

**Contract No. HY/2017/10
Tuen Mun - Chek Lap Kok Link -
Northern Connection Tunnel
Buildings, Electrical and Mechanical
Works**

Nineteenth Monthly EM&A Report

13 January 2020

Environmental Resources Management
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Contract No. HY/2017/10 Tuen Mun – Chek Lap Kok Link – Northern Connection Tunnel Buildings, Electrical and Mechanical Works

**Environmental Resources
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Nineteenth Monthly EM&A Report

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Client: Gammon		Project No: 0463091			
Summary: This document presents the Nineteenth Monthly EM&A Report for Tuen Mun – Chek Lap Kok Link – Northern Connection Tunnel Buildings, Electrical and Mechanical Works.		Date: 13 January 2020			
		Approved by: 			
		Mr Craig Reid Partner			
		Certified by: 			
		Dr Jasmine Ng ET Leader			
	Nineteenth Monthly EM&A Report	CW	JN	CAR	13/1/20
Revision	Description	By	Checked	Approved	Date
<p>This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.</p> <p>We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.</p>		<p>Distribution</p> <p><input type="checkbox"/> Internal</p> <p><input checked="" type="checkbox"/> Public</p> <p><input type="checkbox"/> Confidential</p>			
		 			



Ref.: HYDHZMBEEM00_0_7829L.20.doc

14 January 2020

By Fax (2783 0155) and By Post

AECOM Asia Company Limited
Supervising Officer's Representative Office
No. 8 Mong Fat Street, Tuen Mun, New Territories, Hong Kong

Attention: Mr. Desmond Fung

Dear Mr. Fung,

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

**Contract No. HY/2017/10
TM-CLKL – Northern Connection Tunnel Buildings, E&M Works
19th Monthly EM&A Report for December 2019**

Reference is made to the Environmental Team's submission of the monthly EM&A report for December 2019 (ET's ref.: "0463091_19th Monthly EM&A_20200113.doc" dated 13 January 2020) certified by the ET Leader and provided to us via e-mail on 13 January 2020.

Please be informed that we have no adverse comments on the captioned submission. We write to verify the captioned submission in accordance with Condition 4.4 of EP-354/2009/D.

Thank you for very much your attention. Please feel free to contact the undersigned or the ENPO Leader, Mr. Y H Hui, should you require further information.

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

F. C. Tsang
Independent Environmental Checker
Tuen Mun-Chek Lap Kok Link

c.c.

HyD	Mr. Patrick Ng	(By Fax: 3188 6614)
HyD	Mr. Cheng Pan	(By Fax: 3188 6614)
AECOM	Mr. Conrad Ng	(By Fax: 3922 9797)
ERM	Dr. Jasmine Ng	(By Fax: 2723 5660)
Gammon	Mr. Max Poon	(By Fax: 3520 0486)

Internal: DY, YH, RY, HW, ENPO Site

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Ramboll Hong Kong Limited 英環香港有限公司

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EXECUTIVE SUMMARY

Under *Contract No. HY/2017/10*, Gammon Construction Limited (GCL) is commissioned by the Highways Department (HyD) to undertake Northern Connection Tunnel Buildings, Electrical and Mechanical Works of the Tuen Mun – Chek Lap Kok Link Project (TM-CLK Link Project) while AECOM Asia Company Limited was appointed by HyD as the Engineer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, ERM-Hong Kong, Limited (ERM) has been appointed as the Environmental Team (ET) in accordance with *Environmental Permit No. EP-354/2009/A*. Ramboll Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO). Subsequent applications for variation of environmental permits (VEP), *EP-354/2009/B*, *EP-354/2009/C* and *EP-354/2009/D*, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

The construction phase of the Contract commenced on 7 June 2018 and will tentatively be completed by 2021. The impact monitoring of the EM&A programme, including air quality and environmental site inspections, were commenced on 7 June 2018.

This is the Nineteenth Monthly EM&A report presenting the EM&A works carried out during the period from 1 to 31 December 2019 for the *Contract No. HY/2017/10 Northern Connection Tunnel Buildings, Electrical and Mechanical Works* (the “Contract”) in accordance with the Updated EM&A Manual of the TM-CLK Link Project. As informed by the Contractor, major activities in the reporting period included:

Land-based Works

- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Toll Control Building;
- Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at North Ventilation Building;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Administration Building;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Maintenance Depot;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Fire Services Department Building;
- Electrical and Mechanical Works and Architectural Builder's Work at Customs and Excise Department Building;

- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at N1;
- Electrical and Mechanical Works at Kiosk N2;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at the Tunnel;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at underpass at C3 area;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Toll Booth;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Satellite Control Building;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Kiosk S2; and
- Electrical and Mechanical Works at South Ventilation Building.

A summary of monitoring and audit activities conducted in the reporting period is listed below ⁽¹⁾:

24-hour TSP Monitoring	11 sessions
1-hour TSP Monitoring	11 sessions
Landfill Gas Hazard Monitoring	24 days
Joint Environmental Site Inspection	4 sessions

Summary of Breaches of Action/Limit Levels

Breaches of Action and Limit Levels for Air Quality

Four (4) exceedances of Action Level and one (1) exceedance of Limit Level of 1-hour TSP were recorded by the Environmental Team of Contract No. HY/2012/08 during the reporting period.

Breaches of Action Level for Landfill Gas Hazard Monitoring

Results of landfill gas hazard monitoring in the reporting month complied with the Action Level.

(1) ET justification on the Contract Specific Environmental Monitoring and Audit activities under this Contract was submitted to ENPO on 11 September 2018

Environmental Complaints, Non-compliance & Summons

There was no environmental complaint, notification of summons or successful prosecution recorded in the reporting period.

Reporting Change

There was no reporting change in the reporting period.

Upcoming Works for the Next Reporting Month

Works to be undertaken in the next monitoring period of January 2020 include the following:

Land-based Works

- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Toll Control Building;
- Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at North Ventilation Building;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Administration Building;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Maintenance Depot;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Fire Services Department Building;
- Electrical and Mechanical Works and Architectural Builder's Work at Customs and Excise Department Building;
- Electrical and Mechanical Works and Architectural Builder's Work at N1;
- Electrical and Mechanical Works at Kiosk N2;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at the Tunnel;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at underpass at C3 area;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Satellite Control Building;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Kiosk S2; and
- Electrical and Mechanical Works at South Ventilation Building.

Future Key Issues

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of January 2020 are mainly associated with dust and waste management issues.

According to the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway would be operating beyond capacity after 2016. This forecast has been based on the estimated increase in cross boundary traffic, developments in the Northwest New Territories (NWNT), and possible developments in North Lantau, including the Airport developments, the Lantau Logistics Park (LLP) and the Hong Kong – Zhuhai – Macao Bridge (HZMB). In order to cope with the anticipated traffic demand, two new road sections between NWNT and North Lantau – Tuen Mun – Chek Lap Kok Link (TM-CLKL) and Tuen Mun Western Bypass (TMWB) are proposed.

An Environmental Impact Assessment (EIA) of TM-CLKL (the Project) was prepared in accordance with the EIA Study Brief (No. ESB-175/2007) and the *Technical Memorandum of the Environmental Impact Assessment Process (EIAO-TM)*. The EIA Report was submitted under the Environmental Impact Assessment Ordinance (EIAO) in August 2009. Subsequent to the approval of the EIA Report (EIAO Register Number AEIAR-146/2009), an Environmental Permit (EP-354/2009) for TM-CLKL was granted by the Director of Environmental Protection (DEP) on 4 November 2009, and EP variation (VEP) (EP-354/2009/A) was issued on 8 December 2010. Subsequent applications for variation of environmental permits (VEPs), *EP-354/2009/B*, *EP-354/2009/C* and *EP-354/2009/D*, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

Under *Contract No. HY/2017/10*, Gammon Construction Limited (GCL) is commissioned by the Highways Department (HyD) to undertake the Northern Connection Tunnel Buildings, Electrical and Mechanical Works of TM-CLKL while AECOM Asia Company Limited was appointed by HyD as the Engineer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, ERM-Hong Kong, Limited (ERM) has been appointed as the Environmental Team (ET). Ramboll Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO).

The construction phase of the Contract commenced on 7 June 2018 and will be tentatively completed by 2021. The impact monitoring phase of the EM&A programme, including air quality and environmental site inspections, commenced on 7 June 2018.

The general layout plan of the Contract components is presented in *Figures 1.1 & 1.2a to c*.

Project Management Initials: Designer: KATH Checked: SYLC Approved: CWN ISO A1 594mm x 841mm

Plot File by: jerrywong 23-Jan-18
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PROJECT
 TUEN MUN -
 CHEK LAP KOK LINK

CONTRACT TITLE
 TUEN MUN - CHEK LAP KOK LINK
 - NORTHERN CONNECTION TUNNEL
 BUILDINGS, ELECTRICAL AND
 MECHANICAL WORKS

CLIENT

 路政署 DEPARTMENT
 HIGHWAYS DEPARTMENT
 港珠澳大橋香港工程管理有限公司
 Hong Kong - Zhuhai - Macao Bridge
 Hong Kong Project Management Office

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Figure 1.1

ISSUE/REVISION

NO.	DATE	DESCRIPTION	CHK.
A	JAN.18	TENDER ADDENDUM NO.1	SYLC
-	DEC.17	TENDER DRAWING	SYLC

STATUS

SCALE
 A1 1:40000
 DIMENSION UNIT
 MILLIMETRES

KEY PLAN

PROJECT NO. 60240249
 CONTRACT NO. HY/2017/10

SHEET TITLE
 OVERALL SITE PLAN

SHEET NUMBER
 60240249/C4/7051A

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PROJECT
TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE
TUEN MUN - CHEK LAP KOK LINK - NORTHERN CONNECTION TUNNEL BUILDINGS, ELECTRICAL AND MECHANICAL WORKS

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HIGHWAYS DEPARTMENT
港務局
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Figure 1.2a

ISSUE/REVISION

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-	DEC.17	TENDER DRAWING	SYLC

STATUS

SCALE
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DIMENSION UNIT
MILLIMETRES

KEY PLAN

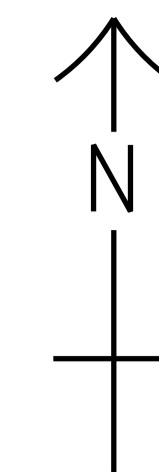
PROJECT NO.
60240249

CONTRACT NO.
HY/2017/10

SHEET TITLE
ZONING PLAN (SHEET 1)

SHEET NUMBER
60240249/C4/7061A

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**TUEN MUN -
 CHEK LAP KOK LINK**

CONTRACT TITLE
 TUEN MUN - CHEK LAP KOK LINK
 - NORTHERN CONNECTION TUNNEL
 BUILDINGS, ELECTRICAL AND
 MECHANICAL WORKS

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Figure 1.2b

ISSUE/REVISION
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-	DEC.17	TENDER DRAWING	SYLC

STATUS
 階段

SCALE
 比例

A1 1 : 2500

DIMENSION UNIT
 尺寸單位

MILLIMETRES

KEY PLAN
 索引圖

PROJECT NO.
 項目編號

60240249

CONTRACT NO.
 合約編號

HY/2017/10

SHEET TITLE
 圖紙名稱

ZONING PLAN
 (SHEET 2)

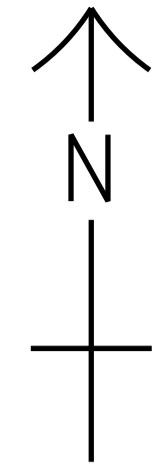
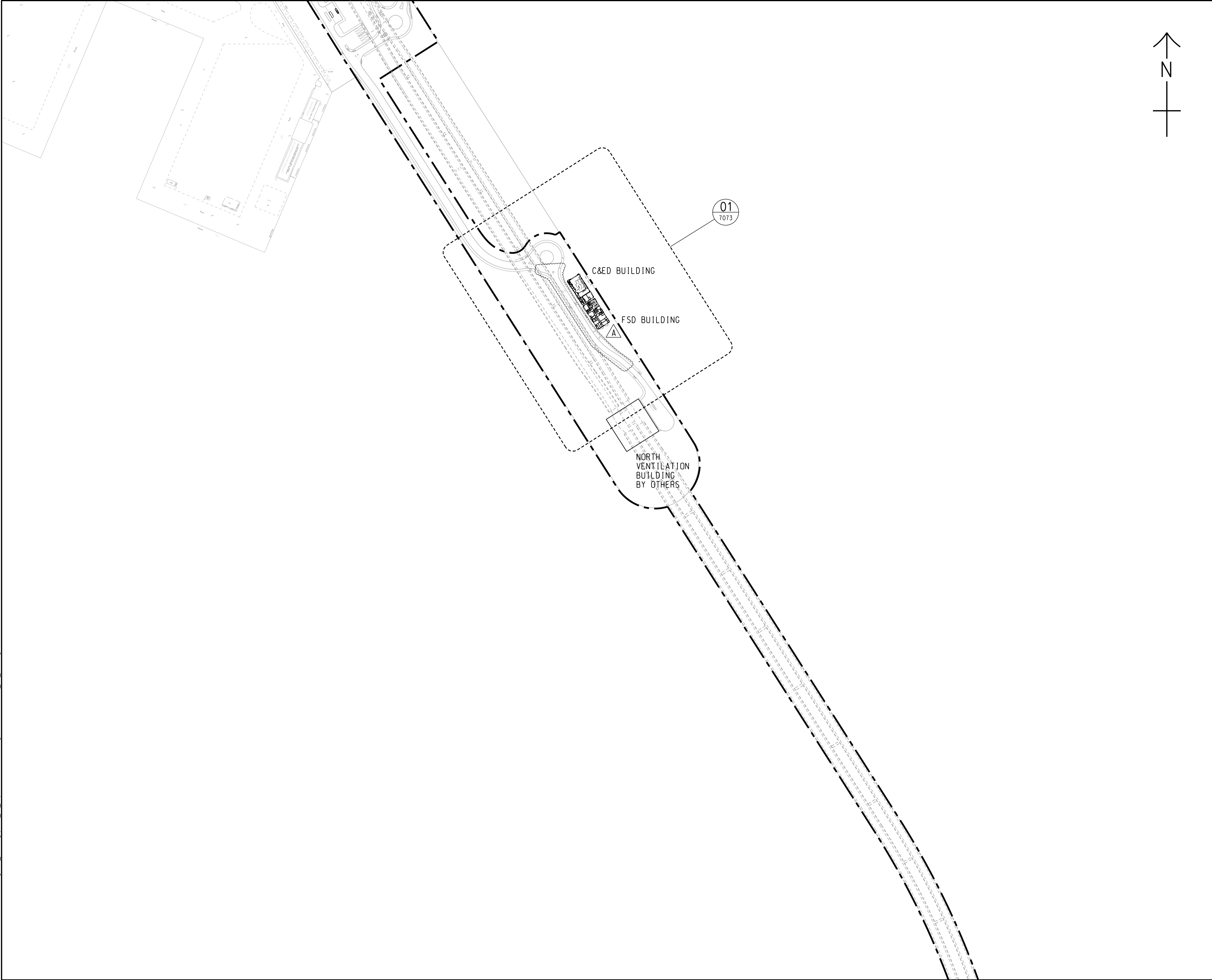
SHEET NUMBER
 圖紙編號

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PROJECT
 項目
TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE
 TUEN MUN - CHEK LAP KOK LINK - NORTHERN CONNECTION TUNNEL BUILDINGS, ELECTRICAL AND MECHANICAL WORKS

CLIENT
 業主

 路政署 HIGHWAYS DEPARTMENT
 港珠澳大橋香港工程管理局
 Hong Kong - Zhuhai - Macao Bridge
 Hong Kong Project Management Office

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Figure 1.2c

ISSUE/REVISION
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I/R	DATE	DESCRIPTION	CHK.
修訂	日期	內容摘要	核校
A	JAN.18	TENDER ADDENDUM NO.1	SYLC
-	DEC.17	TENDER DRAWING	SYLC

STATUS
 階段

SCALE
 比例
 A1 1 : 2500

DIMENSION UNIT
 尺寸單位
 MILLIMETRES

KEY PLAN
 索引圖

PROJECT NO.
 項目編號
 60240249

CONTRACT NO.
 合約編號
 HY/2017/10

SHEET TITLE
 圖紙名稱
 ZONING PLAN
 (SHEET 3)

SHEET NUMBER
 圖紙編號
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1.2 SCOPE OF REPORT

This is the Nineteenth Monthly EM&A Report under the *Contract No. HY/2017/10 Tuen Mun – Chek Lap Kok Link – Northern Connection Tunnel Buildings, Electrical and Mechanical Works*. This report presents a summary of the environmental monitoring and audit works in December 2019.

1.3 ORGANIZATION STRUCTURE

The organization structure of the Contract is shown in *Appendix A*. The key personnel contact names and contact details are summarized in *Table 1.1* below.

Table 1.1 *Contact Information of Key Personnel*

Party	Position	Name	Telephone	Fax
HyD (Highways Department)	Project Coordinator	Joseph Lee	2762 4958	3188 6614
	Senior Engineer	Cheng Pan	2762 3383	3188 6614
ER (AECOM Asia Company Limited)	Principle Resident Engineer	S. W. Fok	2293 6200	2293 6300
	Resident Engineer	Desmond Fung	2293 6200	2293 6300
ENPO / IEC (Ramboll Hong Kong Ltd.)	ENPO Leader	Y.H. Hui	3465 2850	3465 2899
	IEC	Dr. F.C. Tsang	3465 2851	3465 2899
Contractor (Gammon Construction Limited)	Site Agent	Kenneth Tai	9039 4723	-
	Environmental Officer	Max Poon	9103 6303	-
ET (ERM-HK)	ET Leader	Dr. Jasmine Ng	2271 3311	2723 5660

1.4 SUMMARY OF CONSTRUCTION WORKS

The construction phase of the Contract commenced on 7 June 2018. The three-month rolling construction programme is shown in *Appendix B*.

As informed by the Contractor, details of the major works carried out in this reporting month are listed below:

Land-based Works

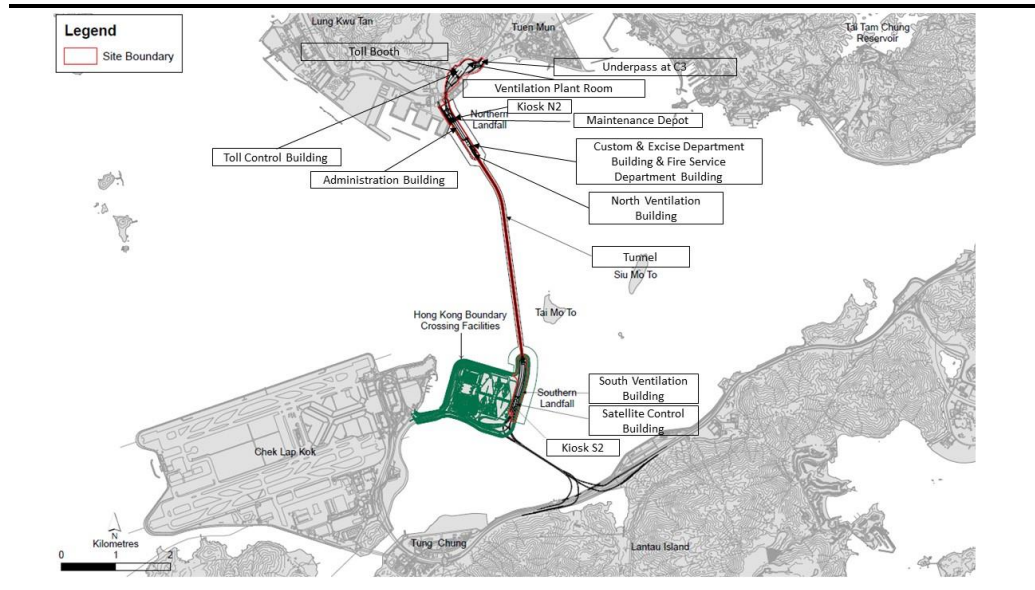
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Toll Control Building;
- Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at North Ventilation Building;

- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Administration Building;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Maintenance Depot;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Fire Services Department Building;
- Electrical and Mechanical Works and Architectural Builder's Work at Customs and Excise Department Building;
- Electrical and Mechanical Works and Architectural Builder's Work at N1;
- Electrical and Mechanical Works at Kiosk N2;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at the Tunnel;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at underpass at C3 area;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Toll Booth;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Satellite Control Building;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Kiosk S2; and
- Electrical and Mechanical Works at South Ventilation Building.

The locations of the construction activities are shown in *Figure 1.3*. The Environmental Sensitive Receivers in the vicinity of the Contract are shown in *Figure 1.4*.

The implementation schedule of environmental mitigation measures is presented in *Appendix C*.

Figure 1.3 *Locations of Major Construction Activities in the Reporting Month*



The EM&A programme required environmental monitoring for air quality and environmental site inspections for air quality, water quality and waste management. The EM&A requirements and related findings for each component are summarized in the following sections

2.1 AIR QUALITY

2.1.1 Monitoring Requirements and Equipment

In accordance with the Updated EM&A Manual and the Enhanced TSP Monitoring Plan, impact 1-hour TSP monitoring was conducted three (3) times every six (6) days and impact 24-hour TSP monitoring was carried out once every six (6) days when the highest dust impact was expected. 1-hr and 24-hr TSP monitoring frequency was increased to three times per day every three days and daily every three days, respectively, as excavation works for launching shaft under *Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section* commenced on 24 October 2014.

Results of air quality monitoring were adopted from the published EM&A data of *Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section* ⁽¹⁾.

The Action and Limit Levels of the air quality monitoring were adopted from the published EM&A reports of *Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section* ⁽²⁾. The Action and Limit Levels are provided in *Appendix D*.

The locations of the monitoring stations overlapped with *Contract No. HY/2012/08* are shown in *Figure 2.1* and presented in *Table 2.1*.

Table 2.1 *Locations of Impact Air Quality Monitoring Stations and its Corresponding Monitoring Requirements*

Monitoring Station	Monitoring Dates	Location	Description	Parameters & Frequency
ASR1	1, 4, 7, 10, 13, 16, 19, 22, 25, 28 and 31 December 2019	Tuen Mun Fireboat Station	Office	TSP monitoring
ASR5		Pillar Point Fire Station	Office	<ul style="list-style-type: none"> 1-hour Total Suspended Particulates (1-hour TSP, $\mu\text{g}/\text{m}^3$), 3 times in every 6 days 24-hour Total Suspended Particulates (24-hour TSP, $\mu\text{g}/\text{m}^3$), daily for 24-hour in every 6 days
AQMS1		Previous River Trade Golf	Bare ground	Enhanced TSP monitoring

(1) Published EM&A data for impact air quality monitoring by *Contract No. HY/2012/08* are available at: <http://www.hzmbenpo.com/>

(2) Published EM&A reports of *Contract No. HY/2012/08* are available at: <http://www.hzmbenpo.com/>

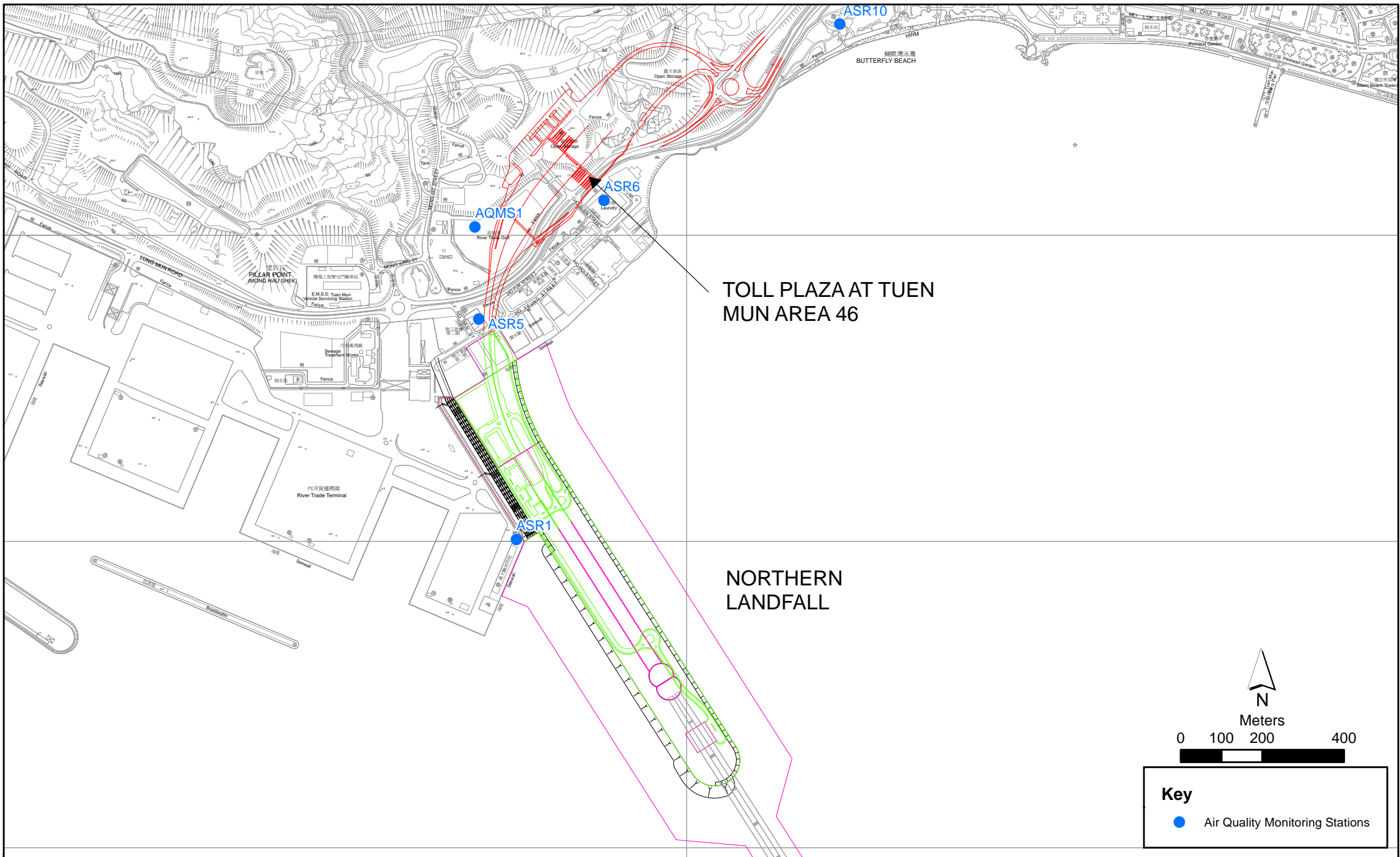



Figure 2.1

Air Quality Monitoring Stations for the Enhanced TSP Monitoring
 (Source: Adopted from Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link -
 Northern Connection Sub-sea Tunnel Section)

Key

- Air Quality Monitoring Stations

Environmental Resources Management



Monitoring Station	Monitoring Dates	Location	Description	Parameters & Frequency
ASR6		Butterfly Beach Laundry	Office	(commenced on 24 October 2014 under <i>Contract No. HY/2012/08</i>) <ul style="list-style-type: none"> 1-hour Total Suspended Particulates (1-hour TSP, $\mu\text{g}/\text{m}^3$), 3 times in every 3 days
ASR10		Butterfly Beach Park	Recreational uses	<ul style="list-style-type: none"> 24-hour Total Suspended Particulates (24-hour TSP, $\mu\text{g}/\text{m}^3$), daily for 24-hour in every 3 days

2.1.2 *Results and Observations*

Results of air quality monitoring were adopted from the published EM&A data of *Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section* ⁽¹⁾.

Four (4) exceedances of Action Level and one (1) exceedance of Limit Level of 1-hour TSP were recorded by the Environmental Team of Contract No. *HY/2012/08* during the reporting period. The exceedances were considered not related to this Contract upon further investigation and the investigation report is presented in *Appendix J*. No action is required to be undertaken in accordance with the Event Action Plan as presented in *Appendix E*.

No exceedance of Action and Limit Levels for 24-hour TSP was recorded in the reporting month.

2.2 *LANDFILL GAS HAZARD MONITORING*

In accordance with the Updated EM&A Manual of the TM-CLK Link Project, landfill gas hazard monitoring should be performed to ensure that the works area at Pillar Point Valley (PPV) Landfill is free of landfill gas during any excavations works. A total of 24 days of landfill gas hazard monitoring was conducted at Toll Control Building during 1 to 31 December 2019 (*Appendix F*).

The landfill gas hazard monitoring was conducted in accordance to the Updated EM&A Manual with a Altair 5X Gas Detector. The calibration certificate for the equipment is presented in *Appendix G*.

The Action Level of the landfill gas hazard monitoring was adopted from the Updated EM&A Manual of the TM-CLK Link Project and are provided in *Appendix D*.

2.2.1 *Results and Observations*

Results for landfill gas hazard monitoring are summarized in *Table 2.2* and the monitoring data is provided in *Appendix H*.

(1) Published EM&A data for impact air quality monitoring by *Contract No. HY/2012/08* are available at: <http://www.hzmbenpo.com/>

Results of methane, oxygen and carbon dioxide in the reporting month complied with the Action Level. No action as stated in the Updated EM&A Manual of the TM-CLK Link Project and presented in *Appendix D* is required to be undertaken.

Table 2.2 *Summary of Landfill Gas Hazard Monitoring Results in the Reporting Period*

	Average (%)	Range (%)	Action Level (%) ^(a)
Methane	0	0	10/20
Oxygen	20.8	20.8-20.9	19/18
Carbon Dioxide	0.03	0.03-0.04	0.5/1.5

Notes:

(a) Depending on the results of the measurements, actions required will vary. Actions in the event of landfill gas being detected in excavation/confined area was adopted from the Updated EM&A Manual of the TM-CLK Link Project.

2.3 *EM&A SITE INSPECTION*

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 month, four (4) site inspections were carried out on 6, 13, 20 and 27 December 2019.

Key observations and recommendations during the site inspections in this reporting period are summarized in *Table 2.3*.

Table 2.3 *Specific Observations and Recommendations during the Weekly Site Inspection in this Reporting Month*

Inspection Date	Observations	Recommendations/ Remarks
6 December 2019	Satellite Control Building <ul style="list-style-type: none"> Chemicals were observed not placed in drip tray. Damaged drip tray should be replaced. 	Satellite Control Building <ul style="list-style-type: none"> The Contractor was reminded to place chemicals in drip tray. The Contractor was reminded to replace the damaged drip tray.
13 December 2019	Fire Services Department Building <ul style="list-style-type: none"> Chemical containers were observed not placed in drip tray. Customs and Excise Department Building <ul style="list-style-type: none"> Dusty materials should be properly covered. 	Fire Services Department Building <ul style="list-style-type: none"> The Contractor was reminded to place chemical containers in drip tray. Customs and Excise Department Building <ul style="list-style-type: none"> The Contractor was reminded to cover the dusty materials with tarpaulin sheet.
20 December 2019	Customs and Excise Department Building <ul style="list-style-type: none"> Cement bags should be covered properly with tarpaulin sheet. Chemical containers were observed not locked. 	Customs and Excise Department Building <ul style="list-style-type: none"> The Contractor was reminded to cover properly the cement bags. The Contractor was reminded to place chemical containers in drip tray.

Inspection Date	Observations	Recommendations/ Remarks
27 December 2019	Satellite Control Building <ul style="list-style-type: none"> Better housekeeping should be maintained. Chemical containers were observed not placed in drip tray. South Ventilation Building <ul style="list-style-type: none"> Accumulated general refuse should be cleared. 	Satellite Control Building <ul style="list-style-type: none"> The Contractor was reminded to maintain better housekeeping and regularly cleanup general refuse. The Contractor was reminded to place chemical containers in drip tray. South Ventilation Building <ul style="list-style-type: none"> The Contractor was reminded to clear accumulated general refuse.

The Contractor has rectified all of the observations as identified during environmental site inspections in the reporting month.

2.4 WASTE MANAGEMENT STATUS

The Contractor had submitted application form for registration as chemical waste producer under the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting.

Wastes generated during this reporting period included mainly construction wastes (inert and non-inert). Reference has been made to the waste flow table prepared by the Contractor (*Appendix I*). The quantities of different types of wastes are summarized in *Table 2.4*.

Table 2.4 Quantities of Different Waste Generated in the Reporting Month

Month/Year	Inert C&D Materials ^(a) (m ³)	Inert Construction Waste Re-used (m ³)	Non-inert Construction Waste ^(b) (kg)	Imported Fill (m ³)	Recyclable Materials ^(c) (kg)	Chemical Wastes (kg)
December 2019	489	0	276,850	0	0	0

Notes:

- (a) Inert construction wastes include hard rock and large broken concrete disposed as public fill.
- (b) Non-inert construction wastes include general refuse disposed at landfill.
- (c) Recyclable materials include metals, paper, cardboard, plastics, timber and others.

The Contractor was advised to properly maintain on site C&D materials and waste collection, sorting and recording system, dispose of C&D materials and wastes at designated ground and maximize reuse/ recycle of C&D materials and wastes. The Contractor was also reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

For chemical waste containers, the Contractor was reminded to treat properly and store temporarily in designated chemical waste storage area on site in accordance with the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*.

2.5

ENVIRONMENTAL LICENSES AND PERMITS

The status of environmental licensing and permit is summarized in *Table 2.5* below.

Table 2.5 Summary of Environmental Licensing and Permit Status

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Environmental Permit	EP-354/2009/D	13 March 2015	N/A	HyD	Tuen Mun- Chek Lap Kok Link
APCO Construction Dust Notification	433493	14 May 2018	N/A	GCL	For Tuen Mun working area
Construction Waste Billing Account	7030836	15 May 2018	N/A	GCL	N/A
Chemical Waste Producer Registration	5213-422-G2827-01	13 June 2018	N/A	GCL	N/A
Discharge License under WPCO for Buildings at C2 area	WT00031783-2018	22 October 2018	31 October 2023	GCL	Sampling Frequency: Bimonthly
Discharge License under WPCO for Buildings at C3 area	WT00032062-2018	30 October 2018	31 October 2023	GCL	Sampling Frequency: Quarterly
Construction Noise Permit	GW-RW0524-19	3 November 2019	29 April 2020	GCL	For Toll Control Building, Administration Building, Maintenance Depot, FSD, C&ED, Boundary Wall, Tunnel, Approach ramp, NVB and WA18
Construction Noise Permit	GW-RS0778-19	30 August 2019	28 February 2020	GCL	For Kiosk S2 and SCB
Construction Noise Permit	GW-RS1130-19	19 December 2019	18 June 2020	GCL	For Kiosk S2 and SCB
Construction Noise Permit	GW-RS0448-19	25 September 2019	14 December 2019	GCL	For Deck Void Lighting Installation

2.6 *IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES*

In response to the site audit findings, the Contractors carried out all corrective actions.

A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in *Appendix C*. The necessary mitigation measures relevant to this Contract were implemented properly.

The landscape and visual (L&V) mitigation measures were also monitored on weekly basis in the reporting period. The monitoring status is summarized in *Appendix C*.

2.7 *SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT*

Four (4) exceedances of Action Level and one (1) exceedance of Limit Level of 1-hour TSP were recorded by the Environmental Team of Contract No. HY/2012/08 during the reporting period.

No exceedance of Action and Limit Levels for 24-hour TSP was recorded in the reporting month.

Results of landfill gas hazard monitoring in the reporting month complied with the Action Level.

Cumulative statistics are provided in *Appendix J*.

2.8 *SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS*

The Environmental Complaint Handling Procedure is provided in *Figure 2.2*.

There was no environmental complaint, notification of summons or successful prosecution recorded in the reporting period.

Statistics on complaints, notifications of summons, successful prosecutions are summarized in *Appendix J*.

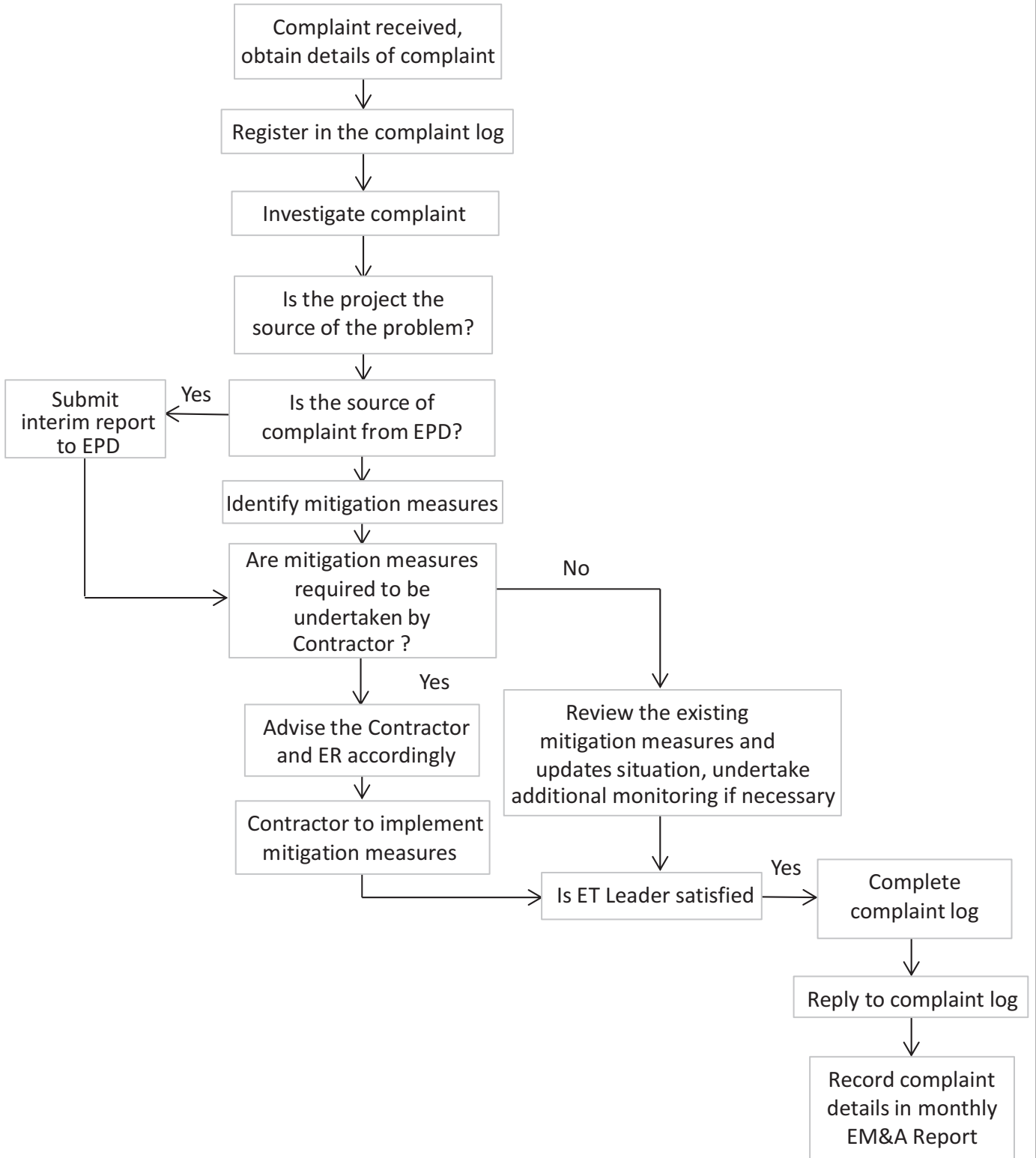


Figure 2.2

Environmental Complaint Handling Procedure

3.1 CONSTRUCTION ACTIVITIES FOR THE COMING MONTH

As informed by the Contractor, the major works for the Contract in January 2020 will be:

Land-based Works

- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Toll Control Building;
- Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at North Ventilation Building;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Administration Building;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Maintenance Depot;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Fire Services Department Building;
- Electrical and Mechanical Works and Architectural Builder's Work at Customs and Excise Department Building;
- Electrical and Mechanical Works and Architectural Builder's Work at N1;
- Electrical and Mechanical Works at Kiosk N2;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at the Tunnel;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at underpass at C3 area;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Satellite Control Building;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Kiosk S2; and
- Electrical and Mechanical Works at South Ventilation Building.

3.2

KEY ISSUES FOR THE COMING MONTH

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of January 2020 are mainly associated with dust and waste management issues.

4.1 CONCLUSIONS

This Nineteenth Monthly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 31 December 2019, in accordance with the Updated EM&A Manual and the requirements of EP-354/2009/D.

Air quality (including 1-hour TSP and 24-hour TSP) monitoring were carried out in this reporting month.

Four (4) exceedances of Action Level and one (1) exceedance of Limit Level of 1-hour TSP were recorded by the Environmental Team of Contract No. *HY/2012/08* during the reporting period. No exceedance of Action and Limit Levels for 24-hour TSP was recorded in the reporting month.

Results of landfill gas hazard monitoring in the reporting month complied with the Action Level.

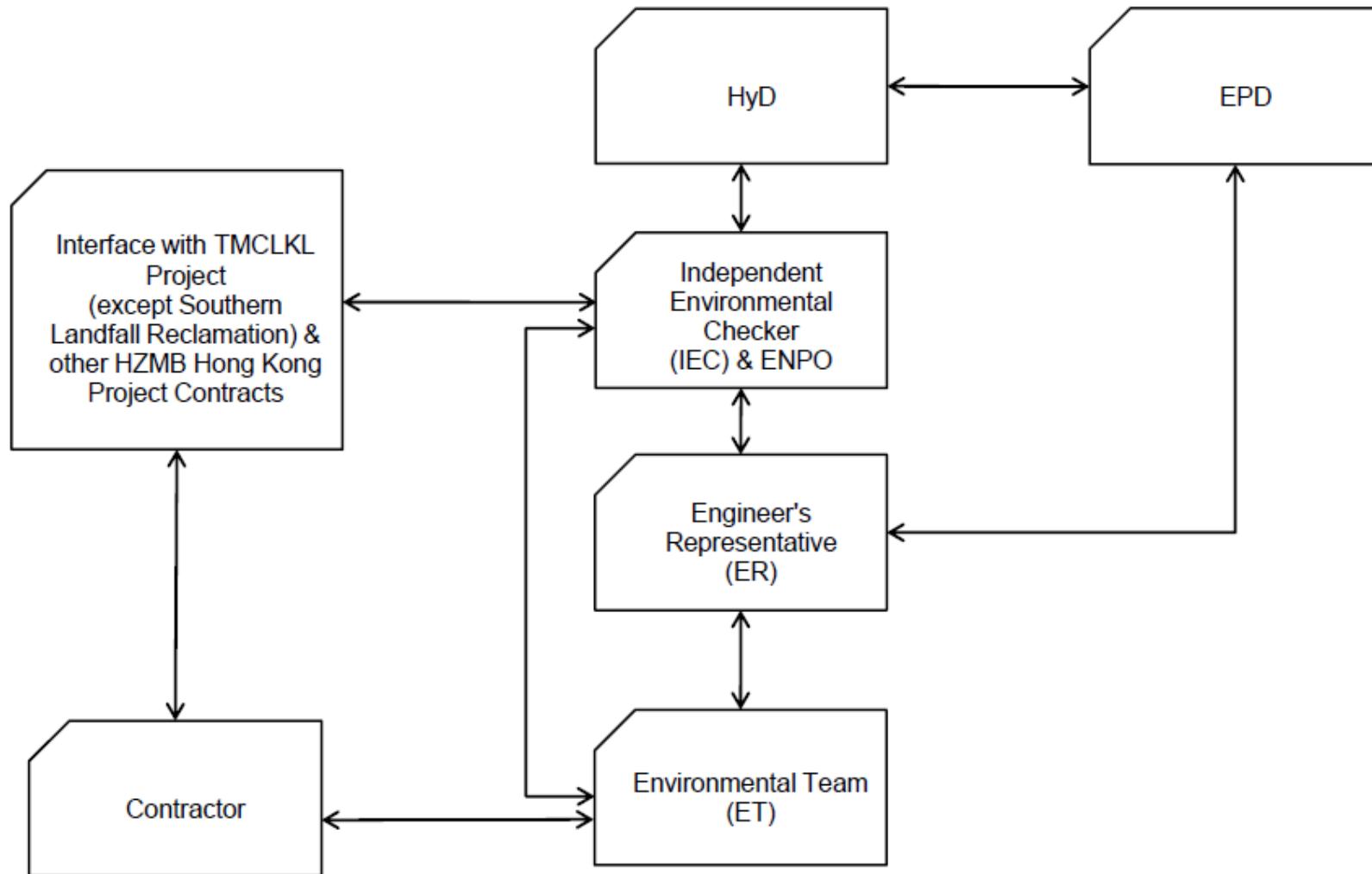
Environmental site inspection was carried out four (4) times in December 2019. Remedial actions recommended for the deficiencies identified during the site audits were properly implemented by the Contractor.

There was no environmental complaint, notification of summons or successful prosecution recorded in the reporting period.

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

Project Organization for Environmental Works



↔ Line of Communication

Appendix B

Construction Programme

ID	Activity	Duration (Days)	Duration % Complete	Start	Finish	Total Float	2018												2019												2020											
							May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep							
	ADB-EMD1115	Authorities Review and Comment of Electrical Loading Demand Calculation	56	50%	27-Aug-18 A																																					
	ADB-EMD1135	Authorities Review and Comment of Generator Calculation	56	50%	09-Aug-18 A																																					
	Fire Service System																																									
	ADB-EMD1155	Authorities Review and Comment of FS Pump Head Calculation	56	50%	13-Aug-18 A																																					
	ADB-EMD1175	Authorities Review and Comment of Sprinkler Pump Head Calculation	56	50%	13-Aug-18 A																																					
	ADB-EMD1195	Authorities Review and Comment of FM200 System Design Calculation	56	50%	13-Aug-18 A																																					
	Plumbing & Drainage System																																									
	ADB-EMD1215	Authorities Review and Comment of Pump Head Calculation	56	50%	25-Aug-18 A																																					
	ADB-EMD1235	Authorities Review and Comment of Pressure Vessel Calculation	56	50%	25-Aug-18 A																																					
	ADB-EMD1255	Authorities Review and Comment of Hot water system capacity calculation	56	50%	25-Aug-18 A																																					
	North Ventilation Building																																									
	MVAC System																																									
	NVB-EMD1035	Authorities Review and Comment of Mechanical Ventilation Capacity Calculation	56	50%	26-Sep-18 A																																					
	Electrical System																																									
	NVB-EMD1055	Authorities Review and Comment of HV Electrical Loading Calculation	56	50%	26-Sep-18 A																																					
	NVB-EMD1075	Authorities Review and Comment of UPS and Battery Capacity Calculations	56	50%	17-Aug-18 A																																					
	NVB-EMD1095	Authorities Review and Comment of Electrical Loading Demand Calculation	56	50%	03-Sep-18 A																																					
	NVB-EMD1115	Authorities Review and Comment of Generator Calculation	56	50%	17-Aug-18 A																																					
	Fire Service System																																									
	NVB-EMD1135	Authorities Review and Comment of FS Pump Head Calculation	56	50%	01-Aug-18 A																																					
	NVB-EMD1155	Authorities Review and Comment of Sprinkler Pump Head Calculation	56	50%	14-Aug-18 A																																					
	NVB-EMD1175	Authorities Review and Comment of FM200 System Design Calculation	28	50%	13-Aug-18 A																																					
	Plumbing & Drainage System																																									
	NVB-EMD1305	Authorities Review and Comment of Drainage Sump Pumps and Pump Pits Calculation	56	50%	07-Aug-18 A																																					
	Maintenance Depot																																									
	MVAC System																																									
	MD-EMD1015	Authorities Review and Comment of AC Cooling Capacity Calculation	56	50%	17-Aug-18 A																																					
	Electrical System																																									
	MD-EMD1075	Authorities Review and Comment of Electrical Loading Demand Calculation	56	50%	27-Aug-18 A																																					
	MD-EMD1095	Authorities Review and Comment of Generator Calculation	56	50%	06-Oct-18 A																																					
	Fire Service System																																									
	MD-EMD1115	Authorities Review and Comment of FS Pump Head Calculation	56	50%	14-Aug-18 A																																					
	MD-EMD1135	Authorities Review and Comment of Sprinkler Pump Head Calculation	56	50%	14-Aug-18 A																																					
	MD-EMD1155	Authorities Review and Comment of FM200 System Design Calculation	56	50%	14-Aug-18 A																																					
	Plumbing & Drainage System																																									
	MD-EMD1175	Authorities Review and Comment of Pump Head Calculation	56	50%	13-Aug-18 A																																					
	MD-EMD1195	Authorities Review and Comment of Pressure Vessel Calculation	56	50%	13-Aug-18 A																																					
	MD-EMD1215	Authorities Review and Comment of Drainage Sump Pumps and Pump Pits Calculation	56	50%	27-Aug-18 A																																					
	Satellite Control Building																																									
	Electrical System																																									
	SCB-EMD1055	Authorities Review and Comment of UPS and Battery Capacity Calculations	56	50%	05-Sep-18 A																																					
	SCB-EMD1075	Authorities Review and Comment of Electrical Loading Demand Calculation	56	50%	01-Nov-18 A																																					
	SCB-EMD1095	Authorities Review and Comment of Generator Calculation	56	50%	27-Nov-18 A																																					

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NORTHERN TUNNEL CONNECTION BUILDING E&M WORKS

THREE MONTHLY PROGRAMME AS OF 20 Dec 2019

P 2

Date	Revision	Checked	Approved
20-Dec-19			

ID	Activity	Duration (Days)	Duration % Complete	Start	Finish	Total Float	2018												2019												2020				
							May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Fire Service System																																			
	SCB-EMD1115	Authorities Review and Comment of FS Pump Head Calculation	56	50%	14-Aug-18 A																														
	SCB-EMD1135	Authorities Review and Comment of Sprinkler Pump Head Calculation	56	50%	14-Aug-18 A																														
	SCB-EMD1155	Authorities Review and Comment of FM200 System Design Calculation	56	50%	14-Aug-18 A																														
Plumbing & Drainage System																																			
	SCB-EMD1285	Authorities Review and Comment of Pump Head Calculation	56	50%	27-Aug-18 A																														
	SCB-EMD1335	Authorities Review and Comment of Pressure Vessel Calculation	56	50%	27-Aug-18 A																														
Costom & Excise Department Building																																			
Electrical System																																			
	CEDB-EMD1015	Authorities Review and Comment of UPS and Battery Capacity Calculations	56	50%	01-Nov-18 A																														
	CEDB-EMD1035	Authorities Review and Comment of Electrical Loading Demand Calculation	56	50%	01-Nov-18 A																														
	CEDB-EMD1055	Authorities Review and Comment of Generator Calculation	56	50%	27-Nov-18 A																														
Fire Service System																																			
	CEDB-EMD1075	Authorities Review and Comment of FS Pump Head Calculation	56	50%	21-Dec-18 A																														
	CEDB-EMD1095	Authorities Review and Comment of Sprinkler Pump Head Calculation	56	50%	08-Oct-18 A																														
Plumbing & Drainage System																																			
	CEDB-EMD1135	Authorities Review and Comment of Pump Head Calculation	56	50%	07-Sep-18 A																														
	CEDB-EMD1155	Authorities Review and Comment of Pressure Vessel Calculation	56	50%	05-Sep-18 A																														
Fire Services Department Building																																			
Electrical System																																			
	FSDB-EMD1015	Authorities Review and Comment of UPS and Battery Capacity Calculations	56	50%	01-Nov-18 A																														
	FSDB-EMD1035	Authorities Review and Comment of Electrical Loading Demand Calculation	56	50%	01-Nov-18 A																														
	FSDB-EMD1055	Authorities Review and Comment of Generator Calculation	56	50%	27-Nov-18 A																														
Fire Service System																																			
	FSDB-EMD1075	Authorities Review and Comment of FS Pump Head Calculation	56	50%	07-Sep-18 A																														
	FSDB-EMD1095	Authorities Review and Comment of Sprinkler Pump Head Calculation	56	50%	07-Sep-18 A																														
	FSDB-EMD1205	Authorities Review and Comment of FM200 System Design Calculation	56	50%	07-Sep-18 A																														
Plumbing & Drainage System																																			
	FSDB-EMD1135	Authorities Review and Comment of Pump Head Calculation	56	50%	05-Sep-18 A																														
	FSDB-EMD1155	Authorities Review and Comment of Pressure Vessel Calculation	56	50%	05-Sep-18 A																														
South Ventilation Building																																			
MVAC System																																			
	SVB-EMD1015	Authorities Review and Comment of Staircase Pressurization System Calculation	56	50%	24-Jan-19 A																														
	SVB-EMD1035	Authorities Review and Comment of Mechanical Ventilation Capacity Calculation	56	50%	11-Sep-18 A																														
Electrical System																																			
	SVB-EMD1055	Authorities Review and Comment of HV Electrical Loading Calculation	56	50%	01-Nov-18 A																														
	SVB-EMD1095	Authorities Review and Comment of Electrical Loading Demand Calculation	56	50%	28-Nov-18 A																														
	SVB-EMD1115	Authorities Review and Comment of Generator Calculation	56	50%	07-Dec-18 A																														
Fire Service System																																			
	SVB-EMD1135	Authorities Review and Comment of FS Pump Head Calculation	56	50%	21-Dec-18 A																														
	SVB-EMD1155	Authorities Review and Comment of Sprinkler Pump Head Calculation	56	50%	21-Dec-18 A																														
	SVB-EMD1175	Authorities Review and Comment of FM200 System Design Calculation	56	50%	30-Nov-18 A																														
Vehicular Underpass																																			
Fire Service System																																			

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NORTHERN TUNNEL CONNECTION BUILDING E&M WORKS

THREE MONTHLY PROGRAMME AS OF 20 Dec 2019

P 3	Date	Revision	Checked	Approved
	20-Dec-19			

ID	Activity	Duration (Days)	Duration % Complete	Start	Finish	Total Float	2018												2019												2020					
							May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep																													
							May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
TVS-EMM1155																																				
Tunnel and Road Lighting System																																				
TRLS-EMM1035																																				
CCMS, TCS and ELV System																																				
ELV-EMM1020																																				
ELV-EMM1050																																				
ELV-EMM1080																																				
Drawing Submission & Approval																																				
Satellite Control Building																																				
Individual Shop Drawing																																				
SCB-ISD1040																																				
SCB-ISD1090																																				
Custom & Excise Department Building																																				
Individual Shop Drawing																																				
CEDB-ISD1040																																				
CEDB-ISD1090																																				
Tunnel																																				
Individual Shop Drawing																																				
TUN-ISD1090																																				
TUN-ISD1140																																				
TUN-ISD1170																																				
TUN-ISD1180																																				
TUN-ISD1190																																				
Fire Services Department Building																																				
Individual Shop Drawing																																				
FSDB-ISD1040																																				
FSDB-ISD1090																																				
Vehicular Underpass																																				
Individual Shop Drawing																																				
VU-ISD1090																																				
North Ventilation Building																																				
Individual Shop Drawing																																				
NVB-ISD1090																																				
E&M Manufacture & Delivery																																				
Toll Control Building																																				
CCMS, TCS and ELV System																																				
TCB-MD1210																																				
TCB-MD1212																																				
TCB-MD1215																																				
Electrical System																																				
TCB-MD1280																																				
Administration Building																																				
Electrical System																																				
ADB-MD1310																																				
Satellite Control Building																																				
Electrical System																																				
SCB-MD1025																																				
SCB-MD1045																																				
MVAC System																																				
SCB-MD1010																																				
Fire Service System																																				
SCB-MD1100																																				
SCB-MD1110																																				
SCB-MD1130																																				
Plumbing & Drainage System																																				
SCB-PO1120																																				

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NORTHERN TUNNEL CONNECTION BUILDING E&M WORKS

THREE MONTHLY PROGRAMME AS OF 20 Dec 2019

P 5	Date	Revision	Checked	Approved
	20-Dec-19			

ID	Activity	Duration (Days)	Duration % Complete	Start	Finish	Total Float	2018												2019												2020								
							May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep				
CCMS and ELV System																																							
SCB-MD1155	Shipping to HK - CMCS Equipment	14	100%	30-Oct-19 A																																			
SCB-MD1160	Manufacture & Delivery to HK - other ELV Equipment	83	93.98%	27-Jun-19 A																																			
Costom & Excise Department Building																																							
Electrical System																																							
CEDB-MD1025	Shipping to HK - Generator	28	100%	11-Nov-19 A																																			
CEDB-MD1035	Shipping to HK - UPS and Battery	42	35%	21-Aug-19 A																																			
CEDB-MD1045	Shipping to HK - LV Switchboard	14	0%	09-Nov-19 A																																			
CEDB-MD1050	Manufacture & Delivery to HK - LV Cables	120	100%	20-Nov-18 A																																			
CEDB-MD1060	Manufacture & Delivery to HK - MCB & MCCB and Distribution Board	38	81.58%	20-Jun-19 A																																			
MVAC System																																							
CEDB-MD1010	Manufacture & Delivery to HK - AHU & PAU	60	28.33%	20-Jul-19 A																																			
Fire Service System																																							
CEDB-MD1090	Manufacture & Delivery to HK - FM200	120	65%	20-Jul-19 A																																			
CEDB-MD1120	Manufacture & Delivery to HK - LMCP (FS)	51	49.02%	20-Jun-19 A																																			
Plumbing & Drainage System																																							
CEDB-MD1080	Manufacture & Delivery to HK - Water Pump	90	71.11%	29-Mar-19 A																																			
CCMS and ELV System																																							
CEDB-MD1175	Shipping to HK - CMCS Equipment	14	50%	30-Oct-19 A																																			
CEDB-MD1180	Manufacture & Delivery to HK - other ELV Equipment	83	93.98%	21-Sep-19 A																																			
Lift System																																							
CEDB-MD1000	Manufacture & Delivery to HK - Lift System	124	88.71%	20-Jul-19 A																																			
Fire Services Department Building																																							
Electrical System																																							
FSDB-MD1005	Shipping to HK - Generator	28	100%	12-Nov-19 A																																			
FSDB-MD1015	Shipping to HK - UPS and Battery	42	57.14%	21-Nov-19 A																																			
FSDB-MD1020	Manufacture - LV Switchboard	86	100%	17-Apr-19 A																																			
FSDB-MD1022	FAT - LV Switchboard	10	100%	09-Dec-19 A																																			
FSDB-MD1025	Shipping to HK - LV Switchboard	14	50%	10-Dec-19 A																																			
FSDB-MD1030	Manufacture & Delivery to HK - LV Cables	120	100%	20-Nov-18 A																																			
FSDB-MD1040	Manufacture & Delivery to HK - MCB & MCCB and Distribution Board	60	100%	02-Sep-19 A																																			
Fire Service System																																							
FSDB-MD1185	Manufacture & Delivery to HK - FM200	150	90%	20-Jun-19 A																																			
Plumbing & Drainage System																																							
FSDB-MD1060	Manufacture & Delivery to HK - Water Pump	90	86.67%	29-Jul-19 A																																			
CCMS and ELV System																																							
FSDB-MD1135	Shipping to HK - CMCS Equipment	14	50%	31-Oct-19 A																																			
FSDB-MD1140	Manufacture & Delivery to HK - other ELV Equipment	83	93.98%	21-Sep-19 A																																			
South Ventilation Building																																							
Electrical System																																							
SVB-MD1035	Shipping to HK - LV Switchboard	14	100%	30-Oct-19 A																																			
SVB-MD1042	FAT - HV Switchboard	14	100%	04-Dec-19 A																																			
SVB-MD1045	Shipping to HK - HV Switchboard	14	50%	07-Dec-19 A																																			
MVAC System																																							
SVB-MD1175	Shipping to HK - Tunnel Ventilation Fan	45	91.11%	20-Oct-19 A																																			
Fire Service System																																							
SVB-MD1130	Manufacture & Delivery to HK - FS Pump	120	100%	19-Mar-19 A																																			
CCMS and ELV System																																							
SVB-MD1205	Shipping to HK - CMCS Equipment	14	50%	30-Oct-19 A																																			
SVB-MD1210	Manufacture & Delivery to HK - other ELV Equipment	83	95%	18-Jun-19 A																																			
Vehicular Underpass																																							
VU-MD1065	Shipping to HK - CMCS Equipment	21	95.24%	13-Nov-19 A																																			
VU-MD1070	Manufacture & Delivery to HK - other ELV Equipment	90	100%	18-Jun-19 A																																			
Tunnel																																							
TUN-MD1045	Shipping to HK - CMCS Equipment	7	100%	13-Nov-19 A																																			
TUN-MD1060	Manufacture & Delivery to HK - Sump Pump	109	83.49%	11-Oct-19 A																																			
TUN-MD1090	Shipping to HK - AQMS Equipment	7	50%	26-Sep-19 A																																			
Approach Road																																							
AR-MD1000	Manufacture & Delivery to HK - Road Lighting Fitting	90	92.22%	21-Mar-19 A																																			

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P 6	Date	Revision	Checked	Approved
	20-Dec-19			

ID	Activity	Duration (Days)	Duration % Complete	Start	Finish	Total Float	2018												2019												2020				
							May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
AR-MD1020	Manufacture & Delivery to HK - other ELV Equipment	83	86.75%	18-Jun-19 A															[Gantt bar for AR-MD1020]																
Key Date 1 - Toll Control Building (TCB) & TCSS Provision																																			
ABWF Works (for All)																																			
ATCB1010	Door and Window Frames	82	93.9%	04-Mar-19 A															[Gantt bar for ATCB1010]																
ATCB1120	External Cladding and Wall Plastering	94	89%	01-Apr-19 A															[Gantt bar for ATCB1120]																
ATCB1130	ABWF second fix & final fix	90	50%	27-Aug-19 A															[Gantt bar for ATCB1130]																
Key Date 2 - Administration Building, Maintenance Depot, Kiosk N2, TCSS Provision																																			
Administration Building (ADB)																																			
ABWF Works (for All)																																			
AADB1140	Door and Window Frames	19	99%	25-Sep-19 A															[Gantt bar for AADB1140]																
AADB1151	ABWF Works to Plant Rooms 1/F	52	80%	22-Jul-19 A															[Gantt bar for AADB1151]																
AADB1160	ABWF Works to Office and Corridors G/F	126	80%	25-Jul-19 A															[Gantt bar for AADB1160]																
AADB1161	ABWF Works to Office and Corridors 1/F	126	80%	25-Jul-19 A															[Gantt bar for AADB1161]																
AADB1170	ABWF Works to Toilets G/F	132	80%	27-Jul-19 A															[Gantt bar for AADB1170]																
AADB1171	ABWF Works to Toilets 1/F	132	80%	30-Jul-19 A															[Gantt bar for AADB1171]																
AADB1190	External Cladding and Wall Plastering	69	100%	27-Sep-19 A															[Gantt bar for AADB1190]																
AADB1200	ABWF second fix & final fix	90	35%	02-Oct-19 A															[Gantt bar for AADB1200]																
Maintenance Depot																																			
ABWF Works (for All)																																			
AMD1010	Door and Window Frames	10	100%	27-Sep-19 A															[Gantt bar for AMD1010]																
AMD1020	ABWF Works to Plant Rooms	58	90%	23-Jul-19 A															[Gantt bar for AMD1020]																
AMD1030	ABWF Works to Office and Corridors	132	90%	27-Jul-19 A															[Gantt bar for AMD1030]																
AMD1040	ABWF Works to Toilets	144	84%	31-Jul-19 A															[Gantt bar for AMD1040]																
AMD1070	ABWF second fix & final fix	80	80%	30-Sep-19 A															[Gantt bar for AMD1070]																
Key Date 6 - E&M Works for Administration Building, Maintenance Depot, North Vent Building, Kiosk N2																																			
E&M Works for Administration Building																																			
Installation																																			
G/F																																			
ADB-EMGF1030	E&M Installation - Final fix - G/F	40	100%	19-Sep-19 A															[Gantt bar for ADB-EMGF1030]																
ADB-EMGF1190	Sub-circuit Power On - LV Switch Room - G/F	0	100%																[Gantt bar for ADB-EMGF1190]																
ADB-EMGF1210	E&M Installation - Generator Room & Fuel Tank Room - G/F	70	98%	21-Aug-19 A															[Gantt bar for ADB-EMGF1210]																
ADB-EMGF1240	E&M Installation - MVAC Plant Rooms - G/F	76	98%	21-Aug-19 A															[Gantt bar for ADB-EMGF1240]																
ADB-EMGF1280	E&M Installation - PD Plant Rooms - G/F	50	85%	05-Sep-19 A															[Gantt bar for ADB-EMGF1280]																
ADB-EMGF1300	E&M Installation - ELV Plant Rooms - G/F	50	85%	12-Sep-19 A															[Gantt bar for ADB-EMGF1300]																
1/F																																			
ADB-EM1F1030	E&M Installation - Final fix - 1/F	40	100%	19-Sep-19 A															[Gantt bar for ADB-EM1F1030]																
ADB-EM1F1060	E&M Installation - MVAC Plant Rooms - 1/F	64	100%	05-Sep-19 A															[Gantt bar for ADB-EM1F1060]																
ADB-EM1F1080	E&M Installation - Electrical Plant Rooms - 1/F	64	100%	29-Aug-19 A															[Gantt bar for ADB-EM1F1080]																
ADB-EM1F1100	E&M Installation - ELV Plant Rooms - 1/F	52	85%	05-Sep-19 A															[Gantt bar for ADB-EM1F1100]																
Roof																																			
ADB-EMRF1010	E&M Installation - 1st fix - Roof	25	100%	19-Sep-19 A															[Gantt bar for ADB-EMRF1010]																
ADB-EMRF1013	E&M Installation - 2nd fix - Roof	25	100%	23-Sep-19 A															[Gantt bar for ADB-EMRF1013]																
ADB-EMRF1016	E&M Installation - Final fix - Roof	25	75%	14-Nov-19 A															[Gantt bar for ADB-EMRF1016]																
Lift Installation (L01)																																			
ADB-LF1020	Lift & lift machine room installation	80	90%	20-Aug-19 A															[Gantt bar for ADB-LF1020]																
ADB-LF1030	Testing & commissioning	12	0%	02-Jan-20															[Gantt bar for ADB-LF1030]																
ADB-LF1040	Final adjustment, Submission of Form LE5 & EMSD processing	18	0%	16-Jan-20															[Gantt bar for ADB-LF1040]																
ADB-LF1050	Issuance of lift use permit	0	0%																[Gantt bar for ADB-LF1050]																
Testing and Commissioning																																			
ADB-TC1000	T&C for Subcircuit Power On	18	100%	09-Nov-19 A															[Gantt bar for ADB-TC1000]																
ADB-TC1020	Equipment Start-up T&C for FSI for FSI	12	100%	31-Oct-19 A															[Gantt bar for ADB-TC1020]																

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ID	Activity	Duration (Days)	Duration % Complete	Start	Finish	Total Float	2018												2019												2020				
							May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
EU130	Equipment Start-up T&C for FSI	12	0%	05-Feb-20																															
EU135	Individual E&M System T&C for FSI	42	0%	19-Feb-20																															
VU110	Jet Fans installation	24	80%	26-Sep-19 A																															
VU140	Dampers installation	24	0%	27-Dec-19																															
VU180	Cladding Works	25	75%	16-Aug-19 A																															
Plant Room																																			
E&M Works																																			
EPR130	E&M Installation	90	90%	03-Jan-19 A																															
EPR150	Equipment Start-up T&C for FSI	6	0%	12-Feb-20																															
EPR153	Individual E&M System T&C for FSI	18	0%	19-Feb-20																															
EPR155	Integrated T&C for FSI	6	0%	11-Mar-20																															
EPR160	Non-Essential T&C	30	0%	18-Mar-20																															
VU160	Pressurization Fans Installation	24	80%	02-Oct-19 A																															
Deck Void																																			
Bridge H1, G1, G2																																			
DV120	Electrical Installation - Bridge H1	20	100%	31-Oct-19 A																															
DV130	Electrical Installation - Bridge G1	20	100%	31-Oct-19 A																															
DV140	Electrical Installation - Bridge G2	20	100%	31-Oct-19 A																															
DV150	T&C for Electrical Installation	12	50%	28-Nov-19 A																															
TD1, TD2, RB_W																																			
DV190	Electrical Installation - Bridge TD1	20	100%	19-Oct-19 A																															
DV200	Electrical Installation - Bridge TD2	20	100%	12-Sep-19 A																															
DV210	Electrical Installation - Bridge RB_W	20	90%	07-Nov-19 A																															
DV220	T&C for Electrical Installation	12	50%	28-Nov-19 A																															
Approach Roads																																			
Under Portions IX, XI, XX																																			
AR130	Cabling works - Portion IX	40	45%	03-Oct-19 A																															
AR140	Road lighting installation & termination - Portion IX	25	45%	31-Oct-19 A																															
AR150	T&C of Roading Lighting	30	0%	31-Dec-19																															
Under Portion X																																			
AR190	Road lighting installation & termination in portion X	90	90%	27-Aug-19 A																															
AR200	T&C of Roading Lighting in portion X	30	0%	20-Dec-19																															
Key Date 6B - E&M Works for South Vent Duct, Tunnel, and Approach Roads																																			
E&M Works																																			
SVD135	Access to Portions IVa (ML03)	0	100%	30-Nov-19 A																															
SVD140	Access to Portions VI d	0	0%	06-Feb-20																															
Ventilation Ducts																																			
SVD-1000	Cable Containment Installation	8	0%	20-Dec-19																															
SVD-1010	Damper Installation	8	0%	20-Dec-19																															
SVD-1020	Cable Laying	8	0%	02-Jan-20																															
SVD-1030	Installation T&C	4	0%	11-Jan-20																															
Service Gallery																																			
Ch 7200 - 5000																																			
TNL-SG1010	Wall Mounted Pipe Module Installation CH7200 - 5000	30	99%	01-Apr-19 A																															
TNL-SG1030	High Level 2nd Fix and Final Fix Installation CH7200 - 5000	46	10%	15-Oct-19 A																															
TNL-SG1040	Cabling Works CH7200 - 5000	29	0%	20-Dec-19																															
TNL-SG1050	Low Level 2nd Fix and Final Fix Installation CH7200 - 5000	24	0%	30-Jan-20																															
CH5000 - 3050																																			
TNL-SG1070	Wall Mounted Pipe Module Installation CH5000 - 3050	30	99%	23-May-19 A																															
TNL-SG1080	Ceiling Mounted Module Installation CH5000 - 3050	30	99%	30-May-19 A																															
TNL-SG1090	High Level 2nd Fix and Final Fix Installation CH5000 - 3050	43	10%	15-Oct-19 A																															
TNL-SG1100	Cabling Works CH5000 - 3050	28	0%	30-Jan-20																															
TNL-SG1110	Low Level 2nd Fix and Final Fix Installation CH5000 - 3050	24	0%	03-Mar-20																															
CH3050 - 2500																																			
TNL-SG1120	Drilling works CH3050 - 2500	3	99.01%	17-Jul-19 A																															
TNL-SG1130	Wall Mounted Pipe Module Installation CH3050 - 2500	12	99%	24-Jul-19 A																															
TNL-SG1140	Ceiling Mounted Module Installation CH3050 - 2500	12	99%	31-Jul-19 A																															
TNL-SG1160	Cabling Works CH3050 - 2500	13	0%	03-Mar-20																															
Road Level & OHVD																																			

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P 11	Date	Revision	Checked	Approved
	20-Dec-19			

ID	Activity	Duration (Days)	Duration % Complete	Start	Finish	Total Float	2018												2019												2020											
							May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep							
TNL-10TC1020	T&C for Tunnel Lighting - CH 7200 to 2500	47	0%	23-Mar-20																																						
TNL-10TC1030	T&C for other Tunnel Services - CH 7200 to 2500	48	0%	18-Mar-20																																						
TNL-10TC1050	T&C for MSFD - CH 7200 to 2500	30	25%	21-Nov-19 A																																						
Key Date 7 - E&M Works for Satellite Control Building and Kiosks S1&S2																																										
E&M Works for Satellite Control Building																																										
E&M Works																																										
Installation																																										
G/F																																										
SCB-EMGF1000	ABWF Works ready for E&M Mobilization to General Areas - G/F	0	0%	20-Dec-19																																						
SCB-EMGF1010	E&M Installation - 1st fix - G/F	30	40%	02-Dec-19 A																																						
SCB-EMGF1020	E&M Installation - 2nd fix - G/F	30	5%	09-Dec-19 A																																						
SCB-EMGF1030	E&M Installation - Final fix - G/F	30	0%	19-Feb-20																																						
SCB-EMGF1050	E&M Installation - Generator Room & Fuel Tank Room - G/F	70	35%	02-Dec-19 A																																						
SCB-EMGF1070	E&M Installation - LV Switch Room - G/F	60	20%	22-Nov-19 A																																						
SCB-EMGF1080	Cable laying - LV Switch Room - from G/F	42	0%	08-Feb-20																																						
SCB-EMGF1110	E&M Installation - CLP Tx Room - G/F	18	100%	15-Oct-19 A																																						
SCB-EMGF1120	Inspection & Handover to CLP	6	0%	20-Dec-19																																						
SCB-EMGF1130	Installation by CLP - CLP Tx Room - G/F	68	0%	30-Dec-19																																						
SCB-EMGF1180	E&M Installation - FS Plant Rooms - G/F	80	10%	02-Dec-19 A																																						
SCB-EMGF1200	E&M Installation - PD Plant Rooms - G/F	90	10%	21-Nov-19 A																																						
1/F																																										
SCB-EM1F1000	ABWF Works ready for E&M Mobilization to General Areas - 1/F	0	0%	20-Dec-19																																						
SCB-EM1F1010	E&M Installation - 1st fix - 1/F	30	30%	09-Dec-19 A																																						
SCB-EM1F1020	E&M Installation - 2nd fix - 1/F	30	0%	15-Jan-20																																						
SCB-EM1F1030	E&M Installation - Final fix - 1/F	30	0%	20-Feb-20																																						
SCB-EM1F1040	ABWF Works ready for E&M Mobilization to Computer Room (TCSS) - 1/F	0	0%	20-Dec-19																																						
SCB-EM1F1050	E&M Installation - Computer Room (TCSS) - 1/F	60	0%	02-Jan-20																																						
SCB-EM1F1070	ABWF Works ready for E&M Mobilization to EL Room - 1/F	0	0%	20-Dec-19																																						
SCB-EM1F1080	E&M Installation - EL Room - 1/F	90	0%	20-Dec-19																																						
SCB-EM1F1090	ABWF Works ready for E&M Mobilization to FS Plant Rooms - 1/F	0	0%	20-Dec-19																																						
SCB-EM1F1100	E&M Installation - FS Plant Rooms - 1/F	85	0%	20-Dec-19																																						
SCB-EM1F1110	ABWF Works ready for E&M Mobilization to Elv Plant Room - 1/F	0	0%	20-Dec-19																																						
SCB-EM1F1120	E&M Installation - ELV Plant Room - 1/F	70	0%	27-Dec-19																																						
Roof																																										
SCB-EMRF1000	ABWF Works ready for E&M Mobilization to R/F	0	0%	20-Dec-19																																						
SCB-EMRF1003	E&M Installation - 1st fix - R/F	25	0%	20-Dec-19																																						
SCB-EMRF1006	E&M Installation - 2nd fix - R/F	25	0%	22-Jan-20																																						
SCB-EMRF1010	E&M Installation - Final fix - R/F	25	0%	24-Feb-20																																						
SCB-EMRF1020	ABWF Works ready for E&M Mobilization to FS Plant Rooms	0	0%	20-Dec-19																																						
SCB-EMRF1030	E&M Installation - FS Plant Rooms	75	0%	02-Jan-20																																						
Lift Installation (L01)																																										
SCB-LF1010	Access to lift shaft and lift machine room	0	0%	20-Dec-19																																						
SCB-LF1020	Lift & lift machine room installation	75	0%	20-Dec-19																																						
SCB-LF1030	Testing & commissioning	12	0%	24-Mar-20																																						
Kiosk S2																																										
S2120	Structure	30	0%	20-Dec-19																																						
S2130	ABWF Works (Door, windows, tiles)	15	0%	31-Jan-20																																						
S2140	E&M works	36	0%	18-Feb-20																																						
Key Date 6C - E&M Works for South Ventilation Building																																										
SVB-SEM1000	SEM Drawings ready for Structural Works for SVB	0	0%	20-Dec-19																																						
Installation																																										

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P 14	Date	Revision	Checked	Approved
	20-Dec-19			

ID	Activity	Duration (Days)	Duration % Complete	Start	Finish	Total Float	2018												2019												2020											
							May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep							
TVF Installation																																										
NB-SVB-TVF-1																																										
SVB-TVF2000	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	0%	20-Dec-19																																						
SVB-TVF2010	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	7	90%	31-Oct-19 A																																						
SVB-TVF2020	Ventilation fan and duct installation - Fan Room (G/F)	2	0%	30-Dec-19																																						
SVB-TVF2030	Leakage test for TVF	8	0%	02-Jan-20																																						
NB-SVB-TVF-2																																										
SVB-TVF2040	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	50%	11-Dec-19 A																																						
SVB-TVF2050	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	7	90%	07-Nov-19 A																																						
SVB-TVF2060	Ventilation fan and duct installation - Fan Room (G/F)	2	0%	03-Jan-20																																						
SVB-TVF2070	Leakage test for TVF	8	0%	06-Jan-20																																						
NB-SVB-TVF-3																																										
SVB-TVF2080	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	0%	03-Jan-20																																						
SVB-TVF2090	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	7	0%	10-Jan-20																																						
SVB-TVF2100	Ventilation fan and duct installation - Fan Room (G/F)	2	0%	18-Jan-20																																						
SVB-TVF2110	Leakage test for TVF	8	0%	21-Jan-20																																						
NB-SVB-TVF-4																																										
SVB-TVF2120	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	0%	10-Jan-20																																						
SVB-TVF2130	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	8	90%	07-Nov-19 A																																						
SVB-TVF2140	Ventilation fan and duct installation - Fan Room (G/F)	2	0%	21-Jan-20																																						
SVB-TVF2150	Leakage test for TVF	8	0%	23-Jan-20																																						
SB-SVB-TVF-1																																										
SVB-TVF2160	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	0%	20-Dec-19																																						
SVB-TVF2170	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	7	0%	30-Dec-19																																						
SVB-TVF2180	Ventilation fan and duct installation - Fan Room (G/F)	2	0%	08-Jan-20																																						
SVB-TVF2190	Leakage test for TVF	8	0%	10-Jan-20																																						
SB-SVB-TVF-2																																										
SVB-TVF2200	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	0%	30-Dec-19																																						
SVB-TVF2210	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	7	0%	08-Jan-20																																						
SVB-TVF2220	Ventilation fan and duct installation - Fan Room (G/F)	2	0%	16-Jan-20																																						
SVB-TVF2230	Leakage test for TVF	8	0%	18-Jan-20																																						
SB-SVB-TVF-3																																										
SVB-TVF2240	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	0%	07-Jan-20																																						
SVB-TVF2250	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	7	0%	16-Jan-20																																						
SVB-TVF2260	Ventilation fan and duct installation - Fan Room (G/F)	2	0%	24-Jan-20																																						
SVB-TVF2270	Leakage test for TVF	8	0%	30-Jan-20																																						
SB-SVB-TVF-4																																										
SVB-TVF2280	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	90%	13-Nov-19 A																																						
SVB-TVF2290	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	8	0%	24-Jan-20																																						
SVB-TVF2300	Ventilation fan and duct installation - Fan Room (G/F)	2	0%	06-Feb-20																																						
SVB-TVF2310	Leakage test for TVF	8	0%	08-Feb-20																																						
SB-SVB-TVF-5																																										
SVB-TVF2320	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	90%	13-Nov-19 A																																						
SVB-TVF2330	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	7	0%	20-Dec-19																																						
SVB-TVF2340	Ventilation fan and duct installation - Fan Room (G/F)	2	0%	31-Dec-19																																						
SVB-TVF2350	Leakage test for TVF	8	0%	03-Jan-20																																						
SB-SVB-TVF-6																																										

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NORTHERN TUNNEL CONNECTION BUILDING E&M WORKS

THREE MONTHLY PROGRAMME AS OF 20 Dec 2019

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Date	Revision	Checked	Approved
20-Dec-19			

ID	Activity	Duration (Days)	Duration % Complete	Start	Finish	Total Float	2018												2019												2020								
							May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep				
Key Date 10 - FSD Building Structure & E&M Works																																							
ABWF Works																																							
AFSD1010	Door and Window Frames	19	52%	21-Oct-19 A																																			
AFSD1020	ABWF Works to Plant Rooms G/F	56	90%	10-Sep-19 A																																			
AFSD1021	ABWF Works to Plant Rooms 1/F	56	90%	21-Oct-19 A																																			
AFSD1030	ABWF Works to Office and Corridors G/F	124	90%	10-Sep-19 A																																			
AFSD1031	ABWF Works to Office and Corridors 1/F	124	90%	21-Oct-19 A																																			
AFSD1040	ABWF Works to Toilets G/F	136	90%	10-Sep-19 A																																			
AFSD1050	Waterproofing and Roofing	52	100%	21-Oct-19 A																																			
AFSD1060	External Cladding and Wall Plastering	101	60%	02-Oct-19 A																																			
E&M Works																																							
Installation																																							
G/F																																							
FSDB-EMGF1010	E&M Installation - 1st fix - G/F	40	40%	04-Nov-19 A																																			
FSDB-EMGF1020	E&M Installation - 2nd fix - G/F	40	5%	02-Dec-19 A																																			
FSDB-EMGF1030	E&M Installation - Final fix - G/F	30	0%	09-Mar-20																																			
FSDB-EMGF1040	ABWF Works ready for E&M Mobilization to CLP TX Room - G/F	0	0%	20-Dec-19																																			
FSDB-EMGF1050	E&M Installation - CLP Tx Room - G/F	18	80%	04-Nov-19 A																																			
FSDB-EMGF1060	Inspection & Handover to CLP	6	0%	24-Dec-19																																			
FSDB-EMGF1070	Installation by CLP - CLP Tx Room - G/F	82	0%	03-Jan-20																																			
FSDB-EMGF1120	E&M Installation - Electrical Plant Rooms - G/F	60	15%	18-Nov-19 A																																			
FSDB-EMGF1140	E&M Installation - FS Plant Rooms - G/F	50	15%	18-Nov-19 A																																			
FSDB-EMGF1150	ABWF Works ready for E&M Mobilization to Elv Plant Rooms - G/F	0	100%	02-Dec-19 A																																			
FSDB-EMGF1160	E&M Installation - Elv Plant Rooms - G/F	50	5%	02-Dec-19 A																																			
1/F																																							
FSDB-EM1F1000	ABWF Works ready for E&M Mobilization to General Areas - 1/F	0	0%	24-Dec-19																																			
FSDB-EM1F1010	E&M Installation - 1st fix - 1/F	40	0%	24-Dec-19																																			
FSDB-EM1F1020	E&M Installation - 2nd fix - 1/F	39	0%	15-Feb-20																																			
FSDB-EM1F1040	ABWF Works ready for E&M Mobilization to Emergency Generator & Fuel Tank Rooms - 1/F	0	0%	24-Dec-19																																			
FSDB-EM1F1050	E&M Installation - Emergency Generator & Fuel Tank Rooms - 1/F	60	0%	24-Dec-19																																			
FSDB-EM1F1060	ABWF Works ready for E&M Mobilization to LV Switch Room - 1/F	0	0%	24-Dec-19																																			
FSDB-EM1F1070	E&M Installation - LV Switch Room - 1/F	55	0%	27-Dec-19																																			
FSDB-EM1F1080	Cable laying - LV Switch Room - from 1/F	41	0%	05-Mar-20																																			
FSDB-EM1F1110	ABWF Works ready for E&M Mobilization to FS Plant Rooms - 1/F	0	0%	24-Dec-19																																			
FSDB-EM1F1120	E&M Installation - FS Plant Rooms - 1/F	60	0%	24-Dec-19																																			
FSDB-EM1F1130	ABWF Works ready for E&M Mobilization to PD Plant Rooms - 1/F	0	0%	24-Dec-19																																			
FSDB-EM1F1140	E&M Installation - PD Plant Rooms - 1/F	60	0%	02-Jan-20																																			
Roof																																							
FSDB-EMRF1000	ABWF Works ready for E&M Mobilization to Roof	0	0%	20-Dec-19																																			
FSDB-EMRF1010	E&M Installation - 1st fix - Roof	20	0%	20-Dec-19																																			
FSDB-EMRF1020	E&M Installation - 2nd fix - Roof	20	0%	16-Jan-20																																			
FSDB-EMRF1030	E&M Installation - Final fix - Roof	20	0%	12-Feb-20																																			
Key Date 7A - E&M Works for Approach Roads at South Side																																							
Approach Roads																																							
EAR170	Access Portions VIa	0	0%	14-Mar-20																																			
EAR175	Access Portions VIc	0	0%	02-Mar-20																																			
EAR180	Road Lighting Cabling (VIa)	18	0%	14-Mar-20																																			
EAR185	Road Lighting Cabling (VIc)	15	0%	02-Mar-20																																			
EAR190	Road Lighting Installation & Termination	18	0%	19-Mar-20																																			
Tunnel																																							
EAR160	Access Portions IVb	0	0%	20-Dec-19																																			

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NORTHERN TUNNEL CONNECTION BUILDING E&M WORKS

THREE MONTHLY PROGRAMME AS OF 20 Dec 2019

P 18	Date	Revision	Checked	Approved
	20-Dec-19			

ID	Activity	Duration (Days)	Duration % Complete	Start	Finish	Total Float	2018												2019												2020				
							May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
C&EDB-GF1110	ABWF Works ready for E&M Mobilization to Generator & Fuel Tank Rooms - G/F	0	0%	31-Jan-20																															
C&EDB-GF1120	E&M Installation - Generator & Fuel Tank Rooms - G/F	90	0%	31-Jan-20																															
C&EDB-GF1130	ABWF Works ready for E&M Mobilization to FS Plant Rooms - G/F	0	0%	31-Jan-20																															
C&EDB-GF1140	E&M Installation - FS Plant Rooms - G/F	90	0%	31-Jan-20																															
C&EDB-GF1150	ABWF Works ready for E&M Mobilization to Elv Plant Rooms - G/F	0	0%	31-Jan-20																															
C&EDB-GF1160	E&M Installation - Elv Plant Rooms - G/F	90	0%	31-Jan-20																															
1/F																																			
C&EDB-1F1000	ABWF Works ready for E&M Mobilization to General Areas - 1/F	0	0%	10-Feb-20																															
C&EDB-1F1010	E&M Installation - 1st fix - 1/F	40	0%	10-Feb-20																															
C&EDB-1F1040	ABWF Works ready for E&M Mobilization to LV Switch Room - 1/F	0	0%	10-Feb-20																															
C&EDB-1F1050	E&M Installation - LV Switch Room - 1/F	60	0%	10-Feb-20																															
C&EDB-1F1080	ABWF Works ready for E&M Mobilization to Electrical Plant Rooms - 1/F	0	0%	10-Feb-20																															
C&EDB-1F1090	E&M Installation - Electrical Plant Rooms - 1/F	90	0%	10-Feb-20																															
2/F																																			
C&EDB-2F1000	ABWF Works ready for E&M Mobilization to General Areas - 2/F	0	0%	09-Mar-20																															
C&EDB-2F1010	E&M Installation - 1st fix - 2/F	40	0%	09-Mar-20																															
C&EDB-2F1050	ABWF Works ready for E&M Mobilization to Electrical Plant Rooms - 2/F	0	0%	09-Mar-20																															
C&EDB-2F1060	E&M Installation - Electrical Plant Rooms - 2/F	90	0%	09-Mar-20																															
C&EDB-2F1070	ABWF Works ready for E&M Mobilization to FS Plant Rooms - 2/F	0	0%	09-Mar-20																															
C&EDB-2F1080	E&M Installation - FS Plant Rooms - 2/F	90	0%	09-Mar-20																															
C&EDB-2F1090	ABWF Works ready for E&M Mobilization to Elv Plant Rooms - 2/F	0	0%	09-Mar-20																															
C&EDB-2F1100	E&M Installation - Elv Plant Rooms - 2/F	90	0%	09-Mar-20																															
Key Date 11 - Landscape Soft Works & Trees Protection																																			
Landscape Soft Works																																			
SL110	Works Substantially Completed at North Side (KD6A)	0	0%																																
SL120	Landscape Soft Works at North Side (wet season)	122	0%	21-Mar-20																															
Trees Protection																																			
SL199	Protection Existing Trees & Submit Report with Photographic Record No.10	41	100%	31-Oct-19 A																															
SL200	Protection Existing Trees & Submit Report with Photographic Record No.11	41	5%	18-Dec-19 A																															
SL201	Protection Existing Trees & Submit Report with Photographic Record No.12	41	0%	10-Feb-20																															
Key Date 8 - All Works for Tunnel Commissioning & Opening																																			
Petrol Filling Station																																			
Structure																																			
PS120	Excavation	20	40%	01-Dec-19 A																															
PS130	Footing	20	30%	10-Dec-19 A																															
PS140	Petrol Filling Station Roof	14	0%	23-Jan-20																															
PS150	Structure for Petrol Filling Station	36	0%	23-Jan-20																															
PS160	Underground Fuel Tank Structure	36	0%	23-Jan-20																															
PS170	Backfilling	20	0%	09-Mar-20																															
E&M Works																																			
EPS110	Miscellaneous ABWF Works	42	0%	09-Mar-20																															
EPS120	Fuel Tank/Fuel Pipe System Installation	42	0%	09-Mar-20																															
Statutory Inspections and approvals																																			
Administration Building																																			
ADB-SI1010	Submit WWO46 Part IV for PD	0	0%	31-Dec-19																															
ADB-SI1030	WSD inspection of Plumbing Installation (PL)	4	0%	10-Jan-20																															
ADB-SI1040	WSD inspection of Plumbing Installation (FS)	4	50%	20-Dec-19 A																															
ADB-SI1050	Water Samples Test	24	0%	15-Jan-20																															
ADB-SI1060	Obtain Water Certificate and water supply connection - FS	4	0%	17-Jan-20																															
ADB-SI1070	Obtain Water Certificate and water supply connection - PL	4	0%	10-Mar-20																															
ADB-SI1100	Obtain DG Licence	0	100%																																
ADB-SI1110	Submit CT2B	0	0%	31-Dec-19																															

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NORTHERN TUNNEL CONNECTION BUILDING E&M WORKS

THREE MONTHLY PROGRAMME AS OF 20 Dec 2019

P 20 Date Revision Checked Approved

20-Dec-19				

Appendix C

Environmental Mitigation and Enhancement Measure Implementation Schedules

(In reference to CINOTECH (2011) Agreement No.
CE35/2011 EP Baseline Environmental Monitoring for
Hong Kong-Zhuhai-Macao Bridge Tuen Mun-Chek Lap
Kok Link - Investigation. Updated EM&A Manual for
Tuen Mun-Chek Lap Kok Link)

Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link
Northern Connection Tunnel Buildings, Electrical and Mechanical Works
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
Air Quality									
4.8.1	3.8	Watering of the construction sites in Lantau for 8 times/day and in Tuen Mun for 12 times/day to reduce dust emissions by 87.5% and 91.7% respectively and shall be undertaken.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	The Contractor shall, to the satisfaction of the Engineer, install effective dust suppression measures and take such other measures as may be necessary to ensure that at the Site boundary and any nearby sensitive receiver, dust levels are kept to acceptable levels.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	The Contractor shall not burn debris or other materials on the works areas.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	In hot, dry or windy weather, the watering programme shall maintain all exposed road surfaces and dust sources wet.	All unpaved haul roads / throughout construction period in hot, dry or windy weather	Contractor	TMEIA Avoid smoke impacts and disturbance		Y		✓
4.8.1	3.8	Where breaking of oversize rock/concrete is required, watering shall be implemented to control dust. Water spray shall be used during the handling of fill material at the site and at active cuts, excavation and fill sites where dust is likely to be created.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		N/A
4.8.1	3.8	Open dropping heights for excavated materials shall be controlled to a maximum height of 2m to minimise the fugitive dust arising from unloading.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		N/A
4.8.1	3.8	During transportation by truck, materials shall not be loaded to a level higher than the side and tail boards, and shall be dampened or covered before transport.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		N/A
4.8.1	3.8	Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		N/A
4.8.1	3.8	No earth, mud, debris, dust and the like shall be deposited on public roads. Wheel washing facility shall be usable prior to any earthworks excavation activity on the site.	All site exits / throughout construction period	Contractor	TMEIA Avoid dust		Y		✓

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link
Northern Connection Tunnel Buildings, Electrical and Mechanical Works
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
4.8.1	3.8	Areas of exposed soil shall be minimised to areas in which works have been completed shall be restored as soon as is practicable.	All exposed surfaces / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	All stockpiles of aggregate or spoil shall be enclosed or covered and water applied in dry or windy condition.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		N/A
4.11	Section 3	EM&A in the form of 1 hour and 24 hour dust monitoring and site audit.	All representative existing ASRs / throughout construction period	Contractor	EM&A Manual		Y		N/A (Results adopted from published EM&A data of Contract No. HY/2012/08)
WATER QUALITY (LAND WORKS)									
6.10	-	Wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		N/A
6.10	-	Sewage effluent and discharges from on-site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Temporary access roads should be surfaced with crushed stone or gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		N/A
6.10	-	Measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		N/A
6.10	5.8	Manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link
Northern Connection Tunnel Buildings, Electrical and Mechanical Works
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.10	-	Discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	All vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		N/A
6.10	-	Vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site disposal.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		N/A
6.10	-	The Contractor shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance.	All areas/ throughout construction period	Contractor	TM-EIAO Waste Disposal Ordinance		Y		✓
6.10	-	All fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		↔
6.10	-	Surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		N/A

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Northern Connection Tunnel Buildings, Electrical and Mechanical Works
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.10	-	Roadside gullies to trap silt and grit shall be provided prior to discharging the stormwater into the marine environment. The sumps will be maintained and cleaned at regular intervals.	Roadside/ design and operation	Design Consultant/ Contractor	TM-EIAO	Y		Y	N/A
6.10	Section 11	All construction works shall be subject to routine audit to ensure implementation of all EIA recommendations and good working practice.	All areas/ throughout construction period	Contractor	EM&A Manual		Y		✓
WASTE									
12.6		The Contractor shall identify a coordinator for the management of waste.	Contract mobilisation	Contractor	TMEIA		Y		✓
12.6		The Contractor shall prepare and implement a Waste Management Plan which specifies procedures such as a ticketing system, to facilitate tracking of loads and to ensure that illegal disposal of wastes does not occur, and protocols for the maintenance of records of the quantities of wastes generated, recycled and disposed. A recording system for the amount of waste generated, recycled and disposed (locations) should be established.	Contract mobilisation	Contractor	TMEIA, Works Branch Technical Circular No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material		Y		✓
12.6		The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	Contract mobilisation	Contractor	TMEIA, Land (Miscellaneous Provisions) Ordinance (Cap 28); Waste Disposal Ordinance (Cap 354); Dumping at Sea Ordinance (Cap 466); Water Pollution Control Ordinance.		Y		✓
12.6	8.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures including waste reduction, reuse and recycling.	Contract Mobilisation	Contractor	TMEIA		Y		✓
12.6	8.1	The extent of cutting operation should be optimised where possible. Earth retaining structures and bored pile walls should be proposed to minimise the extent of cutting.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The site and surroundings shall be kept tidy and litter free.	All areas / throughout construction period	Contractor	TMEIA		Y		↔
12.6	8.1	No waste shall be burnt on site.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The Contractor shall be prohibited from disposing of C&D materials at any sensitive locations. The Contractor should propose the final disposal sites in the EMP and WMP for approval before implementation.	All areas / throughout construction period	Contractor	TMEIA		Y		✓

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Tuen Mun – Chek Lap Kok Link
Northern Connection Tunnel Buildings, Electrical and Mechanical Works
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	Stockpiled material shall be covered by tarpaulin and /or watered as appropriate to prevent windblown dust/ surface run off.	All areas / throughout construction period	Contractor	TMEIA		Y		<>
12.6	8.1	Excavated material in trucks shall be covered by tarpaulins to reduce the potential for spillage and dust generation.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Wheel washing facilities shall be used by all trucks leaving the site to prevent transfer of mud onto public roads.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Standard formwork or pre-fabrication should be used as far as practicable so as to minimise the C&D materials arising. The use of more durable formwork/plastic facing for construction works should be considered. The use of wooden hoardings should be avoided and metal hoarding should be used to facilitate recycling. Purchasing of construction materials should avoid over-ordering and wastage.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The Contractor should recycle as many C&D materials (this is a waste section) as possible on-site. The public fill and C&D waste should be segregated and stored in separate containers or skips to facilitate the reuse or recycling of materials and proper disposal. Where practicable, the concrete and masonry should be crushed and used as fill materials. Steel reinforcement bar should be collected for use by scrap steel mills. Different areas of the sites should be considered for segregation and storage activities.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	All falsework will be steel instead of wood.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Chemical waste producers should register with the EPD. Chemical waste should be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes as follows: <i>f</i> suitable for the substance to be held, resistant to corrosion, maintained in good conditions and securely closed; <i>f</i> Having a capacity of <450L unless the specifications have been approved by the EPD; and <i>w</i> Chinese according to the instructions prescribed in Schedule 2 of the Regulations. <i>f</i> Clearly labelled and used solely for the storage of chemical wastes; <i>f</i> Enclosed with at least 3 sides; <i>f</i> Impermeable floor and bund with	All areas / throughout construction period	Contractor	TMEIA		Y		✓

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link
Northern Connection Tunnel Buildings, Electrical and Mechanical Works
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
		capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in the area, whichever is greatest; <i>f</i> Adequate ventilation; <i>f</i> Sufficiently covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and <i>f</i> Incompatible materials are adequately separated.							
12.6	8.1	Waste oils, chemicals or solvents shall not be disposed of to drain,	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Adequate numbers of portable toilets should be provided for on-site workers. Portable toilets should be maintained in reasonable states, which will not deter the workers from utilising them.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Night soil should be regularly collected by licensed collectors.	All areas / throughout construction period	Contractor	TMEIA		Y		N/A
12.6	8.1	General refuse arising on-site should be stored in enclosed bins or compaction units separately from C&D and chemical wastes. Sufficient dustbins shall be provided for storage of waste as required under the Public Cleansing and Prevention of Nuisances By-laws. In addition, general refuse shall be cleared daily and shall be disposed of to the nearest licensed landfill or refuse transfer station. Burning of refuse on construction sites is prohibited.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	All waste containers shall be in a secure area on hardstanding;	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Office wastes can be reduced by recycling of paper if such volume is sufficiently large to warrant collection. Participation in a local collection scheme by the Contractor should be advocated. Waste separation facilities for paper, aluminium cans, plastic bottles, etc should be provided on-site.	Site Offices/ throughout construction period	Contractor	TMEIA		Y		✓
12.6	Section 8	EM&A of waste handling, storage, transportation, disposal procedures and documentation through the site audit programme shall be undertaken.	All areas / throughout construction period	Contractor	EM&A Manual		Y		✓
LANDSCAPE AND VISUAL									

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link
Northern Connection Tunnel Buildings, Electrical and Mechanical Works
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
10.9	7.6	Existing trees on boundary of the Project Area shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas (Tree protection measures will be detailed at Tree Removal Application Stage) (CM1)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Trees unavoidably affected by the works shall be transplanted where practical. Trees will be transplanted straight to their final receptor site and not held in a temporary nursery. A detailed Tree Transplanting Specification shall be provided in the Contract Specification. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme (CM2)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Hillside and roadside screen planting to proposed roads, associated structures and slope works (CM3)	All areas/detailed design/ during construction/post construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material (in earth tone) (CM4)	All areas/detailed design/ during construction/ post construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Screening of construction works by hoardings around works area in visually unobtrusive colours, to screen works (CM5)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Control night-time lighting and glare by hooding all lights (CM6)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Ensure no run-off into water body adjacent to the Project Area (CM7)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (CM8)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Recycle/ Reuse all felled trees and vegetation, e.g. mulching (CM9)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Compensatory tree planting shall be provided to the satisfaction of relevant Government departments. Required numbers and locations of compensatory trees shall be determined and agreed separately with Government during the Tree Felling Application process under ETWBTC 3/2006 (CM10)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Re-vegetation of affected woodland/shrubland with native species (OM1)	All areas/detailed design/ during construction/ during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by AFCD/HyD/L CSD

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link
Northern Connection Tunnel Buildings, Electrical and Mechanical Works
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
10.9	7.6	Tall buffer screen tree / shrub / climber planting should be incorporated to soften hard engineering structures and facilities (OM2)	All areas/detailed design/ during construction/ during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by AFCD/HyD/L CSD
10.9	7.6	Streetscape elements (e.g. paving, signage, street furniture, lighting etc.) shall be sensitively designed in a manner that responds to the local context, and minimises potential negative landscape and visual impacts. Lighting units should be directional and minimise unnecessary light spill (OM3)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by HyD/LCSD
10.9	7.6	Structure, ornamental tree / shrub / climber planting should be provided along roadside amenity strips, central dividers and newly formed slopes to enhance the townscape quality and further greenery enhancement (OM4)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by HyD/LCSD
10.9	7.6	Aesthetically pleasing design (visually unobtrusive and non-reflective) as regard to the form, material and finishes	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by HyD

*** Remarks:**

- ✓ Compliance of Mitigation Measures
- <> Compliance of Mitigation but need improvement
- x Non-compliance of Mitigation Measures
- ▲ Non-compliance of Mitigation Measures but rectified by Contractor
- Δ Deficiency of Mitigation Measures but rectified by Contractor
- N/A Not Applicable in Reporting Period

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

Appendix D

Summary of Action and Limit Levels

Table D1 *Action and Limit Levels for 1-hour and 24-hour TSP*

Parameters	Action	Limit
24 Hour TSP Level in $\mu\text{g}/\text{m}^3$	ASR1 = 213 ASR5 = 238 AQMS1 = 213 ASR6 = 238 ASR10 = 214	260
1 Hour TSP Level in $\mu\text{g}/\text{m}^3$	ASR1 = 331 ASR5 = 340 AQMS1 = 335 ASR6 = 338 ASR10 = 337	500

Table D2 *Actions in the Event of Landfill Gas being Detected in Excavation / Confined Area*

Parameter	Measurement	Action
Oxygen	< 19%	- Ventilate to restore oxygen to > 19%
	< 18%	- Stop work - Evacuate personnel / prohibit entry - Increase ventilation to restore to > 19%
Methane	> 10% LEL (> 0.5% v/v)	- Prohibit hot work - Ventilate to restore methane to < 10% LEL
	> 20% LEL (>1% v/v)	- Stop work - Evacuate personnel / prohibit entry - Increase ventilation to restore to < 10%
Carbon Dioxide	> 0.5%	- Ventilate to restore oxygen to < 0.5%
	> 1.5%	- Stop work - Evacuate personnel / prohibit entry - Increase ventilation to restore to < 0.5%

Appendix E

Event Action Plan

Appendix E1 Event/ Action Plan for Air Quality

EVENT	ET ⁽¹⁾	ACTION		Contractor
		IEC ⁽¹⁾	ER ⁽¹⁾	
Action Level				
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify the source. 2. Inform the IEC and the ER. 3. Repeat measurement to confirm finding. 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET. 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice 2. Amend working methods if appropriate
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify the source. 2. Inform the IEC and the ER. 3. Repeat measurements to confirm findings. 4. Increase monitoring frequency to daily. 5. Discuss with the IEC and the Contractor on remedial actions required. 6. If exceedance continues, arrange meeting with the IEC and the ER. 7. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET. 2. Check the Contractor's working method. 3. Discuss with the ET and the Contractor on possible remedial measures. 4. Advise the ER on the effectiveness of the proposed remedial measures. 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for remedial actions to IEC within 3 working days of notification 2. Implement the agreed proposals 3. Amend proposal if appropriate

EVENT	ACTION			
	ET ⁽¹⁾	IEC ⁽¹⁾	ER ⁽¹⁾	Contractor
Limit Level				
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify the source. 2. Inform the ER and the DEP. 3. Repeat measurement to confirm finding. 4. Increase monitoring frequency to daily. 5. Assess effectiveness of Contractor's remedial actions and keep the IEC, the DEP and the ER informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET. 2. Check Contractor's working method. 3. Discuss with the ET and the Contractor on possible remedial measures. 4. Advise the ER on the effectiveness of the proposed remedial measures. 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IEC within 3 working days of notification 3. Implement the agreed proposals 4. Amend proposal if appropriate
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify the IEC, the ER, the DEP and the Contractor. 2. Identify the source. 3. Repeat measurements to confirm findings. 4. Increase monitoring frequency to daily. 5. Carry out analysis of the Contractor's working procedures to determine possible mitigation to be implemented. 6. Arrange meeting with the IEC and the ER to discuss the remedial actions to be taken. 7. Assess effectiveness of the Contractor's remedial actions 	<ol style="list-style-type: none"> 1. Discuss amongst the ER, ET and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly. 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant activity of works as determined by the ER until the exceedance is abated.

and keep the IEC, the DEP and
the ER informed of the results.

8. If the exceedance stops, cease
additional monitoring.

Abbreviations: ET - Environmental Team, IEC - Independent Environmental Checker, ER - Engineer's Representative, DEP - Director of Environmental Protection

Appendix F

EM&A Monitoring Schedule

**HY/2017/10 Tuen Mun - Chek Lap Kok Link - Northern Tunnel Connection Buildings, E&M Works
Tentative Landfill Gas Monitoring Schedule (1 to 31 December 2019)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
01-Dec	02-Dec	03-Dec	04-Dec	05-Dec	06-Dec	07-Dec
	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)
08-Dec	09-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec
	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)
15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec
	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)
22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec
	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)			LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)
29-Dec	30-Dec	31-Dec				
	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)				

**HY/2017/10 Tuen Mun - Chek Lap Kok Link - Northern Tunnel Connection Buildings, E&M Works
Landfill Gas Monitoring Schedule (1 to 31 January 2020)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			01-Jan	02-Jan	03-Jan	04-Jan
				LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)
05-Jan	06-Jan	07-Jan	08-Jan	09-Jan	10-Jan	11-Jan
	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)
12-Jan	13-Jan	14-Jan	15-Jan	16-Jan	17-Jan	18-Jan
	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)
19-Jan	20-Jan	21-Jan	22-Jan	23-Jan	24-Jan	25-Jan
	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	
26-Jan	27-Jan	28-Jan	29-Jan	30-Jan	31-Jan	
			LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	LFG Monitoring (a.m. & p.m.)	

The schedule is subject to excavation work at Toll Control Building. The schedule will be revised after reviewing the progress of the construction works or due to adverse (safety, weather etc) conditions.

Appendix G

Calibration Certificate of Monitoring Equipment



MSA Hong Kong Ltd.

25/F Jupiter Tower, 9 Jupiter Street, Hong Kong

Tel 852-22587588 Fax 25478780 Email info.hk@msasafety.com Website www.msasafety.com

Ref. 2019/05/005
Customer Gammon Constructions Limited

Date: 24-May-19

CERTIFICATE FOR CALIBRATION CHECK TEST

Model	Serial No.	Calibration Check Gas	Regulator	Full Scale	Response
Altair 5XIR	145986	1.45% Methane,	.25litre/min	100% LEL	29%LEL
		15% Oxygen		30% Vol	15% O2
		2.5% Carbon Dioxide		9.99%	2.5% CO2

Remarks: Regular inspection completed. Calibration passed

MSA Hong Kong Ltd. certify that instrument/s listed above has/have been calibrated check tested on:
24-May-19

This instrument was calibrated in accordance with all requirements of the specifications of MSA.

This instrument must be calibration checked prior to use in accordance with the instruction manual.

This instrument was calibrated using NIST traceable equipment and was in accordance with all requirements of the drawings and specifications of MSA.

For and on behalf of
MSA Hong Kong Ltd.



Authorised Signature



MSA Hong Kong Ltd.

25/F Jupiter Tower, 9 Jupiter Street, Hong Kong

Tel 852-22587588 Fax 25478780 Email info.hk@msasafety.com Website www.msasafety.com

Ref. 2019/12/009
Customer Gammon Constructions Limited

Date: 11-Dec-19

CERTIFICATE FOR CALIBRATION CHECK TEST

Model	Serial No.	Calibration Check Gas	Regulator	Full Scale	Response
Altair 5XIR	145986	1.45% Methane,	.25litre/min	100% LEL	29%LEL
		15% Oxygen		30% Vol	15% O2
		2.5% Carbon Dioxide		9.99%	2.5% CO2

Remarks: Regular inspection completed. Calibration passed

MSA Hong Kong Ltd. certify that instrument/s listed above has/have been calibrated check tested on:
11-Dec-19

This instrument was calibrated in accordance with all requirements of the specifications of MSA.

This instrument must be calibration checked prior to use in accordance with the instruction manual.

This instrument was calibrated using NIST traceable equipment and was in accordance with all requirements of the drawings and specifications of MSA.

For and on behalf of
MSA Hong Kong Ltd.



Authorised Signature

Appendix H

Landfill Gas Monitoring
Results and Graphical
Presentation

Landfill Gas Monitoring Results on Methane Level

Project	Works	Date(yyyy-mm-dd)	Monitoring Location	Time (hh:mm, 24hour)	Results (%)	Action Level (%)	Limit Level (%)
TMCLKL	HY/2017/10	2019-12-02	Toll Control Building	8:15	0	10.0	20.0
TMCLKL	HY/2017/10	2019-12-02	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-03	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-03	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-04	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-04	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-05	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-05	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-06	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-06	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-07	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-07	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-09	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-09	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-10	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-10	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-11	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-11	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-12	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-12	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-13	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-13	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-14	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-14	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-16	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-16	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-17	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-17	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-18	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-18	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-19	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-19	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-20	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-20	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-21	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-21	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-23	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-23	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-24	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-24	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-27	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-27	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-28	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-28	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-30	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-30	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2019-12-31	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2019-12-31	Toll Control Building	13:15	0		
					Average	0	
					Min.	0	
					Max.	0	

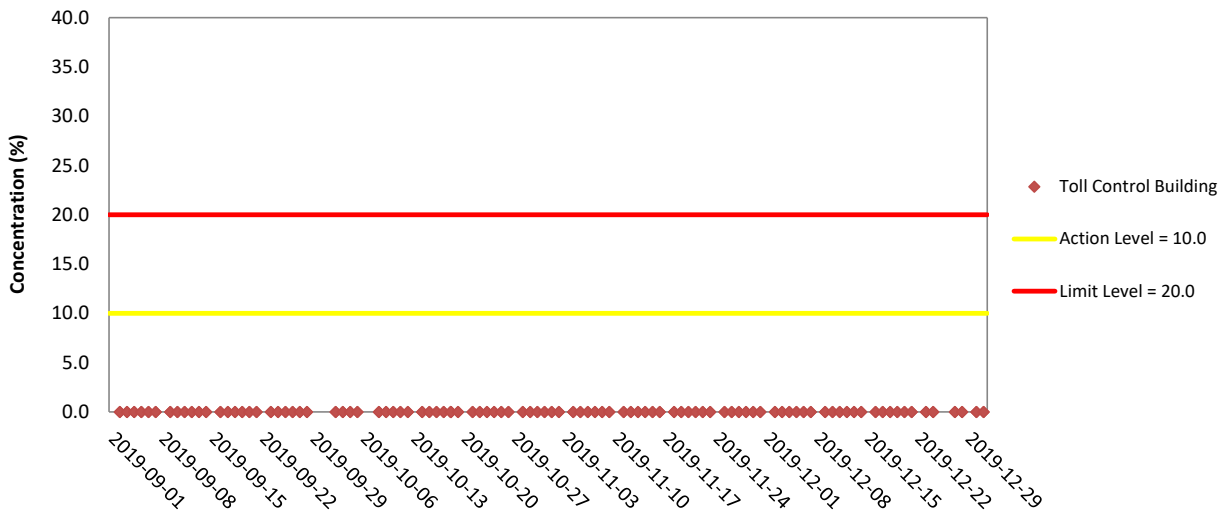
Landfill Gas Monitoring Results on Oxygen Level

Project	Works	Date(yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Results (%)	Action Level (%)	Limit Level (%)
TMCLKL	HY/2017/10	2019-12-02	Toll Control Building	8:15	20.8	19.0	18.0
TMCLKL	HY/2017/10	2019-12-02	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-03	Toll Control Building	8:15	20.9		
TMCLKL	HY/2017/10	2019-12-03	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-04	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-04	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-05	Toll Control Building	8:15	20.9		
TMCLKL	HY/2017/10	2019-12-05	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-06	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-06	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-07	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-07	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-09	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-09	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-10	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-10	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-11	Toll Control Building	8:15	20.8		
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TMCLKL	HY/2017/10	2019-12-12	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-12	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-13	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-13	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-14	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-14	Toll Control Building	13:15	20.9		
TMCLKL	HY/2017/10	2019-12-16	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-16	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-17	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-17	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-18	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-18	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-19	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-19	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-20	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-20	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-21	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-21	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-23	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-23	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-24	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-24	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-27	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-27	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-28	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-28	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2019-12-30	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-30	Toll Control Building	13:15	20.9		
TMCLKL	HY/2017/10	2019-12-31	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2019-12-31	Toll Control Building	13:15	20.8		
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					Min.	20.8	
					Max.	20.9	

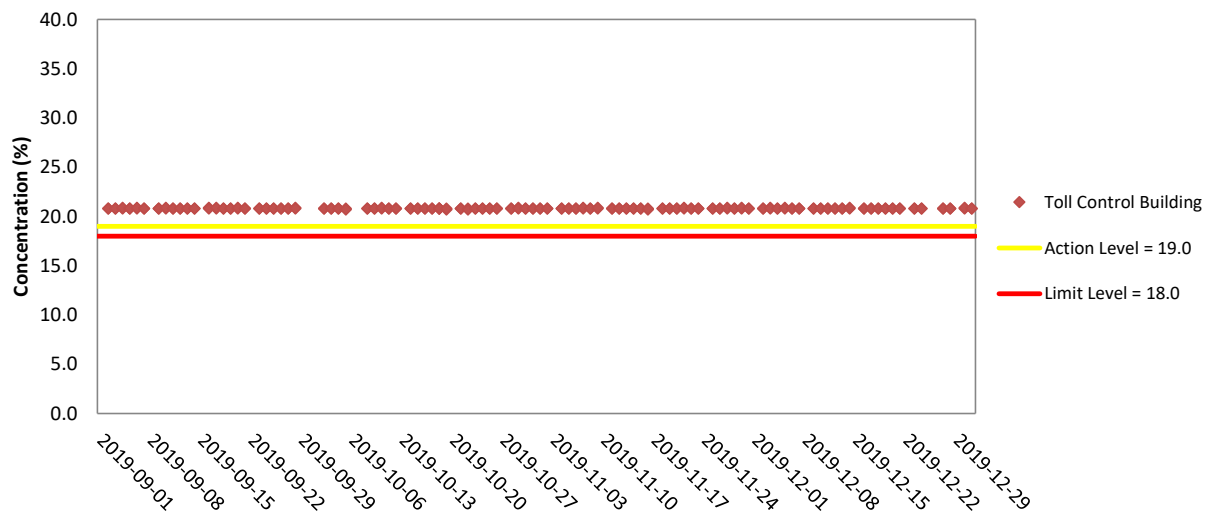
Landfill Gas Monitoring Results on Carbon Dioxide Level

Project	Works	Date(yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Results (%)	Action Level (%)	Limit Level (%)
TMCLKL	HY/2017/10	2019-12-02	Toll Control Building	8:15	0.03	0.5	1.5
TMCLKL	HY/2017/10	2019-12-02	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-03	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-03	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-04	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-04	Toll Control Building	13:15	0.04		
TMCLKL	HY/2017/10	2019-12-05	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-05	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-06	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-06	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-07	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-07	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-09	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-09	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-10	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-10	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-11	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-11	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-12	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-12	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-13	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-13	Toll Control Building	13:15	0.04		
TMCLKL	HY/2017/10	2019-12-14	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-14	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-16	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-16	Toll Control Building	13:15	0.04		
TMCLKL	HY/2017/10	2019-12-17	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-17	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-18	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-18	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-19	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-19	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-20	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-20	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-21	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-21	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-23	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-23	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-24	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-24	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-27	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-27	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-28	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-28	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-30	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-30	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2019-12-31	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2019-12-31	Toll Control Building	13:15	0.03		
					Average		
					Min.		
					Max.		

Landfill Gas Monitoring Results on Methane Level



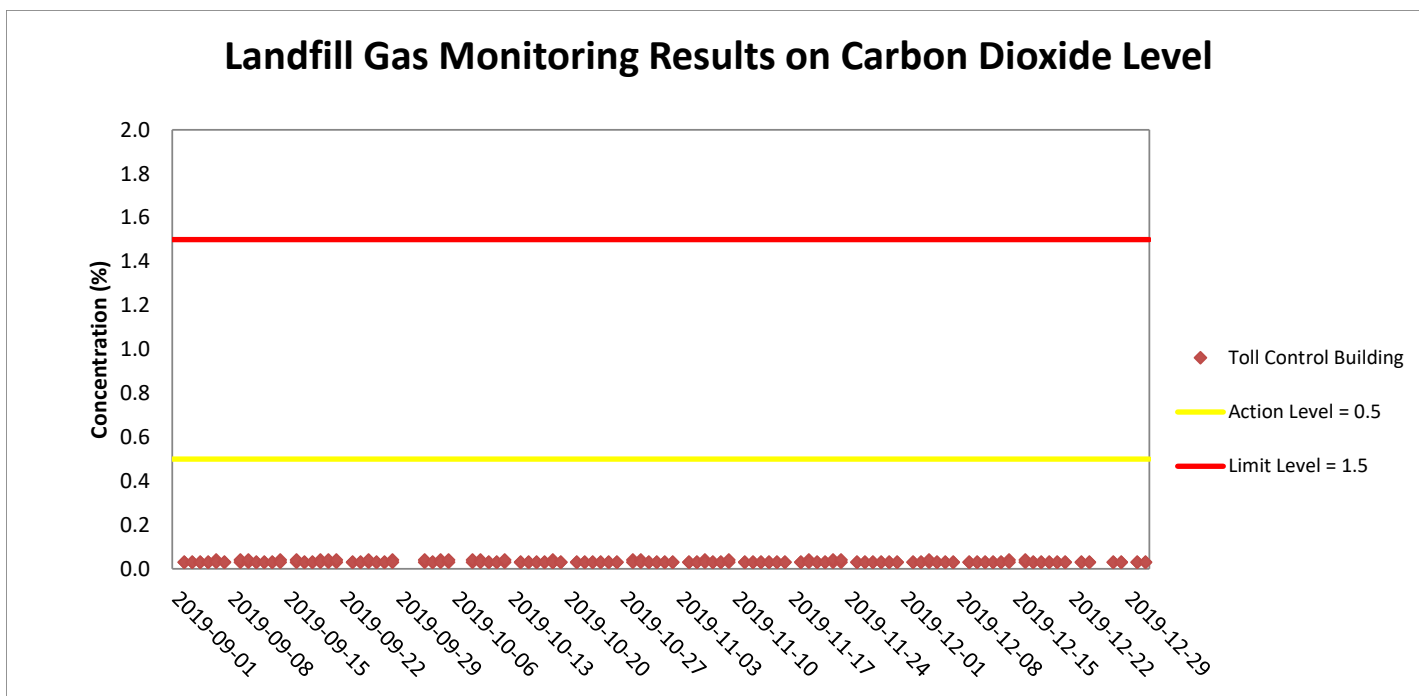
Landfill Gas Monitoring Results on Oxygen Level



Weather condition within the reporting period was sunny to rainy

Major construction works undertaken within the reporting period include

- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Toll Control Building;
- Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at North Ventilation Building;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Administration Building;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Maintenance Depot;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Fire Services Department Building;
- Electrical and Mechanical Works and Architectural Builder's Work at Customs and Excise Department Building;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at N1;
- Electrical and Mechanical Works at Kiosk N2;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at the Tunnel;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at underpass at C3 area;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Toll Booth;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Satellite Control Building;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Kiosk S2; and
- Electrical and Mechanical Works at South Ventilation Building.



Weather condition within the reporting period was sunny to rainy

Major construction works undertaken within the reporting period include

- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Toll Control Building;
- Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at North Ventilation Building;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Administration Building;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Maintenance Depot;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Fire Services Department Building;
- Electrical and Mechanical Works and Architectural Builder's Work at Customs and Excise Department Building;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at N1;
- Electrical and Mechanical Works at Kiosk N2;
- Electrical and Mechanical Works and Architectural Builder's Work and Finishes at the Tunnel;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at underpass at C3 area;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Toll Booth;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Satellite Control Building;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Kiosk S2; and
- Electrical and Mechanical Works at South Ventilation Building.

Appendix I

Monthly Summary of Waste Flow Table

Contract No. : HY/2017/10

Tuen Mun Chek Lap Kok Link – Northern Connection Tunnel Buildings, Electrical and Mechanical Works

Monthly Summary Waste Flow Table for 2019 (Year)

Month/Material	Actual Quantities of Inert C&D Materials Generation						Actual Quantities of C&D wastes Generation		Actual Quantities of Recyclables Generation			
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fills	Imported Fill	Chemical Waste	General Refuse	Metals	Felled trees	Paper/ cardboard packaging	Plastics
Unit	('000m ³)	('000m ³)	('000m ³)	('000m ³)	('000m ³)	('000m ³)	('000Kg)	('000Kg)	('000Kg)	('000Kg)	('000Kg)	('000Kg)
Jan	2.089	-	0.150	-	1.939	-	-	74.680	47.620	-	0.077	-
Feb	2.474	0.008	0.345	-	2.129	-	-	67.230	-	-	0.056	-
Mar	0.079	0.060	-	-	0.079	-	-	73.690	23.310	-	-	-
Apr	0.013	-	-	-	0.013	-	-	56.730	18.020	-	0.056	-
May	-	-	-	-	-	-	-	62.240	-	-	0.056	-
Jun	0.011	0.004	-	-	0.011	-	-	118.070	-	-	0.077	-
SUB-TOTAL	4.666	0.072	0.495	0.000	4.171	0.000	0.000	452.640	88.950	0.000	0.322	0.000
Jul	0.058	0.019	-	-	0.058	-	-	148.880	-	-	0.070	-
Aug	0.192	0.073	-	-	0.192	-	-	177.240	-	-	-	-
Sep	0.177	0.015	-	-	0.177	-	-	196.740	-	-	0.063	-
Oct	0.200	-	-	-	0.200	-	-	265.560	-	-	0.056	-
Nov	0.510	0.119	-	-	0.510	-	-	305.880	-	-	0.063	-
Dec	0.489	0.042	-	-	0.489	-	-	276.850	-	-	-	-
TOTAL	6.292	0.340	0.495	0.000	5.797	0.000	0.000	1,823.790	88.950	0.000	0.574	0.000

Notes :

- 1 - The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
- 2 - Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
- 3 - Broken concrete for recycling into aggregates.
- 4 - Assumed 5 kg per damaged water-filled barrier.
- 5 - Disposed as Public Fills includes Hard Rock and Large Broken Concrete.

Appendix J

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

Appendix J1 Cumulative Statistics on Exceedances

		Total No. recorded in this reporting month	Total No. recorded since contract commencement
1-Hr TSP	Action	4	39
	Limit	1	8
24-Hr TSP	Action	0	2
	Limit	0	0
Landfill gas hazard monitoring			
• Methane	Action	0	0
	Limit	0	0
• Oxygen	Action	0	0
	Limit	0	0
• Carbon Dioxide	Action	0	0
	Limit	0	0

Appendix J2 Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of Summons	Successful Prosecutions
This Reporting Month (December 2019)	0	0	0
Total No. received since contract commencement	1	0	0

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To Ramboll Hong Kong Limited (ENPO)

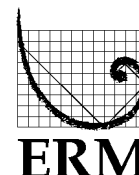
From ERM- Hong Kong, Limited

Ref/Project number Contract No. HY/2017/10
Tuen Mun – Chek Lap Kok Link – Northern
Connection Tunnel Buildings, Electrical and
Mechanical Works

Subject Notification of Exceedance for Air Quality
Impact Monitoring

Date 30 December 2019

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com



Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following
Log no.:

Action Level Exceedance

0463091_1December2019_1hrTSP_Station ASR10
0463091_1December2019_1hrTSP_Station ASR5

Limit Level Exceedance

0463091_1December2019_1hrTSP_Station ASR1

Three (3) exceedances were recorded on 1 December 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

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ERM-Hong Kong, Limited

CONTRACT NO. HY/2017/10
 TUEN MUN – CHEK LAP KOK LINK –
 NORTHERN CONNECTION TUNNEL BUILDINGS,
 ELECTRICAL AND MECHANICAL WORKS

Air Quality Impact Monitoring

Notification of Exceedance

Log No.	<p style="text-align: center;"><u>Action Level Exceedance</u></p> <p style="text-align: center;">0463091_1December2019_1hrTSP_Station ASR10 0463091_1December2019_1hrTSP_Station ASR5</p> <p style="text-align: center;"><u>Limit Level Exceedance</u></p> <p style="text-align: center;">0463091_1December2019_1hrTSP_Station ASR1</p> <p style="text-align: center;">[Total No. of Exceedances = 3]</p>	
Date	<p style="text-align: center;">1 December 2019 (Measured) 6 January 2020 (Results obtained from ENPO Website)</p>	
Monitoring Station	<p style="text-align: center;">ASR1, ASR5 and ASR10</p>	
Parameter(s) with Exceedance(s)	<p style="text-align: center;">1- hr TSP</p>	
Action Levels	<p style="text-align: center;">1-hr TSP ($\mu\text{g}/\text{m}^3$)</p>	<p>ASR1 = 331 ASR5 = 340 ASR6 = 338 ASR10 = 335 AQMS1 = 337</p>
	<p style="text-align: center;">24-hr TSP ($\mu\text{g}/\text{m}^3$)</p>	<p>ASR1 = 213 ASR5 = 238 ASR6 = 238 ASR10 = 214 AQMS1 = 213</p>
Limit Levels	<p style="text-align: center;">1-hr TSP ($\mu\text{g}/\text{m}^3$)</p>	<p style="text-align: center;">500</p>
	<p style="text-align: center;">24-hr TSP ($\mu\text{g}/\text{m}^3$)</p>	<p style="text-align: center;">260</p>
Measured Levels	<p>Refer to the attached data sheet (Data are source from Contract No. HY/2012/08).</p>	
Works Undertaken (at the time of monitoring event)	<p>No works undertaken under this Contract on 1 December 2019.</p>	
Possible Reason for Action or Limit Level Exceedance(s)	<p>The exceedance is unlikely to be due to the Contract, in view of the following:</p> <ul style="list-style-type: none"> • No construction works was conducted on 1 December 2019. • The construction area under this Contract were mainly paved. The remaining unpaved area are seated by machines such as crane machines and generators or used as material storage area with proper cover of tarpaulin sheet. The exposed area are suppressed/covered. Dust are not anticipated. During ET's site inspection on 29 November 2019, the work area at Maintenance Depot and Administration Building were mainly paved. No dust generating activities/dust emission was observed (refer to <i>Appendix A</i>). <p>Based on the above, the exceedances are unlikely to be due to the Contract.</p>	
Actions Taken / To Be Taken	<p>The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area. The ET will monitor for future trends in exceedances.</p>	
Remarks	<p>The monitoring results on 1 December 2019, locations of air quality monitoring stations, wind data are attached.</p>	

Results of Air Quality Monitoring

Project	Contract	Date (yyyy-mm-dd)	Station	Time	Parameter	Results	Unit
TMCLKL	HY/2012/08	2019-12-01	AQMS1	13:58:00	1-hour TSP	185	ug/m3
TMCLKL	HY/2012/08	2019-12-01	AQMS1	15:00:00	1-hour TSP	117	ug/m3
TMCLKL	HY/2012/08	2019-12-01	AQMS1	16:02:00	1-hour TSP	161	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR1	13:47:00	1-hour TSP	231	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR1	14:49:00	1-hour TSP	209	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR1	15:51:00	1-hour TSP	747	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR10	13:11:00	1-hour TSP	137	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR10	14:13:00	1-hour TSP	129	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR10	15:15:00	1-hour TSP	407	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR5	13:36:00	1-hour TSP	196	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR5	14:38:00	1-hour TSP	127	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR5	15:40:00	1-hour TSP	377	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR6	13:23:00	1-hour TSP	216	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR6	14:25:00	1-hour TSP	149	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR6	15:27:00	1-hour TSP	160	ug/m3
TMCLKL	HY/2012/08	2019-12-01	AQMS1	17:04:00	24-hour TSP	107	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR1	16:53:00	24-hour TSP	168	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR10	16:17:00	24-hour TSP	103	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR5	16:42:00	24-hour TSP	110	ug/m3
TMCLKL	HY/2012/08	2019-12-01	ASR6	16:29:00	24-hour TSP	134	ug/m3

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	Time (24hrs)	Average of Wind Speed (m/s)	Average of Wind Direction(degree)
19/12/01	1:00	1.3	304
19/12/01	2:00	1.3	319
19/12/01	3:00	0.9	303
19/12/01	4:00	0.4	290
19/12/01	5:00	0.4	339
19/12/01	6:00	0	-
19/12/01	7:00	0	-
19/12/01	8:00	1.3	28
19/12/01	9:00	1.3	28
19/12/01	10:00	1.8	207
19/12/01	11:00	1.3	210
19/12/01	12:00	1.8	309
19/12/01	13:00	2.7	273
19/12/01	14:00	2.2	288
19/12/01	15:00	1.8	272
19/12/01	16:00	0.9	302
19/12/01	17:00	0.9	319
19/12/01	18:00	0.9	288
19/12/01	19:00	1.3	289
19/12/01	20:00	1.3	315
19/12/01	21:00	2.2	309
19/12/01	22:00	1.8	311
19/12/01	23:00	1.3	318

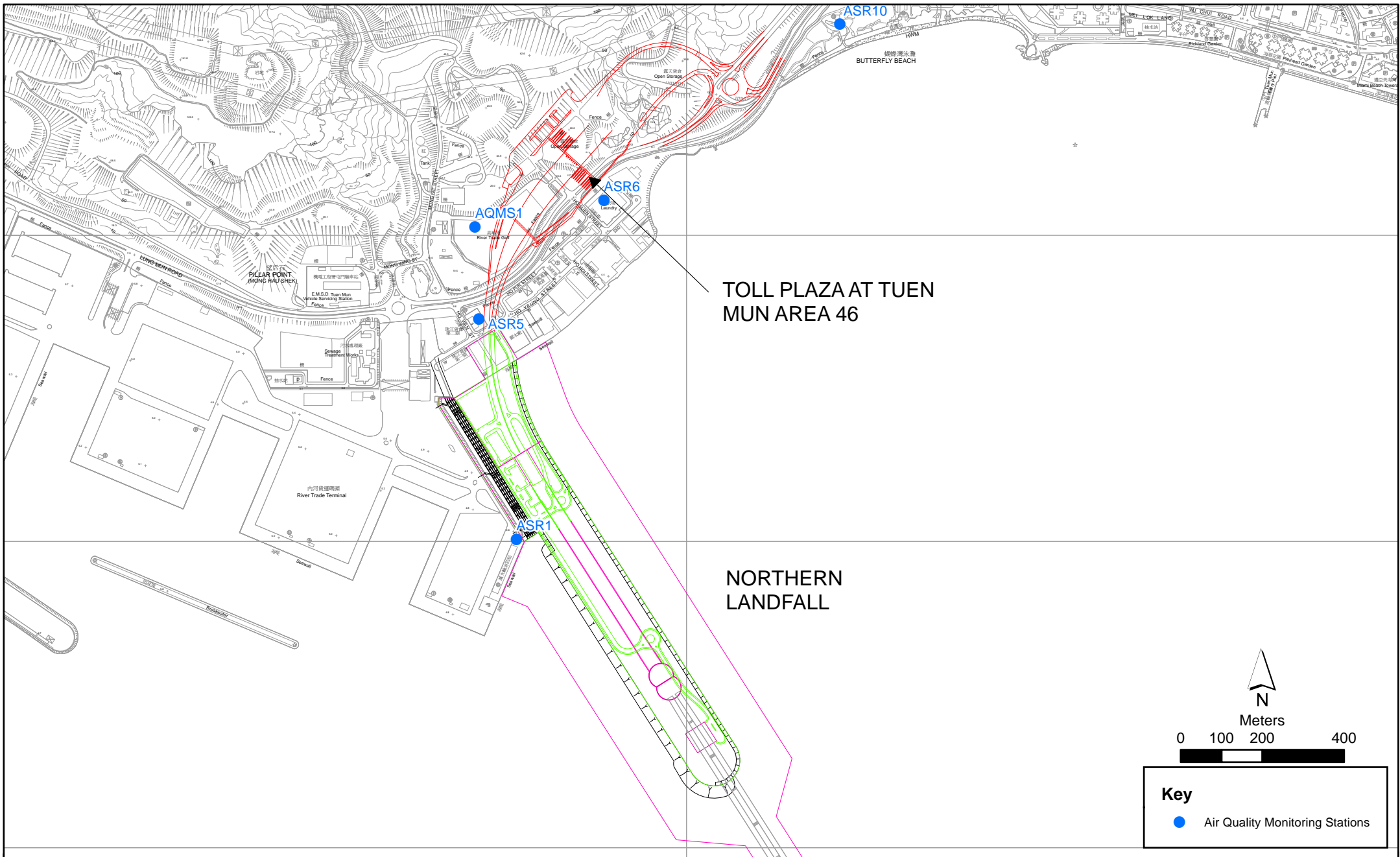
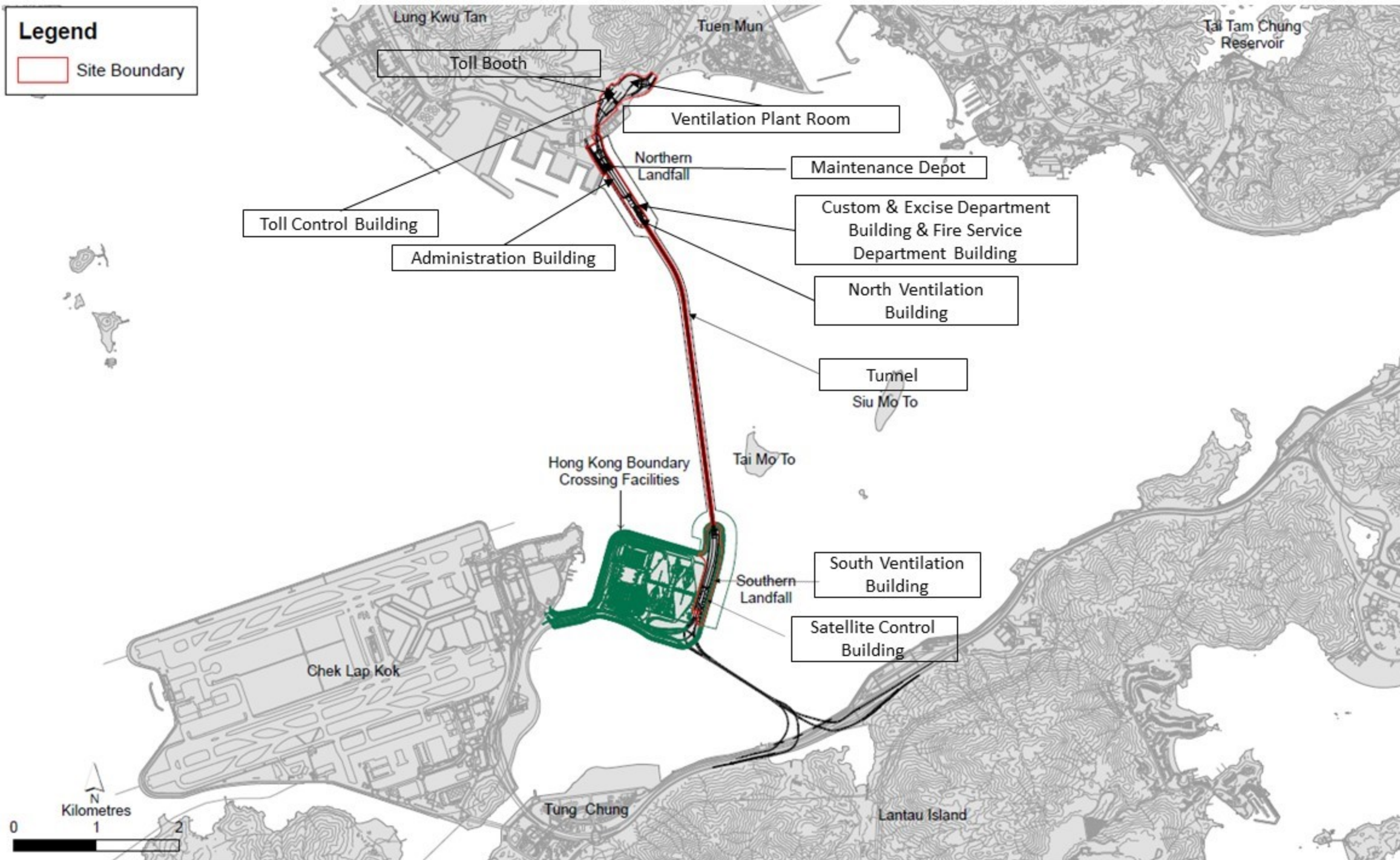


Figure 2.1

Air Quality Monitoring Stations for the Enhanced TSP Monitoring
 (Source: Adopted from Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link -
 Northern Connection Sub-sea Tunnel Section)

Legend

Site Boundary



Appendix A

ET site inspection on 29
November 2019

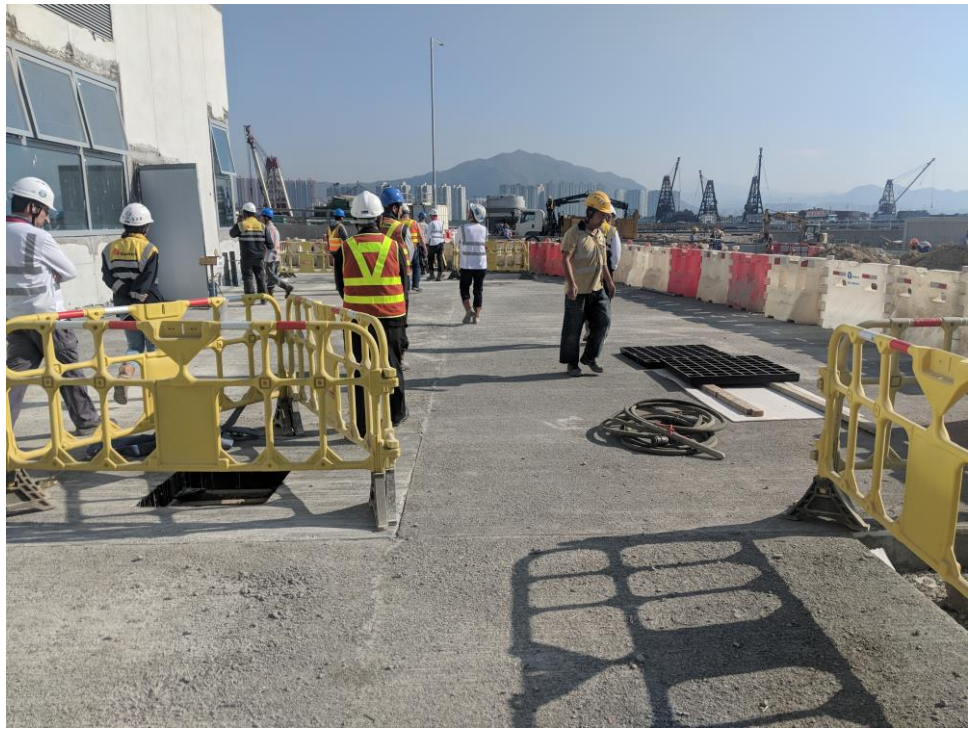


Photo 1 - Site condition at Maintenance Depot



Photo 2 - Site condition at Administration Building

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To Ramboll Hong Kong Limited (ENPO)

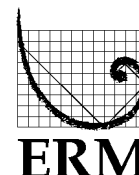
From ERM- Hong Kong, Limited

Ref/Project number Contract No. HY/2017/10
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Impact Monitoring

Date 30 December 2019

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com



Dear Sir/ Madam,

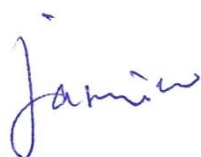
Please find attached the Notification of Exceedance (NOE) of the following
Log no.:

Action Level Exceedance

0463091_4December2019_1hrTSP_Station ASR1
0463091_4December2019_1hrTSP_Station ASR5

Two (2) exceedances were recorded on 4 December 2019.

Regards,



Dr Jasmine Ng
Environmental Team Leader

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ERM-Hong Kong, Limited

CONTRACT NO. HY/2017/10
 TUEN MUN – CHEK LAP KOK LINK –
 NORTHERN CONNECTION TUNNEL BUILDINGS,
 ELECTRICAL AND MECHANICAL WORKS

Air Quality Impact Monitoring

Notification of Exceedance

Log No.	<u>Action Level Exceedance</u> 0463091_28November2019_1hrTSP_Station ASR1 0463091_28November2019_1hrTSP_Station ASR5 [Total No. of Exceedances = 2]	
Date	4 December 2019 (Measured) 6 January 2020 (Results obtained from ENPO Website)	
Monitoring Station	ASR1 and ASR5	
Parameter(s) with Exceedance(s)	1- hr TSP	
Action Levels	1-hr TSP ($\mu\text{g}/\text{m}^3$)	ASR1 = 331 ASR5 = 340 ASR6 = 338 ASR10 = 335 AQMS1 = 337
	24-hr TSP ($\mu\text{g}/\text{m}^3$)	ASR1 = 213 ASR5 = 238 ASR6 = 238 ASR10 = 214 AQMS1 = 213
Limit Levels	1-hr TSP ($\mu\text{g}/\text{m}^3$)	500
	24-hr TSP ($\mu\text{g}/\text{m}^3$)	260
Measured Levels	Refer to the attached data sheet (Data are source from Contract No. HY/2012/08).	
Works Undertaken (at the time of monitoring event)	Works undertaken under this Contract on 4 December 2019 included <ul style="list-style-type: none"> • Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Administration Building; • Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Maintenance Depot; • Electrical and Mechanical Works and Architectural Builder's Work and Finishes at Fire Services Department Building. 	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Contract, in view of the following: <ul style="list-style-type: none"> • With reference to the recorded wind direction (ranged between 14° and 356°, blowing from a northern direction) and wind speed (ranged between 2.7 and 3.1 m/s) when exceedances recorded, ASR5 is located upstream to the construction work area which is unlikely impacted by the construction activities conducted by this Contract on 4 December 2019. ASR1 is located nearby to the construction works at Maintenance Depot and Administration Building. However, the construction works at Maintenance Depot and Administration Building were mainly Electrical and Mechanical Works and Architectural Builders Work and Finishes which are considered not major dust generating works (refer to <i>Appendix A</i>). • No major dust generating activities i.e. excavation works was conducted on 4 December 2019. • The construction area under this Contract were mainly paved. The remaining unpaved area are seated by machines such as crane machines and generators or used as material storage area with proper cover of tarpaulin sheet. The exposed area are suppressed/covered. Dust are not anticipated. Based on the above, the exceedances are unlikely to be due to the Contract.	

Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 4 December 2019, locations of air quality monitoring stations and wind data are attached.

Results of Air Quality Monitoring

Project	Contract	Date (yyyy-mm-dd)	Station	Time	Parameter	Results	Unit
TMCLKL	HY/2012/08	2019-12-04	AQMS1	8:44:00	1-hour TSP	156	ug/m3
TMCLKL	HY/2012/08	2019-12-04	AQMS1	9:51:00	1-hour TSP	160	ug/m3
TMCLKL	HY/2012/08	2019-12-04	AQMS1	10:53:00	1-hour TSP	116	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR1	8:37:00	1-hour TSP	366	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR1	9:39:00	1-hour TSP	220	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR1	10:41:00	1-hour TSP	100	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR10	8:02:00	1-hour TSP	103	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR10	9:04:00	1-hour TSP	113	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR10	10:06:00	1-hour TSP	101	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR5	8:25:00	1-hour TSP	380	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR5	9:27:00	1-hour TSP	180	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR5	10:29:00	1-hour TSP	202	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR6	8:13:00	1-hour TSP	150	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR6	9:15:00	1-hour TSP	163	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR6	10:17:00	1-hour TSP	169	ug/m3
TMCLKL	HY/2012/08	2019-12-04	AQMS1	11:55:00	24-hour TSP	97	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR1	11:43:00	24-hour TSP	164	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR10	11:08:00	24-hour TSP	84	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR5	11:31:00	24-hour TSP	190	ug/m3
TMCLKL	HY/2012/08	2019-12-04	ASR6	11:19:00	24-hour TSP	118	ug/m3

Note:

Indicates Exceedance of Action Level
 Indicates Exceedance of Limit Level

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	Time (24hrs)	Average of Wind Speed (m/s)	Average of Wind Direction(degree)
19/12/04	0:00	1.8	328
19/12/04	1:00	2.7	30
19/12/04	2:00	2.2	25
19/12/04	3:00	1.8	13
19/12/04	4:00	1.8	19
19/12/04	5:00	2.7	355
19/12/04	6:00	1.8	339
19/12/04	7:00	1.8	339
19/12/04	8:00	3.1	356
19/12/04	9:00	2.7	14
19/12/04	10:00	2.2	28
19/12/04	11:00	2.2	16
19/12/04	12:00	1.8	31
19/12/04	13:00	1.8	31
19/12/04	14:00	1.3	306
19/12/04	15:00	2.2	325
19/12/04	16:00	1.8	345
19/12/04	17:00	1.8	341
19/12/04	18:00	0.9	306
19/12/04	19:00	0.4	292
19/12/04	20:00	0.4	311
19/12/04	21:00	1.3	14
19/12/04	22:00	1.3	56
19/12/04	23:00	1.8	28

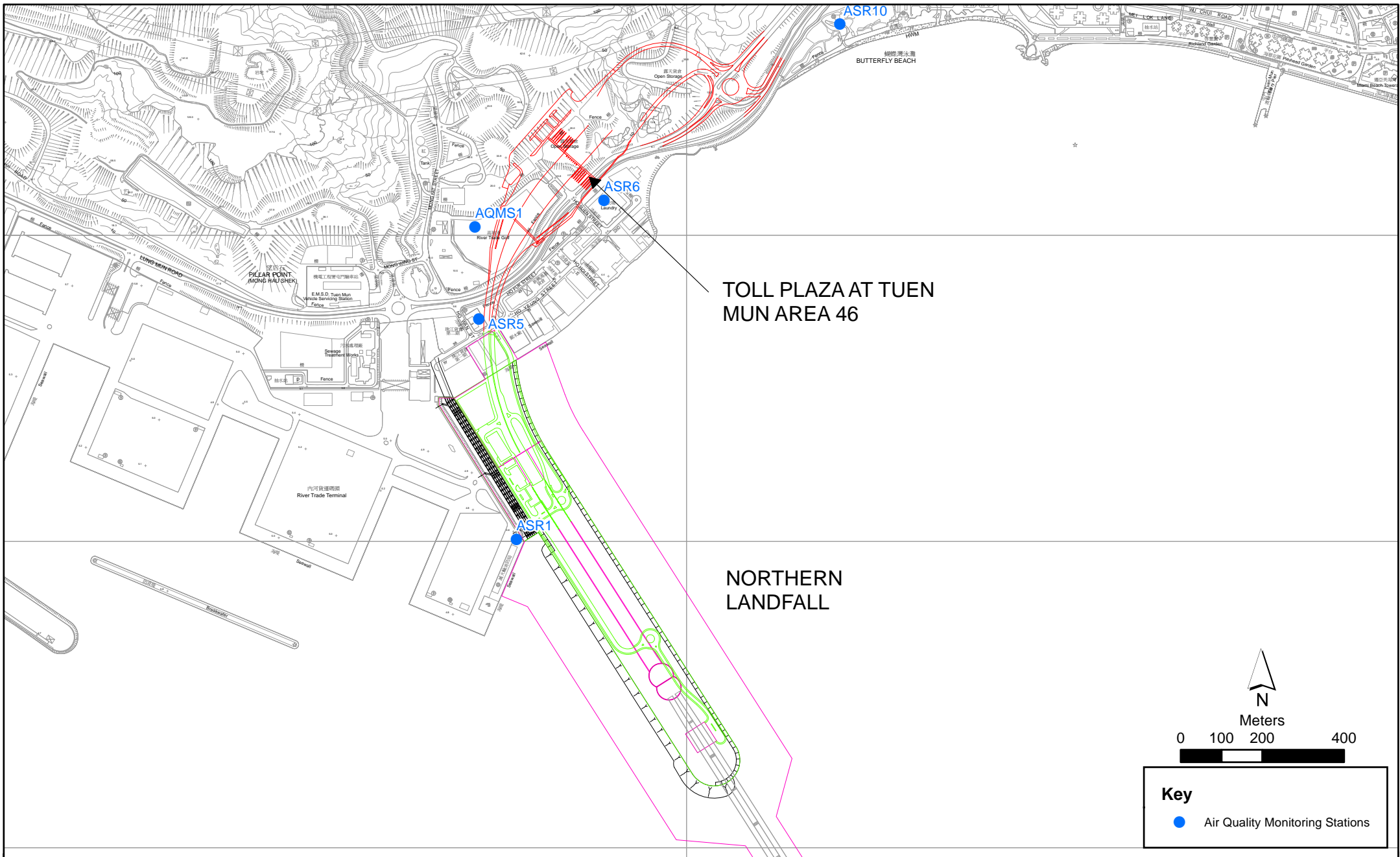


Figure 2.1

Air Quality Monitoring Stations for the Enhanced TSP Monitoring
 (Source: Adopted from Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link -
 Northern Connection Sub-sea Tunnel Section)

Key

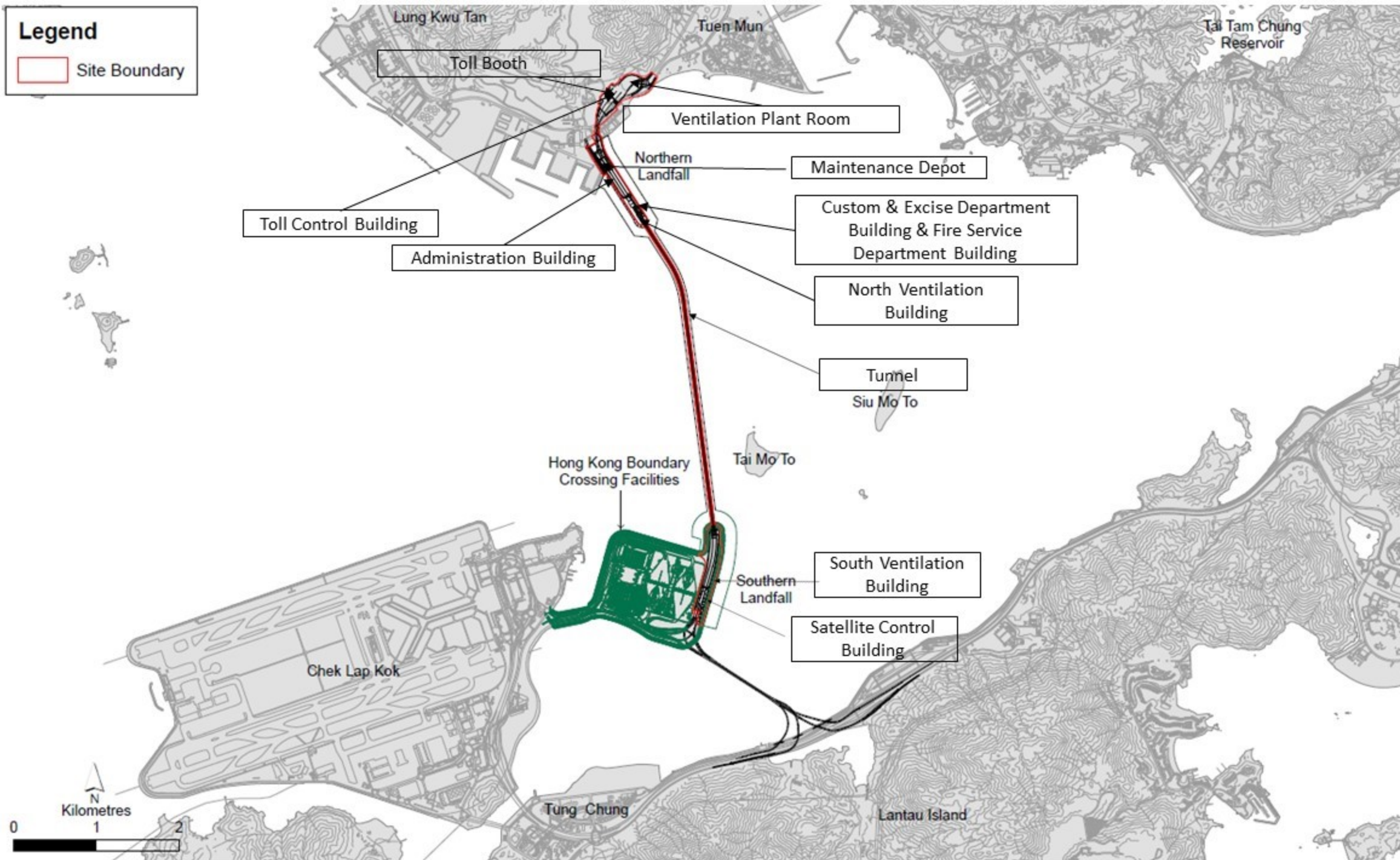
- Air Quality Monitoring Stations

Environmental Resources Management



Legend

Site Boundary



Appendix A

Site Photo



Photo 1 - Construction works at Administration Building



Photo 2 - Construction works at Maintenance Depot



Photo 3 - Construction works at Fire Services Department Building