

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

*Twentieth Monthly EM&A Report*

11 February 2020

**Environmental Resources Management**  
2507, 25/F One Harbourfront  
18 Tak Fung Street  
Hung Hom, Kowloon  
Hong Kong  
Telephone 2271 3000  
Facsimile 2723 5660

[www.erm.com](http://www.erm.com)





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

**Environmental Resources  
Management**

2507, 25/F One Harbourfront  
18 Tak Fung Street  
Hungghom, Kowloon  
Hong Kong  
Telephone: (852) 2271 3000  
Facsimile: (852) 2723 5660  
E-mail: post.hk@erm.com  
http://www.erm.com

*Twentieth Monthly EM&A Report*

**Document Code: 0463091\_20th Monthly EM&A\_20200211.doc**

Client:  Gammon		Project No:  0463091			
Summary:  This document presents the Twentieth Monthly EM&A Report for Tuen Mun – Chek Lap Kok Link – Northern Connection Tunnel Buildings, Electrical and Mechanical Works.		Date: 11 February 2020			
		Approved by: 			
		Mr Craig Reid Partner			
		Certified by: 			
		Dr Jasmine Ng ET Leader			
	Twentieth Monthly EM&A Report	CW	JN	CAR	11/2/20
Revision	Description	By	Checked	Approved	Date
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.  We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.		Distribution <input type="checkbox"/> Internal <input checked="" type="checkbox"/> Public <input type="checkbox"/> Confidential			
		 			

12 February 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  
20<sup>th</sup> Monthly EM&A Report for January 2020**

Reference is made to the Environmental Team's submission of the monthly EM&A report for January 2020 (ET's ref.: "0463091\_20th Monthly EM&A\_20200211.doc" dated 11 February 2020) certified by the ET Leader and provided to us via e-mail on 11 February 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, ENPO Site

Q:\Projects\HYDZHMBEEM00\02\_Proj\_Mgt\02\_Corr\HYDZHMBEEM00\_0\_7871L.20.doc

## TABLE OF CONTENTS

	<i>EXECUTIVE SUMMARY</i>	<i>I</i>
<i>1</i>	<i>INTRODUCTION</i>	<i>1</i>
<i>1.1</i>	<i>BACKGROUND</i>	<i>1</i>
<i>1.2</i>	<i>SCOPE OF REPORT</i>	<i>2</i>
<i>1.3</i>	<i>ORGANIZATION STRUCTURE</i>	<i>2</i>
<i>1.4</i>	<i>SUMMARY OF CONSTRUCTION WORKS</i>	<i>2</i>
<i>2</i>	<i>EM&amp;A RESULTS</i>	<i>5</i>
<i>2.1</i>	<i>AIR QUALITY</i>	<i>5</i>
<i>2.2</i>	<i>LANDFILL GAS HAZARD MONITORING</i>	<i>6</i>
<i>2.3</i>	<i>EM&amp;A SITE INSPECTION</i>	<i>7</i>
<i>2.4</i>	<i>WASTE MANAGEMENT STATUS</i>	<i>8</i>
<i>2.5</i>	<i>ENVIRONMENTAL LICENSES AND PERMITS</i>	<i>8</i>
<i>2.6</i>	<i>IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES</i>	<i>10</i>
<i>2.7</i>	<i>SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT</i>	<i>10</i>
<i>2.8</i>	<i>SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS</i>	<i>10</i>
<i>3</i>	<i>FUTURE KEY ISSUES</i>	<i>11</i>
<i>3.1</i>	<i>CONSTRUCTION ACTIVITIES FOR THE COMING MONTH</i>	<i>11</i>
<i>3.2</i>	<i>KEY ISSUES FOR THE COMING MONTH</i>	<i>11</i>
<i>4</i>	<i>CONCLUSIONS AND RECOMMENDATIONS</i>	<i>13</i>
<i>4.1</i>	<i>CONCLUSIONS</i>	<i>13</i>

*List of Appendices*

- Appendix A Project Organization for Environmental Works
- Appendix B Construction Programmes
- Appendix C Implementation Schedule of Environmental Mitigation Measures (EMIS)
- Appendix D Summary of Action and Limit Levels
- Appendix E Event Action Plan
- Appendix F EM&A Monitoring Schedule
- Appendix G Calibration Certificate of Monitoring Equipment
- Appendix H Landfill Gas Monitoring Results and Graphical Presentation
- Appendix I Monthly Summary of Waste Flow Table
- Appendix J Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions

## **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 Twentieth Monthly EM&A report presenting the EM&A works carried out during the period from 1 to 31 January 2020 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 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 <sup>(1)</sup>:

24-hour TSP Monitoring	9 sessions
1-hour TSP Monitoring	9 sessions
Landfill Gas Hazard Monitoring	20 days
Joint Environmental Site Inspection	5 sessions

#### Summary of Breaches of Action/Limit Levels

##### *Breaches of Action and Limit Levels for Air Quality*

No exceedance of Action and Limit Levels for 1-hour TSP and 24-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.

#### Environmental Complaints, Non-compliance & Summons

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

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

## 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 February 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 February 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: Jerry Wong 23-Jan-18  
 PATH: Y:\TO\RSS\SL\C4 Drawings\C4 Drawings\2018\_01\_02\A-architectural drawings -CON\60240249\_C4\_7051.dgn



This drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent. Do not scale. All measurements must be obtained from the stated dimensions.

# AECOM

**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 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

**CONSULTANT**  
 AECOM Asia Company Ltd.  
 www.aecom.com

**SUB-CONSULTANTS**

## 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

Ref: File by: jerry.wong 23-Jan-18  
 PATH: Y:\1010\SS\NS\C4 Drawings\C4\_Drawing (2018\_01\_02)\Architectural drawings - DSN\60240249\_C4\_7061.dgn  
 Project Management Initials: Designer: KATH Checked: SYLC Approved: CWN ISO A1 594mm x 841mm  
 01/11/18



**AECOM**

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 HIGHWAYS DEPARTMENT  
港務局 大橋香港工程管理有限公司  
Hong Kong - Zhuhai - Macao Bridge  
Hong Kong Project Management Office

CONSULTANT  
AECOM Asia Company Ltd.  
www.aecom.com

SUB-CONSULTANTS  
S.P.L. GROUP

## Figure 1.2a

ISSUE/REVISION

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

STATUS

SCALE  
A1 1:2500

DIMENSION UNIT  
MILLIMETRES

KEY PLAN

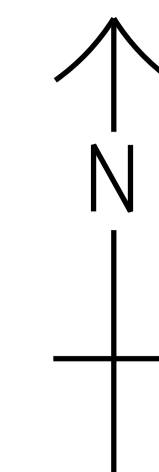
PROJECT NO.  
60240249

CONTRACT NO.  
HY/2017/10

SHEET TITLE  
ZONING PLAN (SHEET 1)

SHEET NUMBER  
60240249/C4/7061A

This drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or distributed without the prior written consent of AECOM. AECOM accepts no responsibility for any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the master drawings.



**AECOM**

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



CONSULTANT  
 工程師/顧問公司

AECOM Asia Company Ltd.  
 www.aecom.com

SUB-CONSULTANTS  
 分判工程師/顧問公司

**Figure 1.2b**

ISSUE/REVISION  
 修訂

I/R 修訂	DATE 日期	DESCRIPTION 修訂描述	CHK. 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  
 圖號/圖名

ZONING PLAN  
 (SHEET 2)

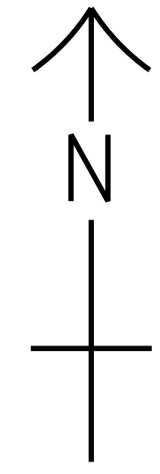
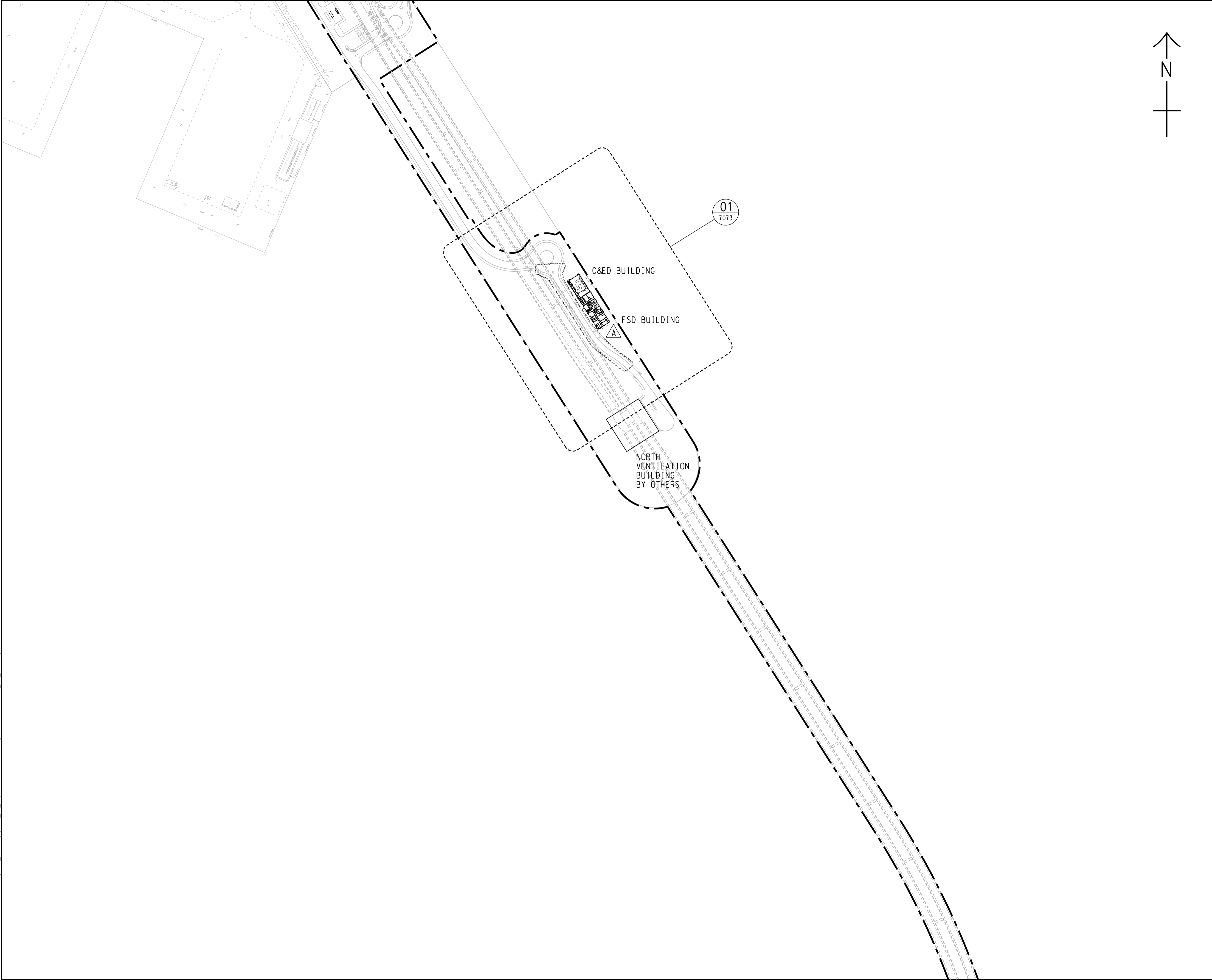
SHEET NUMBER  
 圖號/圖名

60240249/C4/7062A

This drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, for any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the stated dimensions.

Project Management Initials: Designer: KATH Checked: SYLC Approved: CWN  
 16/1/18  
 CWS

Pld File by: jerrywong  
 PATH: \\TOTO10-RSSMSL\C4 Drawings\C4\_Drawing (2018\_01\_02)\Architectural Drawings-DGN\60240249\_C4\_7063.dgn



**AECOM**

**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

**CONSULTANT**  
 工程顧問公司  
 AECOM Asia Company Ltd.  
 www.aecom.com

**SUB-CONSULTANTS**  
 分判工程顧問公司

**Figure 1.2c**

**ISSUE/REVISION**  
 修訂

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  
 60240249/C4/7063A

This drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the stated dimensions.

## 1.2 SCOPE OF REPORT

This is the Twentieth 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 January 2020.

## 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*

<b>Party</b>	<b>Position</b>	<b>Name</b>	<b>Telephone</b>	<b>Fax</b>
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*

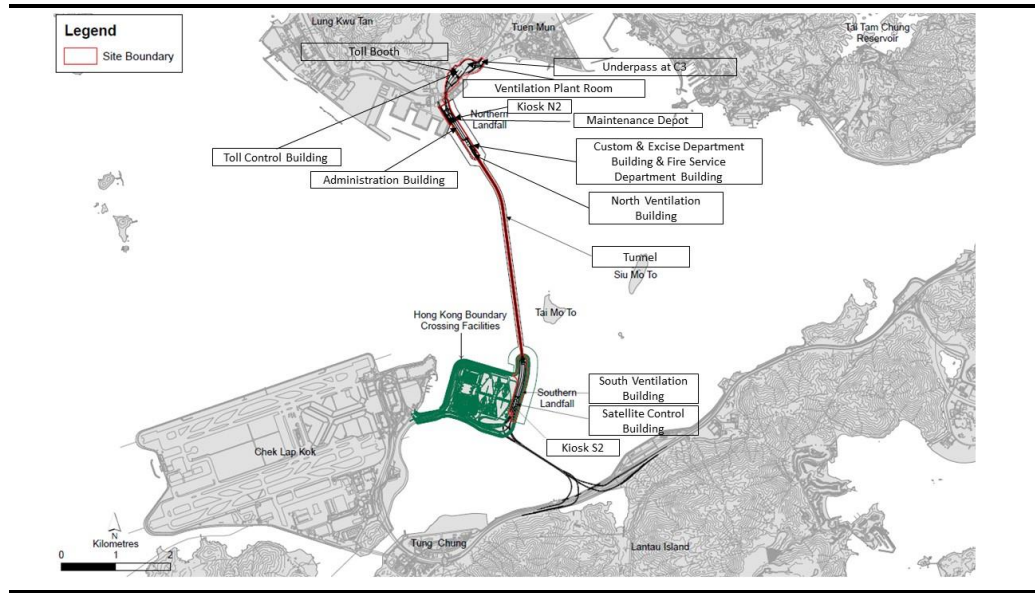
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Toll Control Building;
- Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at North Ventilation Building;

- 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 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*





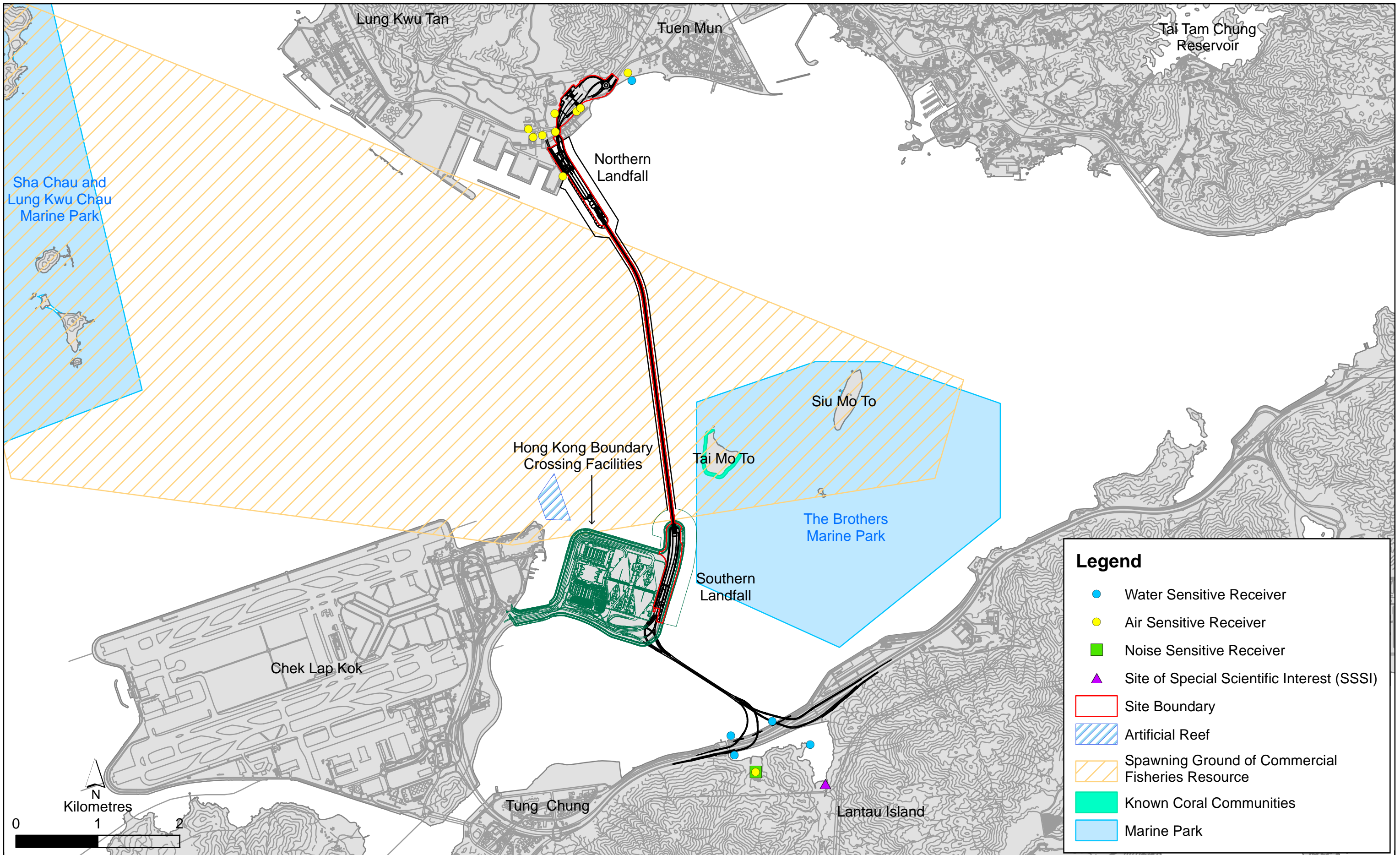


Figure 1.4

Environmental Sensitive Receivers in the Vicinity of the Project

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* <sup>(1)</sup>.

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* <sup>(2)</sup>. 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	3, 6, 9, 12, 15, 18, 21, 24 and 30 January 2020	Tuen Mun Fireboat Station	Office	TSP monitoring
ASR5		Pillar Point Fire Station	Office	<ul style="list-style-type: none"> <li>1-hour Total Suspended Particulates (1-hour TSP, <math>\mu\text{g}/\text{m}^3</math>), 3 times in every 6 days</li> <li>24-hour Total Suspended Particulates (24-hour TSP, <math>\mu\text{g}/\text{m}^3</math>), daily for 24-hour in every 6 days</li> </ul>
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/>

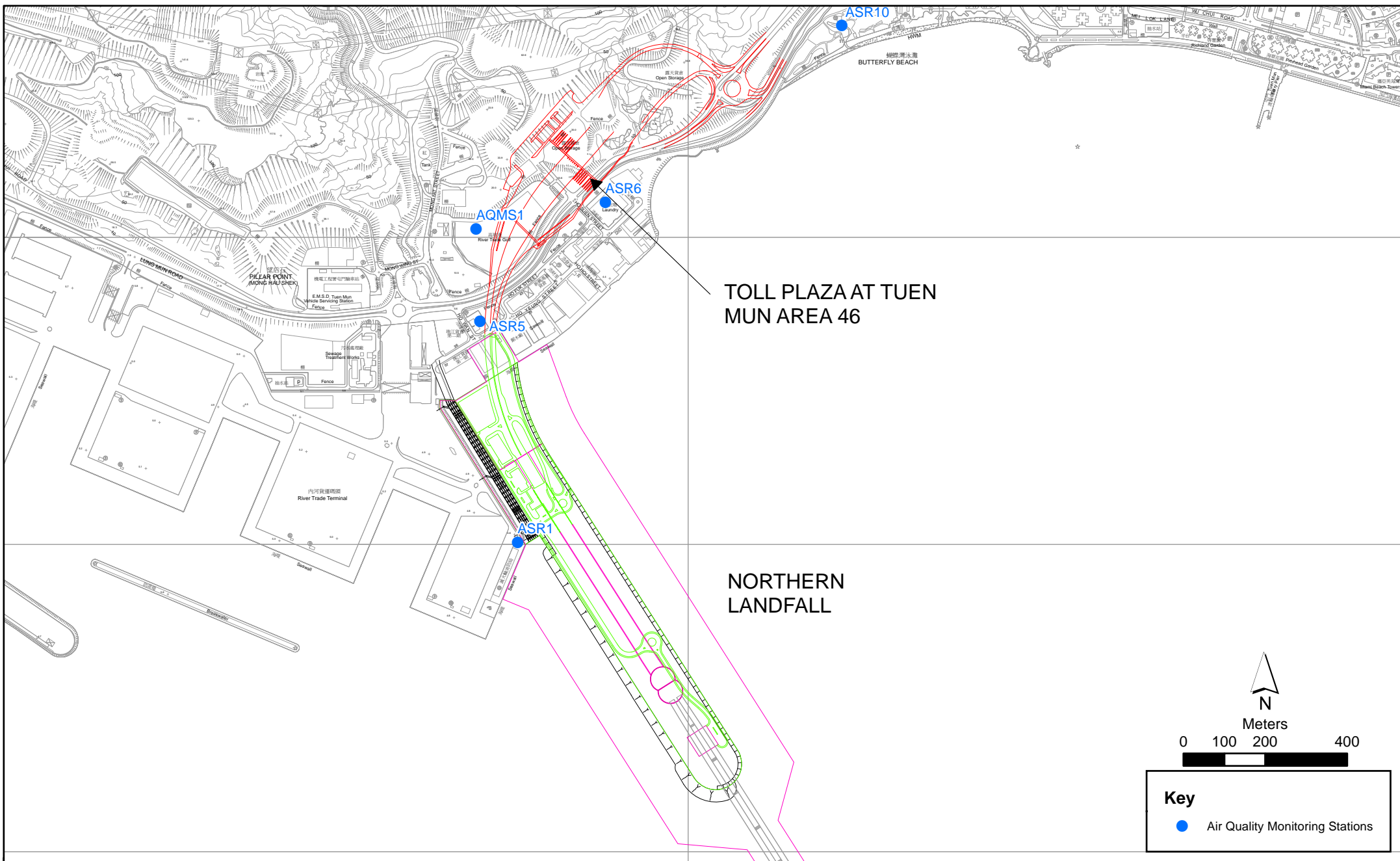


Figure 2.1

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)

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"> <li>1-hour Total Suspended Particulates (1-hour TSP, <math>\mu\text{g}/\text{m}^3</math>), 3 times in every 3 days</li> </ul>
ASR10		Butterfly Beach Park	Recreational uses	<ul style="list-style-type: none"> <li>24-hour Total Suspended Particulates (24-hour TSP, <math>\mu\text{g}/\text{m}^3</math>), daily for 24-hour in every 3 days</li> </ul>

### 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* <sup>(1)</sup>.

No exceedance of Action and Limit Levels for 1-hour TSP and 24-hour TSP were recorded by the Environmental Team of *Contract No. HY/2012/08* during the reporting period. No action is required to be undertaken in accordance with the Event Action Plan as presented in *Appendix E*.

## 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 20 days of landfill gas hazard monitoring was conducted at Toll Control Building during 2 to 24 January 2020 (*Appendix F*). Informed by the Contractor, no landfill gas monitoring is scheduled for February 2020 as no excavation work at Toll Control Building will be undertaken in February 2020.

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*.

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

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

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 (%) <sup>(a)</sup>
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, five (5) site inspections were carried out on 3, 10, 17, 24 and 31 January 2020.

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
3 January 2020	Satellite Control Building <ul style="list-style-type: none"> <li>Chemical containers were observed not placed in drip tray.</li> <li>Housekeeping should be maintained.</li> </ul> South Ventilation Building <ul style="list-style-type: none"> <li>Oil drum on forklift should be removed.</li> </ul>	Satellite Control Building <ul style="list-style-type: none"> <li>The Contractor was reminded to place chemical containers in drip tray.</li> <li>The Contractor was reminded to maintain better housekeeping.</li> </ul> South Ventilation Building <ul style="list-style-type: none"> <li>The Contractor was reminded to remove the oil drum.</li> </ul>
10 January 2020	Tunnel <ul style="list-style-type: none"> <li>Accumulated general refuse should be removed.</li> </ul>	Tunnel <ul style="list-style-type: none"> <li>The Contractor was reminded to regularly cleanup general refuse.</li> </ul>
17 January 2020	North Ventilation Building <ul style="list-style-type: none"> <li>Nil</li> </ul>	North Ventilation Building <ul style="list-style-type: none"> <li>Nil</li> </ul>
24 January 2020	South Ventilation Building <ul style="list-style-type: none"> <li>Drip tray for pipe threading machine was observed damaged.</li> </ul>	South Ventilation Building <ul style="list-style-type: none"> <li>The Contractor was reminded to provide a proper drip tray.</li> </ul>
31 January 2020	Tunnel <ul style="list-style-type: none"> <li>Accumulated general refuse should be removed.</li> </ul>	Tunnel <ul style="list-style-type: none"> <li>The Contractor was reminded to maintain better housekeeping.</li> </ul>

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 <sup>(a)</sup> (m <sup>3</sup> )	Inert Construction Waste Re-used (m <sup>3</sup> )	Non-inert Construction Waste <sup>(b)</sup> (kg)	Imported Fill (m <sup>3</sup> )	Recyclable Materials <sup>(c)</sup> (kg)	Chemical Wastes (kg)
January 2020	10	0	187,500	0	70	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-RS0039-20	23 January 2020	22 July 2020	GCL	For HKBCF Area

## 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*

No exceedance of Action and Limit Levels for 1-hour TSP and 24-hour TSP were recorded by the Environmental Team of Contract No. *HY/2012/08* during the reporting period.

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 February 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 February 2020 are mainly associated with dust and waste management issues.

*4.1 CONCLUSIONS*

This Twentieth Monthly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 31 January 2020, 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.

No exceedance of Action and Limit Levels for 1-hour TSP and 24-hour TSP were recorded by the Environmental Team of Contract No. *HY/2012/08* during the reporting period.

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

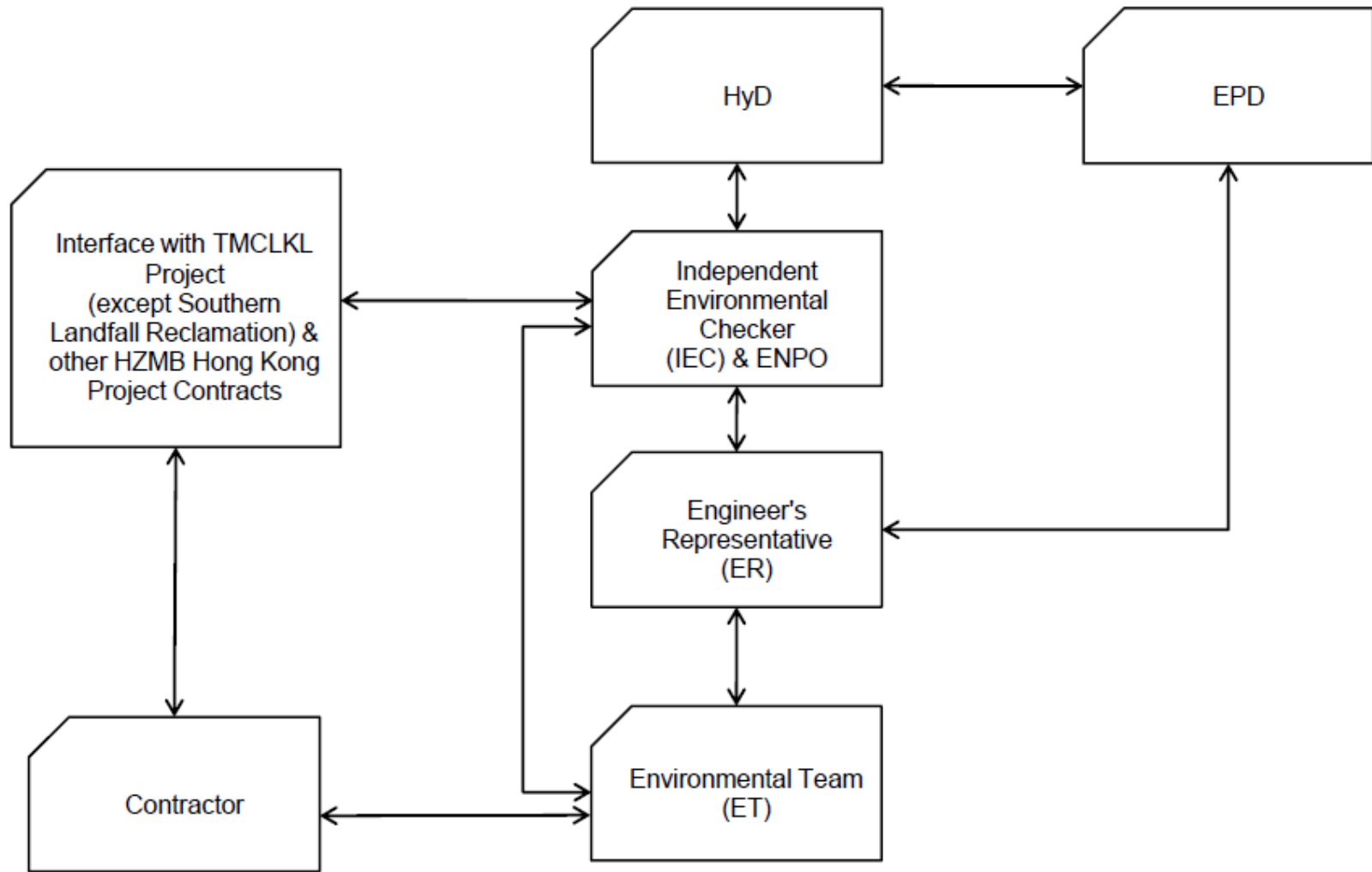
Environmental site inspection was carried out five (5) times in January 2020. Remedial actions recommended for the deficiencies identified during the site audits were properly implemented by the Contractor.

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







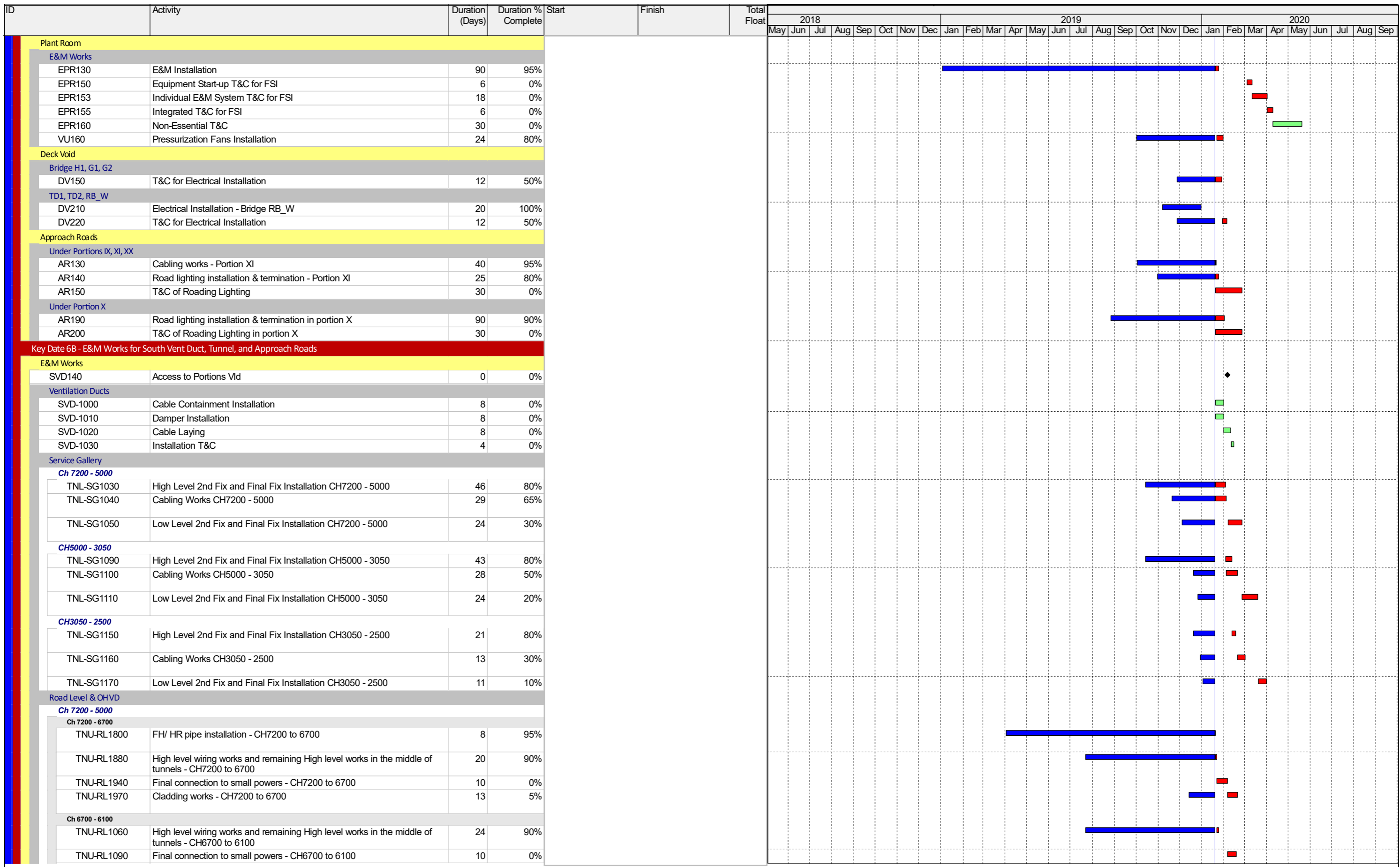












CONTRACT NO. HY2017/10

NORTHERN TUNNEL CONNECTION BUILDING E&M WORKS

THREE MONTHLY PROGRAMME AS OF 20 Jan 2020

P 8

Date	Revision	Checked	Approved
20-Jan-20			





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
TNU-RL3140	FH/ HR pipe installation - CH3050 to 2500	4	100%																																
TNU-RL3150	Cabling Works on Brackets - CH3050 to 2500	11	100%																																
TNU-RL3155	MSFD delivery in OHVD - CH3050 to 2500	9	88.99%																																
TNU-RL3160	MSFD installation works in OHVD - CH3050 to 2500	9	88.99%																																
TNU-RL3170	High level wiring works and remaining High level works in the middle of tunnels - CH3050 to 2500	12	0%																																
TNU-RL3180	Low level works - FS nicle module - CH3050 to 2500	5	0%																																
TNU-RL3190	Low level works - FS nicle connection - CH3050 to 2500	5	0%																																
<b>Other Works</b>																																			
TNU-OW1000	HV Cabling Works in Tunnels	48	100%																																
TNU-OW1010	FR enclosure installation	42	0%																																
<b>T&amp;C</b>																																			
TNL-10TC1010	Permanent power available to tunnels from NVB	0	0%																																
TNL-10TC1016	Partial T&C for Tunnel Ventilation System - CH 7200 to 2500	89	50%																																
TNL-10TC1020	T&C for Tunnel Lighting - CH 7200 to 2500	47	0%																																
TNL-10TC1030	T&C for other Tunnel Services - CH 7200 to 2500	48	0%																																
TNL-10TC1050	T&C for MSFD - CH 7200 to 2500	30	35%																																
TNL-10TC1060	T&C for Service Gallery - Sprinkler System - CH 7200 to 2500	40	0%																																
TNL-10TC1070	T&C for Services Gallery - other services - CH 7200 to 2500	40	0%																																
<b>Key Date 7 - E&amp;M Works for Satellite Control Building and Kiosks S1&amp;S2</b>																																			
<b>E&amp;M Works for Satellite Control Building</b>																																			
<b>E&amp;M Works</b>																																			
<b>Installation</b>																																			
<b>G/F</b>																																			
SCB-EMGF1000	ABWF Works ready for E&M Mobilization to General Areas - G/F	0	0%																																
SCB-EMGF1010	E&M Installation - 1st fix - G/F	30	40%																																
SCB-EMGF1020	E&M Installation - 2nd fix - G/F	30	5%																																
SCB-EMGF1030	E&M Installation - Final fix - G/F	30	0%																																
SCB-EMGF1050	E&M Installation - Generator Room & Fuel Tank Room - G/F	70	35%																																
SCB-EMGF1070	E&M Installation - LV Switch Room - G/F	60	20%																																
SCB-EMGF1080	Cable laying - LV Switch Room - from G/F	42	0%																																
SCB-EMGF1120	Inspection & Handover to CLP	6	0%																																
SCB-EMGF1130	Installation by CLP - CLP Tx Room - G/F	68	0%																																
SCB-EMGF1180	E&M Installation - FS Plant Rooms - G/F	80	10%																																
SCB-EMGF1200	E&M Installation - PD Plant Rooms - G/F	90	10%																																
<b>1/F</b>																																			
SCB-EM1F1000	ABWF Works ready for E&M Mobilization to General Areas - 1/F	0	0%																																
SCB-EM1F1010	E&M Installation - 1st fix - 1/F	30	30%																																
SCB-EM1F1020	E&M Installation - 2nd fix - 1/F	30	0%																																
SCB-EM1F1030	E&M Installation - Final fix - 1/F	30	0%																																
SCB-EM1F1040	ABWF Works ready for E&M Mobilization to Computer Room (TCSS) - 1/F	0	0%																																
SCB-EM1F1050	E&M Installation - Computer Room (TCSS) - 1/F	60	0%																																
SCB-EM1F1070	ABWF Works ready for E&M Mobilization to EL Room - 1/F	0	0%																																
SCB-EM1F1080	E&M Installation - EL Room - 1/F	90	0%																																
SCB-EM1F1090	ABWF Works ready for E&M Mobilization to FS Plant Rooms - 1/F	0	0%																																
SCB-EM1F1100	E&M Installation - FS Plant Rooms - 1/F	85	0%																																
SCB-EM1F1110	ABWF Works ready for E&M Mobilization to Elv Plant Room - 1/F	0	0%																																
SCB-EM1F1120	E&M Installation - ELV Plant Room - 1/F	70	0%																																
<b>Roof</b>																																			

CONTRACT NO. HY2017/10  
 NORTHERN TUNNEL CONNECTION BUILDING E&M WORKS  
 THREE MONTHLY PROGRAMME AS OF 20 Jan 2020

P 10	Date	Revision	Checked	Approved
	20-Jan-20			



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		
<b>SB-SVB-TVF-3</b>																																																									
SVB-TVF2240	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	100%																																																						
SVB-TVF2250	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	7	0%																																																						
SVB-TVF2260	Ventilation fan and duct installation - Fan Room (G/F)	2	100%																																																						
SVB-TVF2270	Leakage test for TVF	8	0%																																																						
<b>SB-SVB-TVF-4</b>																																																									
SVB-TVF2280	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	100%																																																						
SVB-TVF2290	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	8	100%																																																						
SVB-TVF2300	Ventilation fan and duct installation - Fan Room (G/F)	2	100%																																																						
SVB-TVF2310	Leakage test for TVF	8	0%																																																						
<b>SB-SVB-TVF-5</b>																																																									
SVB-TVF2320	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	100%																																																						
SVB-TVF2330	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	7	100%																																																						
SVB-TVF2340	Ventilation fan and duct installation - Fan Room (G/F)	2	100%																																																						
SVB-TVF2350	Leakage test for TVF	8	0%																																																						
<b>SB-SVB-TVF-6</b>																																																									
SVB-TVF2360	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	100%																																																						
SVB-TVF2370	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	7	100%																																																						
SVB-TVF2380	Ventilation fan and duct installation - Fan Room (G/F)	2	100%																																																						
SVB-TVF2390	Leakage test for TVF	8	0%																																																						
<b>SB-SVB-TVF-7</b>																																																									
SVB-TVF2410	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	7	100%																																																						
SVB-TVF2420	Ventilation fan and duct installation - Fan Room (G/F)	2	100%																																																						
SVB-TVF2430	Leakage test for TVF	8	0%																																																						
<b>SB-SVB-TVF-8</b>																																																									
SVB-TVF2450	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	7	100%																																																						
SVB-TVF2460	Ventilation fan and duct installation - Fan Room (G/F)	2	100%																																																						
SVB-TVF2470	Leakage test for TVF	8	0%																																																						
<b>SB-SVB-TVF-9</b>																																																									
SVB-TVF2490	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	7	100%																																																						
SVB-TVF2500	Ventilation fan and duct installation - Fan Room (G/F)	2	100%																																																						
SVB-TVF2510	Leakage test for TVF	8	0%																																																						
<b>SB-SVB-TVF-10</b>																																																									
SVB-TVF2520	Silencer, splitter and duct installation - Upper Attenuator Room (1/F)	6	100%																																																						
SVB-TVF2530	Damper/Silencer and duct installation - Lower Attenuator Room(B1/F)	8	100%																																																						
SVB-TVF2540	Ventilation fan and duct installation - Fan Room (G/F)	2	100%																																																						
SVB-TVF2550	Leakage test for TVF	8	0%																																																						
<b>B2/F</b>																																																									
SVB-EMB21010	E&M Installation - 1st fix - B2/F	25	95%																																																						
SVB-EMB21020	E&M Installation - 2nd fix - B2/F	25	70%																																																						
SVB-EMB21030	E&M Installation - Final fix - B2/F	25	15%																																																						
SVB-EMB21060	E&M Installation - Electrical Plant Rooms- B2/F	40	60%																																																						
SVB-EMB21080	E&M Installation - MVAC Palnt Rooms - B2/F	60	55%																																																						
SVB-EMB21100	E&M Installation - FS Plant Rooms - B2/F	45	60%																																																						
SVB-EMB21110	E&M Installation - PD Palnt Rooms - B2/F	60	35%																																																						
<b>B1/F</b>																																																									

CONTRACT NO. HY2017/10

NORTHERN TUNNEL CONNECTION BUILDING E&M WORKS

THREE MONTHLY PROGRAMME AS OF 20 Jan 2020

P 12

Date	Revision	Checked	Approved
20-Jan-20			



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				
EAR130	Road Lighting Installation & Termination	50	30%				[Gantt bar: Dec 18 - Jan 19]																																
EAR140	T&C & Miscellaneous Works for Statutory Inspection	12	0%				[Gantt bar: Feb 19]																																
EAR300	KD6A Achieved	0	0%				[Milestone: Mar 19]																																
<b>Tunnel</b>																																							
<b>CH7200 - 7300</b>																																							
TNL-09CL5610	T&C & Miscellaneous Works for Statutory Inspection - CH 7300 to 7200	30	0%				[Gantt bar: Mar 19 - Apr 19]																																
TNU-RL2000	Bracket fixing on side wall - CH7200 to 7300	4	0%				[Gantt bar: Dec 18]																																
TNU-RL2010	Lighting in the middle of tunnels - CH7200 to 7300	9	0%				[Gantt bar: Dec 18 - Jan 19]																																
TNU-RL2020	FH/ HR pipe installation - CH7200 to 7300	4	70%				[Gantt bar: Dec 18 - Jan 19]																																
TNU-RL2040	MSFD delivery in OHVD - CH7200 to 7300	4	100%				[Gantt bar: Dec 18]																																
TNU-RL2050	MSFD installation works in OHVD - CH7200 to 7300	4	100%				[Gantt bar: Dec 18]																																
TNU-RL2060	High level wiring works & remaining High level works in tunnel middle - CH7200 to 7300	12	0%				[Gantt bar: Jan 19 - Feb 19]																																
TNU-RL2070	Low level works - FS nicle module - CH7200 to 7300	4	0%				[Gantt bar: Feb 19]																																
TNU-RL2080	Low level works - FS nicle connection - CH7200 to 7300	4	0%				[Gantt bar: Feb 19]																																
TNU-RL2090	Final connection to small powers - CH7200 to 7300	4	0%				[Gantt bar: Feb 19]																																
TNU-RL2100	Cladding works - CH7200 to 7300	5	0%				[Gantt bar: Feb 19 - Mar 19]																																
<b>Key Date 10 - FSD Building Structure &amp; E&amp;M Works</b>																																							
<b>ABWF Works</b>																																							
AFSD1010	Door and Window Frames	19	56%				[Gantt bar: Dec 18 - Jan 19]																																
AFSD1020	ABWF Works to Plant Rooms G/F	56	92%				[Gantt bar: Dec 18 - Jan 19]																																
AFSD1021	ABWF Works to Plant Rooms 1/F	56	92%				[Gantt bar: Dec 18 - Jan 19]																																
AFSD1030	ABWF Works to Office and Corridors G/F	124	92%				[Gantt bar: Dec 18 - Jan 19]																																
AFSD1031	ABWF Works to Office and Corridors 1/F	124	92%				[Gantt bar: Dec 18 - Jan 19]																																
AFSD1040	ABWF Works to Toilets G/F	136	92%				[Gantt bar: Dec 18 - Jan 19]																																
AFSD1060	External Cladding and Wall Plastering	101	62%				[Gantt bar: Dec 18 - Jan 19]																																
AFSD1070	ABWF second fix & final fix	73	0%				[Gantt bar: Mar 19 - Apr 19]																																
<b>E&amp;M Works</b>																																							
<b>Installation</b>																																							
<b>G/F</b>																																							
FSDB-EMGF1010	E&M Installation - 1st fix - G/F	40	85%				[Gantt bar: Dec 18 - Jan 19]																																
FSDB-EMGF1020	E&M Installation - 2nd fix - G/F	40	40%				[Gantt bar: Dec 18 - Jan 19]																																
FSDB-EMGF1030	E&M Installation - Final fix - G/F	30	0%				[Gantt bar: Feb 19 - Mar 19]																																
FSDB-EMGF1040	ABWF Works ready for E&M Mobilization to CLP TX Room - G/F	0	0%				[Milestone: Dec 18]																																
FSDB-EMGF1050	E&M Installation - CLP Tx Room - G/F	18	95%				[Gantt bar: Dec 18 - Jan 19]																																
FSDB-EMGF1060	Inspection & Handover to CLP	6	0%				[Gantt bar: Jan 19]																																
FSDB-EMGF1070	Installation by CLP - CLP Tx Room - G/F	82	0%				[Gantt bar: Jan 19 - Feb 19]																																
FSDB-EMGF1120	E&M Installation - Electrical Plant Rooms - G/F	60	30%				[Gantt bar: Dec 18 - Jan 19]																																
FSDB-EMGF1140	E&M Installation - FS Plant Rooms - G/F	50	35%				[Gantt bar: Dec 18 - Jan 19]																																
FSDB-EMGF1160	E&M Installation - Elv Plant Rooms - G/F	50	5%				[Gantt bar: Dec 18 - Jan 19]																																
<b>1/F</b>																																							
FSDB-EM1F1000	ABWF Works ready for E&M Mobilization to General Areas - 1/F	0	100%				[Milestone: Dec 18]																																
FSDB-EM1F1010	E&M Installation - 1st fix - 1/F	40	55%				[Gantt bar: Dec 18 - Jan 19]																																
FSDB-EM1F1020	E&M Installation - 2nd fix - 1/F	39	15%				[Gantt bar: Dec 18 - Jan 19]																																
FSDB-EM1F1030	E&M Installation - Final fix - 1/F	35	0%				[Gantt bar: Feb 19 - Mar 19]																																
FSDB-EM1F1050	E&M Installation - Emergency Generator & Fuel Tank Rooms - 1/F	60	35%				[Gantt bar: Dec 18 - Jan 19]																																
FSDB-EM1F1060	ABWF Works ready for E&M Mobilization to LV Switch Room - 1/F	0	100%				[Milestone: Dec 18]																																
FSDB-EM1F1070	E&M Installation - LV Switch Room - 1/F	55	35%				[Gantt bar: Dec 18 - Jan 19]																																
FSDB-EM1F1080	Cable laying - LV Switch Room - from 1/F	41	0%				[Gantt bar: Feb 19 - Mar 19]																																
FSDB-EM1F1120	E&M Installation - FS Plant Rooms - 1/F	60	35%				[Gantt bar: Dec 18 - Jan 19]																																

CONTRACT NO. HY2017/10  
NORTHERN TUNNEL CONNECTION BUILDING E&M WORKS  
THREE MONTHLY PROGRAMME AS OF 20 Jan 2020

P 14	Date	Revision	Checked	Approved
	20-Jan-20			

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
FSD-EM1F1140	E&M Installation - PD Plant Rooms - 1/F	60	35%																																				
<b>Roof</b>																																							
FSD-EMRF1000	ABWF Works ready for E&M Mobilization to Roof	0	0%																																				
FSD-EMRF1010	E&M Installation - 1st fix - Roof	20	0%																																				
FSD-EMRF1020	E&M Installation - 2nd fix - Roof	20	0%																																				
FSD-EMRF1030	E&M Installation - Final fix - Roof	20	0%																																				
<b>Key Date 7A - E&amp;M Works for Approach Roads at South Side</b>																																							
<b>Approach Roads</b>																																							
EAR170	Access Portions VIa	0	0%																																				
EAR175	Access Portions VIc	0	0%																																				
EAR180	Road Lighting Cabling (VIa)	18	0%																																				
EAR185	Road Lighting Cabling (VIc)	15	0%																																				
EAR190	Road Lighting Installation & Termination	18	0%																																				
EAR200	T&C	12	0%																																				
<b>Tunnel</b>																																							
EAR160	Access Portions IVb	0	0%																																				
EAR165	Access Portions IVc	0	0%																																				
<b>CH2500 - 2115</b>																																							
TNU-RL3000	Bracket fixing on side wall - CH2500 to 2115	3	0%																																				
TNU-RL3010	Lighting in the middle of tunnels - CH2500 to 2115	6	0%																																				
TNU-RL3020	FH/ HR pipe installation - CH2500 to 2115	6	0%																																				
TNU-RL3030	Cabling Works on Brackets - CH2500 to 2115	8	0%																																				
TNU-RL3040	MSFD delivery in OHVD - CH2500 to 2115	7	0%																																				
TNU-RL3050	MSFD installation works in OHVD - CH2500 to 2115	8	0%																																				
TNU-RL3060	High level wiring works & remaining High level works in tunnel middle - CH2500 to 2115	12	0%																																				
TNU-RL3070	Low level works - FS nicle module - CH2500 to 2115	4	0%																																				
TNU-RL3080	Low level works - FS nicle connection - CH2500 to 2115	4	0%																																				
<b>CH2115 - 1800</b>																																							
TNU-RL3240	Bracket fixing on side wall - CH2115 to 1800	3	0%																																				
TNU-RL3250	Lighting in the middle of tunnels - CH2115 to 1800	6	0%																																				
TNU-RL3260	FH/ HR pipe installation - CH2115 to 1800	6	0%																																				
TNU-RL3270	Cabling Works on Brackets - CH2115 to 1800	8	0%																																				
TNU-RL3275	MSFD delivery in OHVD - CH2115 to 1800	7	0%																																				
TNU-RL3280	MSFD installation works in OHVD - CH2115 to 1800	8	0%																																				
TNU-RL3290	High level wiring works & remaining High level works in tunnel middle - CH2115 to 1800	12	0%																																				
TNU-RL3300	Low level works - FS nicle module - CH2115 to 1800	4	0%																																				
TNU-RL3310	Low level works - FS nicle connection - CH2115 to 1800	4	0%																																				
<b>T&amp;C</b>																																							
TNL-10TC1000	Permanent power available to tunnels from SVB	0	0%																																				
TNL-10TC1130	T&C for Tunnel Lighting - CH 2500 to 1800	37	0%																																				
TNL-10TC1160	T&C for MSFD - CH 2500 to 1800	19	0%																																				
<b>Key Date 9 - C&amp;ED Building &amp; E&amp;M Works</b>																																							
<b>Building Structure</b>																																							
CED260	Roof Slab	30	100%																																				
CED270	Top Roof	14	100%																																				
<b>ABWF Works</b>																																							
ACED1000	Blockwork Walls	54	70%																																				
ACED1010	Door and Window Frames	48	20%																																				
ACED1020	ABWF Works to Plant Rooms G/F	60	20%																																				
ACED1021	ABWF Works to Plant Rooms 1/F	60	20%																																				
ACED1022	ABWF Works to Plant Rooms 2/F	60	20%																																				
ACED1023	ABWF Works to Plant Rooms 3/F	60	20%																																				
ACED1030	ABWF Works to Office and Corridors G/F	133	20%																																				
ACED1031	ABWF Works to Office and Corridors 1/F	118	20%																																				
ACED1032	ABWF Works to Office and Corridors 2/F	130	20%																																				
ACED1033	ABWF Works to Office and Corridors 3/F	92	20%																																				
ACED1040	ABWF Works to Toilets G/F	142	20%																																				
ACED1041	ABWF Works to Toilets 2/F	142	20%																																				

CONTRACT NO. HY2017/10

P 15

NORTHERN TUNNEL CONNECTION BUILDING E&M WORKS

THREE MONTHLY PROGRAMME AS OF 20 Jan 2020

Date	Revision	Checked	Approved
20-Jan-20			

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
ACED1042	ABWF Works to Toilets 3/F	98	20%																				
ACED1050	Waterproofing and Roofing	50	20%																				
ACED1060	External Cladding and Wall Plastering	97	5%																				
<b>E&amp;M Works</b>																							
<b>Installation</b>																							
C&EDB-GF0001	E&M cast-in Installation	90	100%																				
<b>G/F</b>																							
C&EDB-GF1000	ABWF Works ready for E&M Mobilization to General Areas - G/F	0	0%																				
C&EDB-GF1010	E&M Installation - 1st fix - G/F	40	0%																				
C&EDB-GF1020	E&M Installation - 2nd fix - G/F	40	0%																				
C&EDB-GF1040	ABWF Works ready for E&M Mobilization to CLP Tx Room - G/F	0	0%																				
C&EDB-GF1050	E&M Installation - CLP Tx Room - G/F	18	0%																				
C&EDB-GF1060	Inspection & Handover to CLP	6	0%																				
C&EDB-GF1070	Installation by CLP - CLP Tx Room - G/F	82	0%																				
C&EDB-GF1120	E&M Installation - Generator & Fuel Tank Rooms - G/F	90	35%																				
C&EDB-GF1130	ABWF Works ready for E&M Mobilization to FS Plant Rooms - G/F	0	0%																				
C&EDB-GF1140	E&M Installation - FS Plant Rooms - G/F	90	0%																				
C&EDB-GF1150	ABWF Works ready for E&M Mobilization to Elv Plant Rooms - G/F	0	0%																				
C&EDB-GF1160	E&M Installation - Elv Plant Rooms - G/F	90	0%																				
<b>1/F</b>																							
C&EDB-1F1000	ABWF Works ready for E&M Mobilization to General Areas - 1/F	0	0%																				
C&EDB-1F1010	E&M Installation - 1st fix - 1/F	40	0%																				
C&EDB-1F1020	E&M Installation - 2nd fix - 1/F	40	0%																				
C&EDB-1F1040	ABWF Works ready for E&M Mobilization to LV Switch Room - 1/F	0	0%																				
C&EDB-1F1050	E&M Installation - LV Switch Room - 1/F	60	0%																				
C&EDB-1F1060	Cable laying - LV Switch Room - from 1/F	44	0%																				
C&EDB-1F1080	ABWF Works ready for E&M Mobilization to Electrical Plant Rooms - 1/F	0	0%																				
C&EDB-1F1090	E&M Installation - Electrical Plant Rooms - 1/F	90	0%																				
<b>2/F</b>																							
C&EDB-2F1000	ABWF Works ready for E&M Mobilization to General Areas - 2/F	0	0%																				
C&EDB-2F1010	E&M Installation - 1st fix - 2/F	40	0%																				
C&EDB-2F1020	E&M Installation - 2nd fix - 2/F	40	0%																				
C&EDB-2F1050	ABWF Works ready for E&M Mobilization to Electrical Plant Rooms - 2/F	0	0%																				
C&EDB-2F1060	E&M Installation - Electrical Plant Rooms - 2/F	90	0%																				
C&EDB-2F1070	ABWF Works ready for E&M Mobilization to FS Plant Rooms - 2/F	0	0%																				
C&EDB-2F1080	E&M Installation - FS Plant Rooms - 2/F	90	0%																				
C&EDB-2F1090	ABWF Works ready for E&M Mobilization to Elv Plant Rooms - 2/F	0	0%																				
C&EDB-2F1100	E&M Installation - Elv Plant Rooms - 2/F	90	0%																				
<b>3/F</b>																							
C&EDB-3F1000	ABWF Works ready for E&M Mobilization to General Areas - 3/F	0	0%																				
C&EDB-3F1010	E&M Installation - 1st fix - 3/F	30	0%																				
C&EDB-3F1020	E&M Installation - 2nd fix - 3/F	30	0%																				
C&EDB-3F1050	ABWF Works ready for E&M Mobilization to Electrical Plant Rooms - 3/F	0	0%																				
C&EDB-3F1060	E&M Installation - Electrical Plant Rooms - 3/F	84	0%																				
C&EDB-3F1070	ABWF Works ready for E&M Mobilization to MVAC Plant Rooms - 3/F	0	0%																				
C&EDB-3F1080	E&M Installation - MVAC Plant Rooms - 3/F	84	0%																				
C&EDB-3F1090	ABWF Works ready for E&M Mobilization to FS Plant Rooms - 3/F	0	0%																				
C&EDB-3F1100	E&M Installation - FS Plant Rooms - 3/F	80	0%																				
C&EDB-3F1110	ABWF Works ready for E&M Mobilization to PD Plant Rooms - 3/F	0	0%																				
C&EDB-3F1120	E&M Installation - PD Plant Rooms - 3/F	60	0%																				

CONTRACT NO. HY2017/10

P 16

Date	Revision	Checked	Approved
20-Jan-20			

NORTHERN TUNNEL CONNECTION BUILDING E&M WORKS  
THREE MONTHLY PROGRAMME AS OF 20 Jan 2020







## 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	
<b>Air Quality</b>									
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)
<b>WATER QUALITY (LAND WORKS)</b>									
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

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	-	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		✓
<b>WASTE</b>									
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		✓

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	
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		✓
<b>LANDSCAPE AND VISUAL</b>									

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
- △ 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*

<b>Parameters</b>	<b>Action</b>	<b>Limit</b>
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*

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

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

---

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  
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.)	

Remarks:

Informed by the Contractor, no landfill gas monitoring is scheduled for February 2020 as no excavation work at Toll Control Building will be undertaken in February 2020.

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. 2019/12/009  
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	2020-01-02	Toll Control Building	8:15	0	10.0	20.0
TMCLKL	HY/2017/10	2020-01-02	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-03	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-03	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-04	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-04	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-06	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-06	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-07	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-07	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-08	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-08	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-09	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-09	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-10	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-10	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-11	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-11	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-13	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-13	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-14	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-14	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-15	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-15	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-16	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-16	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-17	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-17	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-18	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-18	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-20	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-20	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-21	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-21	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-22	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-22	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-23	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-23	Toll Control Building	13:15	0		
TMCLKL	HY/2017/10	2020-01-24	Toll Control Building	8:15	0		
TMCLKL	HY/2017/10	2020-01-24	Toll Control Building	13:15	0		
					Average	0	
					Min.	0	
					Max.	0	

**Landfill Gas Monitoring Results on Oxygen Level**

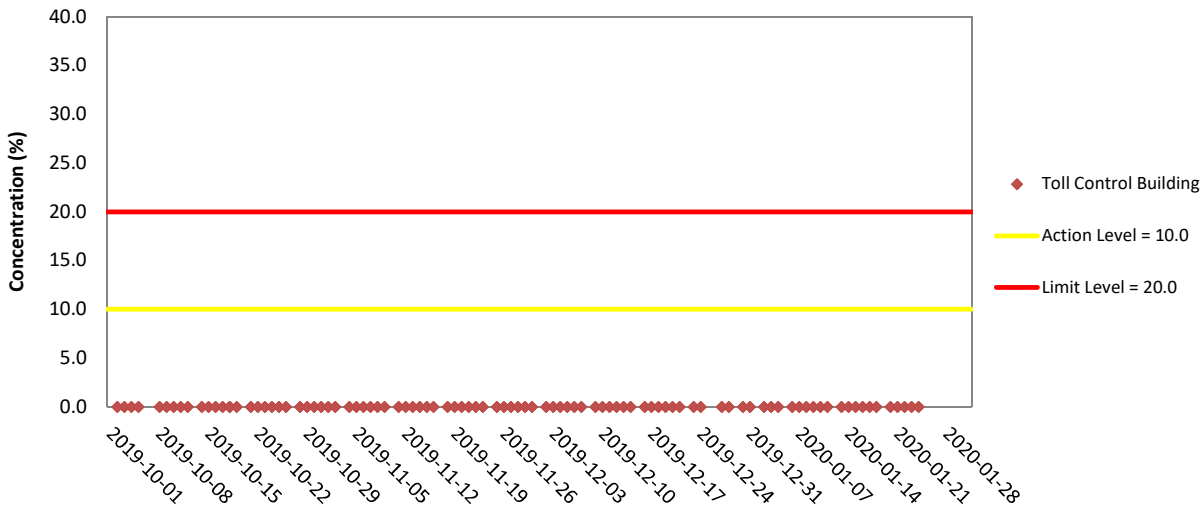
Project	Works	Date(yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Results (%)	Action Level (%)	Limit Level (%)
TMCLKL	HY/2017/10	2020-01-02	Toll Control Building	8:15	20.8	19.0	18.0
TMCLKL	HY/2017/10	2020-01-02	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-03	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-03	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-04	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-04	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-06	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-06	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-07	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-07	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-08	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-08	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-09	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-09	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-10	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-10	Toll Control Building	13:15	20.9		
TMCLKL	HY/2017/10	2020-01-11	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-11	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-13	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-13	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-14	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-14	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-15	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-15	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-16	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-16	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-17	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-17	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-18	Toll Control Building	8:15	20.9		
TMCLKL	HY/2017/10	2020-01-18	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-20	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-20	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-21	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-21	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-22	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-22	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-23	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-23	Toll Control Building	13:15	20.8		
TMCLKL	HY/2017/10	2020-01-24	Toll Control Building	8:15	20.8		
TMCLKL	HY/2017/10	2020-01-24	Toll Control Building	13:15	20.8		
					Average	20.8	
					Min.	20.8	
					Max.	20.9	

**Landfill Gas Monitoring Results on Carbon Dioxide Level**

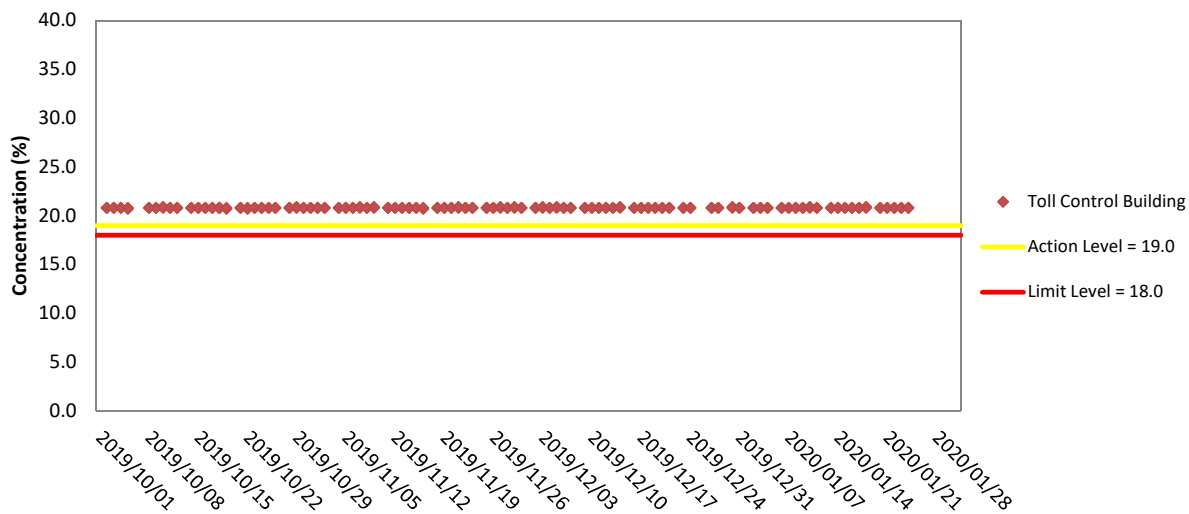
Project	Works	Date(yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Results (%)	Action Level (%)	Limit Level (%)
TMCLKL	HY/2017/10	2020-01-02	Toll Control Building	8:15	0.03	0.5	1.5
TMCLKL	HY/2017/10	2020-01-02	Toll Control Building	13:15	0.04		
TMCLKL	HY/2017/10	2020-01-03	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-03	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-04	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-04	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-06	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-06	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-07	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-07	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-08	Toll Control Building	8:15	0.04		
TMCLKL	HY/2017/10	2020-01-08	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-09	Toll Control Building	8:15	0.04		
TMCLKL	HY/2017/10	2020-01-09	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-10	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-10	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-11	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-11	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-13	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-13	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-14	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-14	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-15	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-15	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-16	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-16	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-17	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-17	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-18	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-18	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-20	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-20	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-21	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-21	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-22	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-22	Toll Control Building	13:15	0.03		
TMCLKL	HY/2017/10	2020-01-23	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-23	Toll Control Building	13:15	0.04		
TMCLKL	HY/2017/10	2020-01-24	Toll Control Building	8:15	0.03		
TMCLKL	HY/2017/10	2020-01-24	Toll Control Building	13:15	0.03		
			Toll Control Building	Average	0.03		
			Toll Control Building	Min.	0.03		
				Max.	0.04		



### Landfill Gas Monitoring Results on Methane Level



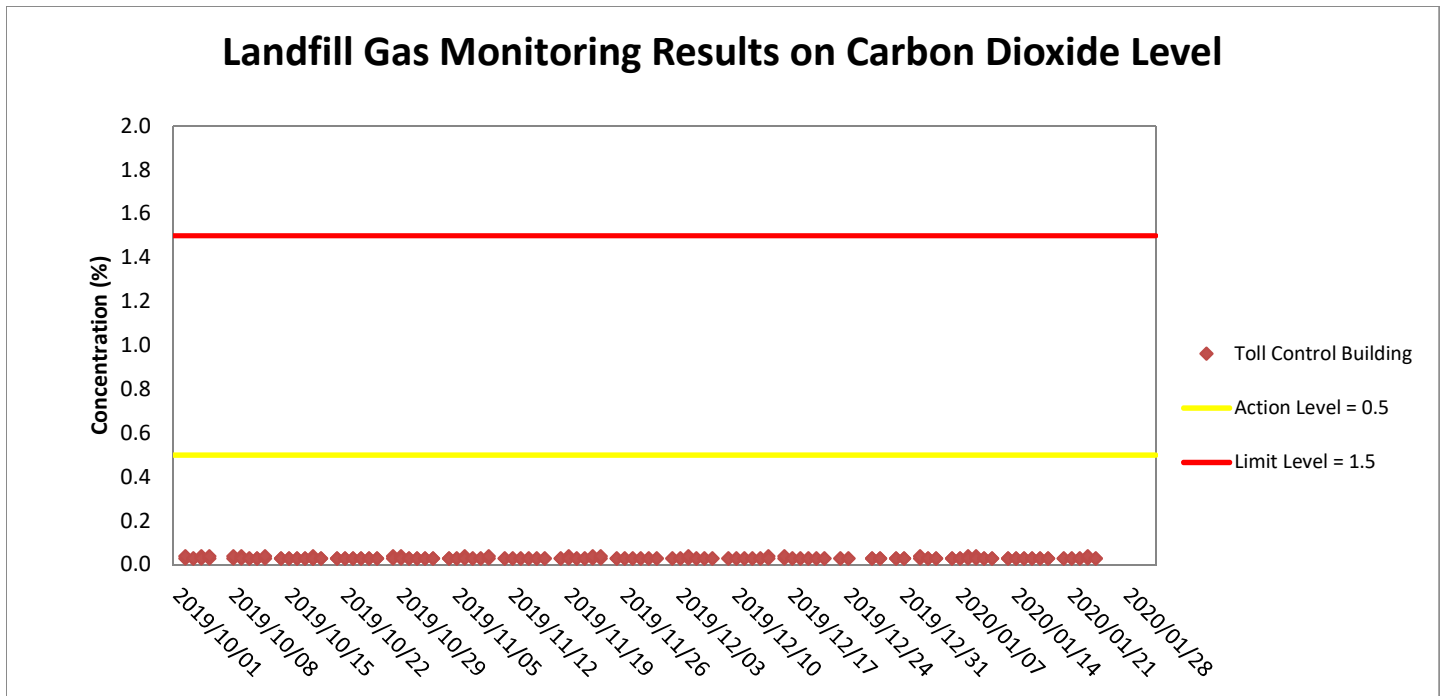
### Landfill Gas Monitoring Results on Oxygen Level



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 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 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 2020 (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 <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000Kg)	('000Kg)	('000Kg)	('000Kg)	('000Kg)	('000Kg)
Jan	0.010	0.000	-	-	0.010	-	-	187.500	-	-	0.070	-
Feb	-	0.000	-	-	-	-	-	-	-	-	-	-
Mar	-	0.000	-	-	-	-	-	-	-	-	-	-
Apr	-	0.000	-	-	-	-	-	-	-	-	-	-
May	-	0.000	-	-	-	-	-	-	-	-	-	-
Jun	-	0.000	-	-	-	-	-	-	-	-	-	-
<b>SUB-TOTAL</b>	<b>0.010</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.010</b>	<b>0.000</b>	<b>0.000</b>	<b>187.500</b>	<b>0.000</b>	<b>0.000</b>	<b>0.070</b>	<b>0.000</b>
Jul	-	0.000	-	-	-	-	-	-	-	-	-	-
Aug	-	0.000	-	-	-	-	-	-	-	-	-	-
Sep	-	0.000	-	-	-	-	-	-	-	-	-	-
Oct	-	-	-	-	-	-	-	-	-	-	-	-
Nov	-	0.000	-	-	-	-	-	-	-	-	-	-
Dec	-	0.000	-	-	-	-	-	-	-	-	-	-
<b>TOTAL</b>	<b>0.010</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.010</b>	<b>0.000</b>	<b>0.000</b>	<b>187.500</b>	<b>0.000</b>	<b>0.000</b>	<b>0.070</b>	<b>0.000</b>

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	0	39
	Limit	0	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 (January 2020)	0	0	0
Total No. received since contract commencement	1	0	0