sensitivity Adjustment Scale Setting:	***557 CPM***
Operator:	*Mike Shek (MSKM)*

Standard Equipment

Equipment:	*Rupprecht & Patashnick TEOM®*			
Venue:	*Cyberport (Pui Ying Secondary School)*			
Model No.:	*Series 1400AB*			
Serial No:	Control:	*140AB219899803*		
	Sensor:	*1200C143659803*	K_o:	*12500*
Last Calibration Date*:	*2 May 2019*			

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): *557* CPM
Sensitivity Adjustment Scale Setting (After Calibration): *557* CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration[1] (mg/m^3) **Y-axis**	Total Count[2]	Count/ Minute[3] **X-axis**
			Temp (°C)	R.H. (%)			
1	*04-05-19*	*09:15 - 10:15*	*23.7*	*81*	*0.04765*	*1914*	*31.90*
2	*04-05-19*	*10:15 - 11:15*	*23.7*	*82*	*0.05036*	*2025*	*33.75*
3	*04-05-19*	*11:15 - 12:15*	*23.8*	*82*	*0.05251*	*2103*	*35.05*
4	*04-05-19*	*12:15 - 13:15*	*23.8*	*82*	*0.05587*	*2231*	*37.18*

Note:
1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X
Slope (K-factor): *0.0015*
Correlation coefficient: *0.9977*

Validity of Calibration Record: *4 May 2020*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 06 May 2019

EQUIPMENT CALIBRATION RECORD

Type: ***Laser Dust Monitor***
Manufacturer/Brand: ***SIBATA***
Model No.: ***LD-3***
Equipment No.: ***A.005.09a***
Sensitivity Adjustment Scale Setting: ***797 CPM***

Operator: *Mike Shek (MSKM)*

Standard Equipment

Equipment: *Rupprecht & Patashnick TEOM®*
Venue: *Cyberport (Pui Ying Secondary School)*
Model No.: *Series 1400AB*
Serial No: Control: *140AB219899803*
Sensor: *1200C143659803* K_o: *12500*
Last Calibration Date*: *2 May 2019*

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): *797* CPM
Sensitivity Adjustment Scale Setting (After Calibration): *797* CPM

Hour	Date (dd-mm-yy)	Time	Ambient Condition		Concentration[1] (mg/m^3) **Y-axis**	Total Count[2]	Count/ Minute[3] **X-axis**
			Temp (°C)	R.H. (%)			
1	04-05-19	09:45 - 10:45	23.7	81	0.04813	1925	32.08
2	04-05-19	10:45 - 11:45	23.7	82	0.05032	2022	33.70
3	04-05-19	11:45 - 12:45	23.8	82	0.05264	2118	35.30
4	04-05-19	12:45 - 13:45	23.8	82	0.05515	2220	37.00

Note:
1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X
Slope (K-factor): *0.0015*
Correlation coefficient: *0.9976*

Validity of Calibration Record: *4 May 2020*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 06 May 2019

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

ilac-MRA HKAS HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2800927	,	2791211
Adaptors used:	-	,	-

Item submitted by

Customer Name: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 12-Sep-2019

Date of test: 16-Sep-2019

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2020	CIGISMEC
Signal generator	DS 360	61227	26-Dec-2019	CEPREI

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1000 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsess of the Sound Level Meter.

Test results

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

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

Actual Measurement data are documented on worksheets.

Approved Signatory: Feng Junqi **Date:** 16-Sep-2019 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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

CERTIFICATE OF CALIBRATION

(Continuation Page)

1, Electrical Tests

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

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

2, Acoustic tests

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

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

3, Response to associated sound calibrator

N/A

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

- End -

Calibrated by: Fung Chi Yip
Date: 16-Sep-2019

Checked by: Shek Kwong Tat
Date: 16-Sep-2019

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

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

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CERTIFICATE OF CALIBRATION

Certificate No.: 19CA0327 01-01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2285692	,	2250455
Adaptors used:	-	,	-

Item submitted by

Customer Name:	AECOM ASIA CO., LTD.
Address of Customer:	-
Request No.:	-
Date of receipt:	27-Mar-2019 (N.009.04)

Date of test: 28-Mar-2019

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2019	CIGISMEC
Signal generator	DS 360	33873	24-Apr-2019	CEPREI
Signal generator	DS 360	61227	26-Dec-2019	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

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

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

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

Test results

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

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

Actual Measurement data are documented on worksheets.

Approved Signatory: Feng Junqi **Date:** 29-Mar-2019 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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12/F., Leader Centre, 37 Wong Chuk Hang Road, Aberdeen, Hong Kong.
E-mail: smec@cigismec.com Website: www.cigismec.com
Tel: (852) 2873 6860
Fax: (852) 2555 7533

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 19CA0327 01-01 **Page** 2 **of** 2

1, Electrical Tests

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

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

2, Acoustic tests

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

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

3, Response to associated sound calibrator

N/A

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

4, **Remark**: This calibration certificate supersedes the last certificate 18CA0406 02-01.

- End -

Calibrated by: Fong Chun Wai **Checked by:** Fung Chi Yip

Date: 28-Mar-2019 **Date:** 29-Mar-2019

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

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

HOKLAS 028
CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 19CA0327 01-02 **Page:** 1 **of** 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	B & K
Type/Model No.:	4231
Serial/Equipment No.:	3006428 / N004.03
Adaptors used:	-

Item submitted by

Curstomer:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	27-Mar-2019

(N.004.03)

Date of test: 27-Mar-2019

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	20-Apr-2019	SCL
Preamplifier	B&K 2673	2743150	27-Apr-2019	CEPREI
Measuring amplifier	B&K 2610	2346941	08-May-2019	CEPREI
Signal generator	DS 360	33873	24-Apr-2019	CEPREI
Digital multi-meter	34401A	US36087050	23-Apr-2019	CEPREI
Audio analyzer	8903B	GB41300350	23-Apr-2019	CEPREI
Universal counter	53132A	MY40003662	24-Apr-2019	CEPREI

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.

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

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

Test results

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

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

Approved Signatory: Feng Junqi **Date:** 29-Mar-2019 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 028) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are traceable to the International System of Units (SI) or recognised measurement standards. This certificate shall not be reproduced except in full.

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

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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 19CA0327 01-02 **Page:** 2 **of** 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.23	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.014 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz **Actual Frequency = 1000.0 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

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

At 1000 Hz **TND = 0.3 %**

Estimated expanded uncertainty 0.7 %

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

- End -

Calibrated by: Fung Chi Yip **Checked by:** Fong Chun Wai

Date: 27-Mar-2019 **Date:** 29-Mar-2019

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

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APPENDIX F

EM&A Monitoring Schedules

Central Kowloon Route – Kai Tak West
Impact Environmental Monitoring Schedule for January 2020

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

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
E-A14a: Block B of Merit Industrial Centre

Noise Monitoring Stations
E-N12a: 19 Hing Yan Street
E-N21a: Block B of Merit Industrial Centre

Monitoring Frequency
24-hour TSP: Once every 6 days
1-hour TSP: 3 times every 6 days (as required in case of complaints)

Monitoring Frequency
Once per week

Central Kowloon Route – Kai Tak West
Tentative Impact Environmental Monitoring Schedule for February 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Feb
2-Feb	3-Feb	4-Feb	5-Feb	6-Feb	7-Feb	8-Feb
			24-hour TSP 1-hour TSP Noise			
9-Feb	10-Feb	11-Feb	12-Feb	13-Feb	14-Feb	15-Feb
		24-hour TSP 1-hour TSP Noise				
16-Feb	17-Feb	18-Feb	19-Feb	20-Feb	21-Feb	22-Feb
	24-hour TSP 1-hour TSP Noise					24-hour TSP 1-hour TSP
23-Feb	24-Feb	25-Feb	26-Feb	27-Feb	28-Feb	29-Feb
					24-hour TSP 1-hour TSP Noise	

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station
E-A14a: Block B of Merit Industrial Centre

Noise Monitoring Stations
E-N12a: 19 Hing Yan Street
E-N21a: Block B of Merit Industrial Centre

Monitoring Frequency
24-hour TSP: Once every 6 days
1-hour TSP: 3 times every 6 days (as required in case of complaints)

Monitoring Frequency
Once per week

APPENDIX G

Air Quality Monitoring Results and their Graphical Presentations

Appendix G
Air Quality Monitoring Results

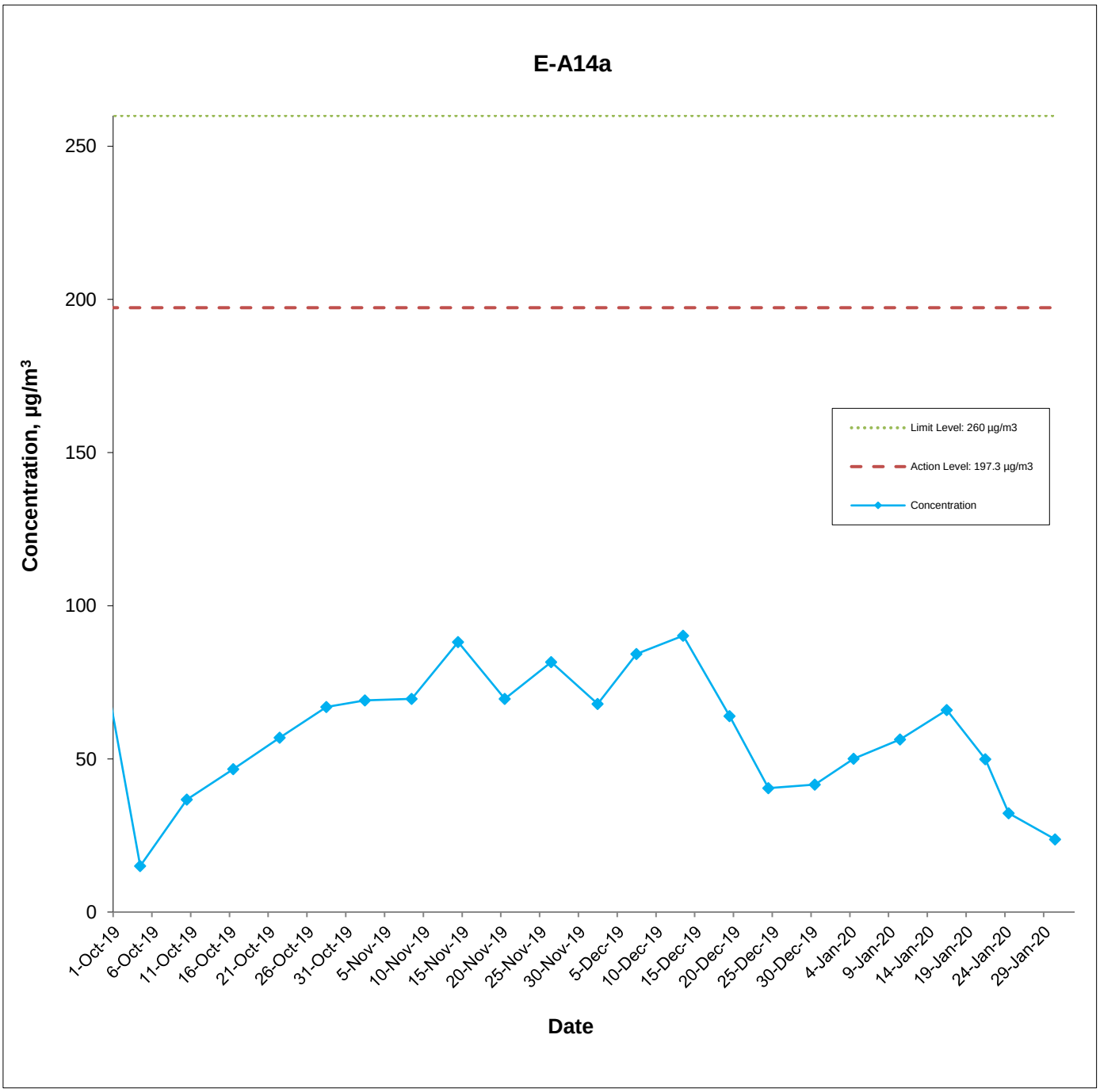
24-hour TSP Monitoring Results at Station E-A14a (Block B, Merit Industrial Centre)

Date	Weather Condition	Air Temp. (^oC)	Atmospheric Pressure (hPa)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Filter Weight (g)		Particulate weight(g)	Elapse Time		Sampling Time(hrs.)	Conc. ($\mu g/m^3$)
				Initial	Final			Initial	Final		Initial	Final		
4-Jan-20	Fine	19.2	1020.9	1.33	1.33	1.33	1916.6	2.7137	2.8096	0.0959	9066.32	9090.32	24.00	50.0
10-Jan-20	Sunny	19.9	1016.4	1.33	1.33	1.33	1916.6	2.7163	2.8243	0.1080	9090.32	9114.32	24.00	56.3
16-Jan-20	Sunny	19.8	1017.7	1.33	1.33	1.33	1916.6	2.6691	2.7955	0.1264	9114.32	9138.32	24.00	65.9
21-Jan-20	Fine	18.8	1022.4	1.33	1.33	1.33	1916.6	2.6770	2.7727	0.0957	9138.32	9162.32	24.00	49.9
24-Jan-20	Sunny	21.5	1018.1	1.33	1.33	1.33	1916.6	2.6791	2.7409	0.0618	9162.32	9186.32	24.00	32.2
30-Jan-20	Sunny	14.7	1021.5	1.33	1.33	1.33	1916.6	2.6982	2.7437	0.0455	9186.32	9210.32	24.00	23.7
													Average	**46.4**
													Minimum	**23.7**
													Maximum	**65.9**

Appendix G
Air Quality Monitoring Results

1-hour TSP Monitoring Results at Station E-A14a (Block B, Merit Industrial Centre)

Date	Start Time (hh:mm)	Weather Condition	1st Hour Conc. (µg/m³)	2nd Hour Conc. (µg/m³)	3rd Hour Conc. (µg/m³)
4-Jan-20	14:05	Fine	65.2	67.9	63.5
10-Jan-20	10:15	Sunny	66.2	65.1	62.7
16-Jan-20	10:05	Sunny	61.9	63.7	65.8
21-Jan-20	9:45	Fine	65.6	63.7	65.2
24-Jan-20	10:00	Sunny	59.5	59.8	59.7
30-Jan-20	9:50	Sunny	58.5	59.2	60.6
				Average	63.0
				Min	58.5
				Max	67.9



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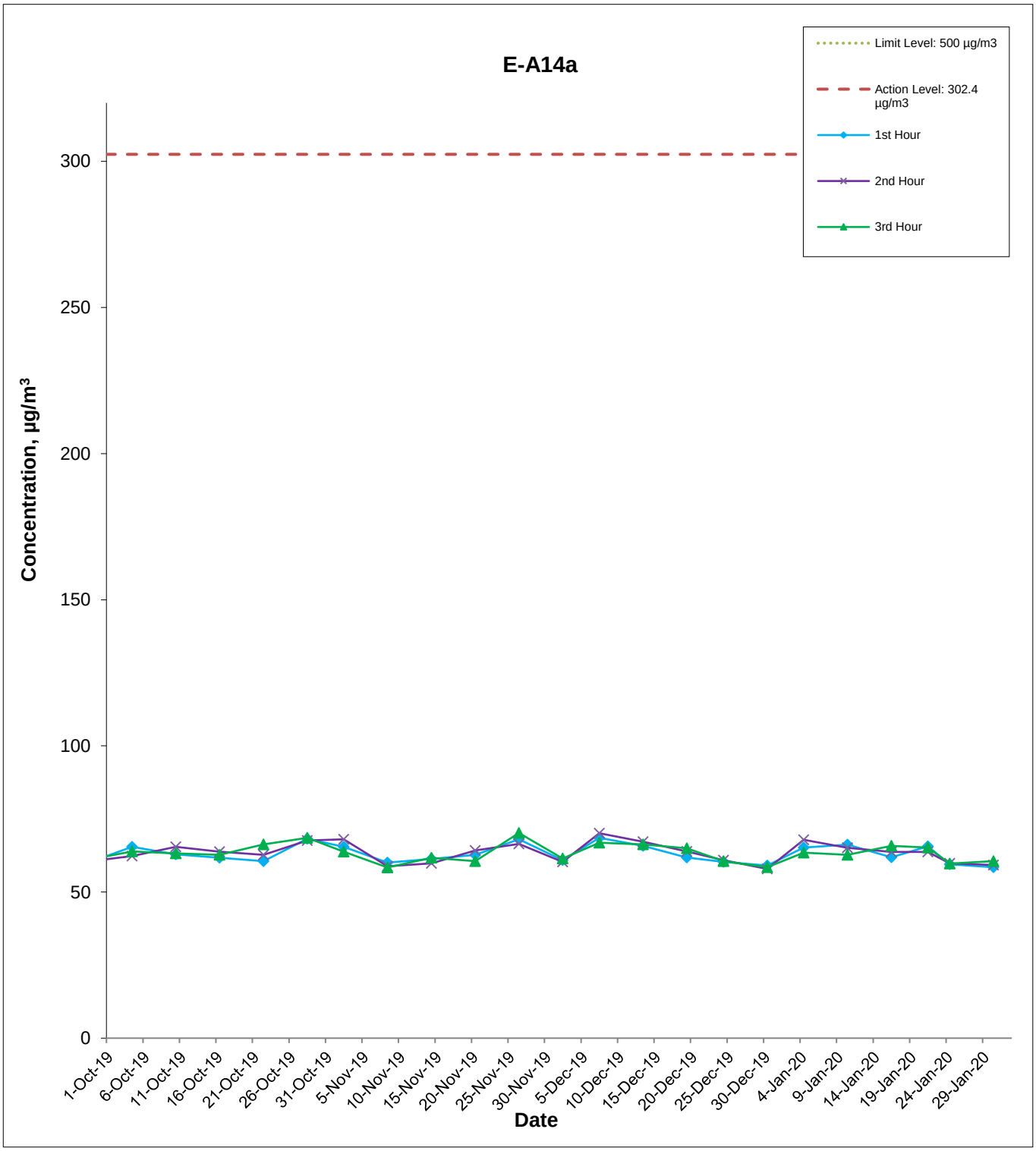
Central Kowloon Route - Kai Tak West (Contract No. HY/2014/07)

AECOM

Graphical Presentation of Impact 24-hour TSP Monitoring Results

Date: February 2020

Appendix G



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Central Kowloon Route - Kai Tak West (Contract No. HY/2014/07)

AECOM

Graphical Presentation of Impact 1-hour TSP Monitoring Results

Date: February 2020

Appendix G

Appendix G – Extract of Meteorological Observations for Hong Kong, January 2020

Date January	Number of hours of Reduced Visibility# (hours)	Total Bright Sunshine (hours)	Daily Global Solar Radiation (MJ/m^2)	Total Evaporation (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
1	0	0.2	4.92	1.6	080	33.5
2	1	3.6	8.36	1.5	050	24.7
3	2	8.9	15.70	2.3	040	21.6
4	1	8.6	15.20	2.2	060	18.4
5	0	6.6	14.66	2.5	060	34.8
6	0	6.7	14.99	2.5	060	24.5
7	0	8.0	13.10	2.3	020	11.8
8	0	8.1	16.17	4.2	010	20.3
9	0	5.0	12.61	2.4	070	35.6
10	0	6.1	12.75	2.2	060	26.3
11	4	7.0	13.60	3.9	040	16.1
12	0	7.9	14.40	2.8	360	24.4
13	0	2.5	10.42	1.5	050	29.8
14	0	9.4	16.17	2.8	060	27.3
15	2	5.8	13.99	2.9	070	37.8
16	7	7.2	15.21	3.1	060	28.0
17	0	0.1	6.34	2.6	010	20.4
18	0	6.5	13.83	2.5	040	25.7
19	2	1.1	9.52	2.7	050	24.8
20	0	2.9	11.06	2.0	020	21.2
21	0	4.9	12.30	2.3	060	33.5
22	3	4.3	11.39	1.5	030	18.5
23	0	7.6	14.44	2.0	020	16.8
24	0	4.6	13.16	2.7	040	26.1
25	1	0.9	8.21	1.5	060	37.5
26	0	1.5	7.59	3.5	360	25.8
27	0	2.7	9.19	2.3	350	28.7
28	0	4.4	10.35	2.4	360	29.3
29	0	7.2	14.87	4.4	360	34.8
30	0	10.2	20.55	4.0	360	31.3
31	0	10.2	19.51	2.4	070	25.2
Mean/Total	23	170.7	12.73	79.5	060	26.3
Normal*	221.9§	143.0	10.17	71.3	060	25.3
Station	Hong Kong International Airport	King's Park			Waglan Island^	

APPENDIX H

Noise Monitoring Results and their Graphical Presentations

Appendix H Regular Construction Noise Monitoring Results

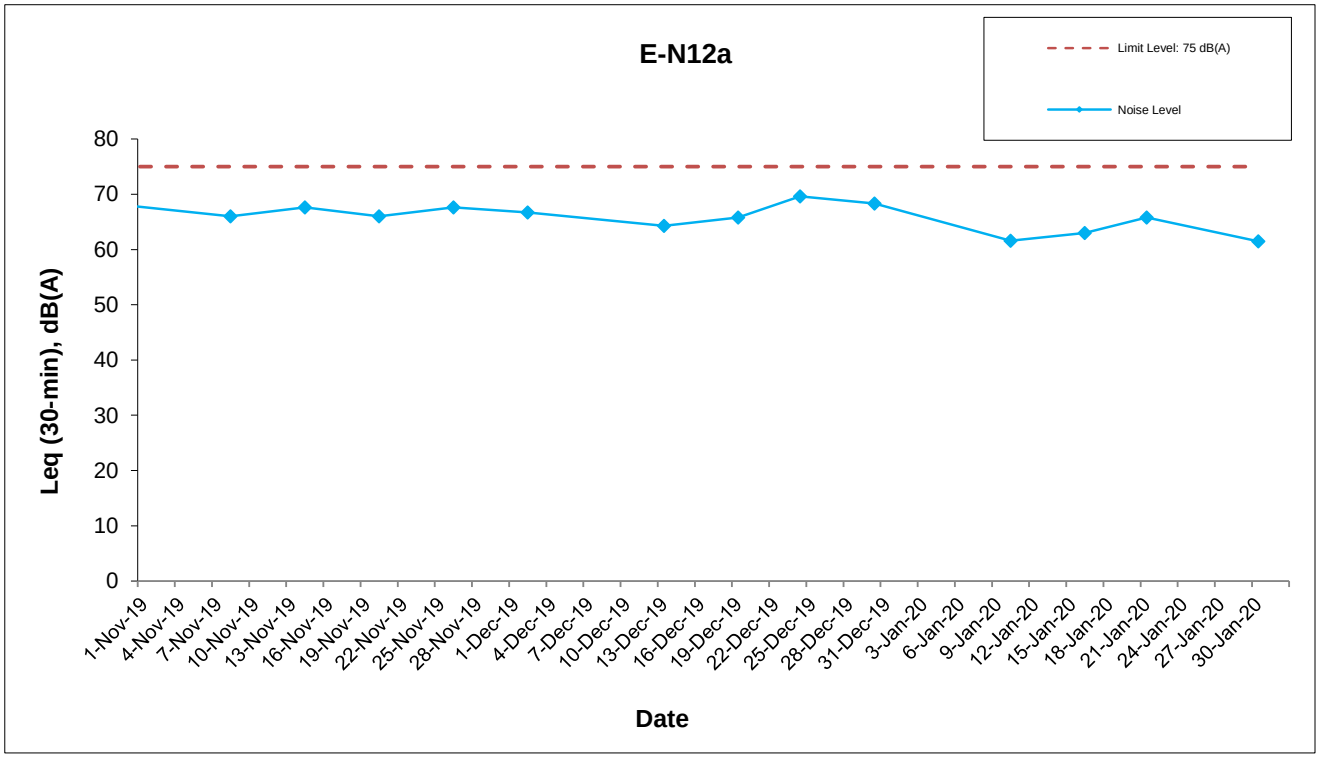
Daytime Noise Monitoring Results at Station E-N12a (19 Hing Yan Street)

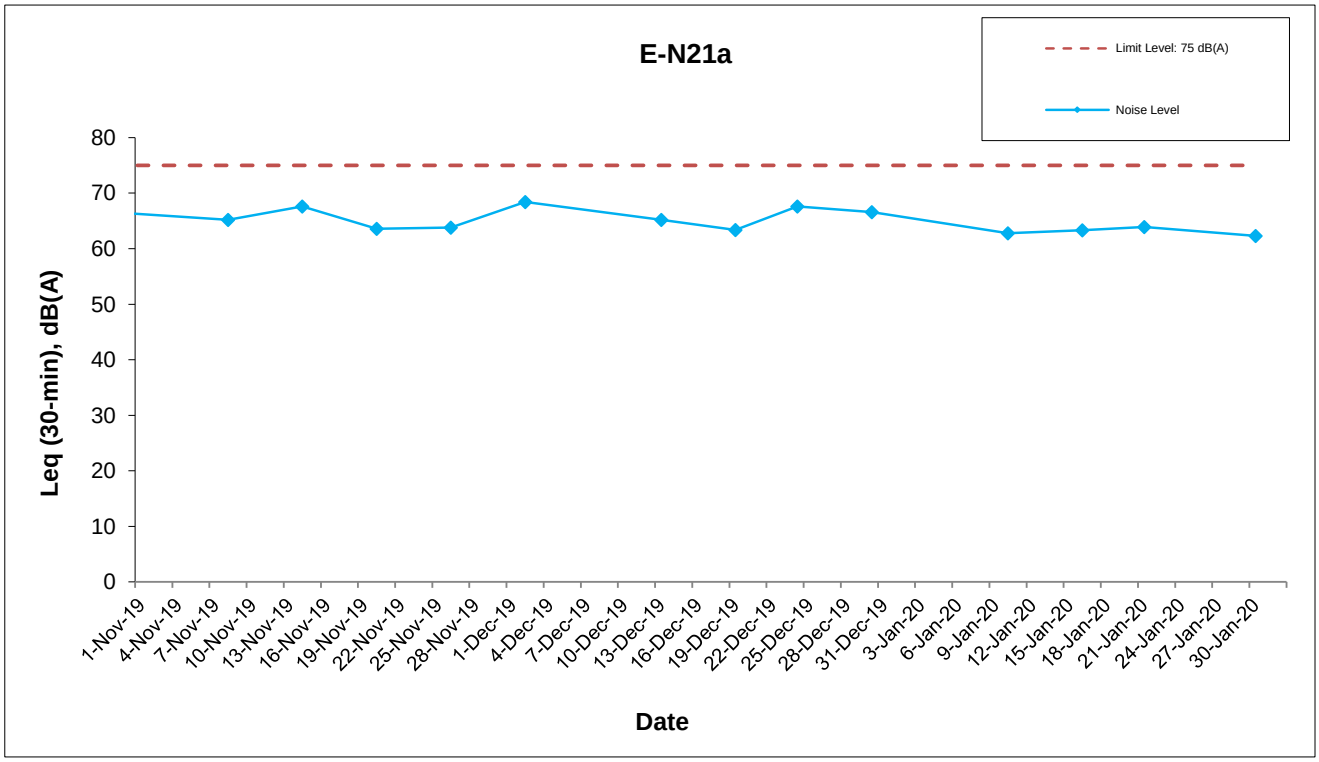
Date	Weather Condition	Noise Level for 30-min, dB(A) +				Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq		
10-Jan-20	Sunny	10:40	59.4	63.4	61.6	75	N
16-Jan-20	Sunny	11:00	60.0	64.5	63.0	75	N
21-Jan-20	Fine	13:20	63.6	67.5	65.8	75	N
30-Jan-20	Sunny	11:00	59.6	63.8	61.5	75	N

Daytime Noise Monitoring Results at Station E-N21a (Block B of Merit Industrial Centre)

Date	Weather Condition	Noise Level for 30-min, dB(A) #				Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq		
10-Jan-20	Sunny	10:20	61.5	63.5	62.8	75	N
16-Jan-20	Sunny	10:05	61.5	64.5	63.3	75	N
21-Jan-20	Sunny	9:40	61.7	65.5	63.9	75	N
30-Jan-20	Sunny	9:50	61.5	63.5	62.3	75	N

+ - Façade measurement.
# - A correction of +3dB(A) was made to the free field measurement.
++ - Free field measurement
* - Limit Level of 70dB(A) applies to education institutes while 65dB(A) applies during school





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APPENDIX I

Event Action Plan

Appendix I Event Action Plan

Event / Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
ACTION LEVEL				
Exceedance for one sample	1. Inform the Contractor, IEC and ER; 2. Discuss with the Contractor and IEC on the remedial measures required; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency	1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing.	1. Identify source(s), investigate the causes of exceedance and propose remedial measures; 2. Implement remedial measures; 3. Amend working methods agreed with the ER as appropriate.
Exceedance for two or more consecutive samples	1. Inform the Contractor, IEC and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. If exceedance continues, arrange meeting with the IEC, ER and Contractor; 6. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; 3. Supervise Implementation of remedial measures.	1. Identify source and investigate the causes of exceedance; 2. Submit proposals for remedial measures to the ER with a copy to ET and IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal as appropriate.

Appendix I Event Action Plan

EVENT	ACTION			
	ET	IEC	ER	Contractor
LIMIT LEVEL				
Exceedance for one sample	1. Inform the Contractor, IEC, EPD and ER; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Discuss with the ER, IEC and contractor on the remedial measures and assess the effectiveness.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ET, ER and Contractor on possible remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; 3. Supervise implementation of remedial measures.	1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to ER with a copy to ET and IEC within three working days of notification; 4. Implement the agreed proposals; 5. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	1. Notify Contractor, IEC, EPD and ER ; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Carry out analysis of the Contractor's working procedures with the ER to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Review the effectiveness of the Contractor's remedial measures and keep IEC, EPD and ER informed of the results; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with ET, ER, and Contractor on the potential remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; 4. 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. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with a copy to the IEC and ET within three working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix I Event Action Plan

Event and Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
Exceedance of Action Level	1. Notify the Contractor, IEC and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; and 3. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the contractor; and 2. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of complaint in writing; 2. Review and agree on the remedial measures proposed by the Contractor; and 3. Supervise implementation of remedial measures.	1. Investigate the complaint and propose remedial measures; 2. Report the results of investigation to the IEC, ET and ER; 3. Submit noise mitigation proposals to the ER with copy to the IEC and ET within 3 working days of notification; and 4. Implement noise mitigation proposals.
Exceedance of Limit Level	1. Notify the Contractor, IEC, EPD and ER ; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency; 4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Review the effectiveness of Contractor's remedial measures and keep IEC, EPD and ER informed of the results; and 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ER, ET and Contractor on the potential remedial measures; and 4. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; and 4. 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. Identify source and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with copy to the IEC and ET within 3 working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; and 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix I Event Action Plan

Event and Action Plan for Continuous Noise Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action/Limit Level	1. Identify source ; 2. Repeat measurement. If two consecutive measurements exceed Action/Limit Level, the exceedance is then confirmed; 3. If exceedance is confirmed, notify IEC, ER and Contractor; 4. Investigate the cause of exceedance and ckeck Contractor's working procedures to determine possible mitigation to be implemented; 5. Discuss jointly with the IEC, ER and Contractor and formulate remedial measures; and 6. Assess effectiveness of Contractor's remedial actions and keep IEC and ER informed of the results.	1. Check monitoring data submitted by the Works Contract 1123 ET; 2. Check the Contractor's working method; 3. Discuss with the ER, Works Contract 1123 ET and Contractor on the potential remedial measures; and 4. Review and advise the Works Contract 1123 ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the Works Contract 1123 ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Ensure the proper implementation of remedial measures; and 4. 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. Identify source with the Works Contract 1123 ET; 2. If exceedance is confirmed, investigation the cause of exceedance and take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with copy to the IEC and ET of notification; 4. Implement the agreed proposals; 5. Liaise with ER to optimize the effectiveness of the agreed mitigation; 6. Revise and resubmit proposals if problem still not under control; and 7. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

APPENDIX J

Cumulative Statistics on Complaints, Notification of Summons and Successful Prosecutions

Appendix J
Cumulative Statistics on Complaints, Notification of Summons and Successful Prosecutions

	Date received	Subject	Status	Total no. received in this month	Total no. received since project commencement
Environmental complaints	10 January 2020 (Referred by the Contractor on 9 January 2020)	Environmental Complaint No: EC-020-CKRKTW20200109_01_C028 <u>Details of Complaint</u> A complaint was received by public relations department of Gammon Construction Limited on 9 January 2020 and referred by the Contractor on 10 January 2020. The complaint related the air and noise concerns on 9 January 2020 was detailed as follows: "居民持續投訴早上噪音問題，每逢早上 7 時便開始進行噪音工作，今日更發現隔音布被拆卸，現要求承建商及路政署跟進及改善以下情況： - 將每日高噪音工作延至早上 8 時 30 分才開始； - 再增加隔音措施； - 如居民需要，約見及到訪投訴住戶，並量度噪音聲浪分貝； - 增加灑水措施，減少沙塵飛揚." <u>Details of Investigation and findings</u> Based on the Contractor's information, the construction activities from 0700 – 1900 hours according to the requirement set out in the Technical Memorandum of Environmental Impact Assessment Ordinance (EIAO-TM) on 9 January 2020 at Ma Tau Kok, which located near the Kowloon City Ferry Pier Bus Terminus were: • Rock breaking at S6 layer (22.5m below ground) • Lifting ELS into shaft for installation • Lifting rock debris by crane for disposal • Pipe piling works for Cut and Cover Tunnel • Gate Relocation As reported by the Contractor, gate relocation is required to suit the works and the noise canvas was partly removed at Ma Tau Kok on 9 January 2020 for set up of the new gate. However, the noise canvas had been erected to resume the noise screening from the construction site to the public at the same day. To minimize the impact for the air quality and noise to the public, mitigation measures for air and noise had been implemented by Contractor at Ma Tau Kok during the construction phase. In addition, the acoustic deck was made by the sheet pile which filled in concrete and additional noise absorption panel had installed underneath the deck to enhance the effectiveness of the noise minimization and dust emission before the breaking activity started. Furthermore, the operation of breaking was only conducted inside the access shaft	Closed	1	20

	Date received	Subject	Status	Total no. received in this month	Total no. received since project commencement
		with the acoustic deck and located around 22.5m below of the ground level. Corresponding to the EM&A monitoring schedule and the additional environmental monitoring at Grand Waterfront in January 2020, air quality monitoring was conducted at EM&A stations and additional monitoring station at Grand Waterfront on 4 and 10 January 2020 and the noise monitoring was conducted on 10 January 2020. Based on the monitoring results on 4 and 10 January 2020, all readings were also complied with the requirement of stipulated level for air and noise. According to ET's in-situ observation during the monitoring, the detectable noise sources mostly came from traffic noise from To Kwa Wan Road and noise from the Kowloon Bay and Ma Tau Kok work area was also intermittently heard at E-N12a and E-N21a. For the additional noise monitoring station at the second refuge floor of Grand Waterfront, intermittence breaking noise, which mitigated by the acoustic deck, and pipe piling noise were also heard from the Ma Tau Kok and no dust generation from site activities was observed. Regular site inspections were conducted by ET on 8 January 2020 and by ET and IEC on 15 January 2020, no adverse observation against the air and noise were recorded at Ma Tau Kok. The detectable noise source was coming from the underground breaking activity, which screened by the acoustic deck, and pipe piling activity was also conducted on the exposed area with the proper noise mitigation measures. Besides, some of mitigation measures for air and noise were also observed during site inspection. It is considered that the mitigation measure was implemented properly by the Contractor to minimize the air and noise nuisance to comply with stipulated level, because the data result of air and noise at the EM&A stations and additional environmental monitoring station at the Grand Waterfront were not exceeded the stipulated level. However, the mitigation measures should be recommended to review daily before commencement of and during construction.			
Notification of summons	--	--	--	0	0
Successful prosecutions	--	--	--	0	0

APPENDIX K

Waste Flow Table

Appendix K
Monthly Summary Waste Flow Table

Monthly Summary Waste Flow Table for 2020

Month	Actual Quantities of Inert C&D Materials Generated Monthly (Note 1)												Actual Quantities of Non-inert C&D Materials (i.e. C&D Wastes) Generated Monthly					Actual Quantities of Contaminated Soil Monthly		Actual Quantities of Land-based Sediment Monthly		Actual Quantities of Marine-based sediment Monthly		
	Generated					Disposed				Reused			Recycled			Disposed		Reused	Reused	Disposed		Disposed		
	Fill Material	Artificial Material			Total Quantity Generated	Disposed as Public Fills at TKO137	Disposed as Public Fills at TM38	Disposed as Public Fills at CWPFBP	Total Quantity Disposal	Reused in the Contract	Reused in Other Projects	Total Quantity Reused	Metals	Paper/ cardboard packaging (Note 3)	Plastics	Chemical Waste	General Refuse (Note 2)	Reused in the Contract	Reused in the Contract	Disposed at Designated Site		Disposed at Designated Site		
	Soil and Rock	Broken Concrete	Asphalt	Building Derbis															Type 1 (Cat. L)	Type 1 (Cat. M_p)	Type 2 (Cat. M_f, Cat. H)	Type 1 (Cat. L, Cat. M_p)	Type 2 (Cat. M_f, Cat. H, Cat. H_p)	Type 3 (Cat. H_f)
Unit	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000Kg)	('000Kg)	('000Kg)	('000L)	('000Kg)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)
Jan	35.394	0.008	0.000	0.000	35.402	0.000	0.031	0.000	0.031	0.000	35.371	35.371	0.000	0.180	0.000	0.000	21.510	0.000	0.000	0.000	0.000	0.000	0.309	0.000
Feb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Apr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
May	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jun	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SUB-TOTAL	35.394	0.008	0.000	0.000	35.402	0.000	0.031	0.000	0.031	0.000	35.371	35.371	0.000	0.180	0.000	0.000	21.510	0.000	0.000	0.000	0.000	0.000	0.309	0.000
Jul	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aug	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sep	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Oct	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nov	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dec	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	35.394	0.008	0.000	0.000	35.402	0.000	0.031	0.000	0.031	0.000	35.371	35.371	0.000	0.180	0.000	0.000	21.510	0.000	0.000	0.000	0.000	0.000	0.309	0.000

Notes:

1. Assume the density of fill is 2 ton/m^3.
2. Refuse disposed to NENT landfill.