

**Vol. 5 of 5**

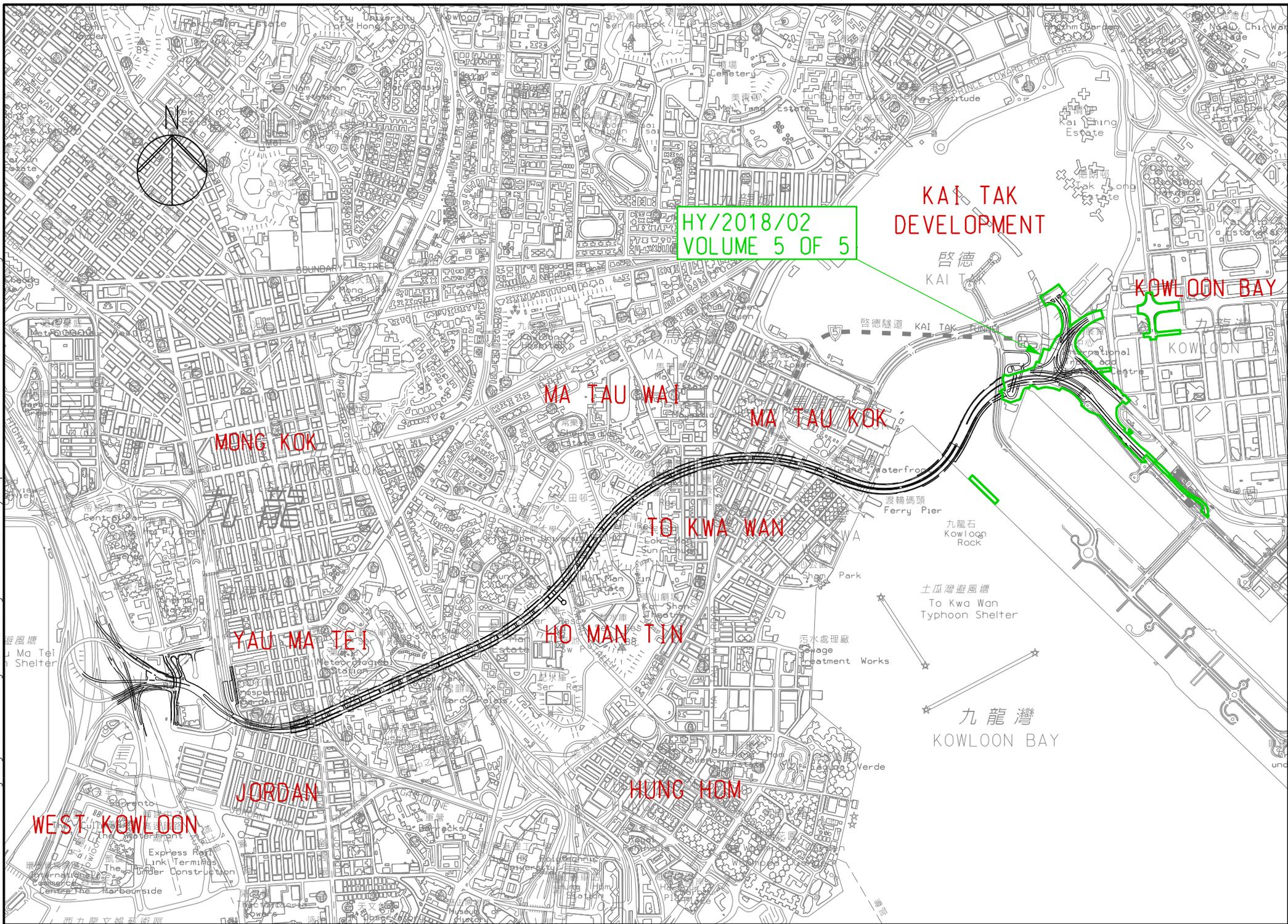
**EP-457/2013/C**

**Central Kowloon Route**

**Kai Tak East**

**Contract No. HY/2018/02**

**September 2019**



HY/2018/02  
VOLUME 5 OF 5

KAI TAK  
DEVELOPMENT

KOWLOON BAY

MAU TAU WAI

MAU TAU KOK

MONG KOK

TO KWA WAN

YAU MA TEI

HO MAN TIN

JORDAN

HUNG HOM

WEST KOWLOON

九龍灣  
KOWLOON BAY



## Environmental Permit No. EP-457/2013/C

### Central Kowloon Route

### Independent Environmental Checker Verification

Works Contract:	Kai Tak East (HY/2018/02)
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#### Reference Document/Plan

Document/ <del>Plan</del> to be <del>Certified</del> / Verified:	Monthly EM&A Report No.1 (September 2019)
Date of Report:	10 October (Rev. 2)
Date received by IEC:	10 October 2019

#### 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/ <del>plan</del> complies with the above referenced condition of EP-457/2013/C.	
	
Ms Mandy To	Date: 10 October 2019
Independent Environmental Checker	



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## Alchmex – Paul Y Joint Venture

Central Kowloon Route Contract HY/2018/02

Section of Kai Tak East

Monthly EM&A Report No. 1

(Period from 9 to 30 September 2019)

Rev. 2

(10 October 2019)

	<b>Name</b>	<b>Signature</b>
Prepared by	Karen K. Y. Cheung	
Checked & Reviewed by	Nelson T. H. Tsui	
Approved & Certified by	Kevin W. M. Li (Environmental Team Leader)	

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## EXECUTIVE SUMMARY

- A.1 Alchmex – Paul Y Joint Venture (“Contractor”) commenced the construction works of Highway Department (HyD) Central Kowloon Route Contract No. HY/2018/02 – Section of Kai Tak East (“The Project”) on 9 September 2019. This is the 1<sup>st</sup> monthly Environmental Monitoring and Audit (EM&A) report presenting the EM&A works carried out during the period from 9 September 2019 to 30 September 2019.
- A.2 A summary of the construction works that undertaken for the Project during the reporting month is listed below.

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### Construction Activities undertaken

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- Site Accommodation for the Supervisor and Contractor

- 
- A.3 A summary of regular construction dust monitoring activities in this reporting period is listed below:

**Construction dust (24-hour TSP) monitoring**

E-A1 4 times

**Construction dust (1-hour TSP) monitoring**

E-A1 12 times

- A.4 No construction work was conducted during time period other than normal working hours during this reporting month.
- A.5 Inert construction and demolition (C&D) materials and non-inert C&D materials were the wastes that generated from this Project. During September 2019, 0.7 ton inert C&D material was generated from the Project. 0.6 ton inert C&D material was sent to public fill, 0.1 ton inert C&D waste was reused in the Contract. No plastics, metal and paper/cardboard packaging was generated and sent to recyclers for recycling during reporting period. About 142.0 tonnes of non-recyclable non-inert C&D materials, such as general refuse, were disposed of at landfill. No chemical waste was generated during this reporting month.
- A.6 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 11, 25 September 2019. Details of the audit findings and implementation status are presented in Section 5.
- A.7 Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor’s ET on 11, 17, 25 September 2019. Details of the audit findings and implementation status are presented in Section 5.
- A.8 No change has been made from the described in the approved EM&A Manual, such as construction method, mitigation proposals and design changes.

- A.9 No exceedance of the Action and Limit Levels of 24-hour TSP and 1-hour TSP monitoring were recorded during the reporting month.
- A.10 No complaint and non-compliance was received in the reporting month.
- A.11 No summon or prosecution was received in this reporting month.
- A.12 No reporting changes were revised in this reporting month.
- A.13 A summary of the construction activities to be undertaken in the in the next reporting month is listed below:

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**Construction Activities to be undertaken**

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- Site Accommodation for the Supervisor and Contractor
  - Ground Investigation
-

## 1. BASIC PROJECT INFORMATION

- 1.1. Central Kowloon Route (CKR) is a 4.7 km long dual 3-lane trunk road in Central Kowloon linking Yau Ma Tei Interchange in West Kowloon with the road network on Kai Tak Development and Kowloon Bay in East Kowloon.
- 1.2. The Central Kowloon Route – Design and Construction Environmental Impact Assessment Report (Register No.: AEIAR-171/2013) was approved with conditions by the Environmental Protection Department (EPD) on 11 July 2013. An Environmental Permit (EP 457/2013) was issued on 9 August 2013. Variations of EP (VEP) was subsequently applied for and the latest EP (EP-457/2013/C) was issued by EPD on 16 January 2017.
- 1.3. The construction of the CKR had been divided into different sections. This Contract No. HY/2018/02 – Section of Kai Tak East (KTE) covers part of the construction activities located at Kai Tak under the EP which includes:
  - Section of Kai Tak East
    - i. construction of an approximately 700m long dual 2-lane Central Kowloon Route mainline at Kai Tak, including at-grade roads and bridges;
    - ii. construction of Kai Tak Interchange, including bridges, underpass, and associated at-grade slip roads, connecting the Central Kowloon Route with the existing road network;
    - iii. construction of a footbridge, and demolition/backfill of an existing subway across Kai Fuk Road;
    - iv. realignment of existing Kai Fuk Road, Kai Cheung Road and Kai Cheung Road/Kai Fuk Road loop road;
    - v. reconstruction of an approximately 30m long existing multi-cell box culvert;
    - vi. construction of an approximately 130m long underground ventilation and E&M adit;
    - vii. construction of Ring Road Underpass, connecting Central Kowloon Route mainline and Central Kowloon Route Administration Building;
    - viii. junction improvement works at existing Wang Kwong Road/Kai Cheung Road and Wang Kwong Road/Lam Hing Street junctions;
    - ix. arrangement and implementation of cross boundary disposal of construction and demolition materials; and
    - x. associated roadworks, drainage, waterworks, landscaping works, geotechnical works, and electrical and mechanical works.

The alignment and works area for the Contract No. HY/2018/02 - are shown in Appendix A.

- 1.4. A summary of the major construction activities undertaken in this reporting period is shown in Table 1.1. The construction programme is presented in Appendix B.

Table 1.1 Summary of the construction Activities Undertaken during the Reporting Month.

**Construction Activities undertaken**

- Site Accommodation for the Supervisor and Contractor

- 1.5. There are no updates on the scope of works and construction methodologies.

- 1.6. The project organisational chart specifying management structure and contact details are shown in Appendix C.

- 1.7. A summary of the valid permits, licences, and /or notifications on environmental protection for this Project is presented in Table 1.2

Table 1.2 Summary of the Status of Valid Environmental Licence,  
Notification, Permit and Documentations

<b>Permit/ Licences/ Notification</b>	<b>Reference</b>	<b>Validity Period</b>
<b>Environmental Permit</b>	EP-457/2013/C	Throughout the Contract
<b>Notification of Construction Works under the Air Pollution Control (Construction Dust) Regulation (Form NA)</b>	445001	Throughout the Contract
<b>Chemical Waste Producer Registration</b>	WPN5113-247-A2940-01	Throughout the Contract
<b>Construction Noise Permit at Construction site near Kai Fuk Road</b>	GW-RE0563-19	16 July 2019 to 11 January 2020
<b>Construction Noise Permit for at Junction of Wang Kwong Road and Lam Hing Street</b>	GW-RE0640-19	15 August 2019 to 14 November 2019
<b>Construction Noise Permit at Kai Fuk Road</b>	GW-RE0664-19	21 August 2019 to 30 September 2019
<b>Construction Noise Permit at Construction site near Kai Tak Tunnel</b>	GW-RE0767-19	2 October 2019 to 23 March 2020
<b>Construction Noise Permit at Construction site near Kowloon Bay International Trade &amp; Exhibition Centre</b>	GW-RE0769-19	2 October 2019 to 23 March 2020
<b>Billing Account for Disposal of Construction Waste</b>	7034073	Throughout the Contract

## 2. ENVIRONMENTAL STATUS

2.1. Environmental permit (EP) conditions under the EIAO, submission status under the EP and implementation status of mitigation measures had been reviewed and implemented on schedule. The status of required submissions under the EP (EP-457/2013/C) as of the reporting period for the Project are summarised in Table 2.1

Table 2.1 Summary of Status of Required Submission for EP-457/2013/C for the Project

EP Condition (EP-457/2013/C)	Submission	Submission date
Condition 1.12	Notification of Commencement Date of Construction of the Project	26 Jul 2019
Condition 2.4	Management organisation of the main construction companies	26 Jul 2019
Condition 2.5	Construction Programme and EP Submission Schedule	26 Jul 2019
Condition 2.6	Design Drawing	26 Jul 2019
Condition 2.8	Landscape Mitigation Plan	26 Jul 2019
Condition 3.3	Baseline Monitoring Report	21 Aug 2019

2.2. Details of the major construction activities undertaken in this reporting period are shown in Table 2.2.

Table 2.2 Summary of the construction Activities Undertaken during the Reporting Month.

Construction activities undertaken	Remarks on progress
• Site Accommodation for the Supervisor and Contractor	• 80% completion

2.3. The drawing showing the the project layout and the location of the monitoring station and environmental sensitive receivers are attached in Appendix A and Appendix I. Co-ordinates of the monitoring location is shown in below:

Table 2.3 Summary for the location of the monitoring station

Monitoring Location	Location ID	Latitude	Longitude
Hong Kong International Trade and Exhibition Centre	E-A1	22.323912	114.203512

### 3. MONITORING RESULTS

#### 3.1. Monitoring Parameters

##### Air Quality

- 3.1.1. The impact monitoring had been carried out in accordance with section 5.8 of the approved EM&A Manual to determine the 1-hour and 24-hour total suspended particulates (TSP) levels at the monitoring locations in the reporting month.
- 3.1.2. The sampling frequency of at least once in every 6 days, shall be strictly observed at the monitoring stations for 24-hour TSP monitoring. For 1-hour TSP monitoring, the sampling frequency of at least 3 times in every 6 days should be undertaken when the highest dust impact occurs.
- 3.1.3. General meteorological conditions (wind speed, direction and precipitation) and notes regarding any significant adjacent dust producing sources had also been recorded throughout the impact monitoring period.

#### 3.2. Monitoring Equipment

##### Air Quality

- 3.2.1. 1-hour TSP levels and 24-hour TSP had been measured with direct reading dust meter and High Volume Samplers respectively. It has been demonstrated its capability in achieving comparable results with high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50).
- 3.2.2. The 1-hour TSP meter was calibrated by the manufacturer prior to purchasing. Zero response of the instrument was checked before and after each monitoring event. Operation of the 1-hour TSP meter followed manufacturer’s Operation and Service Manual. The 24-hour TSP meter was calibrated against firmware 80570-8100-V1.0.4, annually. Operation of the 24-hour TSP meter followed manufacturer’s Operation and Service Manual. Valid calibration certificate of dust monitoring equipment is attached in Appendix G.
- 3.2.3. A summary of the equipment that was deployed for the 24- hour averaged monitoring is shown in Table 3.1. The TSP monitoring was conducted as per the schedule presented in Appendix F.
- 3.2.4. The equipment used for 1-hour TSP and 24-hour TSP measurement and calibration are summarised in Table 3.1

Table 3.1 Construction Dust Monitoring Equipment

Monitoring Parameter	Monitoring Equipment	Serial Number	Date of Calibration
1-hour TSP	LD-5R Digital Dust Indicator	851820	23 Aug 2019
24-hour TSP	TE-5170X High Volume Sampler	1085	7, 26 Sep 2019
	TE-5025A Calibration Kit	3465	22 Jan 2019

### 3.3. Monitoring Methodology and QA/QC results

#### **Air Quality**

3.3.1. The 1-hour TSP monitor, portable dust meters (Sibata Digital Dust Indicator Model LD-5R) was used for the impact monitoring. The 1-hour TSP meters provides a real time 1-hour TSP measurement based on 90° light scattering. Three 1-hour TSP level were logged per every six days.

3.3.2. The 24-hour TSP monitor, High Volume Samplers (Tisch TE 5170 High Volume Air Sampler) were used for the impact monitoring. The 24-hour TSP monitoring consists of the following:

- ◆ The HVS was set at the monitoring location, with electricity supply connected and secured;
- ◆ HVS was calibrated before commencing the 1<sup>st</sup> measurement;
- ◆ The filter paper was weight and provided by HOKLAS lab (Acumen Laboratory and Testing Limited and ALS Technichem (HK) Pty Ltd) before and after the sampling. Certificate of HOKLAS accredited laboratory can be referred to Appendix H;
- ◆ The airflow over time during sampling process was recorded by the HVS.

3.3.3. HVSs were free-standing with no obstruction. The following criteria were considered in the installation of the HVS:

- ◆ Appropriate support to secure the samples against gusty wind needed to be provided the monitoring station;
- ◆ A minimum of 2m separation from walls, parapets and penthouses was required for rooftop samplers;
- ◆ No furnace or incinerator flues was nearby;
- ◆ Airflow around the sampler was unrestricted; and
- ◆ Permission could be obtained to set up the samplers and gain access to the monitoring station.
- ◆ Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring
- ◆ A secured supply of electricity is needed to operate the samplers.

3.3.4. Preparation of Filter Papers

- ◆ Glass fiber filters were labelled and sufficient filters that were clean and without pinholes were selected;
- ◆ All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25°C and not varied by more than ±3°C; the relative humidity (RH) was 40%; and
- ◆ Acumen Laboratory and Testing Limited and ALS Technichem (HK) Pty Limited, as HOKLAS accredited laboratory, implemented comprehensive quality assurance and quality control programmes on the filters.

### 3.3.5. Field Monitoring

- ◆ The power supply was checked to ensure that the HVS was working properly;
- ◆ The filter holder and area surrounding the filter were cleaned;
- ◆ The filter holder was removed by loosening the foul bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully;
- ◆ The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter;
- ◆ The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges;
- ◆ The shelter lid was closed and secured with an aluminum strip;
- ◆ The HVS was warmed- up for about 5 minutes to establish run- temperature conditions;
- ◆ A new flow rate record sheet was inserted into the flow recorder;
- ◆ The flow rates of the HVS was checked and adjusted to between 1.22-1.37 m<sup>3</sup>min<sup>-3</sup>, which was within the range specified in the EM&A Manual (i.e. 0.6- 1.7 m<sup>3</sup>min<sup>-3</sup>);
- ◆ The programmable timer was set for a sampling period of 24 hours ±hour, and the starting time, weather condition and filter number were recorded;
- ◆ The initial elapsed time was recorded;
- ◆ At the end of sampling, the sampled filter was removed carefully and folded in half so that only surfaces with collected particulate matter were in contact;
- ◆ The filter paper was placed in a clean plastic envelope and sealed; all monitoring information was recorded on a standard data sheet and
- ◆ The filters were sent to (Acumen Laboratory and Testing Ltd and ALS Technichem (HK) Pty Ltd) for analysis.

### 3.3.6. Maintenance and Calibration

- ◆ The HVS and their accessories were maintained in a good working condition. For example, motor brushes were replaced routinely and electrical wiring was checked to ensure a continuous power supply; and
- ◆ The flow rate of each HVS with mass flow controller was calibrated using an orifice calibrator, Initial calibrations of the dust monitoring equipment were conducted upon installation and prior to commissioning. Five- point calibration was carried out for HVS using TE-5025 Calibration Kit. HVS is calibrated bimonthly. The calibration records for the HVS is given in Appendix G.

### 3.3.7. Wind Data Monitoring

- ◆ The wind speed has been recorded from Hong Kong Observatory- King's Park meteorological station, along with portable wind speed meter stand by as back up if malfunction occurred or data was not recorded from HKO

### 3.4. Monitoring Locations

#### Air Quality

- 3.4.1. During the site visit, air monitoring station Hong Kong International Trade and Exhibition Centre had been recommended in the approved EM&A Manual and approved by IEC. A designated air monitoring location was identified and agreed with IEC and EPD. Detail of the air monitoring station is described in Table 3.2. The location plan of air quality monitoring stations is shown in Appendix I.

Table 3.2 Location of the Dust Monitoring Stations

Air Quality Monitoring Station	Dust Monitoring Station
E-A1	Hong Kong International Trade and Exhibition Centre

### 3.5. Monitoring date, time, frequency and duration

- 3.5.1. A summary of impact monitoring duration, sampling parameter and frequency is presented in Table 3.3.

Table 3.3: Summary of Impact Monitoring Programme

Impact Monitoring	Duration	Sampling Parameter	Frequency
Dust	1-hour continuous measurement	1-hour TSP	3 times per six days
Dust	24-hour continuous sampling	24-hour TSP	Once per six days

### 3.6. Result Summary

#### Air Quality

- 3.6.1. According to our field observations, the major dust source identified at the designated air quality monitoring station in the reporting month are summarised in Table 3.4

Table 3.4 Observation at Dust Monitoring Station

Monitoring Station	Major Dust Source
E-A1	Nearby traffic

- 3.6.2. Air quality impact monitoring for the reporting month was carried out on 10, 16, 20, 26 September 2019 at E-A1.

3.6.3. The results for 1-hour TSP and 24-hour TSP are summarized in Table 3.5 and Table 3.6. The measurement data and details of influencing factors such as weather conditions and site observation are presented in Appendix J.

Table 3.5 Summary of 1-hour TSP Monitoring Results

Monitoring Location	Range( $\mu\text{g}/\text{m}^3$ )	Action Level( $\mu\text{g}/\text{m}^3$ )	Limit Level( $\mu\text{g}/\text{m}^3$ )
E-A1	50-72	279	500

Table 3.6 Summary of 24-hour TSP Monitoring Results

Monitoring Location	Range( $\mu\text{g}/\text{m}^3$ )	Action Level( $\mu\text{g}/\text{m}^3$ )	Limit Level( $\mu\text{g}/\text{m}^3$ )
E-A1	29-48	142	260

### Waste management

3.6.4. The waste generated from this Project includes inert C&D materials, and non-inert C&D materials. Non-inert C&D materials are made up of general refuse, vegetative wastes and recyclable wastes such as plastics and paper/cardboard packaging waste. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. With reference to relevant handling records and trip tickets of this Project, the quantities of different types of waste generated in the reporting month are summarised in Table 3.7. Details of cumulative waste management data are presented as a waste flow table in Appendix K.

Table 3.7 Quantities of waste generated from the Project

Reporting period	Quantity					
	Inert C&D Materials (in 'tonnes)	Chemical Waste (in '000 Kg)	Others, e.g. General Refuse disposed at Landfill (in 'tonnes)	Non-inert C&D Materials		
				Recycled materials		
				Paper/card board (in '000 Kg)	Plastics (in '000 Kg)	Metals (in '000 Kg)
Sep-2019	0.7	0.0	142.0	0.0	0.0	0.0

#### 4. SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND PROSECUTIONS

4.1. The Environmental Complaint Handling Procedure is shown in below Table 4.1:

Table 4.1 Environmental Complaint Handling Procedure

Complaint Received via Project Hotline	Complaint Received via 1823 or from other government departments
Contractor notify ER, ET and IEC	ER notify Contractor, ET and IEC
Contractor log complaint and date of receipt onto the complaint database. Contractor, ER and ET to conduct investigation of complaint	
If complaint is considered not valid	If complaint is found valid
ET or ER to reply the complainant if necessary	Contractor to identify and implement remedial measures in consultation with the IEC, ET and ER.
	The ER, ET and IEC to review the effectiveness of the Contractor's remedial measures and the updated situation; ET to undertake additional monitoring and audit to verify the situation if necessary, and oversee that circumstances leading to the complaint do not recur. ER to conduct further inspection as necessary.
If the complaint is referred by the EPD, the Contractor to prepare interim report on the status of the complaint investigation and follow-up actions stipulated above, including the details of the remedial measures and additional monitoring identified or already taken, for submission to EPD within the time frame assigned by the EPD	
The ET to record the details of the complaint, results of the investigation, subsequent actions taken to address the complaint and updated situation including the effectiveness of the remedial measures, supported by regular and additional monitoring results in the monthly EM&A reports	

- 4.2. Should non-compliance of the criteria occur, action in accordance with the Action Plan in Appendix D shall be carried out.
- 4.3. No exceedance of the Action and Limit Levels of 24-hour TSP and 1-hour TSP monitoring were recorded during the reporting month.
- 4.4. No complaint and non-compliance was received in the reporting month.
- 4.5. No notification of summons and prosecution was received in the reporting period.
- 4.6. Statistics on complaints, notifications of summons and successful prosecutions are summarized in Appendix L.

## 5. EM&A SITE INSPECTION

- 5.1. Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract. In the reporting period, three (3) site inspections were carried out on 11, 17, 25 September 2019, along with bi-weekly inspection of the implementation of landscape and visual mitigation measures conducted on 11, 25 September 2019.
- 5.2. One joint site inspection with IEC also undertaken on 17 September 2019. Minor deficiencies were observed during weekly site inspection. Key observations during the site inspections are summarized in Table 5.1.

Table 5.1 Site Observations

<b>Date</b>	<b>Environmental Observations</b>	<b>Follow-up Status</b>
11 Sep 2019	1. Drip tray should be provided for the generator.	1. Drip tray was provided for the generator.
17 Sep 2019	1. Stockpiles and dusty materials are not covered with sheeting at area 3B.	1. Stockpiles and dusty materials were covered by tarpaulin sheets at area 3B.
25 Sep 2019	No major observation was found.	-

- 5.3. The Contractor had rectified all observation identified during environmental site inspection in the reporting period.
- 5.4. According to the EIA Study Report, Environmental Permit, contract documents and EM&A Manual, the mitigation measures detailed in the documents had been implemented as much as practical during the reporting period. An updated Implementation Status of Environmental Mitigation Measures (EMIS) is provided in Appendix E.

## **6. FUTURE KEY ISSUES**

6.1. Work to be undertaken in the next reporting month are:

- Site Accommodation for the Supervisor and Contractor
- Ground Investigation

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

6.3. The tentative schedule of 1-hour TSP and 24-hour TSP monitoring in the next reporting period is presented in Appendix M.

6.4. The construction programme for the Project for the next reporting month is presented in Appendix B.

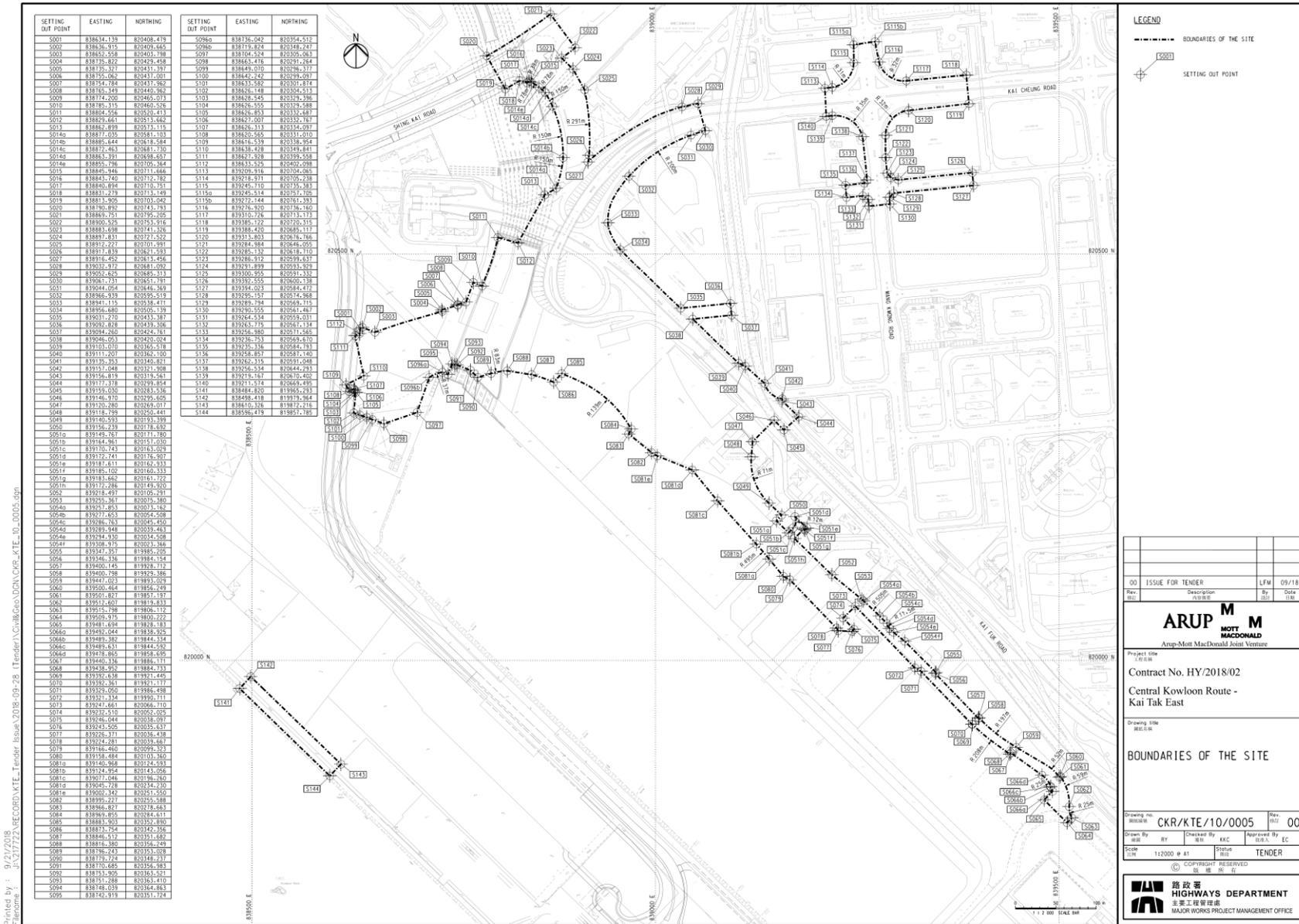
## **7. CONCLUSION AND RECOMMENDATIONS**

- 7.1. This 1<sup>st</sup> monthly EM&A Report presents the EM&A works undertaken during the period from 9 September 2019 to 30 September 2019 in accordance with the EM&A Manual and the requirement under EP- 457/2013/C.
- 7.2. Air quality (including 1-hour TSP and 24-hour TSP) was carried out in the reporting period. No exceedance of the Action and Limit Level was recorded for air quality impact monitoring during the reporting month.
- 7.3. Weekly environmental site inspections were conducted during the reporting period. Joint site inspection with IEC were carried out on 17 September 2019. Minor deficiency was observed during site inspection and was rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.
- 7.4. No complaint and non-compliance situation was received in the reporting month.
- 7.5. No notification of summons or prosecution was received since commencement of the Contract.
- 7.6. The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

# Appendix A

## Alignment and Works Area for the Contract No. HY/2018/02

Contract No. HY/2018/02  
Environmental Monitoring & Auditing



**LEGEND**

--- BOUNDARIES OF THE SITE

◆ SETTING OUT POINT

00	ISSUE FOR TENDER	LFM	09/18
Rev. No.	Description	By	Date

**ARUP MOTT MACDONALD**  
Amp-Mott MacDonald Joint Venture

Contract No. HY/2018/02  
Central Kowloon Route - Kai Tak East

Drawing title: BOUNDARIES OF THE SITE

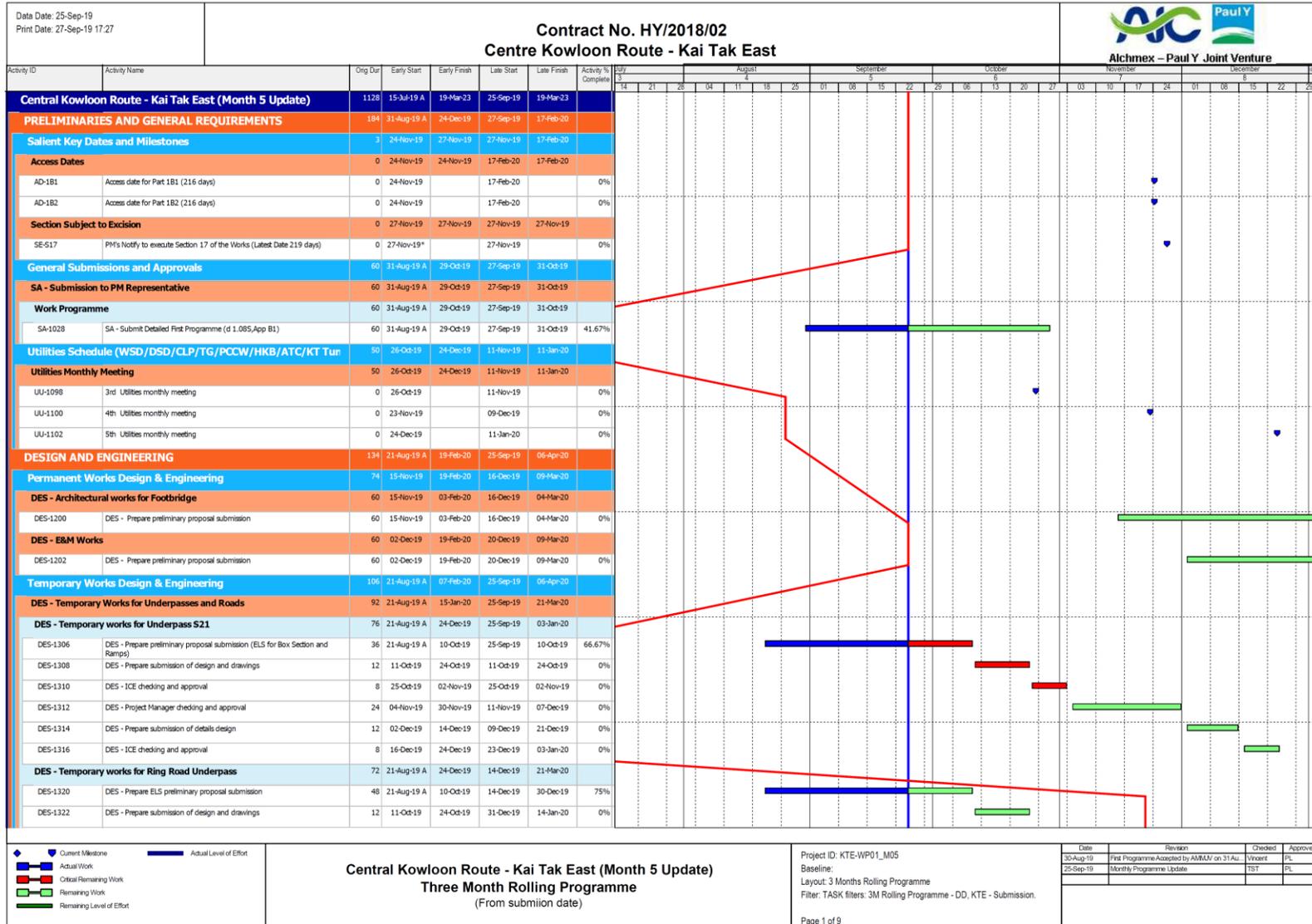
Project No.	CRK/KTE/10/0005	Rev. No.	00
Drawn By	RY	Checked By	KAC
Scale	1:20000 @ A1	Status	TENDER

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

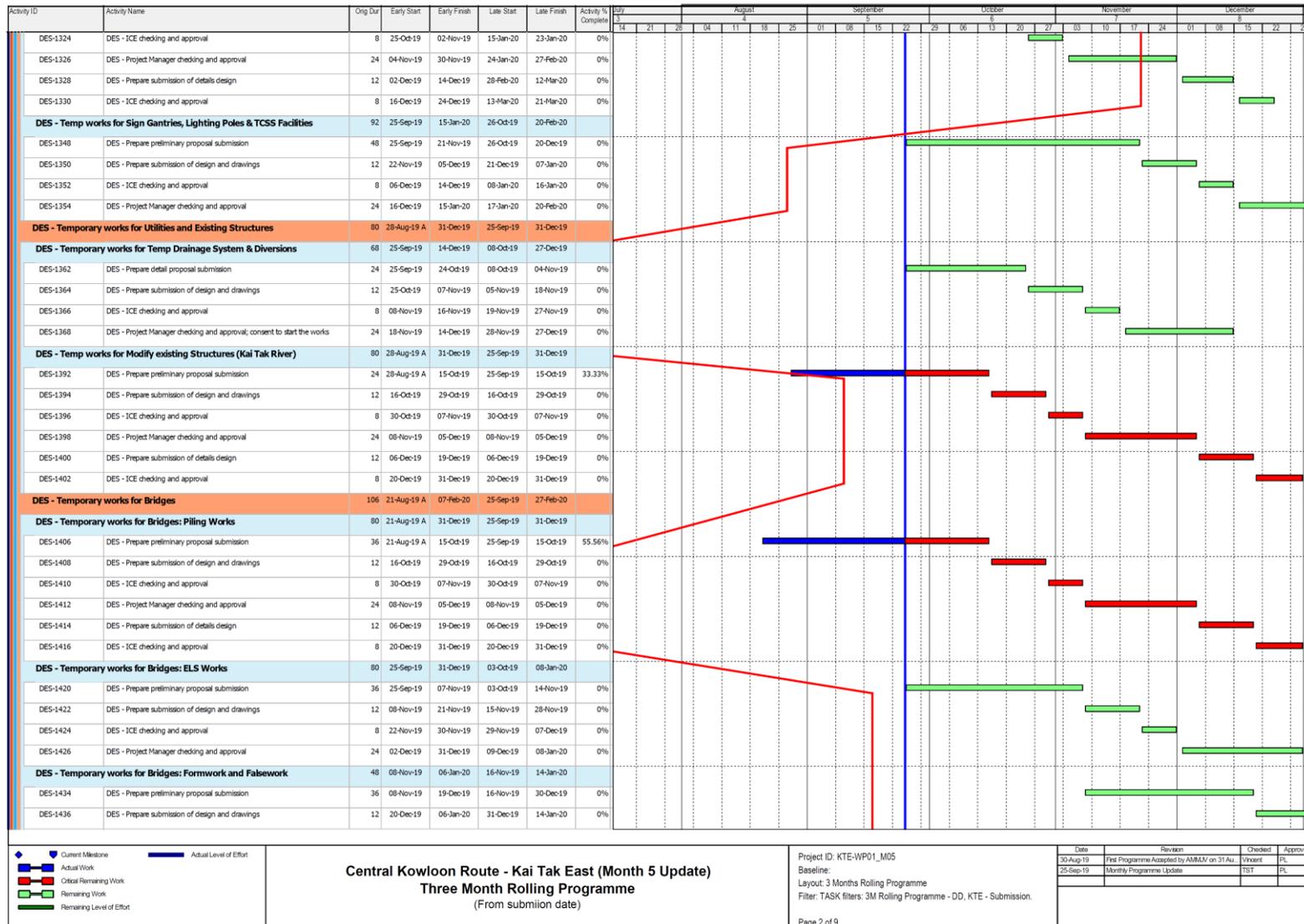
SETTING OUT POINT	EASTING	NORTHING	SETTING OUT POINT	EASTING	NORTHING
S001	838634.139	820408.419	S096a	838736.042	820354.512
S002	838636.315	820409.445	S096b	838738.824	820348.247
S003	838632.538	820407.198	S097	838634.534	820352.083
S004	838735.822	820429.458	S098	838645.416	820291.264
S005	838735.327	820431.397	S099	838449.070	820246.377
S006	838735.262	820431.001	S100	838647.422	820259.007
S007	838734.784	820431.962	S101	838633.582	820301.874
S008	838735.141	820440.362	S102	838628.148	820324.213
S009	838774.200	820465.013	S103	838628.545	820329.336
S010	838782.315	820460.526	S104	838626.355	820324.288
S011	838804.596	820504.613	S105	838626.853	820324.487
S012	838829.461	820513.462	S106	838627.007	820332.767
S013	838861.499	820531.115	S107	838626.313	820334.007
S014a	838877.035	820581.183	S108	838620.585	820331.010
S014b	838885.444	820618.384	S109	838616.539	820328.204
S014c	838872.463	820618.130	S110	838618.498	820349.801
S014d	838863.391	820608.657	S111	838627.928	820359.558
S014e	838863.796	820719.664	S112	838633.929	820460.098
S015	838849.346	820711.466	S113	839209.316	820704.063
S016	838843.140	820712.382	S114	839278.911	820705.238
S017	838840.894	820710.251	S115	839245.710	820705.583
S018	838831.278	820715.149	S116a	839245.514	820711.205
S019	838813.909	820703.642	S116b	839272.144	820703.303
S020	838780.892	820743.793	S117	839276.920	820726.160
S021	838869.351	820756.202	S118	839310.326	820731.717
S022	838900.625	820753.516	S118a	839385.122	820720.315
S023	838883.698	820741.326	S118b	839388.420	820665.117
S024	838897.831	820724.522	S120	839313.803	820678.766
S025	838912.277	820701.391	S121	839284.984	820646.005
S026	838917.833	820681.593	S122	839285.132	820671.100
S027	838916.452	820633.456	S123	839286.912	820599.617
S028	839032.372	820681.092	S124	839291.899	820593.307
S029	839024.629	820665.313	S125	839300.255	820591.332
S030	839081.731	820651.791	S126	839325.555	820600.718
S031	839044.694	820646.368	S127	839334.093	820584.417
S032	838986.939	820595.519	S128	839295.157	820574.368
S033	838941.115	820538.471	S129	839289.794	820561.715
S034	838976.680	820505.139	S130	839205.955	820541.447
S035	839031.270	820433.387	S131	839244.534	820559.031
S036	839038.018	820419.306	S132	839233.115	820561.314
S037	839094.260	820424.761	S133	839246.380	820571.565
S038	839066.053	820420.004	S134	839236.753	820563.670
S039	839103.010	820365.318	S135	839233.386	820561.101
S040	839113.207	820362.100	S136	839258.857	820561.140
S041	839135.151	820340.821	S137	839261.315	820561.668
S042	839153.048	820321.308	S138	839246.534	820644.213
S043	839156.819	820318.561	S139	839235.167	820610.402
S044	839177.378	820298.854	S140	839215.534	820645.965
S045	839159.030	820283.536	S141	838848.820	819865.263
S046	839146.370	820269.802	S142	838848.418	819878.864
S047	839120.280	820269.017	S143	838810.326	819872.216
S048	839118.199	820265.447	S144	838594.419	819897.185
S049	839140.593	820193.399			
S050	839156.239	820178.492			
S051a	839149.497	820171.580			
S051b	839144.361	820157.030			
S051c	839120.143	820163.629			
S051d	839122.741	820176.907			
S051e	839187.611	820162.333			
S051f	839189.100	820160.333			
S051g	839183.862	820161.722			
S051h	839171.786	820148.000			
S052	839218.497	820106.291			
S053	839255.367	820075.380			
S054a	839274.823	820033.182			
S054b	839277.853	820054.308			
S054c	839286.163	820045.050			
S054d	839289.348	820039.483			
S054e	839284.930	820034.308			
S054f	839286.975	820033.386			
S055	839347.357	819985.205			
S056	839366.136	819984.154			
S057	839400.145	819928.172			
S058	839400.199	819923.486			
S059	839447.023	819893.029			
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S061	839501.027	819847.187			
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S065	839481.694	819828.183			
S066a	839592.044	819818.529			
S066b	839497.382	819844.334			
S066c	839498.331	819844.092			
S064d	839478.865	819858.635			
S067	839460.336	819886.111			
S068	839436.822	819884.133			
S069	839392.638	819921.445			
S070	839393.361	819943.117			
S071	839329.050	819986.498			
S072	839321.534	819990.211			
S073	839244.661	820066.110			
S074	839232.510	820052.025			
S075	839196.044	820038.097			
S076	839243.505	820035.637			
S077	839226.211	820036.438			
S078	839244.081	820038.467			
S079	839166.460	820099.323			
S080	839158.188	820103.360			
S081a	839140.368	820124.533			
S081b	839174.598	820143.666			
S081c	839171.044	820136.500			
S081d	839045.728	820234.210			
S081e	839002.147	820251.550			
S082	838993.227	820255.588			
S083	838986.827	820238.463			
S084	838969.855	820284.611			
S085	838883.303	820352.490			
S086	838879.724	820342.354			
S087	838846.512	820351.482			
S088	838816.380	820356.429			
S089	838786.243	820353.028			
S090	838779.724	820348.137			
S091	838706.685	820356.883			
S092	838753.305	820363.521			
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# Appendix B

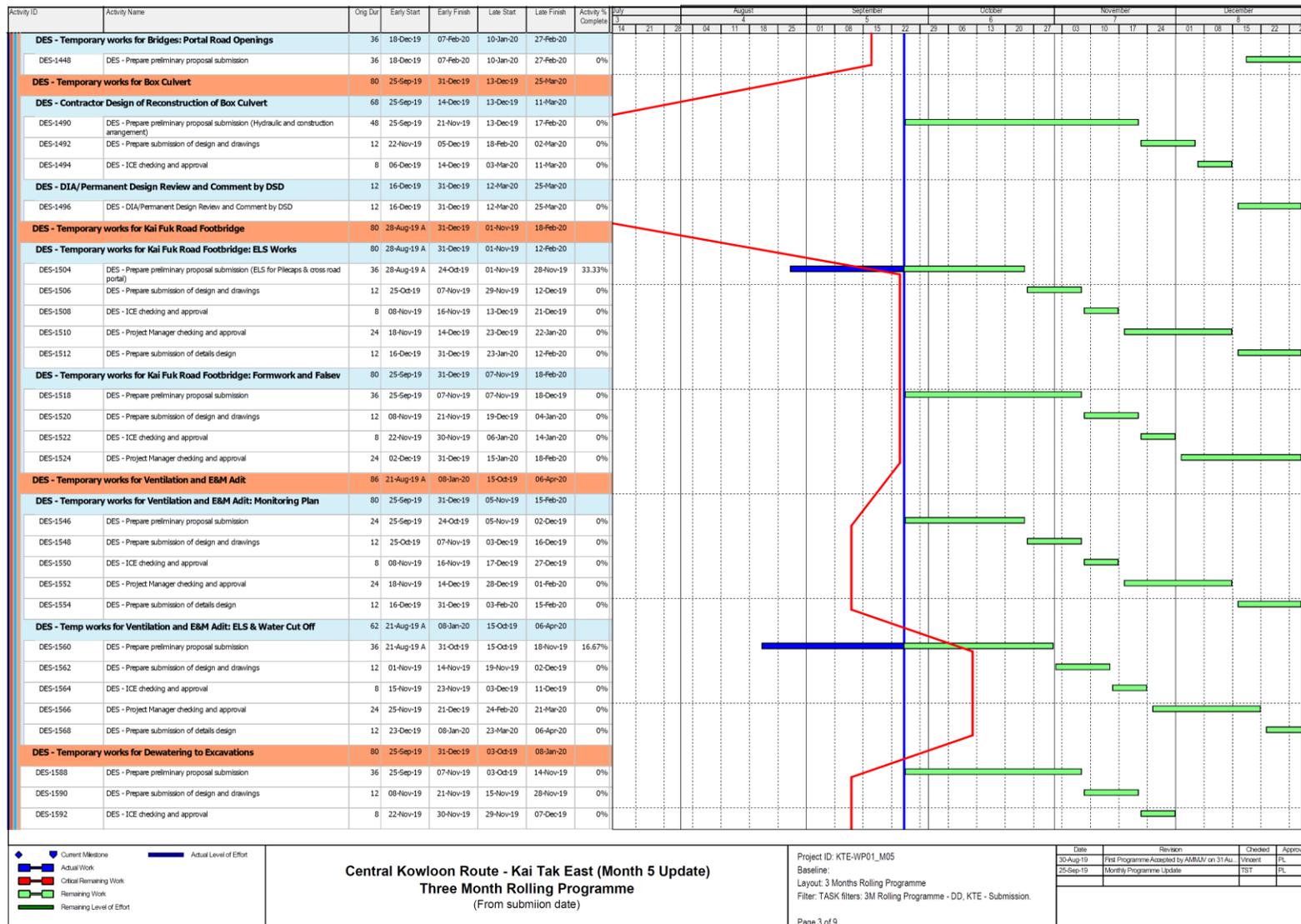
## Construction Programme



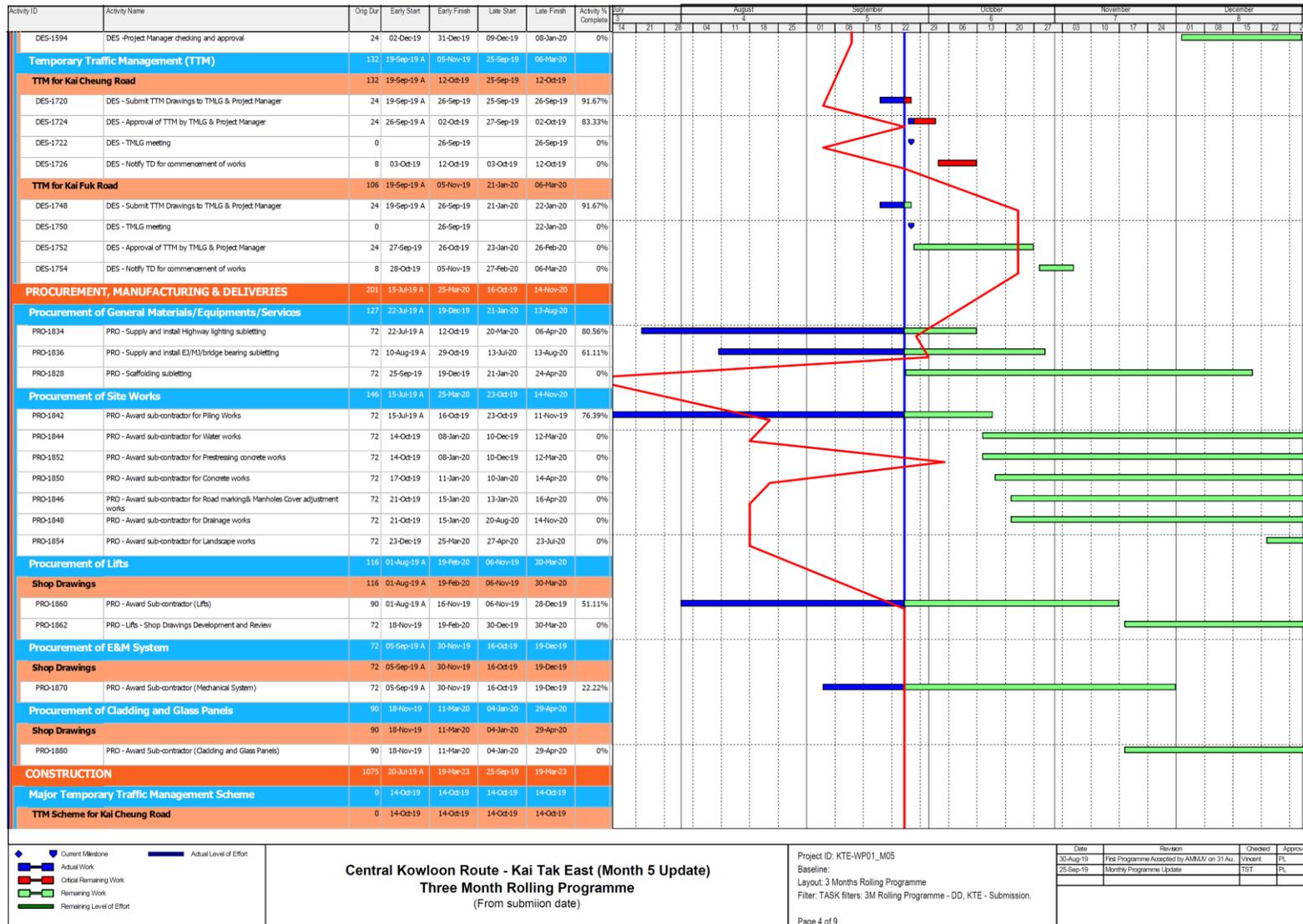
Contract No. HY/2018/02  
 Environmental Monitoring & Auditing



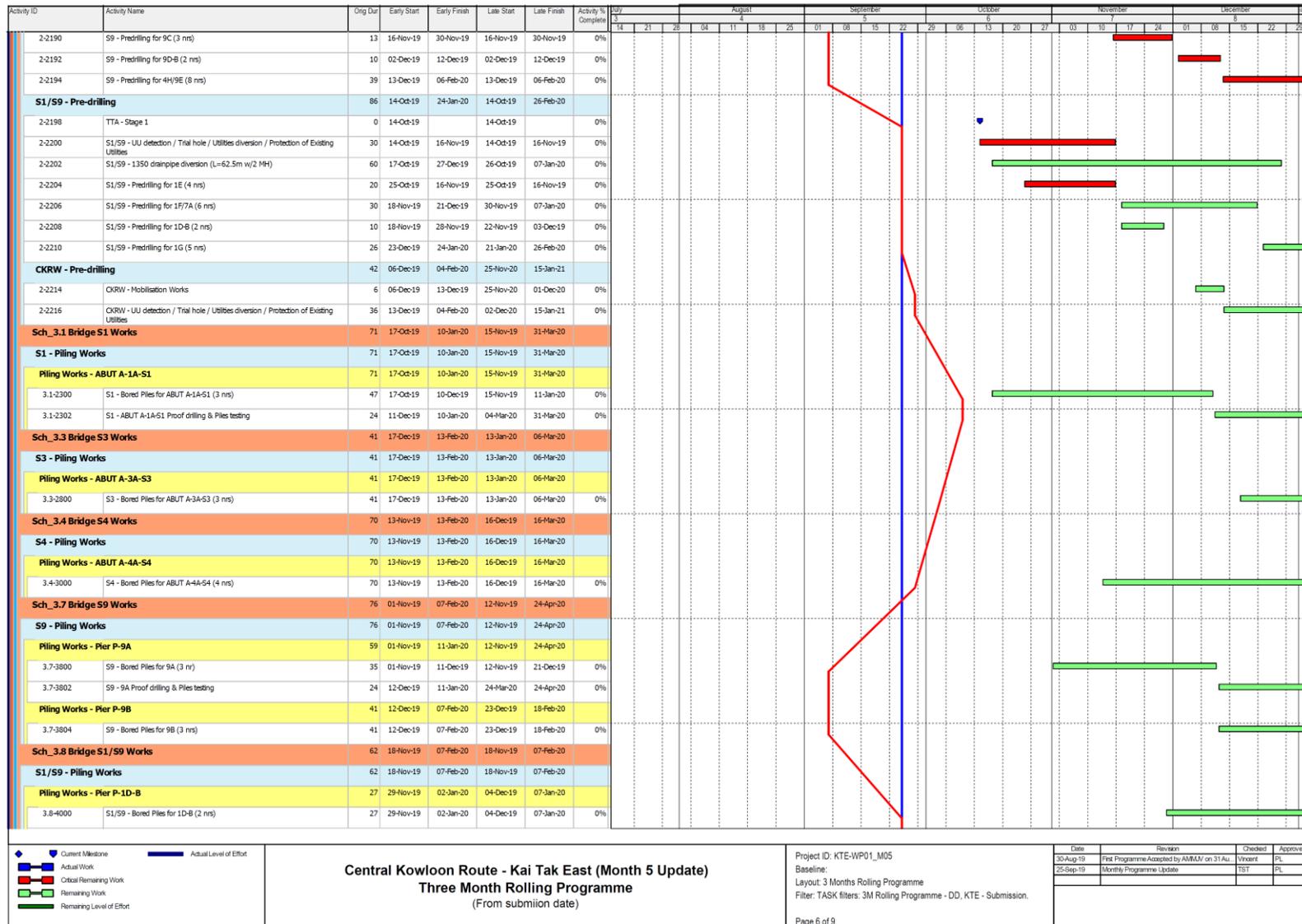
Contract No. HY/2018/02  
 Environmental Monitoring & Auditing

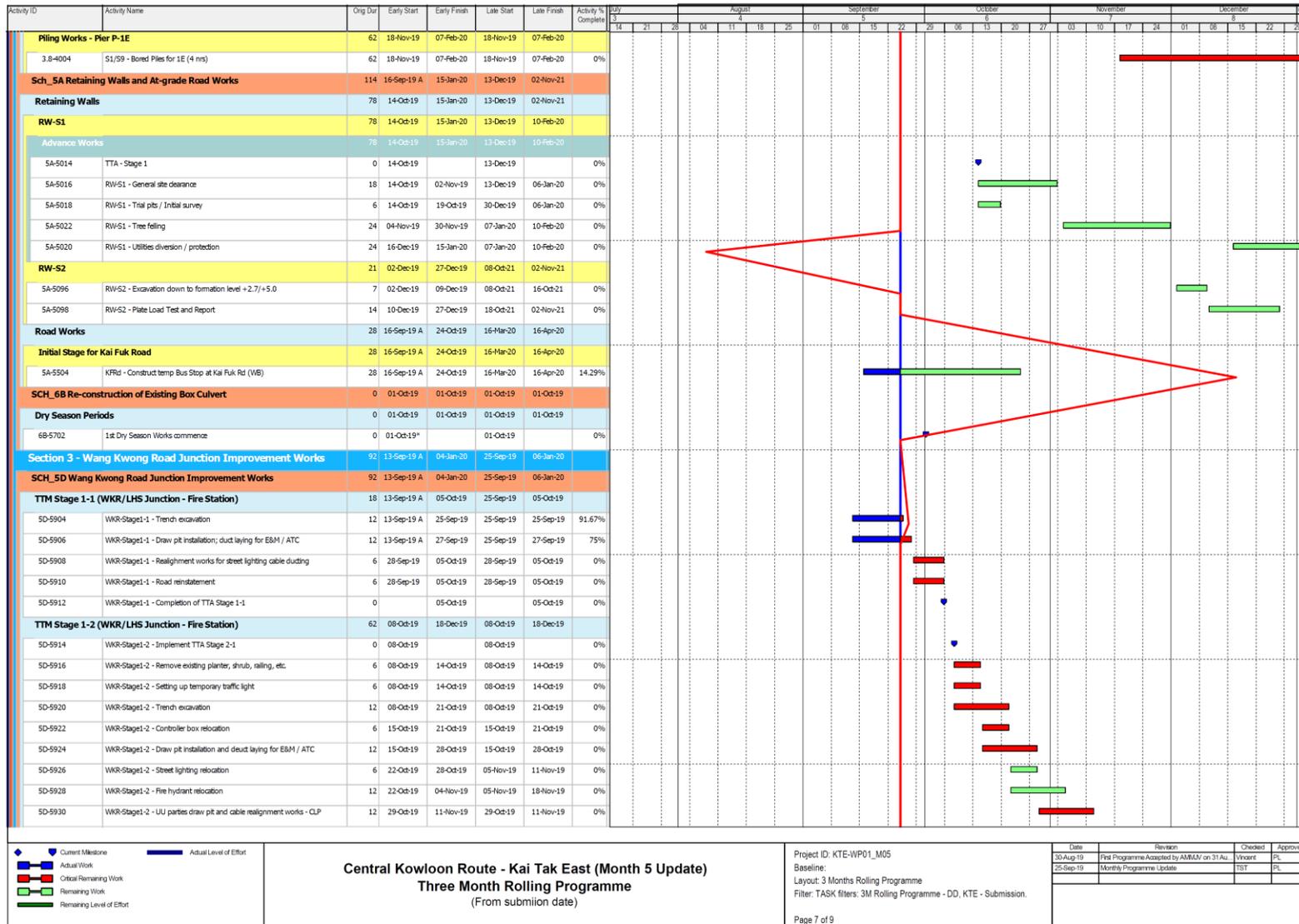


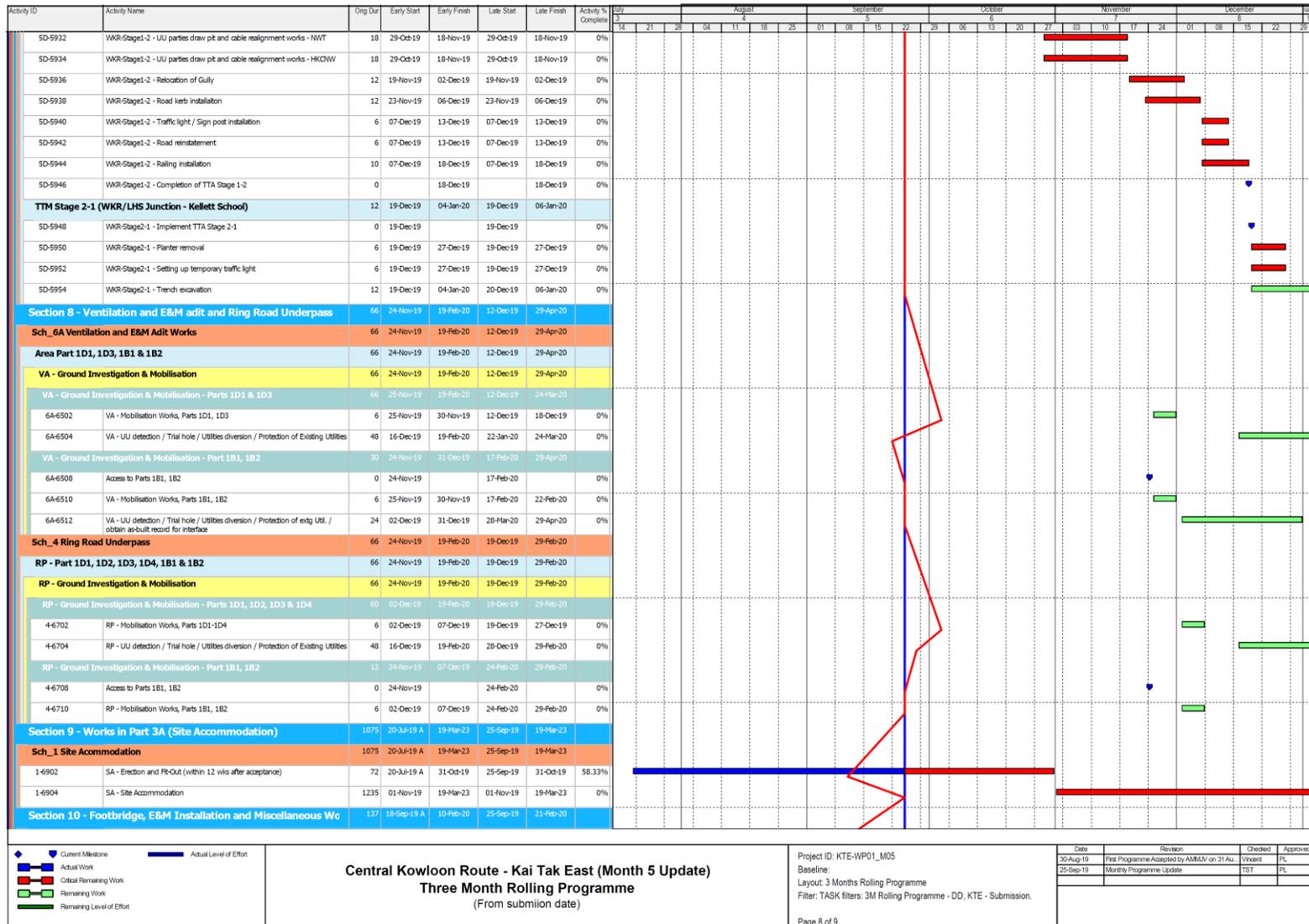
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 Environmental Monitoring & Auditing

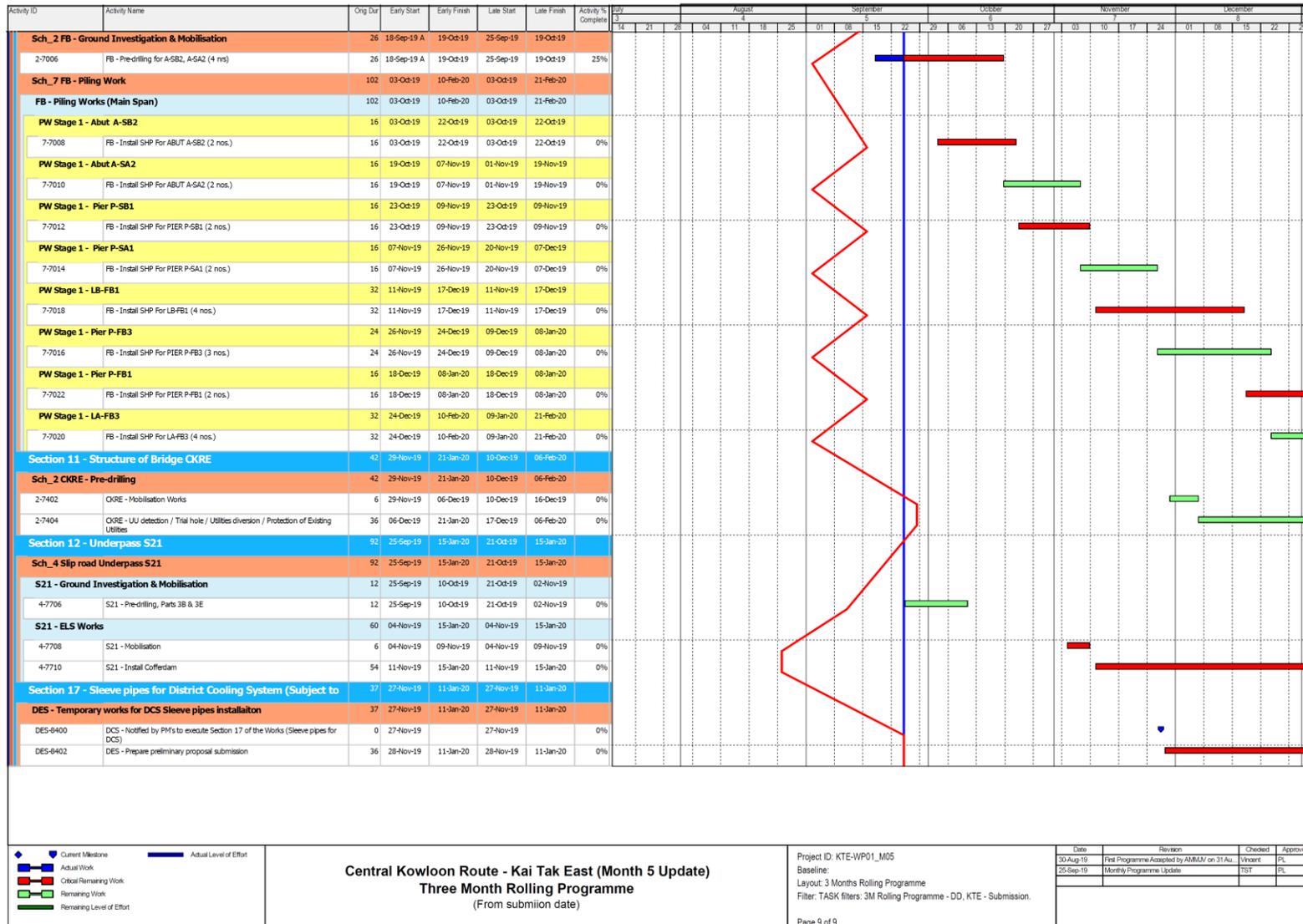


Contract No. HY/2018/02  
 Environmental Monitoring & Auditing









**Central Kowloon Route - Kai Tak East (Month 5 Update)**  
**Three Month Rolling Programme**  
 (From submission date)

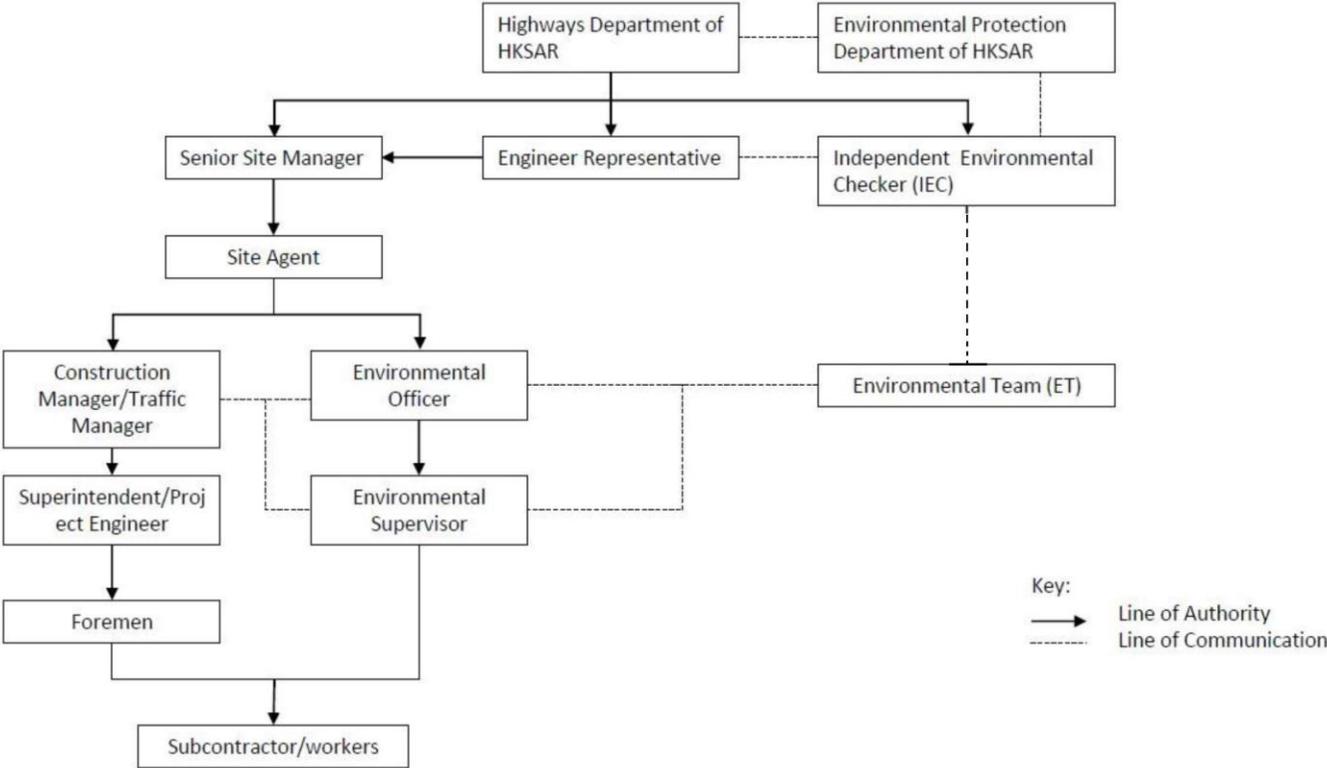
Project ID: KTE-WP01\_M05  
 Baseline:  
 Layout: 3 Months Rolling Programme  
 Filter: TASK filters: 3M Rolling Programme - OD, KTE - Submission.

Date	Revision	Checked	Approved
30-Aug-19	Final Programme Adopted by AMRL/ on 31 Au.	Yvonne	PL
26-Sep-19	Monthly Programme Update	TST	PL

# Appendix C

## Project Organization Chart

Environmental Organization Chart



# Appendix D

## Dust Event-Action Plan (EAP)

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

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

Note:

ET – Environmental Team

ER – Engineer's Representative

IEC – Independent Environmental Checker

# Appendix E

## Environmental Mitigation Implementation Schedule (EMIS)

Environmental Mitigation Implementation Schedule –  
Contract No. HY/2018/02 (Kai Tak East)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and/or standards to be achieved	Implementation Status
<b>Construction Dust Impact</b>								
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	<ul style="list-style-type: none"> <li>• APCO</li> <li>• To control the dust impact To meet HKAQO and TM-EIA criteria</li> </ul>	<ul style="list-style-type: none"> <li>• Implemented</li> </ul>
S4.3.10	D2	<ul style="list-style-type: none"> <li>• 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<sup>2</sup> to achieve the dust removal efficiency.</li> </ul>	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> <li>• APCO</li> <li>• To control the dust impact To meet HKAQO and TM-EIA criteria</li> </ul>	<ul style="list-style-type: none"> <li>• Implemented</li> </ul>
S4.3.10	D3	<ul style="list-style-type: none"> <li>• Proper watering at exposed spoil should be undertaken throughout the construction phase;</li> <li>• 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;</li> <li>• Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;</li> <li>• A stockpile of dusty material should not be extended</li> </ul>	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> <li>• APCO</li> <li>• To control the dust impact To meet HKAQO and TM-EIA criteria</li> </ul>	<ul style="list-style-type: none"> <li>• Implemented, rectified after observation.</li> </ul>

Environmental Mitigation Implementation Schedule –  
 Contract No. HY/2018/02 (Kai Tak East)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and/ or standards to be achieved	Implementation Status
		<p>beyond the pedestrian barriers, fencing or traffic cones;</p> <ul style="list-style-type: none"> <li>•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.</li> <li>•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;</li> <li>•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;</li> <li>•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;</li> <li>•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;</li> <li>•Any area that involves demolition activities should be</li> </ul>						

Environmental Mitigation Implementation Schedule –  
Contract No. HY/2018/02 (Kai Tak East)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and/ or standards to be achieved	Implementation Status
		<p>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;</p> <ul style="list-style-type: none"> <li>Any skip hoist for material transport should be totally enclosed by impervious sheeting;</li> <li>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;</li> <li>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</li> <li>Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabilizer within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.</li> </ul>						
S4.3.10	D6	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected rep. dust monitoring station	Construction stage	<ul style="list-style-type: none"> <li>TM-EIA</li> </ul>	<ul style="list-style-type: none"> <li>Implemented</li> </ul>
Construction Noise (Airborne)								

Environmental Mitigation Implementation Schedule –  
Contract No. HY/2018/02 (Kai Tak East)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and/ or standards to be achieved	Implementation Status
S5.4.1	N1	Implement the following good site practices: <ul style="list-style-type: none"> <li>• Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme;</li> <li>• 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;</li> <li>• Plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs;</li> <li>• Silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works;</li> <li>• Mobile plant should be sited as far away from NSRs as possible and practicable;</li> <li>• Material stockpiles, mobile container site office and other structures should be effectively utilized, where practicable, to screen noise from on-site construction activities.</li> </ul>	Control construction airborne noise	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> <li>• Annex 5, TM-EIAO</li> </ul>	<ul style="list-style-type: none"> <li>• Implemented</li> </ul>
S5.4.1	N2	Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of 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	<ul style="list-style-type: none"> <li>• Annex 5, TM-EIAO</li> </ul>	<ul style="list-style-type: none"> <li>• Implemented</li> </ul>
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	Screen the noisy plant items to be used at all construction	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> <li>• Annex 5, TM-EIAO</li> </ul>	<ul style="list-style-type: none"> <li>• Implemented</li> </ul>

Environmental Mitigation Implementation Schedule –  
Contract No. HY/2018/02 (Kai Tak East)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and/ or standards to be achieved	Implementation Status
		plants including air compressors, generators and handheld breakers, etc.	sites					
S5.4.1	N4	Use 'Quiet plant'	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO	• Implemented
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	• Annex 5, TM-EIAO	• Implemented
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	• Annex 5, TM-EIAO	• Implemented
S5.4.1	N7	Implement a noise monitoring programme under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected rep. noise monitoring station	Construction stage	• TM-EIAO	• Implemented
Water Quality (Construction Phase)								

Environmental Mitigation Implementation Schedule –  
Contract No. HY/2018/02 (Kai Tak East)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and/ or standards to be achieved	Implementation Status
S6.9.1.1	W1	<p>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:</p> <p><u>Construction Runoff</u></p> <ul style="list-style-type: none"> <li>• At the start of site establishment, 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;</li> <li>• 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 silt/ sediment trap. The sediment/ silt traps should be incorporated in the permanent drainage channels to enhance deposition rates;</li> <li>• 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</li> </ul>	To minimize water quality impact from the construction site runoff and general construction activities	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> <li>• Water Pollution Control Ordinance</li> <li>• ProPECC PN 1/94</li> <li>• TM-EIAO</li> <li>• TM-DSS</li> </ul>	<ul style="list-style-type: none"> <li>• Implemented.</li> </ul>

Environmental Mitigation Implementation Schedule –  
 Contract No. HY/2018/02 (Kai Tak East)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and/ or standards to be achieved	Implementation Status
		<p>maximum flow conditions. Sizes may vary depending upon the flow rate, but for a flow rate of 0.1 m<sup>3</sup>/s a sedimentation basin of 30 m<sup>3</sup> would be required and for a flow rate of 0.5 m<sup>3</sup>/s the basin would be 150 m<sup>3</sup>. The detailed design of the sand/ silt traps shall be undertaken by the contractor prior to the commencement of construction;</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• 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 and the reduction of surface sheet flows;</li> <li>• 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;</li> <li>• Measures should be taken to minimize the ingress</li> </ul>						

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 Contract No. HY/2018/02 (Kai Tak East)

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		<p>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;</p> <ul style="list-style-type: none"> <li>• Open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50m<sup>3</sup> 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;</li> <li>• Manholes 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;</li> <li>• 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 summarized 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;</li> <li>• 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 site wheel washing</li> </ul>						

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		<p>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;</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts;</li> <li>• 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;</li> <li>• Adopt best management practices;</li> <li>• All earth works should be conducted sequentially to limit the amount of construction runoff generated from exposed areas during the wet</li> </ul>						

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		season (April to September) as far as practicable.						
S6.9.1.2	W2	<p><u>Tunneling Works and Underground Works</u></p> <ul style="list-style-type: none"> <li>• Cut-&amp;-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.</li> <li>• Uncontaminated discharge should pass through sedimentation tanks prior to off-site discharge;</li> <li>• 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;</li> <li>• Direct discharge of the bentonite slurry (as a result of D-wall) 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 area completed. The requirements in ProPECC PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.</li> </ul>	To minimize construction water quality impact from tunneling works	Contractor	All tunneling portion	Construction stage	<ul style="list-style-type: none"> <li>• Water Pollution Control Ordinance</li> <li>• ProPECC PN 1/94</li> <li>• TM-DSS</li> <li>• TM-EIAO</li> </ul>	<ul style="list-style-type: none"> <li>• Implemented</li> </ul>

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S6.9.1.3	W3	<p><u>Sewage Effluent</u></p> <ul style="list-style-type: none"> <li>Portable chemical toilets and sewage holding tanks are recommended for handling 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.</li> </ul>	To minimize water quality from sewage effluent	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> <li>Water Pollution Control Ordinance</li> <li>TM-DSS</li> </ul>	<ul style="list-style-type: none"> <li>Implemented</li> </ul>
S6.9.1.5	W4	<p><u>Groundwater from Potential Contaminated Area:</u></p> <ul style="list-style-type: none"> <li>No direct discharge of groundwater from contaminated areas should be adopted.</li> <li>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</li> </ul>	To minimize groundwater quality impact from contaminated area	Contractor	Excavation areas where contamination is found	Construction stage	<ul style="list-style-type: none"> <li>Water Pollution Control Ordinance</li> <li>TM-DSS</li> <li>TM-EIAO</li> </ul>	<ul style="list-style-type: none"> <li>Implemented</li> </ul>

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		<p>recharged into the ground.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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 the petrol</li> </ul>						

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		interceptor.						
S6.9.1.6	W6	<p><u>Accidental Spillage</u></p> <p>In order to prevent accidental spillage of chemicals, the following is recommended:</p> <ul style="list-style-type: none"> <li>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;</li> <li>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.</li> </ul> <p>Disposal of chemical wastes should be conducted in compliance with the requirements as stated in the Waste Disposal (Chemical Waste) (General) Regulation.</p>	To minimize water quality impact from accidental spillage	Contractor	All construction site where practicable	Construction stage	<ul style="list-style-type: none"> <li>Water Pollution Control Ordinance</li> <li>ProPECC PN 1/94</li> <li>TM-EIAO</li> <li>TM-DSS</li> </ul>	<ul style="list-style-type: none"> <li>Implemented</li> </ul>
Waste Management (Construction Waste)								
S7.4.1	WM1	<p><u>On-site sorting of C&amp;D material</u></p> <ul style="list-style-type: none"> <li>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</li> </ul>	Separation of unsuitable rock from ending up at concrete batching plants and be turned into concrete for	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> <li>DEVB (W) No. 6/2010</li> </ul>	<ul style="list-style-type: none"> <li>Implemented</li> </ul>

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		dyke rock should be separated at the source sites as far as practicable and stored at designated stockpile area preventing them from delivering to crushing facilities. The crushing plant operator should also be reminded to set up measures to prevent unsuitable rock from ending 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 Contractor 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 be explored.	structural use					
S7.5.1	WM2	<u>Construction and Demolition Material</u> <ul style="list-style-type: none"> <li>• Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement;</li> <li>• Carry out on-site sorting;</li> <li>• Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate;</li> <li>• Adopt 'selective demolition' technique to demolish the existing structures and facilities with a view to</li> </ul>	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> <li>• Land (Miscellaneous Provisions) Ordinance</li> <li>• Waste Disposal Ordinance</li> <li>• ETWB TCW No. 19/2005</li> </ul>	<ul style="list-style-type: none"> <li>• Implemented</li> </ul>

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		<p>recovering broken concrete effectively for recycling purpose, where possible;</p> <ul style="list-style-type: none"> <li>Implement a trip-ticket system for each works contract to ensure that the disposal of C&amp;D materials are properly documented and verified; and</li> <li>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&amp;D materials and to minimize their generation during the course of construction.</li> </ul>	amount for final disposal					
S7.5.1	WM3	<p><b>C&amp;D Waste</b></p> <ul style="list-style-type: none"> <li>Standard formwork or pre-fabrication should be used as far as practicable in order to minimize the arising of C&amp;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;</li> <li>The Contractor should recycle as much of the C&amp;D materials as possible on-site. Public fill and C&amp;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</li> </ul>	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	<ul style="list-style-type: none"> <li>Land (Miscellaneous Provisions) Ordinance</li> <li>Waste Disposal Ordinance</li> <li>ETWB TCW No. 19/2005</li> </ul>	<ul style="list-style-type: none"> <li>Implemented</li> </ul>

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		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.						
S7.5.1	WM4	<p><u>Excavated Contaminated Soils</u></p> <ul style="list-style-type: none"> <li>Details of the mitigation measures on handling of the contaminated soil shall be referred to Section on Land Contamination below.</li> </ul>	The contaminated soil will be excavated for on-site reuse	Contractor	PBH4	Prior to commencement of construction works within the contaminated area	<ul style="list-style-type: none"> <li>Practice Guide (PG) for Investigation and Remediation of Contaminated Land</li> <li>GN/GM for land contamination</li> </ul>	<ul style="list-style-type: none"> <li>Implemented</li> </ul>
S7.5.1	WM5	<p><u>Land-based Sediment</u></p> <ul style="list-style-type: none"> <li>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;</li> <li>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;</li> <li>Before moving the vessels which are used for transporting dredged material, excess material</li> </ul>	To control pollution due to marine sediment	Contractor	Along CKR alignment	Construction stage	<ul style="list-style-type: none"> <li>ETWB TCW No. 34/2002</li> </ul>	<ul style="list-style-type: none"> <li>Implemented</li> </ul>

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		<p>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;</p> <ul style="list-style-type: none"> <li>• Adequate freeboard shall be maintained on barges to ensure that decks are not washed by wave action.</li> <li>• 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;</li> <li>• The Contractors shall comply with the conditions in the dumping licence.</li> <li>• All bottom dumping vessels (Hopper barges) shall be fitted with tight fittings seals to their bottom openings to prevent leakage of material;</li> <li>• The material shall be placed into the disposal pit by bottom dumping;</li> <li>• Contaminated marine mud shall be transported by spit barge of not less than 750m3 capacity and capable of rapid opening and discharge at the disposal site;</li> <li>• 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</li> </ul>						

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		<p>remain closed until the barge returns to the disposal site.</p> <ul style="list-style-type: none"> <li>For Type 3 special disposal treatment, sealing of contaminant with geosynthetic containment before dropping 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.</li> </ul>						
S7.5.1	WM6	<p><u>Chemical Waste</u></p> <ul style="list-style-type: none"> <li>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;</li> <li>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 L unless the specification has been approved by EPD, and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation;</li> <li>The storage area for chemical wastes should be</li> </ul>	Control the chemical waste and ensure proper storage, handling and disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> <li>Waste Disposal (Chemical Waste) (General) Regulation</li> <li>Code of Practice on the Packaging, Labelling and Storage of Chemical Waste</li> </ul>	<ul style="list-style-type: none"> <li>Implemented and rectified after observation.</li> </ul>

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		<p>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;</p> <ul style="list-style-type: none"> <li>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 EPD.</li> </ul>						
S7.5.1	WM7	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> <li>General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes;</li> <li>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.</li> <li>Aluminum 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</li> </ul>	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> <li>Waste Disposal Ordinance</li> </ul>	<ul style="list-style-type: none"> <li>Implemented</li> </ul>

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		feasible; <ul style="list-style-type: none"> <li>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.</li> </ul>						
Land Contamination								
S8.9 & Appendix 8.4	LC2	<u>Excavation of the Contaminated Soil</u> <ul style="list-style-type: none"> <li>Prior to commencement of the excavation works at the contamination zone, the zone should be clearly marked out on site and the surface levels recorded. Excavation of contaminated material should be undertaken using dedicated earth-moving plant.</li> <li>The excavated contaminated soils would be stockpiled at designated area on site and covered by sheet to prevent dispersion of contamination during stockpiling.</li> <li>The Contractor should pay attention to the selection of suitable groundwater lowering schemes and discharge points if the groundwater table is higher than the contaminated soils during excavation. The Contractor should also obtain a valid Water Pollution Control Ordinance (WPCO) discharge licence from EPD where applicable.</li> </ul>	The contaminated soil will be excavated for on-site reuse	Contractor	PBH4	Prior to commencement of construction works within the contaminated area	<ul style="list-style-type: none"> <li>Practice Guide (PG) for Investigation and Remediation of Contaminated Land</li> <li>Guidance Notes for Contaminated Land Assessment and Remediation</li> <li>Guidance Manual for Use of Risk-Based Remediation Goals (RBRGs) for</li> </ul>	<ul style="list-style-type: none"> <li>Implemented</li> </ul>
S8.9 & Appendix 8.4	LC3	<ul style="list-style-type: none"> <li>Following completion of the excavation to the specified depth, at least one sample from the base of the excavation and four samples evenly distributed along the boundary of the excavation shall be taken for a closure assessment testing. The acceptance criterion is shown below:</li> </ul>						<ul style="list-style-type: none"> <li>Implemented</li> </ul>

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		<table border="1"> <tr> <td>Locations</td> <td>Testing requirement</td> <td>Acceptance Criteria</td> </tr> <tr> <td>PBH4</td> <td>PCBs</td> <td>RBRGs (Public Park)</td> </tr> </table> <ul style="list-style-type: none"> <li>If the results of analysis below the RBRGs (Public Park), no further excavation will be required.</li> </ul> <p>If the analysis indicates presence of contamination (i.e. noncompliance of the acceptance criteria), further excavation shall be carried out in 0.5m increment vertically and/or horizontally depending on the location(s) of the sample(s) which has exceeded the acceptance criteria. Further sampling shall also be conducted for compliance testing. The process of excavation, sampling and compliance testing should continue until all contaminated materials are removed and should be supervised by a Land Contamination Specialist.</p>	Locations	Testing requirement	Acceptance Criteria	PBH4	PCBs	RBRGs (Public Park)					Contaminated Land Management	
Locations	Testing requirement	Acceptance Criteria												
PBH4	PCBs	RBRGs (Public Park)												
Appendix 8.4	LC4	A Remediation Report (RR) to demonstrate adequate clean-up shall be prepared and submitted to EPD for endorsement prior to the commencement of any construction/development works within the sites. No construction/development works shall be carried out prior to the endorsement of the RR by EPD.						<ul style="list-style-type: none"> <li>Implemented</li> </ul>						
Hazard to Life														

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S9.18	H8	The driver and his assistant should be physically healthy, experienced and have good safe driving records. The driver should hold a proper driving licence for the approved transport truck. Dedicated training programme and regular road safety briefing sessions/ workshops should be provided to enhance their safe driving attitude and practice. Smoking should be strictly prohibited.	To reduce the risk during explosives transport	Contractor	Works areas at which explosives would be used	Construction stage	-	• Implemented
S9.18	H9	Emergency response plans in case of road accident should be prepared and implemented. The driver and his assistant should be familiar with the emergency procedures including evacuation, and proper communication/ fire-fighting equipment should be provided to the driver and his assistant.	To reduce the risk during explosives transport	Contractor	Works areas at which explosives would be used	Construction stage	-	• N/A
<b>Landscape &amp; Visual</b>								
S10.10.1 Table 10.11	LV3	<p><u>Good Site Management</u></p> <ul style="list-style-type: none"> <li>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.</li> <li>Construction plant and building material shall be orderly and carefully stored in order to create a neat and tidy visual appearance.</li> </ul>	Minimize visual impact	Contractor	Within Project site	Construction stage	-	• Implemented
S10.10.1 Table 10.11	LV4	<p><u>Screen Hoarding</u></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	Minimize visual impact	Contractor	Within Project site	Construction stage	-	• Implemented

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S10.10.1 Table 10.11	LV5	<p><u>Lighting Control during Construction</u></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	Minimize visual impact	Contractor	Within Project site	Construction stage	-	<ul style="list-style-type: none"> <li>N/A</li> </ul>
S10.10.1 Table 10.11	LV6	<p><u>Erosion Control</u></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	Minimize landscape impact	Contractor	Within Project site	Construction stage	-	<ul style="list-style-type: none"> <li>N/A</li> </ul>
S10.10.1 Table 10.11	LV7	<p><u>Tree Protection &amp; Preservation</u></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	Minimize landscape and visual impact	Contractor	Within Project site	Construction stage	<ul style="list-style-type: none"> <li>'Guidelines for Tree Risk Management and Assessment Arrangement on an Area Basis and on a Tree Basis', Greening, Landscape and Tree Management (GLTM) Section, DEVB</li> <li>Latest recommended</li> </ul>	<ul style="list-style-type: none"> <li>Implemented, and rectified after observation.</li> </ul>

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							horticultural practices from GLTM Section, DEVB	
S10.10.1 Table 10.11	LV8	<p><u>Tree Transplantation</u></p> <ul style="list-style-type: none"> <li>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. If this is not possible or practical compensatory planting will be provided for trees unavoidably felled (See LV10). For trees unavoidably affected by the Project works that are transplanted, transplantation must be carried out in accordance with ETWB TCW 2/2004 and 3/2006.</li> </ul>	Minimize landscape and visual impact	Contractor	Within Project site and designated off-site locations	Prior to Construction stage	<ul style="list-style-type: none"> <li>ETWB TCW 3/2006</li> <li>Latest recommended horticultural practices from Greening, Landscape and Tree Management (GLTM) Section, DEVB</li> <li>ETWB TCW 2/2004</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
S10.10.1 Table 10.11	LV9	<p><u>Compensatory Planting</u></p> <ul style="list-style-type: none"> <li>For trees unavoidably affected by the Project that have to be removed, where practical transportation 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</li> </ul>	Minimize visual impact and also enhance landscape	Contractor	Within Project site	Construction stage	<ul style="list-style-type: none"> <li>ETWB TCW 3/2006</li> <li>Latest recommended horticultural practices from</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

Environmental Mitigation Implementation Schedule –  
Contract No. HY/2018/02 (Kai Tak East)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and/ or standards to be achieved	Implementation Status
		<p>satisfaction of relevant Government projects. 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.</p> <ul style="list-style-type: none"> <li>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, additional receptor sites outside the Works Area shall be agreed separately with Government during the Tree Felling Application process.</li> </ul>					<p>Greening, Landscape and Tree Management (GLTM) Section, DEVB</p> <ul style="list-style-type: none"> <li>ETWB TCW 2/2004</li> </ul>	
S10.10.1 Table 10.11	LV10	<p><u>Screen Planting</u></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	Minimize visual impact and also enhance landscape.	Contractor	Within Project Site	Construction Phase	<ul style="list-style-type: none"> <li>Guidelines on Greening of Noise Barriers, issued April 2012, GLTMS, DevB</li> <li>ETWB TCW 2/2004</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

Environmental Mitigation Implementation Schedule –  
Contract No. HY/2018/02 (Kai Tak East)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and/ or standards to be achieved	Implementation Status
S10.10.1 Table 10.11	LV12	<p><u>Reinstatement</u></p> <ul style="list-style-type: none"> <li>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)</li> </ul>	Minimize landscape impact	Contractor	Within Project Site	Construction Phase	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Cultural Heritage Impact (Construction 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	Construction stage	<ul style="list-style-type: none"> <li>AMOs requirements</li> </ul>	<ul style="list-style-type: none"> <li>Implemented</li> </ul>
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	<ul style="list-style-type: none"> <li>EIAO Guidance Note No. 4/2010</li> <li>TM-EIAO</li> </ul>	<ul style="list-style-type: none"> <li>Implemented</li> </ul>
S13.2-13.4	EM2	<ul style="list-style-type: none"> <li>An Environmental Team needs to be employed as per the EM&amp;A Manual;</li> <li>Prepare a systematic Environmental Management Plan to ensure effective implementation of the</li> </ul>	Perform environmental monitoring & auditing	Highways Department/ Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> <li>EIAO Guidance Note No. 4/2010</li> </ul>	<ul style="list-style-type: none"> <li>Implemented</li> </ul>

Environmental Mitigation Implementation Schedule –  
Contract No. HY/2018/02 (Kai Tak East)

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and/ or standards to be achieved	Implementation Status
		mitigation measures; <ul style="list-style-type: none"><li>An environmental impact monitoring needs to be implemented by the Environmental Team to ensure all the requirements given in the EM&amp;A Manual are fully complied with.</li></ul>					<ul style="list-style-type: none"><li>TM-EIAO</li></ul>	

# Appendix F

## Monitoring Schedule of the Reporting Month

# September 2019

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3	4	5	6	7
8	9	10 Impact Dust monitoring (E-A1)	11	12	13	14
15	16 Impact Dust monitoring (E-A1)	17	18	19	20 Impact Dust monitoring (E-A1)	21
22	23	24	25	26 Impact Dust monitoring (E-A1)	27	28
29	30	1	2	3	4	5

# Appendix G

## Calibration Certificates

### (Air Monitoring)



SIBATA SCIENTIFIC TECHNOLOGY LTD.

1-1-62, Nakane, Soka, Saitama, 340-0005 Japan

TEL : 048-933-1582 FAX : 048-933-1591

## CALIBRATION CERTIFICATE

Date: August 28th, 2019

Equipment Name	:	Digital Dust Indicator, Model LD-5R
Code No.	:	080000-72
Quantity	:	1 unit
Serial No.	:	851820
Sensitivity	:	0.001 mg/m <sup>3</sup>
Sensitivity Adjustment	:	640
Scale Setting	:	August 23rd, 2019

We hereby certify that the above mentioned instrument has been calibrated satisfactory.

Sincerely

**SIBATA SCIENTIFIC TECHNOLOGY LTD.**

*Tong Zhang*

Tong Zhang  
Overseas & New Business Group  
Overseas Sales Department





<b>RECALIBRATION DUE DATE:</b>
<b>January 22, 2020</b>

# Certificate of Calibration

Calibration Certification Information			
Cal. Date: January 22, 2019	Rootsmeter S/N: 438320	Ta: 293 °K	
Operator: Jim Tisch		Pa: 756.9 mm Hg	
Calibration Model #: TE-5025A	Calibrator S/N: 3465		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4330	3.2	2.00
2	3	4	1	1.0230	6.4	4.00
3	5	6	1	0.9170	7.9	5.00
4	7	8	1	0.8730	8.7	5.50
5	9	10	1	0.7180	12.7	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)	$\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (y-axis)
1.0087	0.7039	1.4233	0.9958	0.6949	0.8799
1.0044	0.9818	2.0129	0.9915	0.9693	1.2443
1.0024	1.0931	2.2505	0.9896	1.0791	1.3912
1.0013	1.1470	2.3603	0.9885	1.1323	1.4591
0.9959	1.3871	2.8467	0.9832	1.3694	1.7598
<b>QSTD</b>	m=	<b>2.08653</b>	<b>QA</b>	m=	<b>1.30655</b>
	b=	<b>-0.03834</b>		b=	<b>-0.02370</b>
	r=	<b>0.99989</b>		r=	<b>0.99989</b>

Calculations			
$Vstd = \Delta Vol \left( \frac{Pa - \Delta P}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)$	$Va = \Delta Vol \left( \frac{Pa - \Delta P}{Pa} \right)$		
$Qstd = Vstd / \Delta Time$	$Qa = Va / \Delta Time$		

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

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

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

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

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

**InnoTech** Instrumentation Co. Ltd.  
 創新科儀有限公司

**HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)**

Site Information

Location:	Emax	Site ID:		Date:	07-Sep-2019
Serial No:	1085	Model:	TE-5170X	Operator:	Polar Chan

Ambient Condition

Corrected Pressure (mm Hg):	750.6	Temperature (deg K):	302.3
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Calibration Orifice

Model:	TE-5025	Slope:	2.08653
Serial No.:	3465	Intercept:	-0.03834
Calibration Due Date:	22-Jan-20	Corr. Coeff:	0.99989

Calibration Data

Plate or Test #	In, H <sub>2</sub> O (in)	Qa, X-Axis (m <sup>3</sup> /min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	1.58	0.613	31.8	31.38
2	2.65	0.788	34.2	33.75
3	2.90	0.824	34.7	34.24
4	3.00	0.837	34.9	34.44
5	3.30	0.877	35.5	35.03

Sampler Calibration Relationship (Qa on x-axis, IC on y-axis)

m=	13.7076	b=	22.9647	Corr. Coeff=	0.9999
Sampler set point(SSP)	40	CFM			

Calculations

$$Q_{std} = 1/m[\sqrt{H_2O(P_a/P_{std})(T_{std}/T_a)}] - b$$

$$IC = I[\sqrt{P_a/P_{std}}(T_{std}/T_a)]$$

Q<sub>std</sub> = standard flow rate  
 IC = corrected chart response

I = actual chart response  
 m = calibrator Q<sub>std</sub> slope

b = calibrator Q<sub>std</sub> intercept

T<sub>a</sub> = actual temperature during calibration (deg K)

P<sub>a</sub> = actual pressure during calibration (mm Hg)

T<sub>std</sub> = 298 deg K

P<sub>std</sub> = 760 mm Hg

For subsequent calculation of sampler flow:

$$(1.21 * m + b) / [\sqrt{298/T_a}(P_a/760)]$$

m = sampler slope  
 b = sampler intercept  
 I = chart response  
 T<sub>av</sub> = average temperature  
 P<sub>av</sub> = average pressure

Checked by: 

Date: 7-Sep-19

**InnoTech** Instrumentation Co. Ltd.

創新科儀有限公司

**HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)**

Site Information

Location:	Emax	Site ID:	Date:	26-Sep-2019	
Serial No.:	1085	Model:	TE-5170X	Operator:	Polar Chan

Ambient Condition

Corrected Pressure (mm Hg):	763.0	Temperature (deg K):	300.5
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Calibration Orifice

Model:	TE-5025	Slope:	2.08653
Serial No.:	3465	Intercept:	-0.03834
Calibration Due Date:	22-Jan-20	Corr. Coeff:	0.99989

Calibration Data

Plate or Test #	In,H2O (in)	Qa, X-Axis (m3/min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	1.50	0.604	31.6	31.53
2	2.05	0.703	33.0	32.93
3	2.58	0.786	34.1	34.02
4	2.78	0.816	34.5	34.42
5	3.25	0.880	35.4	35.32

Sampler Calibration Relationship (Qa on x-axis, IC on y-axis)

m=	13.6535	b=	23.2969	Corr. Coeff=	0.9999
Sampler set point(SSP)	40	CFM			

Calculations

$Qstd = 1/m[\sqrt{H2O(Pa/Pstd)(Tstd/Ta)}] - b$   
 $IC = I[\sqrt{Pa/Pstd}(Tstd/Ta)]$

- m = sampler slope
- b = sampler intercept
- I = chart response
- Tav = average temperature
- Pav = average pressure

Qstd = standard flow rate  
 IC = corrected chart response  
 I = actual chart response  
 m = calibrator Qstd slope  
 b = calibrator Qstd intercept  
 Ta = actual temperature during calibration (deg K)  
 Pa = actual pressure during calibration (mm Hg)  
 Tstd = 298 deg K  
 Pstd = 760 mm Hg  
 For subsequent calculation of sampler flow:  
 $(1.21*m+b)/[\sqrt{298/Tav}(Pav/760)]$

Checked by: 

Date: 26-Sep-19

# Appendix H

## The Certification of Laboratory with HOKLAS Accredited Analytical Tests



Hong Kong Accreditation Service  
香港認可處

**Certificate of Accreditation**  
認可證書

*This is to certify that*  
特此證明

**ACUMEN LABORATORY AND TESTING LIMITED**  
浩科檢測中心有限公司

**Lot 12, Tam Kon Shan Road, North Tsing Yi, New Territories, Hong Kong**  
香港新界青衣北担杆山路12路段

*has been accepted by the HKAS Executive, on the recommendation of the Accreditation Advisory Board, as a*  
在認可諮詢委員會的建議下獲香港認可處執行機關接受為

**HOKLAS Accredited Laboratory**  
「香港實驗所認可計劃」認可實驗所

*This laboratory meets the requirements of ISO/IEC 17025:2005 and it has been accredited for performing specific tests or calibrations as listed in the scope of accreditation within the test category of*

**Environmental Testing**

*此實驗所符合ISO/IEC 17025:2005所訂的要求*  
*並獲認可進行載於認可範圍內下述測試類別中的指定測試或校正工作*

**環境測試**

*This accreditation to ISO/IEC 17025:2005 demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (see joint IAF-ILAC-ISO Communiqué).*  
*此項 ISO/IEC 17025:2005 的認可資格證明此實驗所具備指定範圍內所須的技術能力並實施一套實驗所質量管理體系(見國際認可論壇、國際實驗所認可合作組織及國際標準化組織的聯合公報)。*

*The common seal of the Hong Kong Accreditation Service is affixed hereto by the authority of the HKAS Executive*  
*現經香港認可處執行機關授權在此蓋上香港認可處的印章*

WONG Wang-wan, Executive Administrator  
執行幹事 黃宏華  
Issue Date : 16 July 2014  
簽發日期：二零一四年七月十六日

Registration Number : **HOKLAS 241**  
註冊號碼：



Date of First Registration : 16 July 2014  
首次註冊日期：二零一四年七月十六日

*This certificate is issued subject to the terms and conditions laid down by HKAS*  
本證書按照香港認可處訂立的條款及條件發出

**L 001195**

# Appendix I

## Location Plan of Air Quality Monitoring Station



# Appendix J

## Monitoring Data (Air Monitoring)

Location: Hong Kong International Trade and Exhibition Centre (E-A1)  
Monitoring date: 10, 16, 20, 26 September 2019  
Parameter : TSP 1-hour  
Other Factors Nearby traffic

Date	1-hour TSP ( $\mu\text{g}/\text{m}^3$ )				
	Weather	Start Time	1 <sup>st</sup> Hour ( $\mu\text{g}/\text{m}^3$ )	2 <sup>nd</sup> Hour ( $\mu\text{g}/\text{m}^3$ )	3 <sup>rd</sup> Hour ( $\mu\text{g}/\text{m}^3$ )
10/09/2019	Sunny	10:32	65	69	50
16/09/2019	Sunny	10:07	67	56	72
20/09/2019	sunny	11:38	59	63	68
26/09/2019	Sunny	10:20	64	69	58

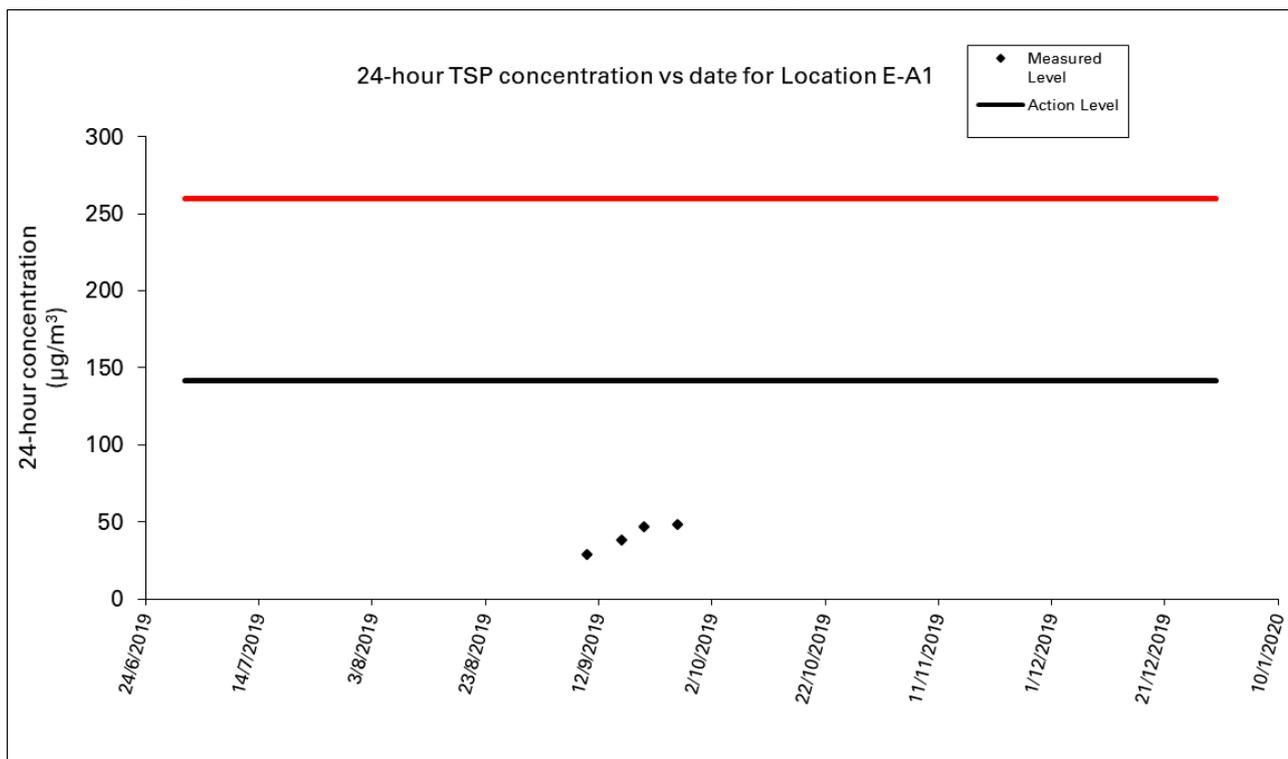


Location: Hong Kong International Trade and Exhibition Centre (E-A1)  
 Monitoring date: 10, 16, 20, 26 September 2019  
 Parameter : TSP 24-hour  
 Other Factors Nearby traffic

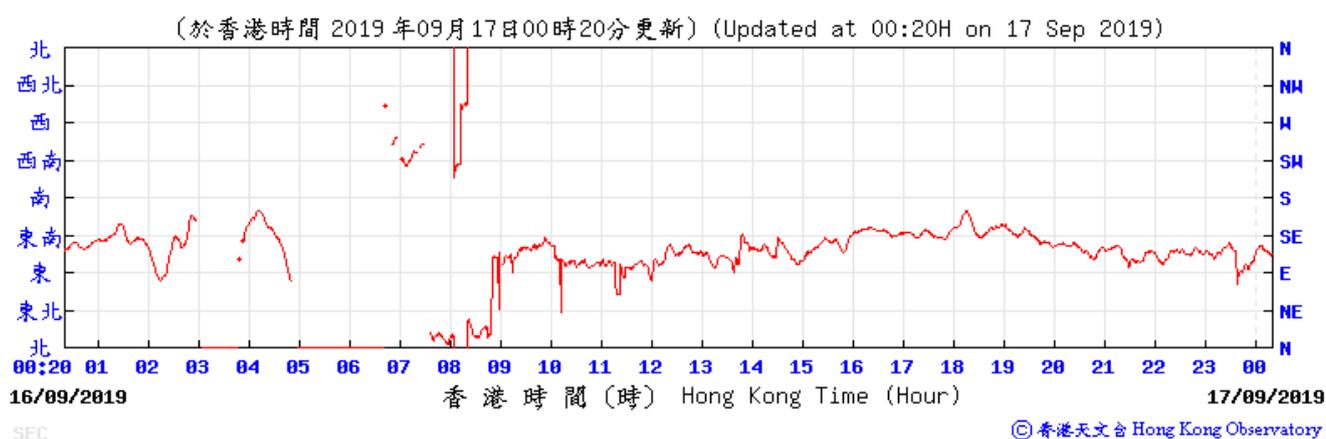
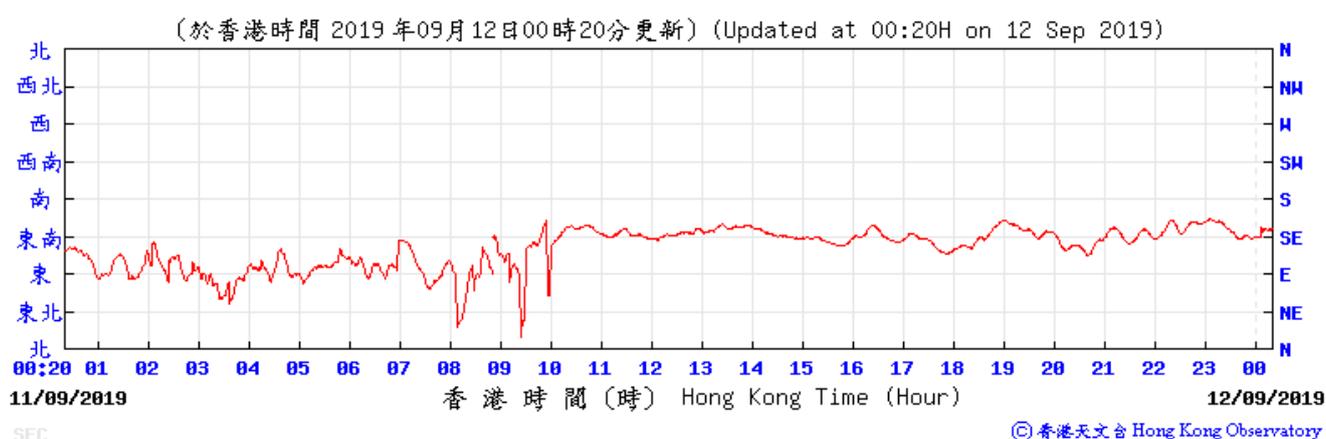
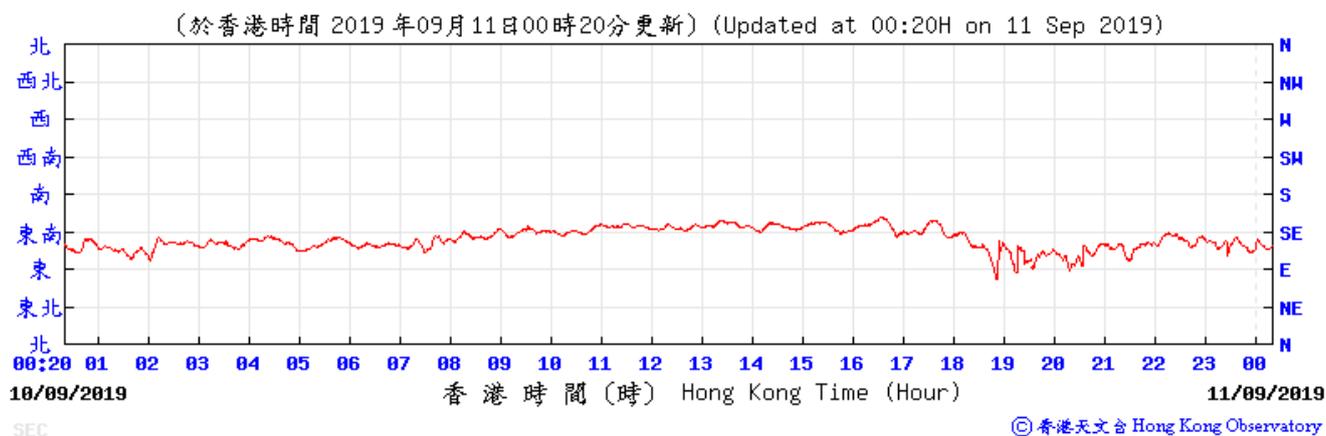
Date of Calibration:	7-Sep-19	Slop =	13.7076
Calibration due date:	21-Sep-19	Intercept =	22.9647
Date of Calibration:	26-Sep-19	Slop =	13.6535
Calibration due date:	10-Oct-19	Intercept =	23.2969

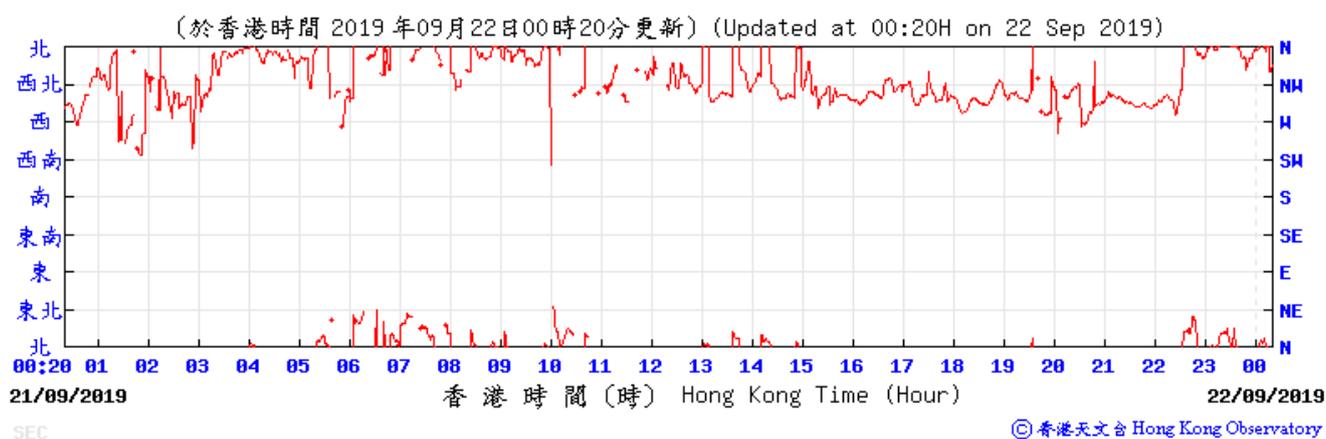
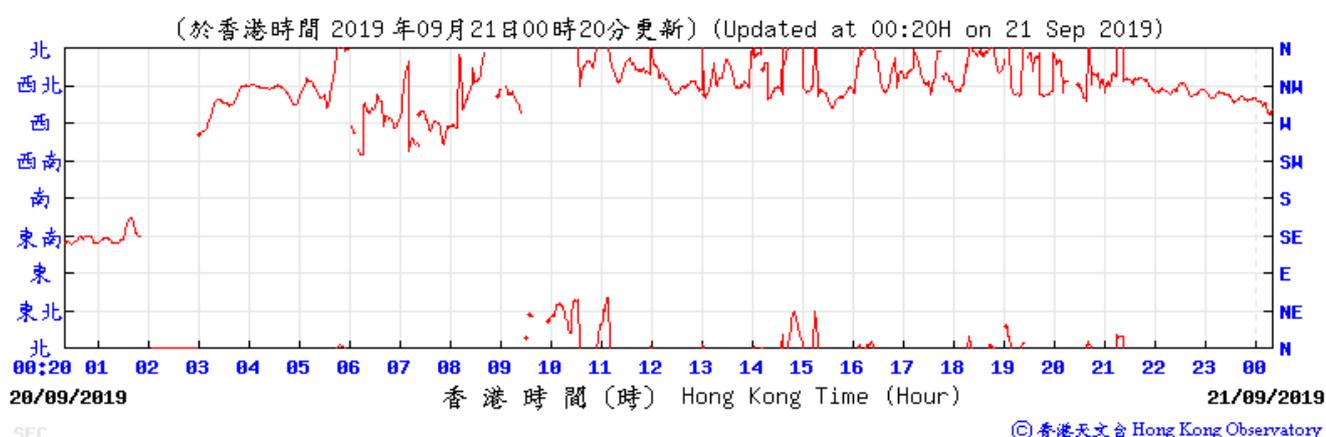
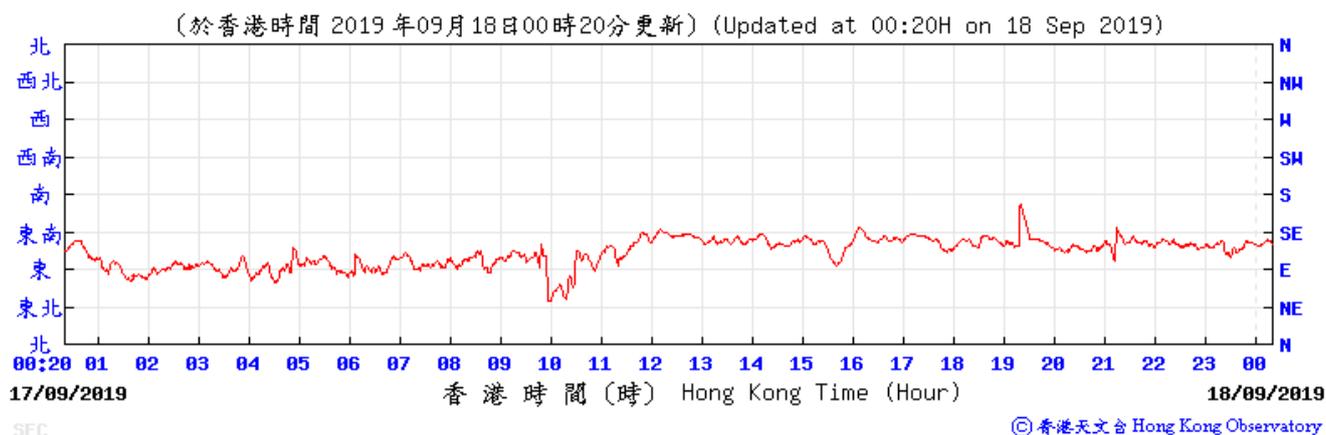
Start Date	Weather Condition	Elapse Time			Chart Reading			Avg Air Temp (°C)	Avg Atmospheric Pressure (mm Hg)	Flow Rate (m <sup>3</sup> /min)	Standard Air Volume (m <sup>3</sup> )	Filter Weight (g)		Particulate weight (g)	Conc. (µg/m <sup>3</sup> )
		Initial	Final	Actual (min)	Min	Max	Avg					Initial	Final		
10/9/2019	Sunny	338.82	362.82	1440.00	43	44	43.5	30.1	756.7	1.46	2099	2.7251	2.7854	0.0603	29
16/9/2019	Sunny	362.85	386.85	1440.00	44	45	44.5	29.3	755.8	1.53	2203	2.7247	2.8096	0.0849	39
20/9/2019	Sunny	386.90	410.90	1440.00	57	58	57.5	29.0	756.6	2.47	3561	2.7602	2.9284	0.1682	47
26/9/2019	Sunny	410.93	434.93	1440.00	57	58	57.5	27.5	763.0	2.52	3627	2.7419	2.9170	0.1751	48

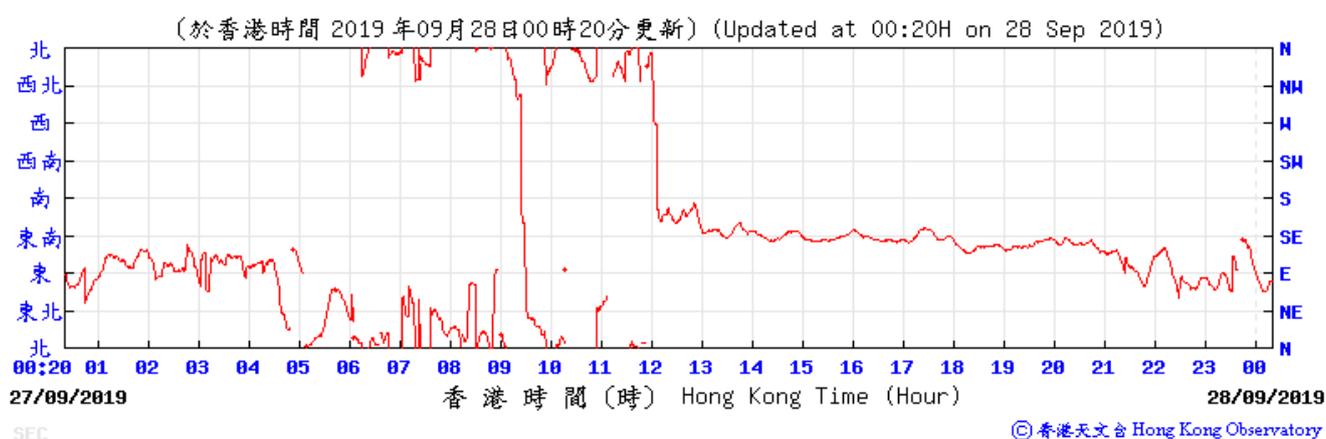
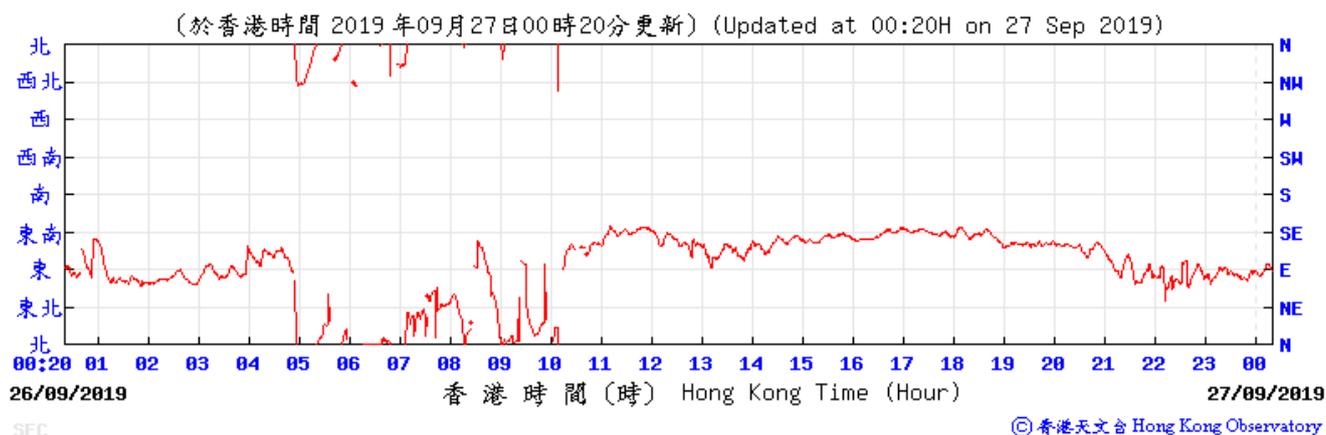
Figure 2: Graphical Illustration of Measured 24-hour TSP ( $\mu\text{g}/\text{m}^3$ ) Levels at E-A1



### Wind direction data for 10, 11, 16, 17, 20, 21, 26, 27 September 2019

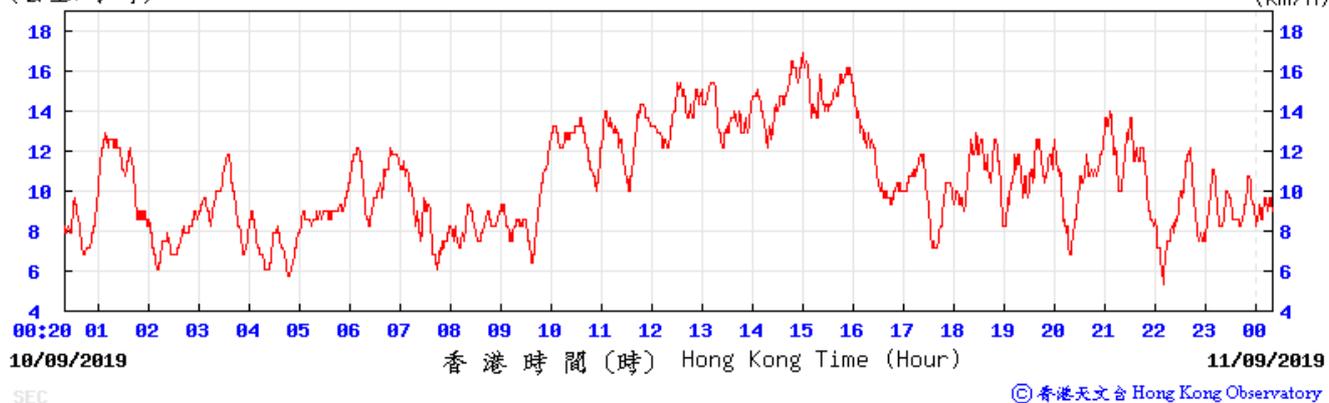




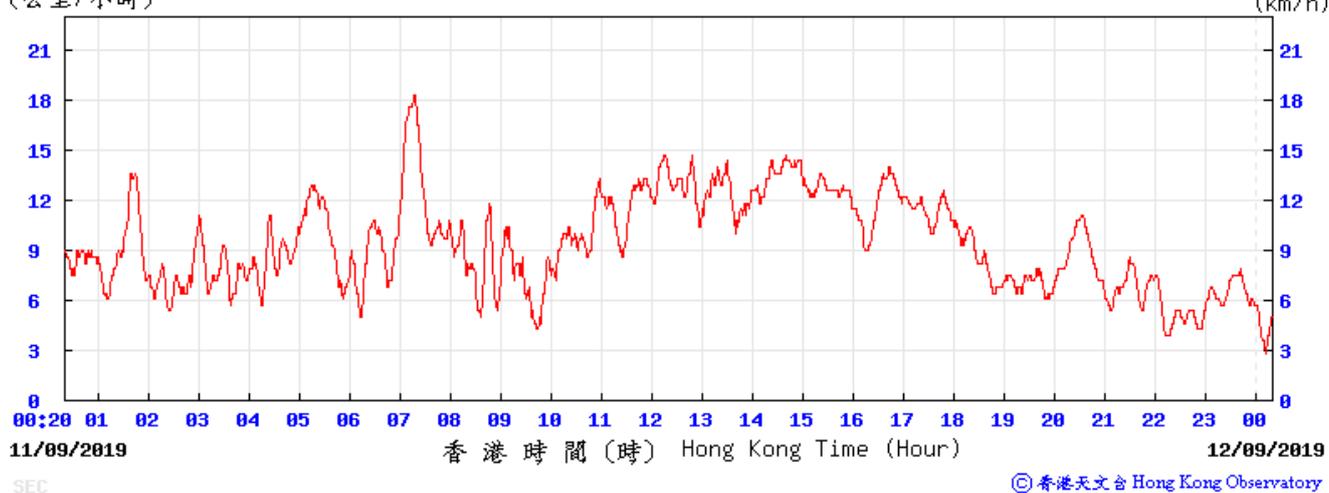


### Wind speed data for 10, 11, 16, 17, 20, 21, 26, 27 September 2019

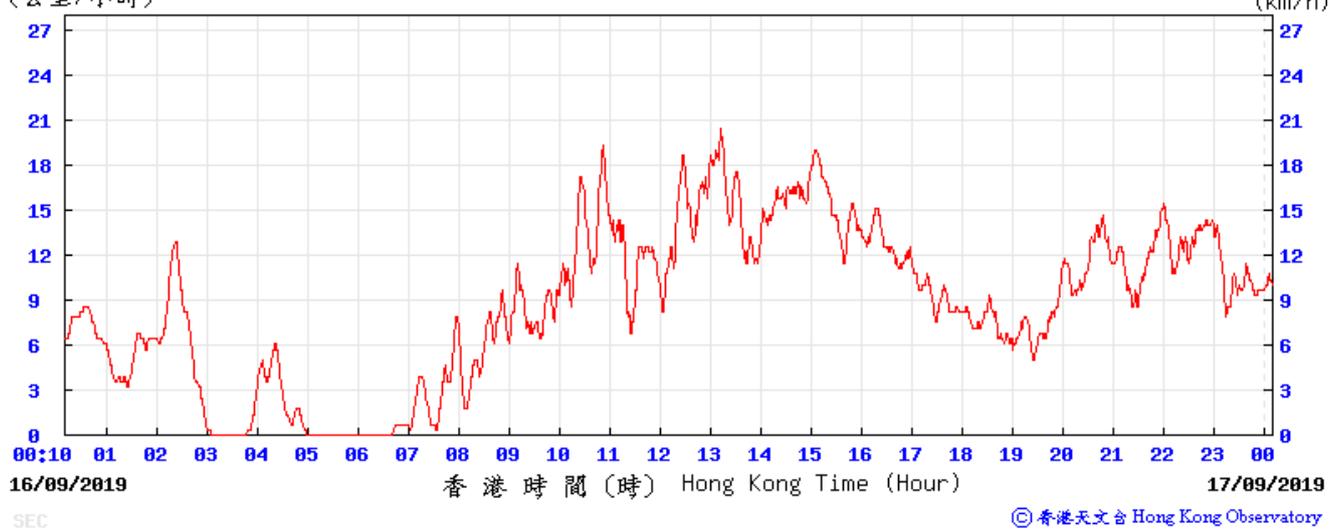
(公里/小時) (於香港時間 2019 年 9 月 11 日 0 時 20 分更新) (Updated at 00:20H on 11 Sep 2019) (km/h)



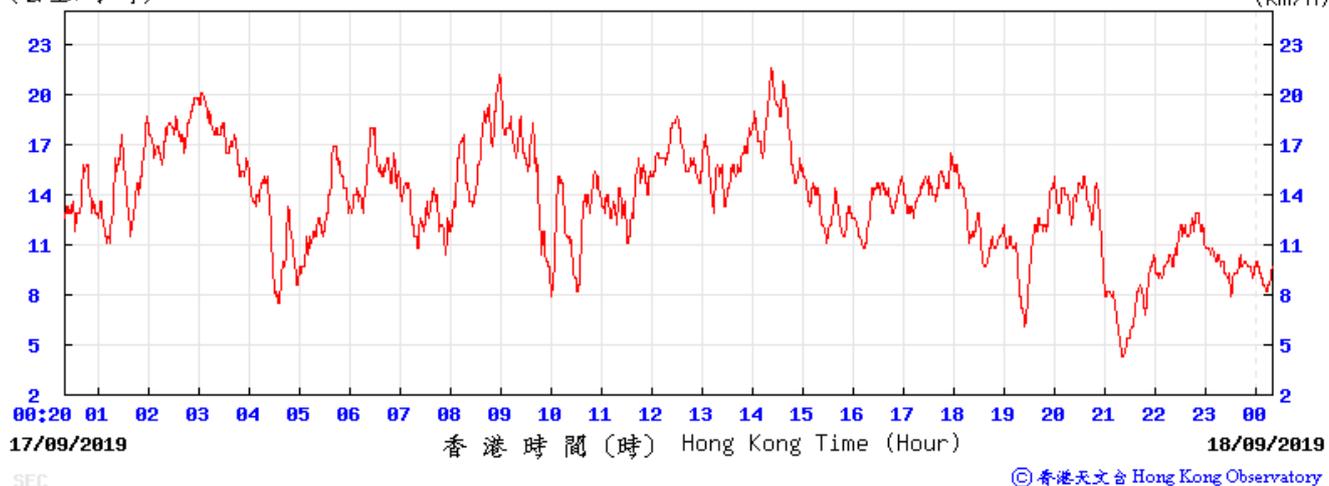
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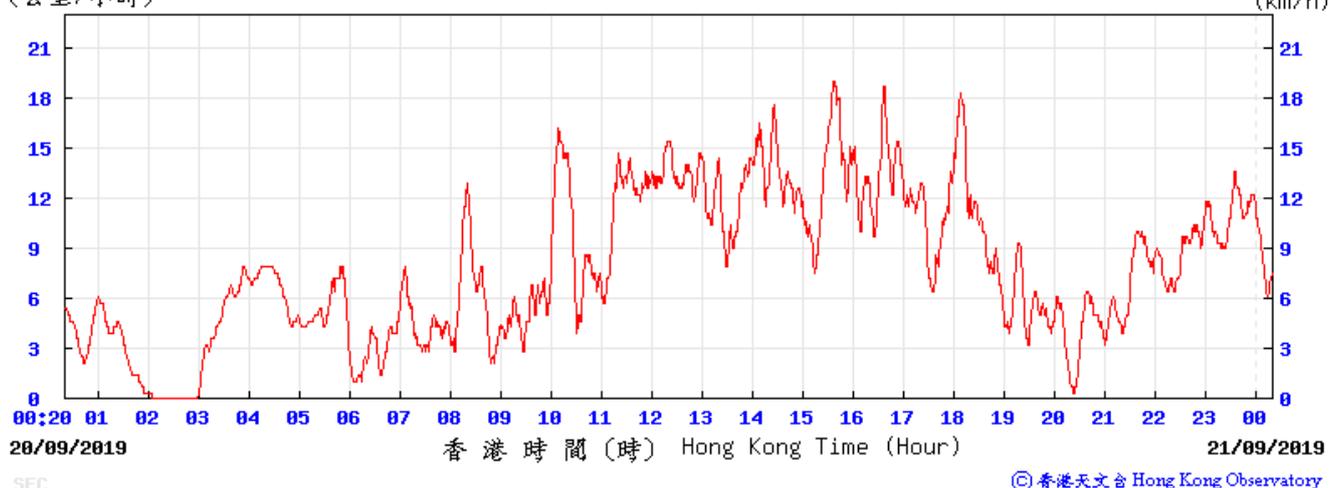
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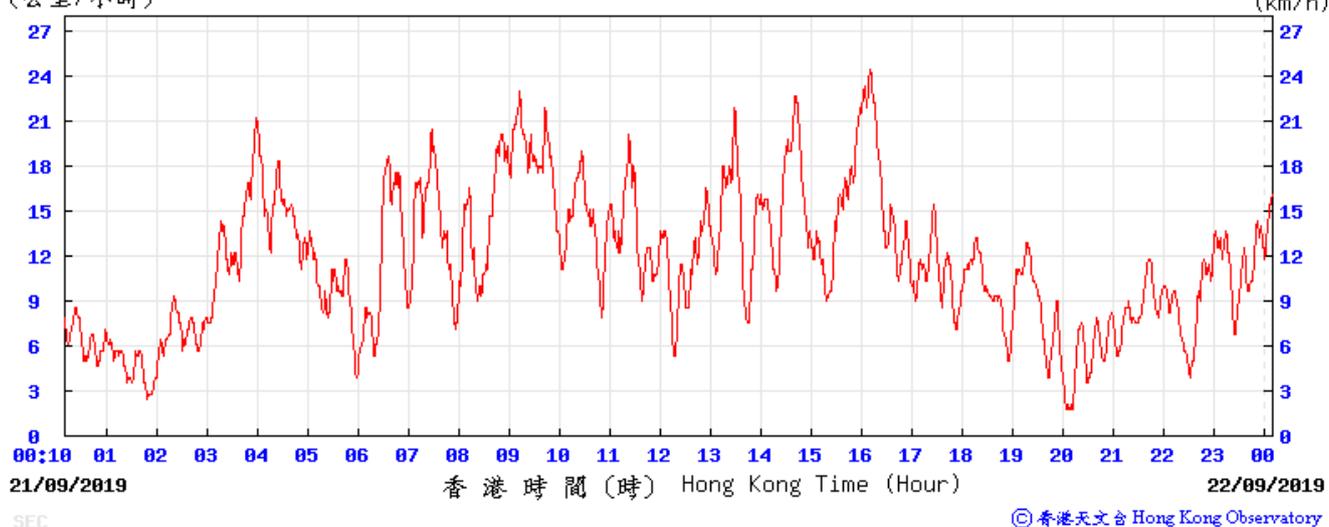
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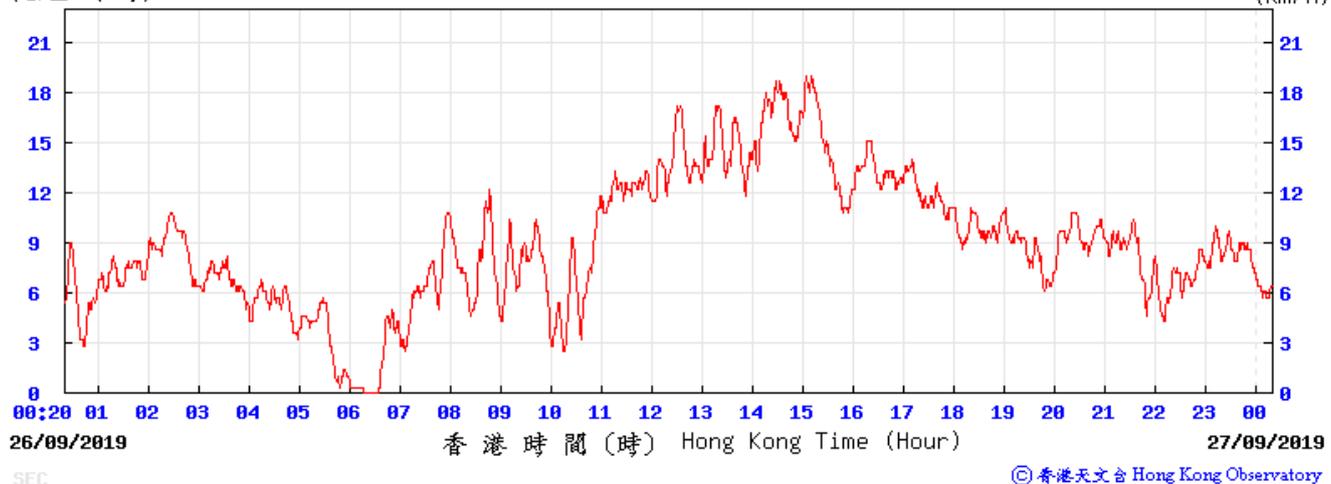
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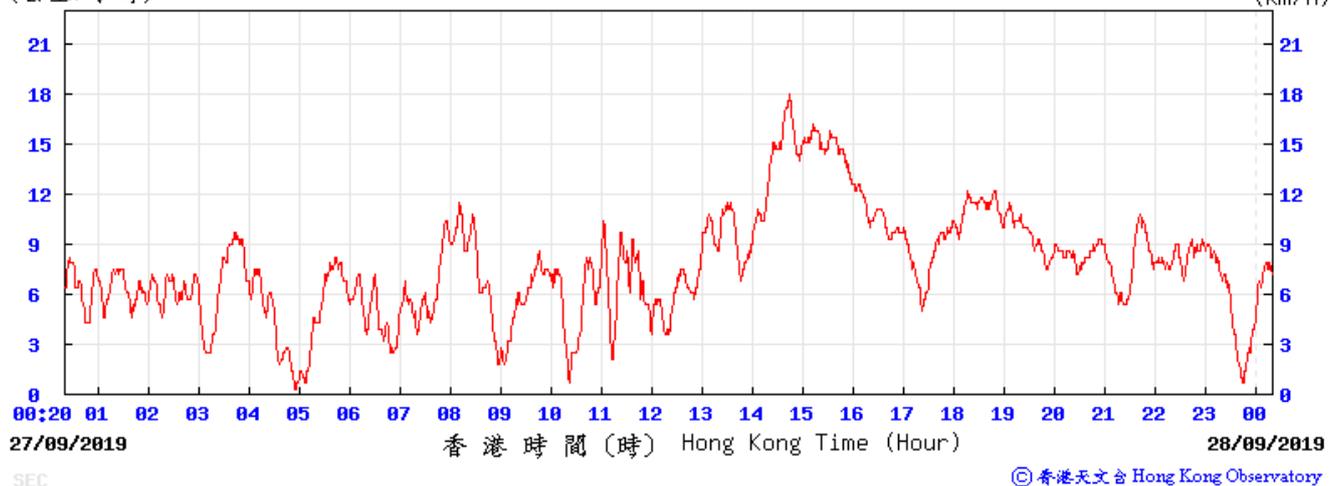
(公里/小時) (於香港時間 2019 年 9 月 22 日 0 時 10 分更新) (Updated at 00:10H on 22 Sep 2019) (km/h)



(公里/小時) (於香港時間 2019 年 9 月 27 日 0 時 20 分更新) (Updated at 00:20H on 27 Sep 2019) (km/h)



(公里/小時) (於香港時間 2019 年 9 月 28 日 0 時 20 分更新) (Updated at 00:20H on 28 Sep 2019) (km/h)



# Appendix K

## Waste Flow Table

**Monthly Summary Waste Flow Table**

**Name of Department:** Highways Department

**Contract No. / Works Order No.:** HY/2018/02

**Monthly Summary Waste Flow Table for September 2019**

[to be submitted not later than the 15<sup>th</sup> day of each month following reporting month] (All quantities shall be rounded off to 1 decimal place.)

Month	Actual Quantities of <u>Inert</u> Construction Waste Generated Monthly					
	(a)=(b)+(c)+(d)+(e)+ (f)+ (g)+ (h)+ (i)+ (j)+ (k) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill	(f) Imported Fill
	(in 'tonnes)	(in 'tonnes)	(in 'tonnes)	(in 'tonnes)	(in 'tonnes)	(in 'tonnes)
Jan-19	N/A					
Feb-19						
Mar-19						
Apr-19	0.0	0.0	0.0	0.0	0.0	0.0
May-19	0.0	0.0	0.0	0.0	0.0	0.0
Jun-19	0.0	0.0	0.0	0.0	0.0	0.0
Sub-total	0.0	0.0	0.0	0.0	0.0	0.0
Jul-19	61.1	0.0	0.0	0.0	0.0	0.0
Aug-19	80.2	0.0	0.0	0.0	3.8	0.0
Sep-19	142.7	0.0	0.1	0.0	0.6	0.0
Oct-19						
Nov-19						
Dec-19						
Total	284.0	0.0	0.1	0.0	4.4	0.0

Month	Actual Quantities of <u>Non-inert</u> Construction Waste Generated Monthly								
	(g) Metals		(h) Paper/ cardboard packaging		(i) Plastics		(j) Chemical Waste		(k) Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in 'tonnes)
	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated
Jan-19	N/A								
Feb-19									
Mar-19									
Apr-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jun-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jul-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.1
Aug-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	76.4
Sep-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	142.0
Oct-19									
Nov-19									
Dec-19									
Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	279.5

# Appendix L

## Statistics on Complaint, Notifications of Summons and Successful Prosecutions

**Statistical Summary of Exceedances**

Air Quality			
Location	Action Level	Limit Level	Total
E-A1	0	0	0

**Statistical Summary of Environmental Complaints**

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
9 September 2019- 30 September 2019	0	0	N/A

**Statistical Summary of Environmental Non-compliance**

Reporting Period	Environmental Non-compliance Statistics		
	Frequency	Cumulative	Details
9 September 2019- 30 September 2019	0	0	N/A

**Statistical Summary of Environmental Summons**

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Details
9 September 2019- 30 September 2019	0	0	N/A

**Statistical Summary of Environmental Prosecution**

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Details
9 September 2019- 30 September 2019	0	0	N/A

# Appendix M

## Monitoring Schedule of the Coming Month

# 十月 2019

星期日	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
29	30	1	2 Impact Dust monitoring (E-A1)	3	4	5
6	7	8 Impact Dust monitoring (E-A1)	9	10	11	12
13	14 Impact Dust monitoring (E-A1)	15	16	17	18	19 Impact Dust monitoring (E-A1)
20	21	22	23	24	25 Impact Dust monitoring (E-A1)	26
27	28	29	30	31 Impact Dust monitoring (E-A1)	1	2