

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

Eighteenth Monthly EM&A Report

10 December 2019

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





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

Eighteenth Monthly EM&A Report

Document Code: 0463091_18th Monthly EM&A_20191210.doc

| | | | | | |
|--|--------------------------------|--|---------|----------|----------|
| Client: Gammon | | Project No: 0463091 | | | |
| Summary: This document presents the Eighteenth Monthly EM&A Report for Tuen Mun – Chek Lap Kok Link – Northern Connection Tunnel Buildings, Electrical and Mechanical Works. | | Date: 10 December 2019 | | | |
| | | Approved by:  <i>Mr Craig Reid</i> Partner | | | |
| | | Certified by:  <i>Dr Jasmine Ng</i> ET Leader | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | Eighteenth Monthly EM&A Report | CW | JN | CAR | 10/12/19 |
| Revision | Description | By | Checked | Approved | Date |
| <p>This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.</p> <p>We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.</p> | | <p>Distribution</p> <p><input type="checkbox"/> Internal</p> <p><input checked="" type="checkbox"/> Public</p> <p><input type="checkbox"/> Confidential</p> | | | |
| | |   | | | |

12 December 2019

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
18th Monthly EM&A Report for November 2019**

Reference is made to the Environmental Team's submission of the monthly EM&A report for November 2019 (ET's ref.: "0463091_18th Monthly EM&A_20191210.doc" dated 10 December 2019) certified by the ET Leader and provided to us via e-mail on 10 December 2019.

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

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

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



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

c.c.

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

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

Q:\Projects\HYDZHMBEEM00\02_Proj_Mgt\02_Corr\HYDZHMBEEM00_0_7786L.19.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&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&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 Eighteenth Monthly EM&A report presenting the EM&A works carried out during the period from 1 to 30 November 2019 for the *Contract No. HY/2017/10 Northern Connection Tunnel Buildings, Electrical and Mechanical Works* (the “Contract”) in accordance with the Updated EM&A Manual of the TM-CLK Link Project. As informed by the Contractor, major activities in the reporting period included:

Land-based Works

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

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

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

| | |
|-------------------------------------|-------------|
| 24-hour TSP Monitoring | 10 sessions |
| 1-hour TSP Monitoring | 10 sessions |
| Landfill Gas Hazard Monitoring | 26 days |
| Joint Environmental Site Inspection | 5 sessions |

Summary of Breaches of Action/Limit Levels

Breaches of Action and Limit Levels for Air Quality

Five (5) exceedances of Action Level and three (3) exceedances of Limit Level of 1-hour TSP were recorded by the Environmental Team of Contract No. HY/2012/08 during the reporting period.

Breaches of Action Level for Landfill Gas Hazard Monitoring

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

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 December 2019 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 Toll Booth;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Satellite Control Building;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Kiosk S2; and
- Electrical and Mechanical Works at South Ventilation Building.

Future Key Issues

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of December 2019 are mainly associated with dust and waste management issues.

BACKGROUND

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



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.

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

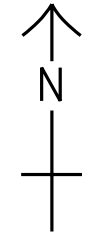
PROJECT NO. 60240249
CONTRACT NO. HY/2017/10

SHEET TITLE
OVERALL SITE PLAN

SHEET NUMBER
60240249/C4/7051A

Plot File by: jerrywong 23-Jan-18
PATH: Y:\TO\RSS\MSL\C4 Drawings\C4_Drawing (2018_01_02)\A-architectural drawings -CON\60240249_C4_7051.dgn

Plot File: jerry.wong 23-Jan-18
 PATH: Y:\1010\SS\SI\C4 Drawings\C4 Drawings\C4_7061.dgn
 Project Management Initials: Designer: KATH Checked: SYLC Approved: CWN ISO A1 594mm x 841mm
 01/1
 01/1
 01/1



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
Hong Kong - Zhuhai - Macao Bridge
Hong Kong Project Management Office

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
SHELL 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

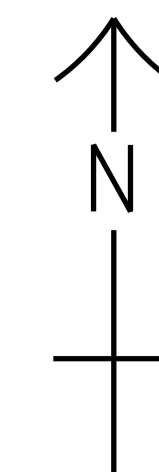
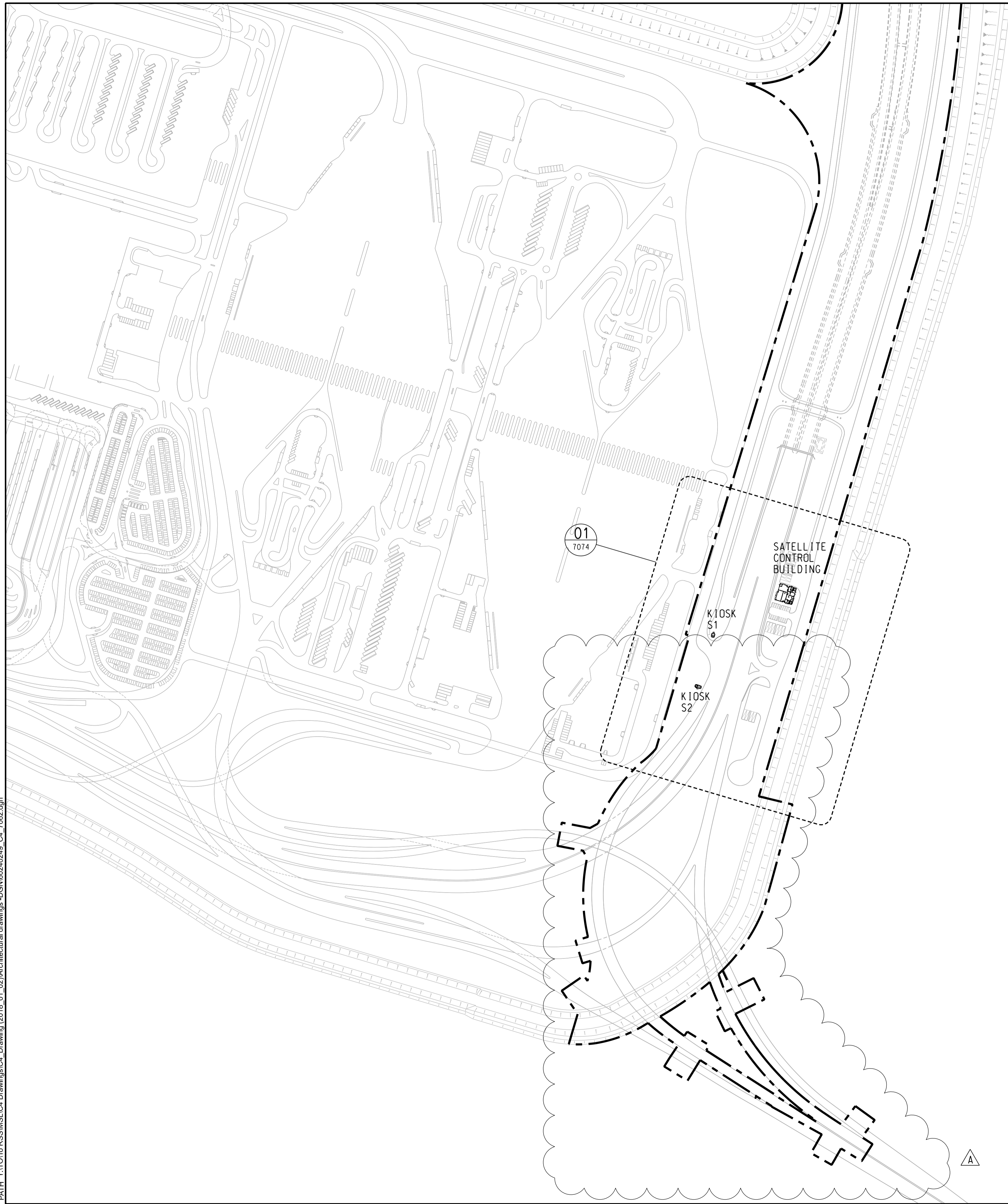
PROJECT NO.
60240249

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 loss or damage caused by the use of 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
 工程顧問公司

AECOM Asia Company Ltd.
 www.aecom.com

SUB-CONSULTANTS
 分判工程顧問公司

Figure 1.2b

ISSUE/REVISION
 修訂

| I/R 修訂 | DATE 日期 | DESCRIPTION 修訂描述 | CHK. 核核 |
|-----------|------------|----------------------|------------|
| 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 2)

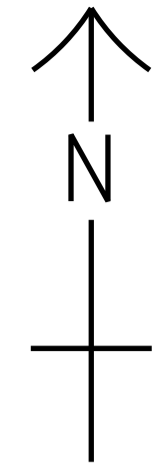
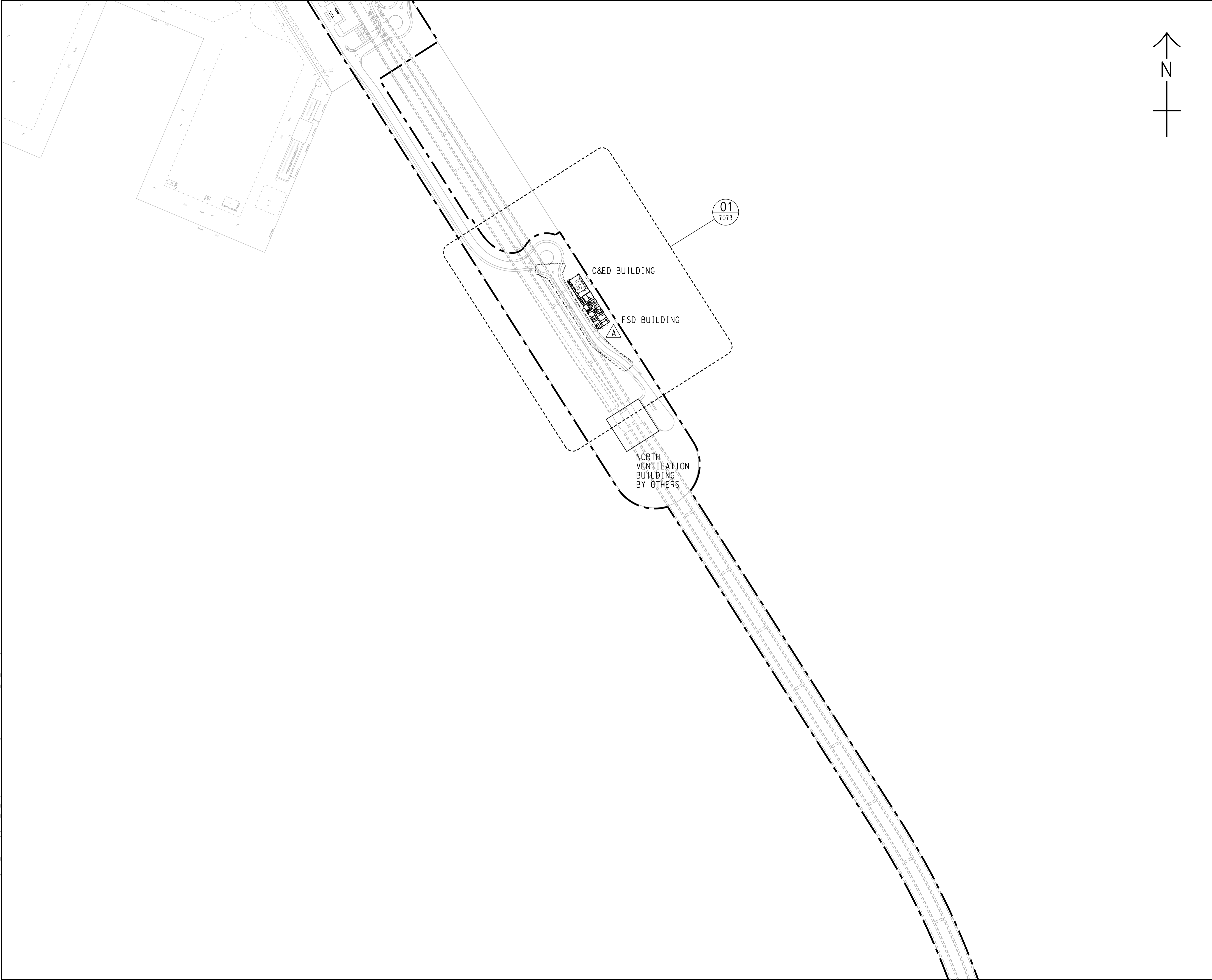
SHEET NUMBER
 圖紙編號

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-RSSMS\SLC4 Drawings\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 Eighteenth 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 November 2019.

1.3 ORGANIZATION STRUCTURE

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

Table 1.1 *Contact Information of Key Personnel*

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

1.4 SUMMARY OF CONSTRUCTION WORKS

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

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

Land-based Works

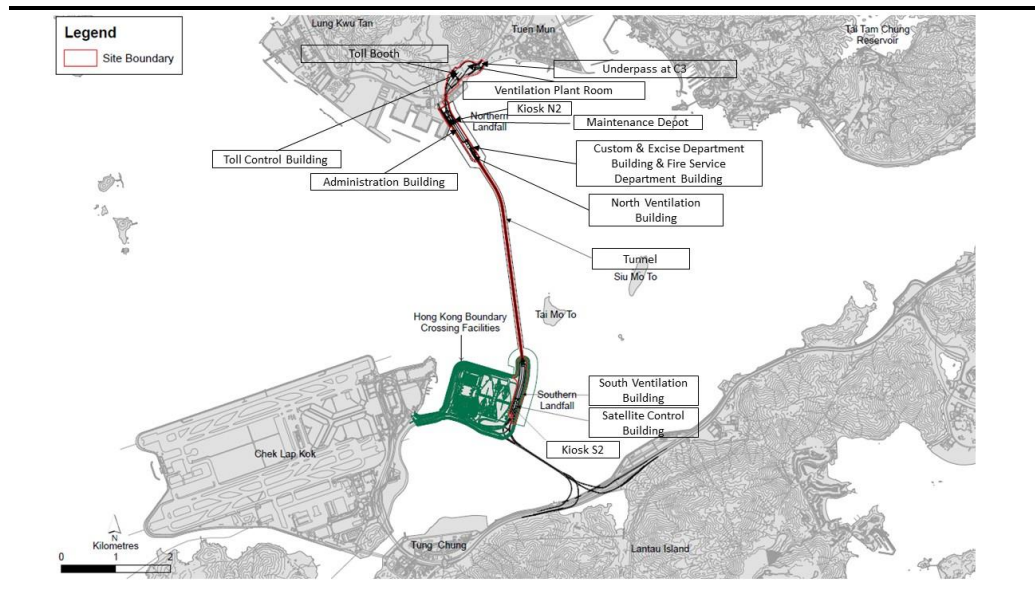
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Toll Control Building;
- Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at North Ventilation Building;

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

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

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

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



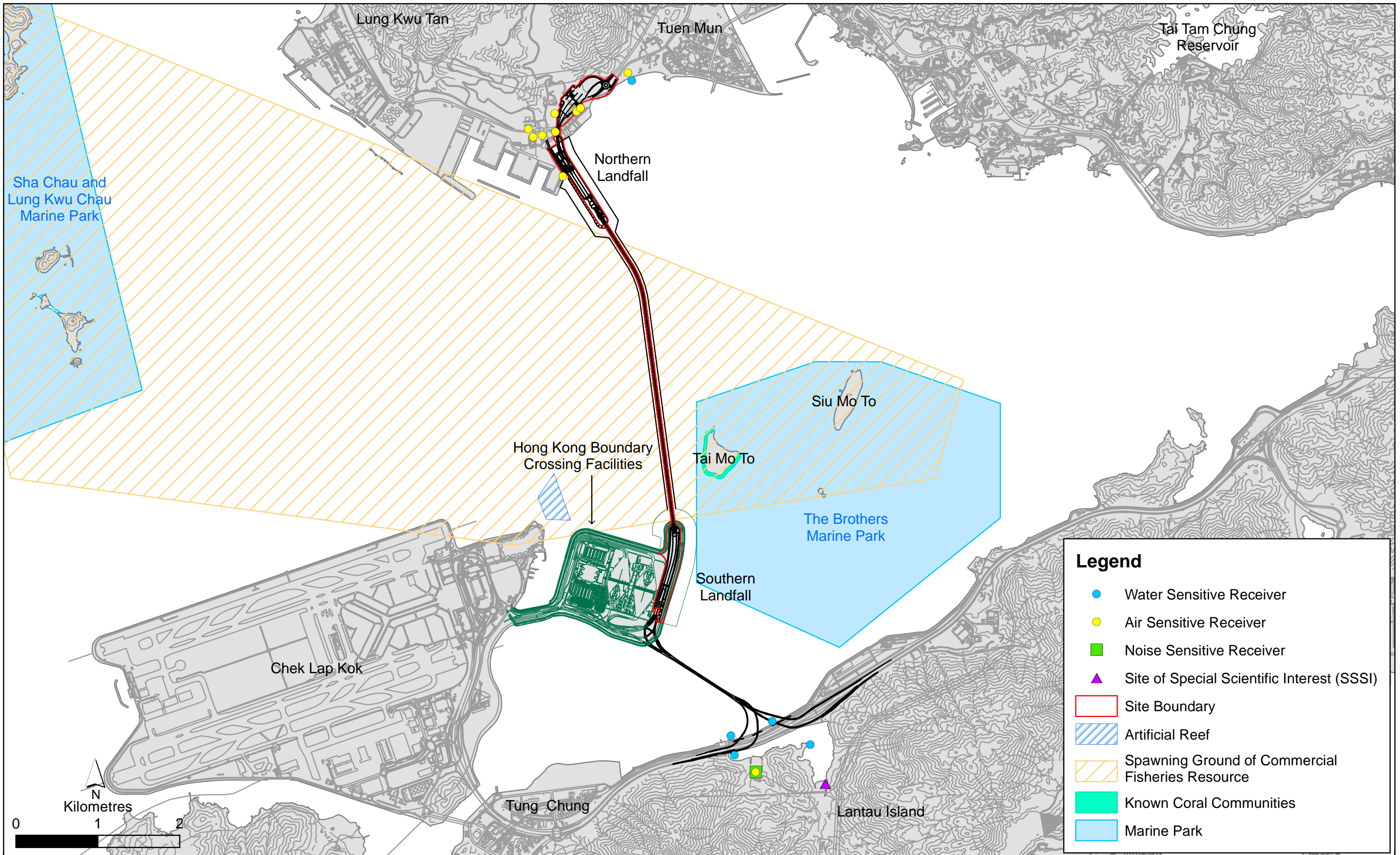


Figure 1.4

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* ⁽¹⁾.

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

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

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

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

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

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



Figure 2.1

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

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

2.1.2 *Results and Observations*

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

Five (5) exceedances of Action Level and three (3) exceedances of Limit Level of 1-hour TSP were recorded by the Environmental Team of *Contract No. HY/2012/08* during the reporting period. The exceedances were considered not related to this Contract upon further investigation and the investigation report is presented in *Appendix J*. No action is required to be undertaken in accordance with the Event Action Plan as presented in *Appendix E*.

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

2.2 *LANDFILL GAS HAZARD MONITORING*

In accordance with the Updated EM&A Manual of the TM-CLK Link Project, landfill gas hazard monitoring should be performed to ensure that the works area at Pillar Point Valley (PPV) Landfill is free of landfill gas during any excavations works. A total of 26 days of landfill gas hazard monitoring was conducted at Toll Control Building during 1 to 30 November 2019 (*Appendix F*).

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

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

2.2.1 *Results and Observations*

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

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

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

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

| | Average (%) | Range (%) | Action Level (%) (a) |
|----------------|-------------|-----------|----------------------|
| Methane | 0 | 0 | 10/20 |
| Oxygen | 20.8 | 20.7-20.9 | 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 1, 8, 15, 22 and 29 November 2019.

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

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

| Inspection Date | Observations | Recommendations/ Remarks |
|------------------|--|--|
| 1 November 2019 | Satellite Control Building <ul style="list-style-type: none"> Chemicals were observed not placed in drip tray. | Satellite Control Building <ul style="list-style-type: none"> The Contractor was reminded to place chemicals in drip tray. |
| 8 November 2019 | Satellite Control Building <ul style="list-style-type: none"> Chemical containers were observed not placed in drip tray. South Ventilation Building <ul style="list-style-type: none"> Pipe threading machine was observed not place in drip tray. | Satellite Control Building <ul style="list-style-type: none"> The Contractor was reminded to place chemical containers in drip tray. South Ventilation Building <ul style="list-style-type: none"> The Contractor was reminded to place the pipe threading machine in drip tray. |
| 15 November 2019 | Fire Services Department Building <ul style="list-style-type: none"> Chemical waste container was observed not locked. | Fire Services Department Building <ul style="list-style-type: none"> The Contractor was reminded to lock the chemical waste container. |
| 22 November 2019 | Satellite Control Building <ul style="list-style-type: none"> Chemical containers were observed not placed in drip tray. | Satellite Control Building <ul style="list-style-type: none"> The Contractor was reminded to place chemical containers in drip tray. |
| 29 November 2019 | Maintenance Depot <ul style="list-style-type: none"> Chemicals were observed not placed in drip tray. | Maintenance Depot <ul style="list-style-type: none"> The Contractor was reminded to place chemicals in drip tray. |

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

2.4 WASTE MANAGEMENT STATUS

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

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

Table 2.4 Quantities of Different Waste Generated in the Reporting Month

| Month/Year | Inert C&D Materials ^(a) (m ³) | Inert Construction Waste Re-used (m ³) | Non-inert Construction Waste ^(b) (kg) | Imported Fill (m ³) | Recyclable Materials ^(c) (kg) | Chemical Wastes (kg) |
|---------------|--|--|--|---------------------------------|--|----------------------|
| November 2019 | 510 | 0 | 305,880 | 0 | 63 | 0 |

Notes:

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

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

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

2.5 ENVIRONMENTAL LICENSES AND PERMITS

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

Table 2.5 Summary of Environmental Licensing and Permit Status

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

2.6 *IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES*

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

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

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

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

Five (5) exceedances of Action Level and three (3) exceedances of Limit Level of 1-hour TSP were recorded by the Environmental Team of Contract No. HY/2012/08 during the reporting period.

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

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

Cumulative statistics are provided in *Appendix J*.

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

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

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

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

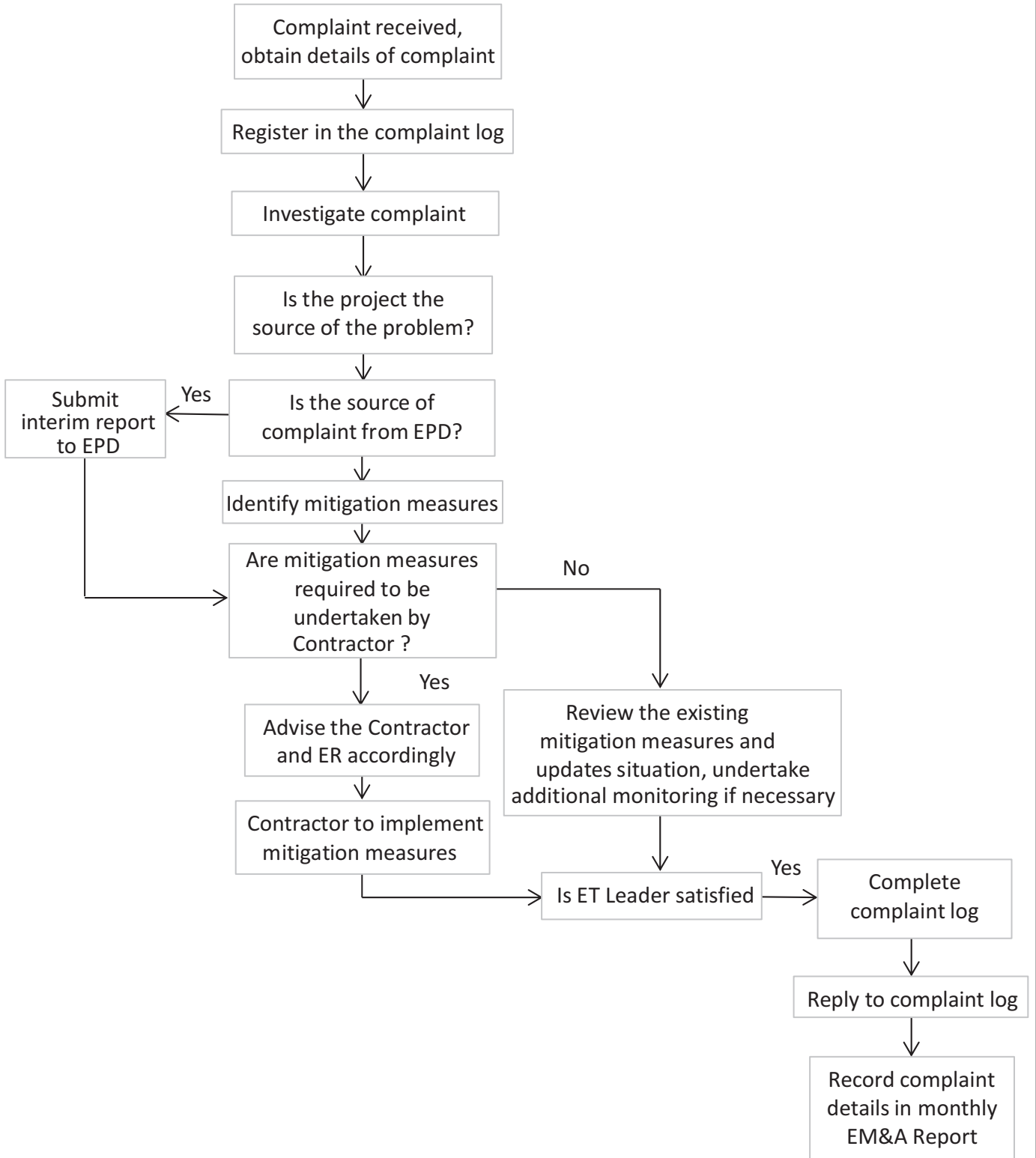


Figure 2.2

Environmental Complaint Handling Procedure

3.1 CONSTRUCTION ACTIVITIES FOR THE COMING MONTH

As informed by the Contractor, the major works for the Contract in December 2019 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 Toll Booth;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Satellite Control Building;
- Electrical and Mechanical Works and Architectural Builders Work and Finishes at Kiosk S2; and
- Electrical and Mechanical Works at South Ventilation Building.

3.2

KEY ISSUES FOR THE COMING MONTH

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of December 2019 are mainly associated with dust and waste management issues.

4.1 CONCLUSIONS

This Eighteenth Monthly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 30 November 2019, in accordance with the Updated EM&A Manual and the requirements of EP-354/2009/D.

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

Five (5) exceedances of Action Level and three (3) exceedances of Limit Level of 1-hour TSP were recorded by the Environmental Team of Contract No. *HY/2012/08* during the reporting period. No exceedance of Action and Limit Levels for 24-hour TSP was recorded in the reporting month.

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

Environmental site inspection was carried out five (5) times in November 2019. Remedial actions recommended for the deficiencies identified during the site audits were properly implemented by the Contractor.

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

The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Appendix A

Project Organization for Environmental Works



↔ Line of Communication

Appendix B

Construction Programme

| ID | Activity | Duration (Days) | Duration % Complete | Start | Finish | Total Float | 2018 | | | | | | | | | | | | 2019 | | | | | | | | | | | | 2020 | | | | |
|---|---|-----------------|---------------------|-------------|--------|-------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|
| | | | | | | | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HY2017/10 - Works Programme Three Month Rolling Programme 20-Nov-19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contract Dates | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Key Dates | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| KD03 | KD03 - Satellite Control Bldg & TCSS Provision | 0 | 0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| KD05 | KD05 - E&M for Toll Area, N1, Underpass, Plant Rm, Footbridges/Roads | 0 | 0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| KD06 | KD06 - E&M for Admin Bldg, Depot, Training Ground, N Vent Bldg, N2 | 0 | 0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| KD06C | KD6C - E&M for South Vent Building | 0 | 0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Portion Access Dates | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P360 | Access to Portion IVa (ML02) | 0 | 100% | 30-Oct-19 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P365 | Access to Portion IVa (ML03) | 0 | 0% | 30-Nov-19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P380 | Access to Portion XVIII | 0 | 100% | 30-Oct-19 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P390 | Access to Portion Va | 0 | 0% | 02-Dec-19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P400 | Access to Portion Vb | 0 | 100% | 30-Oct-19 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P410 | Access to Portion Vd | 0 | 100% | 30-Oct-19 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P420 | Access to Portion II - 8 Jan 2020 | 0 | 0% | 08-Jan-20* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P430 | Access to Portion VI d (Day 641) | 0 | 0% | 06-Feb-20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P440 | Access to Portion IVb | 0 | 0% | 30-Nov-19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P450 | Access to Portion IVc | 0 | 0% | 30-Jan-20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Portion Possession Dates | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P325 | Possession to Portion XXII (Day 483) | 0 | 0% | 20-Nov-19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P335 | Possession to Portion XXIII (Day 483) | 0 | 0% | 20-Nov-19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P345 | Possession to Portion VI b (Day 483) | 0 | 0% | 20-Nov-19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P355 | Possession to Portion VII | 0 | 0% | 30-Nov-19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Portion Handover Dates | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H110 | Vacate Portion XVII b (Day 137 after Possession) | 0 | 0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Major Design Submission & Approval | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Toll Control Building | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MVAC System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TCB-EMD1095 | Authorities Review and Comment of AHU/PAU Static Pressure Calculation | 56 | 50% | 23-Aug-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TCB-EMD1115 | Authorities Review and Comment of MVAC Pump head calculation | 56 | 50% | 23-Aug-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Electrical System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TCB-EMD1015 | Authorities Review and Comment of UPS and Battery Capacity Calculations | 56 | 50% | 22-Aug-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TCB-EMD1055 | Authorities Review and Comment of Generator Calculation | 56 | 50% | 15-Aug-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fire Service System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TCB-EMD1175 | Authorities Review and Comment of FS Pump Head Calculation | 56 | 50% | 01-Aug-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TCB-EMD1195 | Authorities Review and Comment of Sprinkler Pump Head Calculation | 56 | 50% | 14-Aug-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TCB-EMD1215 | Authorities Review and Comment of FM200 System Design Calculation | 56 | 50% | 13-Aug-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Plumbing & Drainage System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TCB-EMD1235 | Authorities Review and Comment of Pump Head Calculation | 56 | 50% | 07-Aug-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TCB-EMD1275 | Authorities Review and Comment of Hot water system capacity calculation | 56 | 50% | 07-Aug-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TCB-EMD1395 | Authorities Review and Comment of Drainage Sump Pumps and Pump Pits Calculation | 56 | 50% | 23-Jul-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Administration Building | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MVAC System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ADB-EMD1015 | Authorities Review and Comment of AC Cooling Capacity Calculation | 56 | 50% | 17-Aug-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ADB-EMD1035 | Authorities Review and Comment of AHU/PAU Static Pressure Calculation | 56 | 50% | 08-Oct-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ADB-EMD1055 | Authorities Review and Comment of Pump head calculation | 56 | 50% | 07-Nov-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ADB-EMD1075 | Authorities Review and Comment of Mechanical Ventilation Capacity Calculation | 56 | 50% | 17-Aug-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Electrical System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ADB-EMD1115 | Authorities Review and Comment of Electrical Loading Demand Calculation | 56 | 50% | 27-Aug-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ADB-EMD1135 | Authorities Review and Comment of Generator Calculation | 56 | 50% | 09-Aug-18 A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

CONTRACT NO. HY2017/10

NORTHERN TUNNEL CONNECTION BUILDING E&M WORKS

THREE MONTHLY PROGRAMME AS OF 20 Nov 2019

| | | | | |
|-----|-----------|----------|---------|----------|
| P 1 | Date | Revision | Checked | Approved |
| | 20-Nov-19 | | | |
| | | | | |
| | | | | |

Appendix C

Environmental Mitigation and Enhancement Measure Implementation Schedules

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

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

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

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

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

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

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

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

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

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

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

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 | | ✓ |
| WASTE | | | | | | | | | |
| 12.6 | | The Contractor shall identify a coordinator for the management of waste. | Contract mobilisation | Contractor | TMEIA | | Y | | ✓ |
| 12.6 | | The Contractor shall prepare and implement a Waste Management Plan which specifies procedures such as a ticketing system, to facilitate tracking of loads and to ensure that illegal disposal of wastes does not occur, and protocols for the maintenance of records of the quantities of wastes generated, recycled and disposed. A recording system for the amount of waste generated, recycled and disposed (locations) should be established. | Contract mobilisation | Contractor | TMEIA, Works Branch Technical Circular No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material | | Y | | ✓ |
| 12.6 | | The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges. | Contract mobilisation | Contractor | TMEIA, Land (Miscellaneous Provisions) Ordinance (Cap 28); Waste Disposal Ordinance (Cap 354); Dumping at Sea Ordinance (Cap 466); Water Pollution Control Ordinance. | | Y | | ✓ |
| 12.6 | 8.1 | Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures including waste reduction, reuse and recycling. | Contract Mobilisation | Contractor | TMEIA | | Y | | ✓ |
| 12.6 | 8.1 | The extent of cutting operation should be optimised where possible. Earth retaining structures and bored pile walls should be proposed to minimise the extent of cutting. | All areas / throughout construction period | Contractor | TMEIA | | Y | | ✓ |
| 12.6 | 8.1 | The site and surroundings shall be kept tidy and litter free. | All areas / throughout construction period | Contractor | TMEIA | | Y | | ↔ |
| 12.6 | 8.1 | No waste shall be burnt on site. | All areas / throughout construction period | Contractor | TMEIA | | Y | | ✓ |
| 12.6 | 8.1 | The Contractor shall be prohibited from disposing of C&D materials at any sensitive locations. The Contractor should propose the final disposal sites in the EMP and WMP for approval before implementation. | All areas / throughout construction period | Contractor | TMEIA | | Y | | ✓ |

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 | | ✓ |
| LANDSCAPE AND VISUAL | | | | | | | | | |

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

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

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

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

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

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

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

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

*** Remarks:**

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

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

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

Appendix D

Summary of Action and Limit Levels

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

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

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

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

Appendix E

Event Action Plan

Appendix E1 Event/ Action Plan for Air Quality

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

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

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

8. If the exceedance stops, cease
additional monitoring.

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

Appendix F

EM&A Monitoring Schedule

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

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

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

Appendix G

Calibration Certificate of Monitoring Equipment



MSA Hong Kong Ltd.

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

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

Ref. 2019/05/005
Customer Gammon Constructions Limited

Date: 24-May-19

CERTIFICATE FOR CALIBRATION CHECK TEST

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

Remarks: Regular inspection completed. Calibration passed

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

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

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

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

For and on behalf of
MSA Hong Kong Ltd.



Authorised Signature

Appendix H

Landfill Gas Monitoring
Results and Graphical
Presentation

Landfill Gas Monitoring Results on Methane Level

| Project | Works | Date(yyyy-mm-dd) | Monitoring Location | Time (hh:mm, 24hour) | Results (%) | Action Level (%) | Limit Level (%) |
|---------|------------|------------------|-----------------------|----------------------|-------------|------------------|-----------------|
| TMCLKL | HY/2017/10 | 2019-11-01 | Toll Control Building | 8:15 | 0 | 10.0 | 20.0 |
| TMCLKL | HY/2017/10 | 2019-11-01 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-02 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-02 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-04 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-04 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-05 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-05 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-06 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-06 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-07 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-07 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-08 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-08 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-09 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-09 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-11 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-11 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-12 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-12 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-13 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-13 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-14 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-14 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-15 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-15 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-16 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-16 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-18 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-18 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-19 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-19 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-20 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-20 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-21 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-21 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-22 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-22 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-23 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-23 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-25 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-25 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-26 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-26 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-27 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-27 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-28 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-28 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-29 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-29 | Toll Control Building | 13:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-30 | Toll Control Building | 8:15 | 0 | | |
| TMCLKL | HY/2017/10 | 2019-11-30 | Toll Control Building | 13:15 | 0 | | |
| | | | | | Average | 0 | |
| | | | | | Min. | 0 | |
| | | | | | Max. | 0 | |

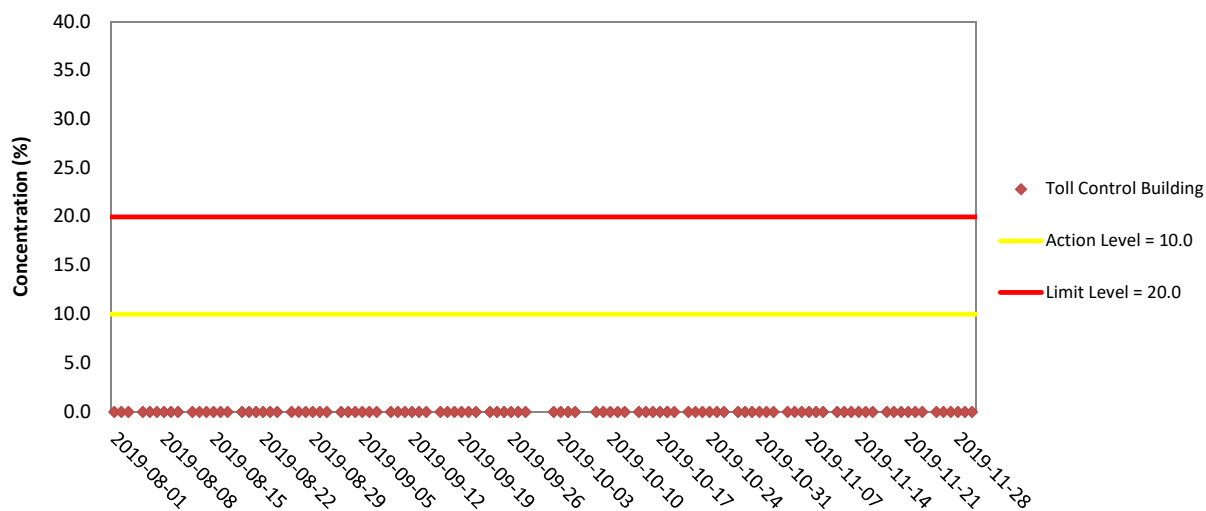
Landfill Gas Monitoring Results on Oxygen Level

| Project | Works | Date(yyyy-mm-dd) | Station | Time (hh:mm, 24hour) | Results (%) | Action Level (%) | Limit Level (%) |
|---------|------------|------------------|-----------------------|----------------------|-------------|------------------|-----------------|
| TMCLKL | HY/2017/10 | 2019-11-01 | Toll Control Building | 8:15 | 20.8 | 19.0 | 18.0 |
| TMCLKL | HY/2017/10 | 2019-11-01 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-02 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-02 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-04 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-04 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-05 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-05 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-06 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-06 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-07 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-07 | Toll Control Building | 13:15 | 20.9 | | |
| TMCLKL | HY/2017/10 | 2019-11-08 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-08 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-09 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-09 | Toll Control Building | 13:15 | 20.9 | | |
| TMCLKL | HY/2017/10 | 2019-11-11 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-11 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-12 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-12 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-13 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-13 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-14 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-14 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-15 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-15 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-16 | Toll Control Building | 8:15 | 20.7 | | |
| TMCLKL | HY/2017/10 | 2019-11-16 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-18 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-18 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-19 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-19 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-20 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-20 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-21 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-21 | Toll Control Building | 13:15 | 20.9 | | |
| TMCLKL | HY/2017/10 | 2019-11-22 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-22 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-23 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-23 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-25 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-25 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-26 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-26 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-27 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-27 | Toll Control Building | 13:15 | 20.9 | | |
| TMCLKL | HY/2017/10 | 2019-11-28 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-28 | Toll Control Building | 13:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-29 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-29 | Toll Control Building | 13:15 | 20.9 | | |
| TMCLKL | HY/2017/10 | 2019-11-30 | Toll Control Building | 8:15 | 20.8 | | |
| TMCLKL | HY/2017/10 | 2019-11-30 | Toll Control Building | 13:15 | 20.8 | | |
| | | | | | Average | 20.8 | |
| | | | | | Min. | 20.7 | |
| | | | | | Max. | 20.9 | |

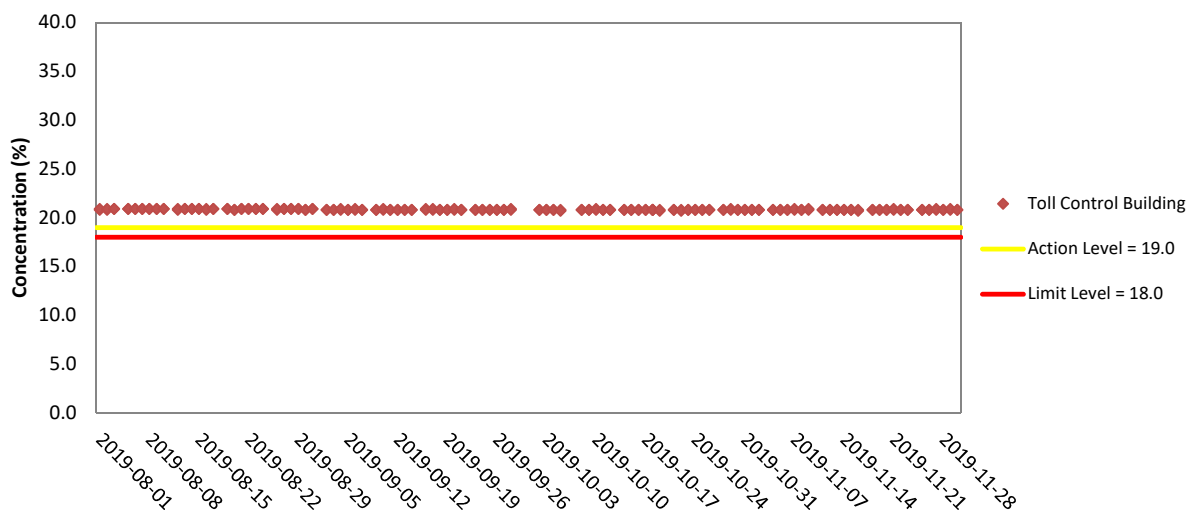
Landfill Gas Monitoring Results on Carbon Dioxide Level

| Project | Works | Date(yyyy-mm-dd) | Station | Time (hh:mm, 24hour) | Results (%) | Action Level (%) | Limit Level (%) |
|---------|------------|------------------|-----------------------|----------------------|-------------|------------------|-----------------|
| TMCLKL | HY/2017/10 | 2019-11-01 | Toll Control Building | 8:15 | 0.03 | 0.5 | 1.5 |
| TMCLKL | HY/2017/10 | 2019-11-01 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-02 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-02 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-04 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-04 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-05 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-05 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-06 | Toll Control Building | 8:15 | 0.04 | | |
| TMCLKL | HY/2017/10 | 2019-11-06 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-07 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-07 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-08 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-08 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-09 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-09 | Toll Control Building | 13:15 | 0.04 | | |
| TMCLKL | HY/2017/10 | 2019-11-11 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-11 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-12 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-12 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-13 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-13 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-14 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-14 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-15 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-15 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-16 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-16 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-18 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-18 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-19 | Toll Control Building | 8:15 | 0.04 | | |
| TMCLKL | HY/2017/10 | 2019-11-19 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-20 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-20 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-21 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-21 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-22 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-22 | Toll Control Building | 13:15 | 0.04 | | |
| TMCLKL | HY/2017/10 | 2019-11-23 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-23 | Toll Control Building | 13:15 | 0.04 | | |
| TMCLKL | HY/2017/10 | 2019-11-25 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-25 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-26 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-26 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-27 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-27 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-28 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-28 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-29 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-29 | Toll Control Building | 13:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-30 | Toll Control Building | 8:15 | 0.03 | | |
| TMCLKL | HY/2017/10 | 2019-11-30 | Toll Control Building | 13:15 | 0.03 | | |
| | | | | | Average | 0.03 | |
| | | | | | Min. | 0.03 | |
| | | | | | Max. | 0.04 | |

Landfill Gas Monitoring Results on Methane Level



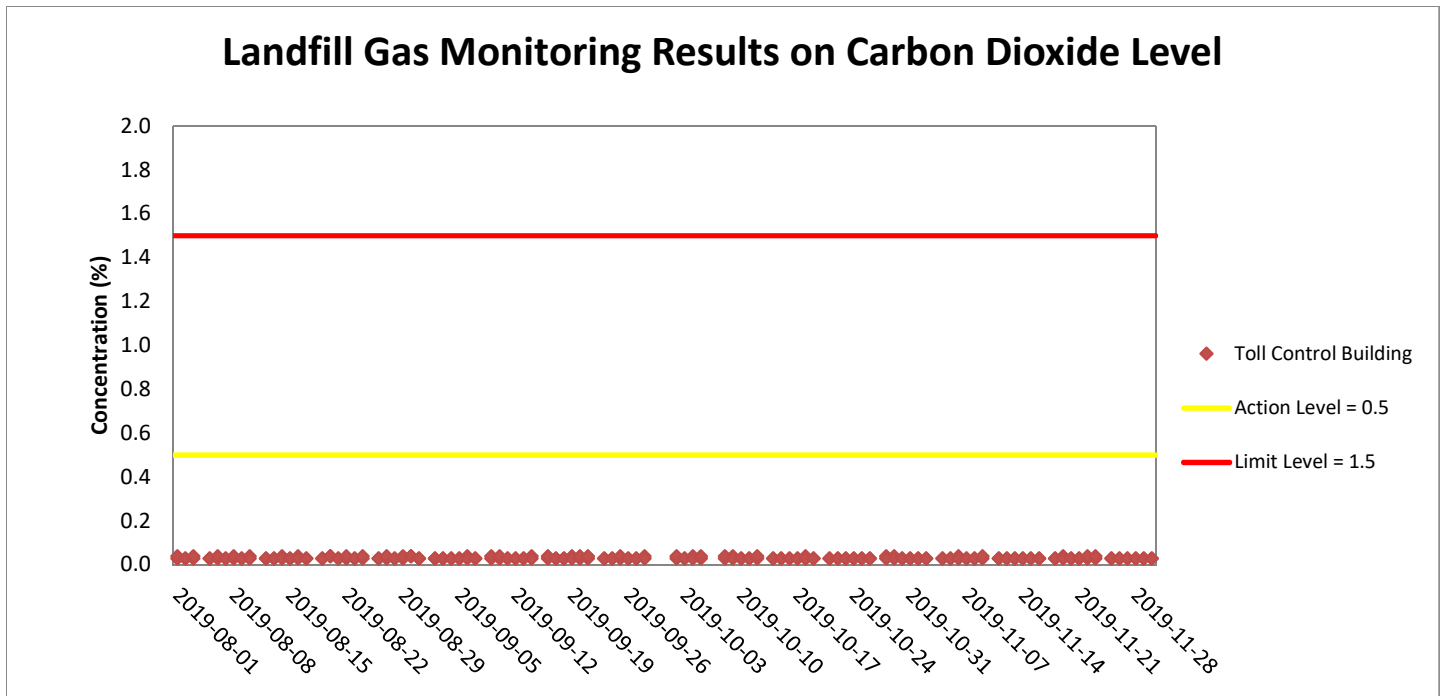
Landfill Gas Monitoring Results on Oxygen Level



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



Weather condition within the reporting period was sunny to rainy

Major construction works undertaken within the reporting period include

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

Appendix I

Monthly Summary of Waste Flow Table

Contract No. : HY/2017/10

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

Monthly Summary Waste Flow Table for 2019 (Year)

| Month/Material | Actual Quantities of Inert C&D Materials Generation | | | | | | Actual Quantities of C&D wastes Generation | | Actual Quantities of Recyclables Generation | | | |
|------------------|---|-------------------------------------|------------------------|--------------------------|--------------------------|-----------------------|--|------------------|---|--------------|----------------------------|--------------|
| | Total Quantity Generated | Hard Rock and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fills | Imported Fill | Chemical Waste | General Refuse | Metals | Felled trees | Paper/ cardboard packaging | Plastics |
| Unit | ('000m ³) | ('000m ³) | ('000m ³) | ('000m ³) | ('000m ³) | ('000m ³) | ('000Kg) | ('000Kg) | ('000Kg) | ('000Kg) | ('000Kg) | ('000Kg) |
| Jan | 2.089 | - | 0.150 | - | 1.939 | - | - | 74.680 | 47.620 | - | 0.077 | - |
| Feb | 2.474 | 0.008 | 0.345 | - | 2.129 | - | - | 67.230 | - | - | 0.056 | - |
| Mar | 0.079 | 0.060 | - | - | 0.079 | - | - | 73.690 | 23.310 | - | - | - |
| Apr | 0.013 | - | - | - | 0.013 | - | - | 56.730 | 18.020 | - | 0.056 | - |
| May | - | - | - | - | - | - | - | 62.240 | - | - | 0.056 | - |
| Jun | 0.011 | 0.004 | - | - | 0.011 | - | - | 118.070 | - | - | 0.077 | - |
| SUB-TOTAL | 4.666 | 0.072 | 0.495 | 0.000 | 4.171 | 0.000 | 0.000 | 452.640 | 88.950 | 0.000 | 0.322 | 0.000 |
| Jul | 0.058 | 0.019 | - | - | 0.058 | - | - | 148.880 | - | - | 0.070 | - |
| Aug | 0.192 | 0.073 | - | - | 0.192 | - | - | 177.240 | - | - | - | - |
| Sep | 0.177 | 0.015 | - | - | 0.177 | - | - | 196.740 | - | - | 0.063 | - |
| Oct | 0.200 | - | - | - | 0.200 | - | - | 265.560 | - | - | 0.056 | - |
| Nov | 0.510 | 0.119 | - | - | 0.510 | - | - | 305.880 | - | - | 0.063 | - |
| Dec | - | - | - | - | - | - | - | - | - | - | - | - |
| TOTAL | 5.803 | 0.298 | 0.495 | 0.000 | 5.308 | 0.000 | 0.000 | 1,546.940 | 88.950 | 0.000 | 0.574 | 0.000 |

Notes :

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

Appendix J

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

Appendix J1 Cumulative Statistics on Exceedances

| | | Total No. recorded in this reporting month | Total No. recorded since contract commencement |
|--------------------------------|--------|---|--|
| 1-Hr TSP | Action | 5 | 35 |
| | Limit | 3 | 7 |
| 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 (November 2019) | 0 | 0 | 0 |
| Total No. received since contract commencement | 1 | 0 | 0 |

Email
message

Environmental
Resources
Management

To Ramboll Hong Kong Limited (ENPO)

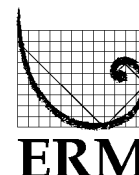
From ERM- Hong Kong, Limited

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

Subject Notification of Exceedance for Air Quality
Impact Monitoring

Date 3 December 2019

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



Dear Sir/ Madam,

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

Action Level Exceedance

0463091_4November2019_1hrTSP_Station ASR5

Limit Level Exceedance

0463091_4November2019_1hrTSP_Station ASR1

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

Regards,

Dr Jasmine Ng
Environmental Team Leader

CONFIDENTIALITY NOTICE

This facsimile transmission is intended only for the use of the addressee and is confidential. If you are not the addressee it may be unlawful for you to read, copy, distribute, disclose or otherwise use the information in this facsimile. If you are not the intended recipient, please telephone or fax us immediately.



ERM-Hong Kong, Limited

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

Air Quality Impact Monitoring

Notification of Exceedance

| | | |
|--|---|---|
| Log No. | <p style="text-align: center;"><u>Action Level Exceedance</u> 0463091_4November2019_1hrTSP_Station ASR5</p> <p style="text-align: center;"><u>Limit Level Exceedance</u> 0463091_4November2019_1hrTSP_Station ASR1</p> <p style="text-align: center;">[Total No. of Exceedances = 2]</p> | |
| Date | <p style="text-align: center;">4 November 2019 (Measured) 3 December 2019 (Results obtained from ENPO Website)</p> | |
| Monitoring Station | <p style="text-align: center;">ASR1 and ASR5</p> | |
| Parameter(s) with Exceedance(s) | <p style="text-align: center;">1- hr TSP</p> | |
| Action Levels | <p style="text-align: center;">1-hr TSP ($\mu\text{g}/\text{m}^3$)</p> | <p>ASR1 = 331 ASR5 = 340 ASR6 = 338 ASR10 = 335 AQMS1 = 337</p> |
| | <p style="text-align: center;">24-hr TSP ($\mu\text{g}/\text{m}^3$)</p> | <p>ASR1 = 213 ASR5 = 238 ASR6 = 238 ASR10 = 214 AQMS1 = 213</p> |
| Limit Levels | <p style="text-align: center;">1-hr TSP ($\mu\text{g}/\text{m}^3$)</p> | <p style="text-align: center;">500</p> |
| | <p style="text-align: center;">24-hr TSP ($\mu\text{g}/\text{m}^3$)</p> | <p style="text-align: center;">260</p> |
| Measured Levels | <p>Refer to the attached data sheet (Data are source from Contract No. HY/2012/08).</p> | |
| Works Undertaken (at the time of monitoring event) | <p>Works undertaken under this Contract on 4 November 2019 included</p> <ul style="list-style-type: none"> • 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 the Tunnel; • Electrical and Mechanical Works and Architectural Builders Work and Finishes at Satellite Control Building; and • Electrical and Mechanical Works at South Ventilation Building. | |

| | |
|--|--|
| Possible Reason for Action or Limit Level Exceedance(s) | <p>The exceedance is unlikely to be due to the Contract, in view of the following:</p> <ul style="list-style-type: none"> • Apart from exceedances of 1-hr TSP at ASR1 during 8:39-9:39 and ASR5 during 8:26-9:26 on 4 November 2019, all 1-hr TSP levels at all monitoring stations were in compliance with the Action and Limit Levels on the same day. • With reference to the recorded wind direction (ranged between 14° and 16°, blowing from a north-easterly direction) and wind speed (2.2 m/s) when exceedances recorded, ASR5 is located downstream to the construction works at Toll Control Building, while ASR1 is located downstream to the construction works at Maintenance Depot and Administration Building. However, the construction works at Toll Control Building, Maintenance Depot and Administration Building were mainly Electrical and Mechanical Works and Architectural Builders Work and Finishes which are considered not major dust generating works. • No major dust generating activities i.e. excavation works was conducted on 4 November 2019. • Dust suppression measures i.e. watering were applied on site nearby Maintenance Depot and Administration Building to prevent dust generation (refer to <i>watering record</i>). • Dust mitigation measures were implemented at Toll Control Building, for example, roads were paved and no debris/ materials were burnt at the works areas. <p>Based on the above, the exceedances are unlikely to be due to the Contract.</p> |
| Actions Taken / To Be Taken | <p>The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area. The ET will monitor for future trends in exceedances.</p> |
| Remarks | <p>The monitoring results on 4 November 2019 and locations of air quality monitoring stations are attached.</p> |

Results of Air Quality Monitoring

| Project | Contract | Date (yyyy-mm-dd) | Station | Time | Parameter | Results | Unit |
|---------|------------|-------------------|---------|----------|-------------|---------|-------|
| TMCLKL | HY/2012/08 | 2019-11-04 | AQMS1 | 8:50:00 | 1-hour TSP | 154 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | AQMS1 | 9:52:00 | 1-hour TSP | 147 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | AQMS1 | 10:54:00 | 1-hour TSP | 143 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR1 | 8:39:00 | 1-hour TSP | 626 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR1 | 9:41:00 | 1-hour TSP | 264 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR1 | 10:43:00 | 1-hour TSP | 251 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR10 | 8:02:00 | 1-hour TSP | 117 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR10 | 9:04:00 | 1-hour TSP | 83 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR10 | 10:06:00 | 1-hour TSP | 105 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR5 | 8:26:00 | 1-hour TSP | 398 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR5 | 9:28:00 | 1-hour TSP | 251 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR5 | 10:30:00 | 1-hour TSP | 242 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR6 | 8:14:00 | 1-hour TSP | 202 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR6 | 9:16:00 | 1-hour TSP | 174 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR6 | 10:18:00 | 1-hour TSP | 169 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | AQMS1 | 11:56:00 | 24-hour TSP | 80 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR1 | 11:45:00 | 24-hour TSP | 141 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR10 | 11:08:00 | 24-hour TSP | 70 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR5 | 11:32:00 | 24-hour TSP | 146 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-04 | ASR6 | 11:20:00 | 24-hour TSP | 106 | ug/m3 |

Note:

Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level

| Meteorological Data for Impact Monitoring in the reporting period | | | |
|--|---------------------|------------------------------------|--|
| Date (yy-mm-dd) | Time (24hrs) | Average of Wind Speed (m/s) | Average of Wind Direction(degree) |
| 19/11/04 | 0:00 | 1.3 | 342 |
| 19/11/04 | 1:00 | 1.8 | 17 |
| 19/11/04 | 2:00 | 2.7 | 341 |
| 19/11/04 | 3:00 | 3.1 | 359 |
| 19/11/04 | 4:00 | 3.6 | 3 |
| 19/11/04 | 5:00 | 3.6 | 4 |
| 19/11/04 | 6:00 | 1.8 | 14 |
| 19/11/04 | 7:00 | 1.3 | 342 |
| 19/11/04 | 8:00 | 2.2 | 16 |
| 19/11/04 | 9:00 | 2.2 | 14 |
| 19/11/04 | 10:00 | 1.8 | 12 |
| 19/11/04 | 11:00 | 2.2 | 30 |
| 19/11/04 | 12:00 | 1.8 | 23 |
| 19/11/04 | 13:00 | 1.8 | 16 |
| 19/11/04 | 14:00 | 1.3 | 18 |
| 19/11/04 | 15:00 | 1.3 | 25 |
| 19/11/04 | 16:00 | 1.8 | 347 |
| 19/11/04 | 17:00 | 1.8 | 332 |
| 19/11/04 | 18:00 | 1.8 | 313 |
| 19/11/04 | 19:00 | 0.9 | 326 |
| 19/11/04 | 20:00 | 0.4 | 324 |
| 19/11/04 | 21:00 | 0.4 | 320 |
| 19/11/04 | 22:00 | 0.9 | 328 |
| 19/11/04 | 23:00 | 1.8 | 343 |

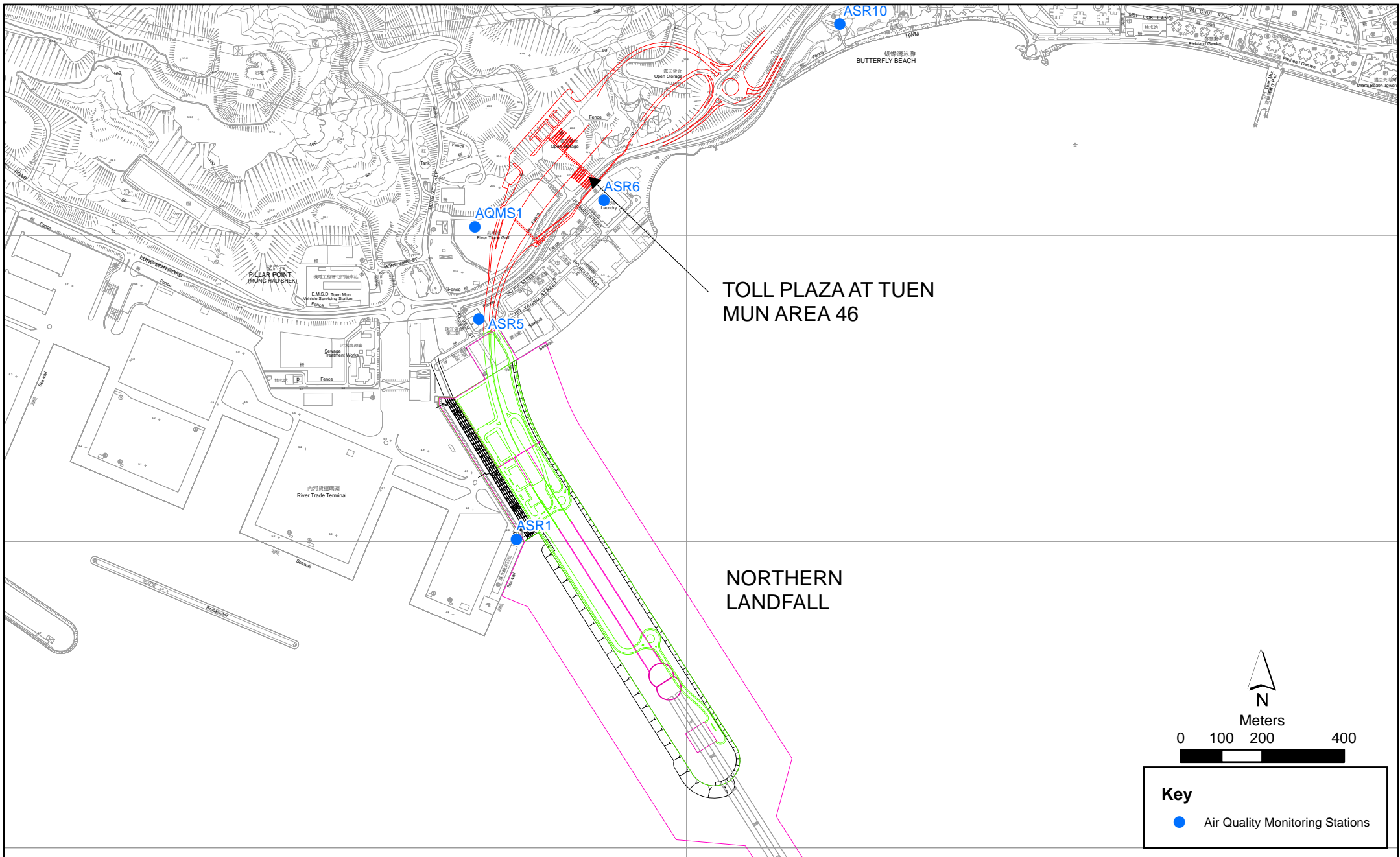
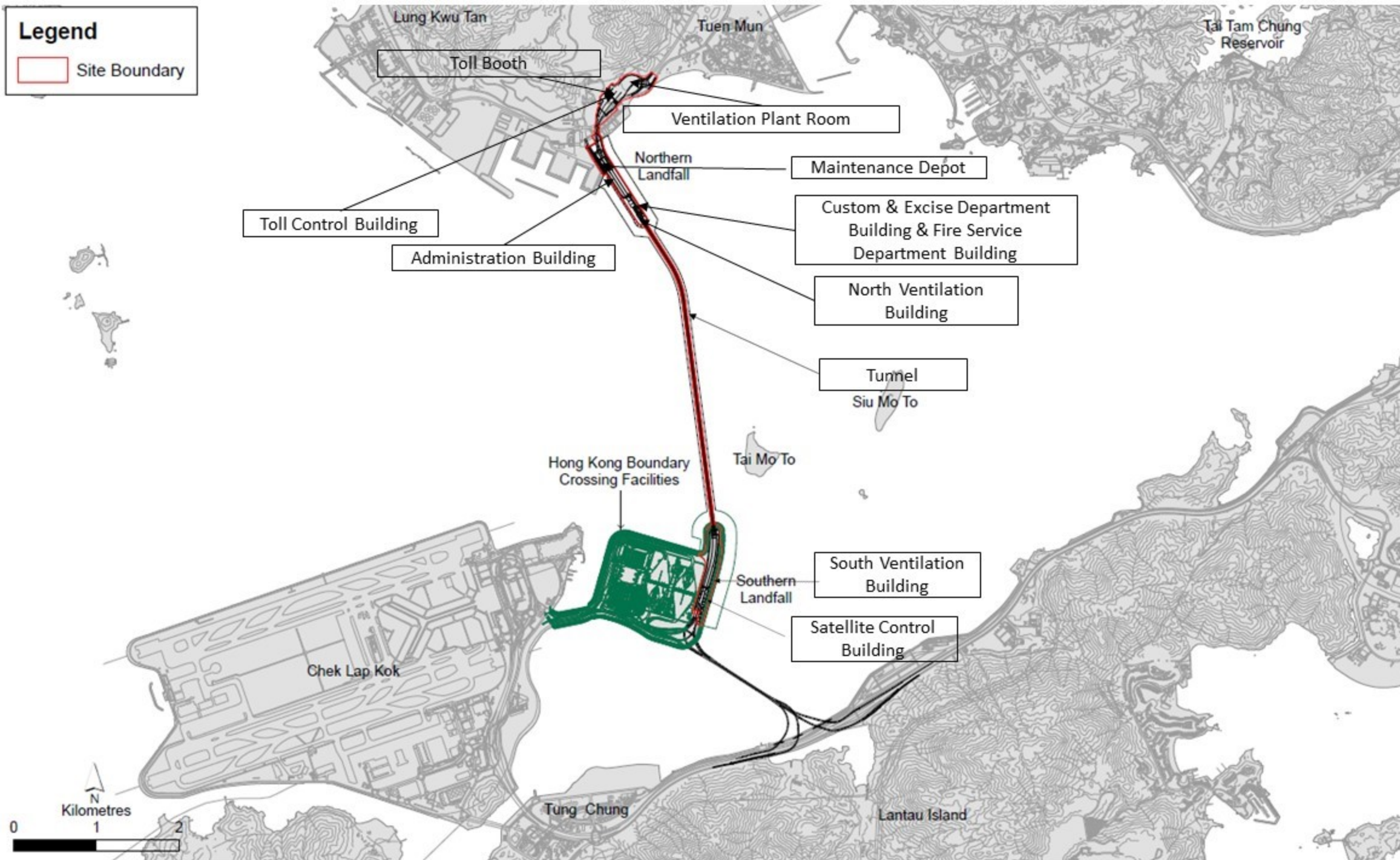


Figure 2.1

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

Legend

Site Boundary



Appendix A

Watering Record on 4 November 2019

| 4 th Nov | | MD & Ad(B) | |
|---------------------|----|-------------|-------|
| Period | | | Sign |
| 7-8 | | | |
| 8-9 | / | 8:05 | Jerry |
| 9-10 | / | 9:00 | Jerry |
| 10-11 | // | 10:00 10:40 | Jerry |
| 11-12 | / | 11:30 | Jerry |
| 12-13 | / | 12:50 | Jerry |
| 13-14 | / | 13:20 | Jerry |
| 14-15 | / | 14:20 | Jerry |
| 15-16 | // | 15:00 15:40 | Jerry |
| 16-17 | / | 16:20 | Jerry |
| 17-18 | / | 17:20 | Jerry |
| 18-19 | | | |

Appendix B

Site Photo



Photo 1 - Construction works at Toll Control Building



Photo 2 - Construction works at Maintenance Depot



Photo 3 - Construction works at Administration Building

Email
message

Environmental
Resources
Management

To Ramboll Hong Kong Limited (ENPO)

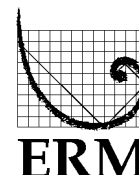
From ERM- Hong Kong, Limited

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

Subject Notification of Exceedance for Air Quality
Impact Monitoring

Date 26 November 2019

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



Dear Sir/ Madam,

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

Action Level Exceedance
0463091_7November2019_1hrTSP_Station ASR5

One (1) exceedance was recorded on 7 November 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

CONFIDENTIALITY NOTICE

This facsimile transmission is intended only for the use of the addressee and is confidential. If you are not the addressee it may be unlawful for you to read, copy, distribute, disclose or otherwise use the information in this facsimile. If you are not the intended recipient, please telephone or fax us immediately.



ERM-Hong Kong, Limited

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

Air Quality Impact Monitoring

Notification of Exceedance

| | | |
|---|--|--|
| Log No. | <u>Action Level Exceedance</u> 0463091_7November2019_1hrTSP_Station ASR5 [Total No. of Exceedances = 1] | |
| Date | 7 November 2019 (Measured) 26 December 2019 (Results obtained from ENPO Website) | |
| Monitoring Station | ASR5 | |
| Parameter(s) with Exceedance(s) | 1- hr TSP | |
| Action Levels | 1-hr TSP ($\mu\text{g}/\text{m}^3$) | ASR1 = 331 ASR5 = 340 ASR6 = 338 ASR10 = 335 AQMS1 = 337 |
| | 24-hr TSP ($\mu\text{g}/\text{m}^3$) | ASR1 = 213 ASR5 = 238 ASR6 = 238 ASR10 = 214 AQMS1 = 213 |
| Limit Levels | 1-hr TSP ($\mu\text{g}/\text{m}^3$) | 500 |
| | 24-hr TSP ($\mu\text{g}/\text{m}^3$) | 260 |
| Measured Levels | Refer to the attached data sheet (Data are source from Contract No. HY/2012/08). | |
| Works Undertaken (at the time of monitoring event) | Works undertaken under this Contract on 7 November 2019 included <ul style="list-style-type: none"> • 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 Administration Building; • Architectural Builder's Work and Finishes at Fire Services Department Building; • Building Structure at Customs and Excise Department Building; • Electrical and Mechanical Works at North Ventilation Building; • Architectural Builders Work and Finishes at Toll Control Building | |

| | |
|--|--|
| Possible Reason for Action or Limit Level Exceedance(s) | <p>The exceedance is unlikely to be due to the Contract, in view of the following:</p> <ul style="list-style-type: none"> • Apart from exceedance of 1-hr TSP at ASR5 during 13:24-14:24 on 7 November 2019, all 1-hr TSP levels at all monitoring stations were in compliance with the Action and Limit Levels on the same day. • With reference to the recorded wind direction (ranged between 16° and 304°, blowing from a north-easterly and north-westerly direction) and wind speed (ranged between 1.8 and 2.2 m/s) when exceedances recorded, ASR5 is located downstream to the construction works at Toll Control Building, while ASR1 is located downstream to the construction works at Toll Control Building. However, the construction works at Toll Control Building were Architectural Builders Work and Finishes which are considered not major dust generating works. • No major dust generating activities i.e. excavation works was conducted on 7 November 2019. • Dust suppression measures were implemented at the site area, for example, road at Toll Control Building were paved, no debris/materials were burnt at the works areas and watering was applied on dry area (refer to <i>Appendices A and B</i>). <p>Based on the above, the exceedance is unlikely to be due to the Contract.</p> |
| Actions Taken / To Be Taken | <p>The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area. The ET will monitor for future trends in exceedances.</p> |
| Remarks | <p>The monitoring results on 7 November 2019 and locations of air quality monitoring stations are attached.</p> |

Results of Air Quality Monitoring

| Project | Contract | Date (yyyy-mm-dd) | Station | Time | Parameter | Results | Unit |
|---------|------------|-------------------|---------|----------|-------------|---------|-------|
| TMCLKL | HY/2012/08 | 2019-11-07 | AQMS1 | 13:46:00 | 1-hour TSP | 85 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | AQMS1 | 14:48:00 | 1-hour TSP | 66 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | AQMS1 | 15:50:00 | 1-hour TSP | 72 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR1 | 13:35:00 | 1-hour TSP | 239 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR1 | 14:37:00 | 1-hour TSP | 180 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR1 | 15:39:00 | 1-hour TSP | 160 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR10 | 13:01:00 | 1-hour TSP | 93 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR10 | 14:03:00 | 1-hour TSP | 55 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR10 | 15:05:00 | 1-hour TSP | 53 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR5 | 13:24:00 | 1-hour TSP | 479 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR5 | 14:26:00 | 1-hour TSP | 161 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR5 | 15:28:00 | 1-hour TSP | 147 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR6 | 13:13:00 | 1-hour TSP | 212 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR6 | 14:15:00 | 1-hour TSP | 117 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR6 | 15:17:00 | 1-hour TSP | 85 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | AQMS1 | 16:52:00 | 24-hour TSP | 86 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR1 | 16:41:00 | 24-hour TSP | 158 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR10 | 16:07:00 | 24-hour TSP | 66 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR5 | 16:30:00 | 24-hour TSP | 196 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-07 | ASR6 | 16:19:00 | 24-hour TSP | 105 | ug/m3 |

Note:

Indicates Exceedance of Action Level
 Indicates Exceedance of Limit Level

| Meteorological Data for Impact Monitoring in the reporting period | | | |
|--|---------------------|------------------------------------|--|
| Date (yy-mm-dd) | Time (24hrs) | Average of Wind Speed (m/s) | Average of Wind Direction(degree) |
| 19/11/07 | 0:00 | 0 | - |
| 19/11/07 | 1:00 | 0 | - |
| 19/11/07 | 2:00 | 0.4 | 22 |
| 19/11/07 | 3:00 | 0.9 | 25 |
| 19/11/07 | 4:00 | 1.8 | 32 |
| 19/11/07 | 5:00 | 1.8 | 21 |
| 19/11/07 | 6:00 | 1.3 | 22 |
| 19/11/07 | 7:00 | 1.8 | 31 |
| 19/11/07 | 8:00 | 1.8 | 15 |
| 19/11/07 | 9:00 | 1.8 | 4 |
| 19/11/07 | 10:00 | 2.2 | 33 |
| 19/11/07 | 11:00 | 2.2 | 33 |
| 19/11/07 | 12:00 | 2.2 | 16 |
| 19/11/07 | 13:00 | 1.8 | 16 |
| 19/11/07 | 14:00 | 2.2 | 304 |
| 19/11/07 | 15:00 | 2.7 | 316 |
| 19/11/07 | 16:00 | 1.3 | 341 |
| 19/11/07 | 17:00 | 1.8 | 316 |
| 19/11/07 | 18:00 | 1.8 | 327 |
| 19/11/07 | 19:00 | 0.4 | 318 |
| 19/11/07 | 20:00 | 0 | - |
| 19/11/07 | 21:00 | 0.4 | 336 |
| 19/11/07 | 22:00 | 1.3 | 313 |
| 19/11/07 | 23:00 | 1.8 | 357 |

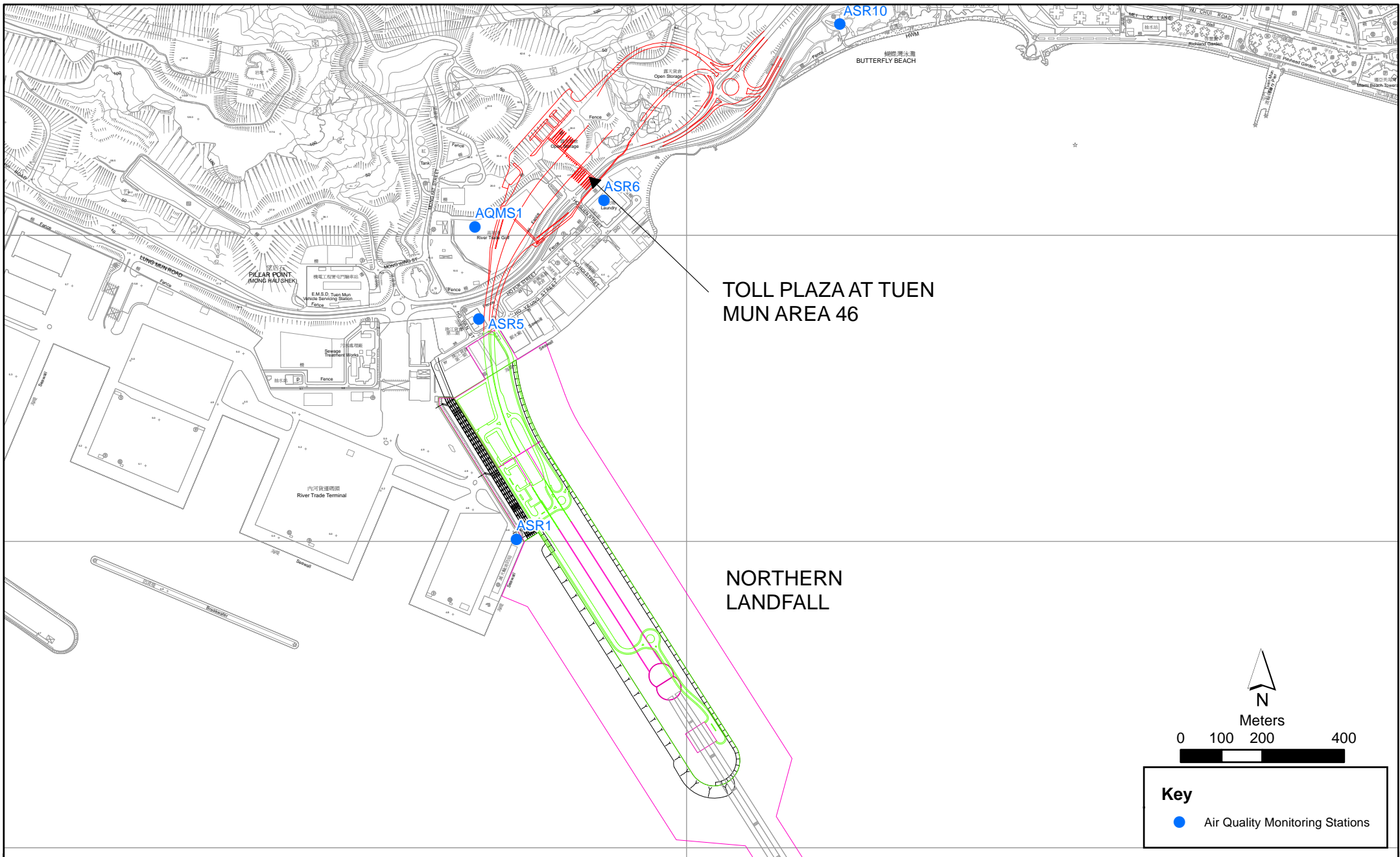


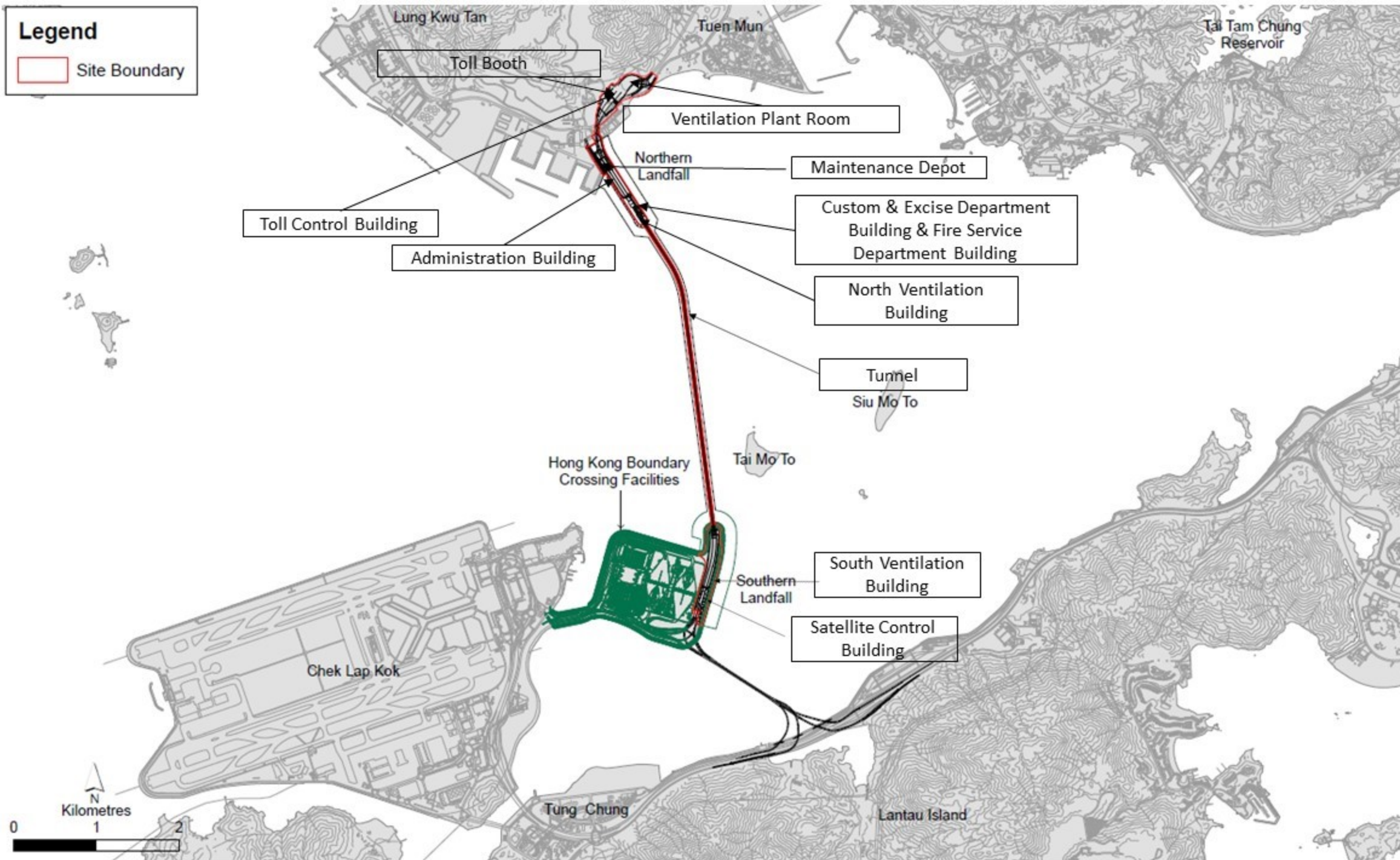
Figure 2.1

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

Key
 ● Air Quality Monitoring Stations

Legend

Site Boundary



Appendix A

Watering Record on 7 November 2019

| 7 th Nov | | Location | |
|---------------------|----|-------------|-------|
| Period | | MD & AdB | Sign |
| | | Time | |
| 7-8 | | | |
| 8-9 | / | 8:03 | Jerry |
| 9-10 | / | 9:05 | Jerry |
| 10-11 | // | 10:05 10:40 | Jerry |
| 11-12 | / | 11:40 | Jerry |
| 12-13 | / | 12:55 | Jerry |
| 13-14 | / | 13:30 | Jerry |
| 14-15 | / | 14:30 | Jerry |
| 15-16 | / | 15:15 | Jerry |
| 16-17 | // | 16:15 16:50 | Jerry |
| 17-18 | / | 17:35 | Jerry |
| 18-19 | | | |

Appendix B

Site Photo



Photo 1 - Construction works at Toll Control Building

Email
message

Environmental
Resources
Management

To Ramboll Hong Kong Limited (ENPO)

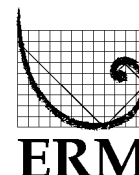
From ERM- Hong Kong, Limited

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

Subject Notification of Exceedance for Air Quality
Impact Monitoring

Date 6 December 2019

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



Dear Sir/ Madam,

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

Action Level Exceedance

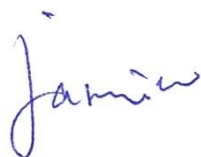
0463091_28November2019_1hrTSP_Station ASR1
0463091_28November2019_1hrTSP_Station ASR1
0463091_28November2019_1hrTSP_Station ASR5

Limit Level Exceedance

0463091_28November2019_1hrTSP_Station ASR1
0463091_28November2019_1hrTSP_Station ASR5

Five (5) exceedances were recorded on 28 November 2019.

Regards,



Dr Jasmine Ng
Environmental Team Leader

CONFIDENTIALITY NOTICE

This facsimile transmission is intended only for the use of the addressee and is confidential. If you are not the addressee it may be unlawful for you to read, copy, distribute, disclose or otherwise use the information in this facsimile. If you are not the intended recipient, please telephone or fax us immediately.



ERM-Hong Kong, Limited

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

Air Quality Impact Monitoring

Notification of Exceedance

| | | |
|---|---|--|
| Log No. | <p style="text-align: center;"><u>Action Level Exceedance</u></p> <p style="text-align: center;">0463091_28November2019_1hrTSP_Station ASR1 0463091_28November2019_1hrTSP_Station ASR1 0463091_28November2019_1hrTSP_Station ASR5</p> <p style="text-align: center;"><u>Limit Level Exceedance</u></p> <p style="text-align: center;">0463091_28November2019_1hrTSP_Station ASR1 0463091_28November2019_1hrTSP_Station ASR5</p> <p style="text-align: center;">[Total No. of Exceedances = 5]</p> | |
| Date | <p style="text-align: center;">28 November 2019 (Measured) 10 December 2019 (Results obtained from ENPO Website)</p> | |
| Monitoring Station | <p style="text-align: center;">ASR1 and ASR5</p> | |
| Parameter(s) with Exceedance(s) | <p style="text-align: center;">1- hr TSP</p> | |
| Action Levels | 1-hr TSP ($\mu\text{g}/\text{m}^3$) | ASR1 = 331 ASR5 = 340 ASR6 = 338 ASR10 = 335 AQMS1 = 337 |
| | 24-hr TSP ($\mu\text{g}/\text{m}^3$) | ASR1 = 213 ASR5 = 238 ASR6 = 238 ASR10 = 214 AQMS1 = 213 |
| Limit Levels | 1-hr TSP ($\mu\text{g}/\text{m}^3$) | 500 |
| | 24-hr TSP ($\mu\text{g}/\text{m}^3$) | 260 |
| Measured Levels | Refer to the attached data sheet (Data are source from Contract No. HY/2012/08). | |
| Works Undertaken (at the time of monitoring event) | Works undertaken under this Contract on 28 November 2019 included <ul style="list-style-type: none"> • 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; • Falsework dismantling at Fire Services Department Building; • Falsework dismantling at Customs and Excise Department Building; • Electrical and Mechanical Works and Architectural Builder's Work and Finishes at the Tunnel. | |

| | |
|--|---|
| Possible Reason for Action or Limit Level Exceedance(s) | <p>The exceedance is unlikely to be due to the Contract, in view of the following:</p> <ul style="list-style-type: none"> • With reference to the recorded wind direction (ranged between 14° and 34°, blowing from a north-easterly direction) and wind speed (ranged between 2.2 and 2.7 m/s) when exceedances recorded, ASR1 is located downstream to the construction works at Maintenance Depot and Administration Building, while ASR5 is located downstream to the construction works at Ventilation Plant Room and Toll Control Building. However, the construction works at Toll Control Building, Ventilation Plant Room, Maintenance Depot and Administration Building were mainly Electrical and Mechanical Works and Architectural Builders Work and Finishes which are considered not major dust generating works (refer to <i>Appendix A</i>). • No major dust generating activities i.e. excavation works was conducted on 28 November 2019. • Dust suppression measures i.e. watering were applied on site nearby Administration Building to prevent dust generation (refer to <i>Appendix B</i>). • During ET's site inspection on 29 November 2019, the work area at Maintenance Depot and Administration Building were mainly paved. No dust generating activities/dust emission was observed (refer to <i>Appendix C</i>) <p>Based on the above, the exceedances are unlikely to be due to the Contract.</p> |
| Actions Taken / To Be Taken | <p>The Contractor has been reminded to review the watering frequency and apply additional watering on the dry area during the dry season in particular. The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area. The ET will monitor for future trends in exceedances.</p> |
| Remarks | <p>The monitoring results on 28 November 2019 and locations of air quality monitoring stations are attached.</p> |

Results of Air Quality Monitoring

| Project | Contract | Date (yyyy-mm-dd) | Station | Time | Parameter | Results | Unit |
|---------|------------|-------------------|---------|----------|-------------|---------|-------|
| TMCLKL | HY/2012/08 | 2019-11-28 | AQMS1 | 8:49:00 | 1-hour TSP | 187 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | AQMS1 | 9:51:00 | 1-hour TSP | 161 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | AQMS1 | 10:53:00 | 1-hour TSP | 143 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR1 | 8:38:00 | 1-hour TSP | 577 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR1 | 9:40:00 | 1-hour TSP | 452 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR1 | 10:42:00 | 1-hour TSP | 385 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR10 | 8:00:00 | 1-hour TSP | 125 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR10 | 9:02:00 | 1-hour TSP | 139 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR10 | 10:04:00 | 1-hour TSP | 143 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR5 | 8:02:00 | 1-hour TSP | 534 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR5 | 9:27:00 | 1-hour TSP | 500 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR5 | 10:29:00 | 1-hour TSP | 299 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR6 | 8:13:00 | 1-hour TSP | 216 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR6 | 9:15:00 | 1-hour TSP | 183 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR6 | 10:17:00 | 1-hour TSP | 175 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | AQMS1 | 11:55:00 | 24-hour TSP | 96 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR1 | 11:44:00 | 24-hour TSP | 207 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR10 | 11:06:00 | 24-hour TSP | 71 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR5 | 11:31:00 | 24-hour TSP | 131 | ug/m3 |
| TMCLKL | HY/2012/08 | 2019-11-28 | ASR6 | 11:19:00 | 24-hour TSP | 109 | ug/m3 |

Note:

Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level

| Meteorological Data for Impact Monitoring in the reporting period | | | |
|--|---------------------|------------------------------------|--|
| Date (yy-mm-dd) | Time (24hrs) | Average of Wind Speed (m/s) | Average of Wind Direction(degree) |
| 19/11/28 | 0:00 | 0 | - |
| 19/11/28 | 1:00 | 0.4 | 346 |
| 19/11/28 | 2:00 | 1.8 | 2 |
| 19/11/28 | 3:00 | 2.2 | 331 |
| 19/11/28 | 4:00 | 0.9 | 20 |
| 19/11/28 | 5:00 | 1.3 | 341 |
| 19/11/28 | 6:00 | 1.3 | 339 |
| 19/11/28 | 7:00 | 1.3 | 357 |
| 19/11/28 | 8:00 | 2.2 | 24 |
| 19/11/28 | 9:00 | 2.7 | 14 |
| 19/11/28 | 10:00 | 2.2 | 34 |
| 19/11/28 | 11:00 | 1.8 | 344 |
| 19/11/28 | 12:00 | 1.8 | 311 |
| 19/11/28 | 13:00 | 1.8 | 310 |
| 19/11/28 | 14:00 | 1.8 | 336 |
| 19/11/28 | 15:00 | 1.3 | 341 |
| 19/11/28 | 16:00 | 1.8 | 337 |
| 19/11/28 | 17:00 | 1.3 | 340 |
| 19/11/28 | 18:00 | 1.8 | 338 |
| 19/11/28 | 19:00 | 1.8 | 335 |
| 19/11/28 | 20:00 | 2.2 | 3 |
| 19/11/28 | 21:00 | 2.2 | 20 |
| 19/11/28 | 22:00 | 2.7 | 24 |
| 19/11/28 | 23:00 | 2.2 | 30 |

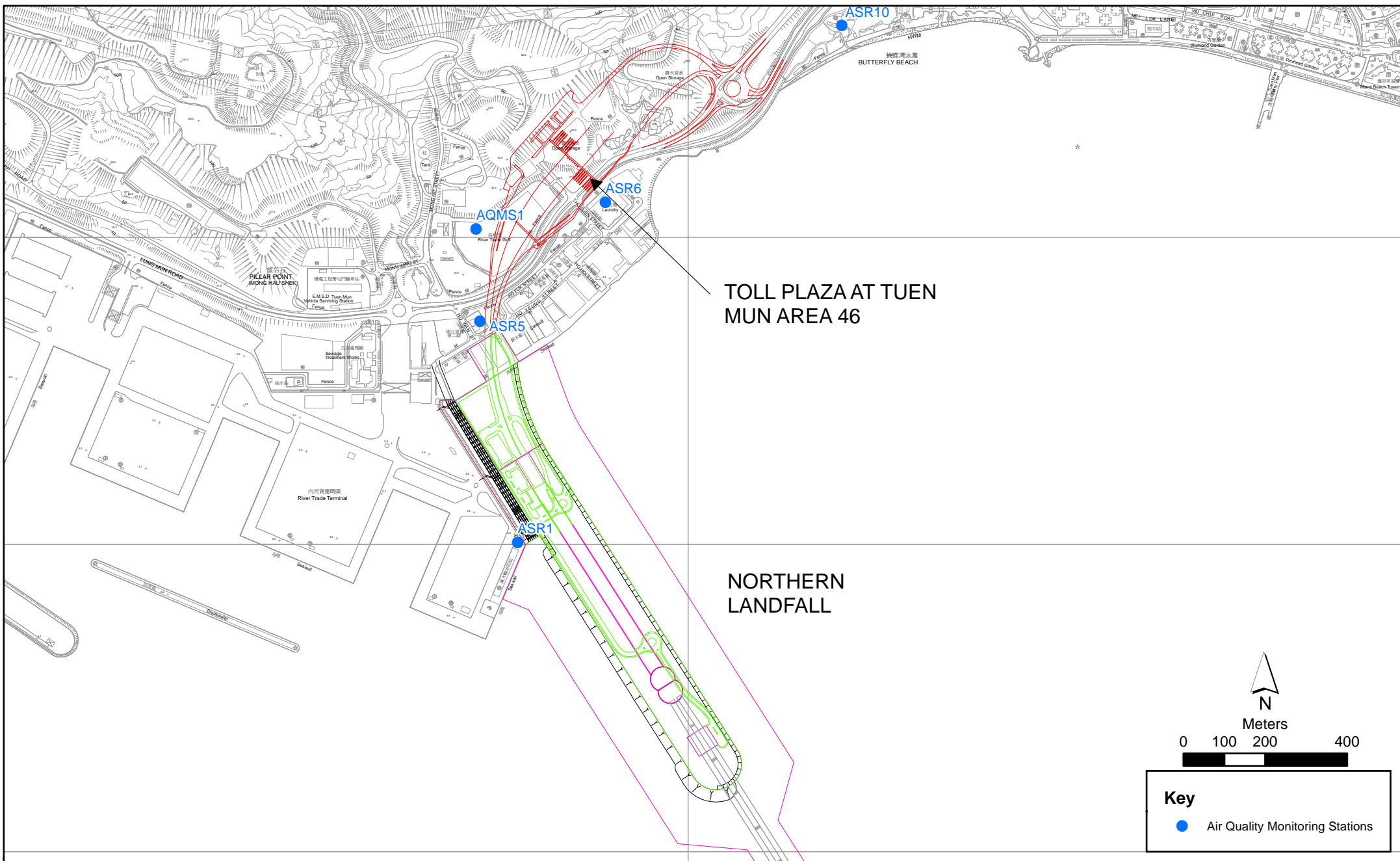
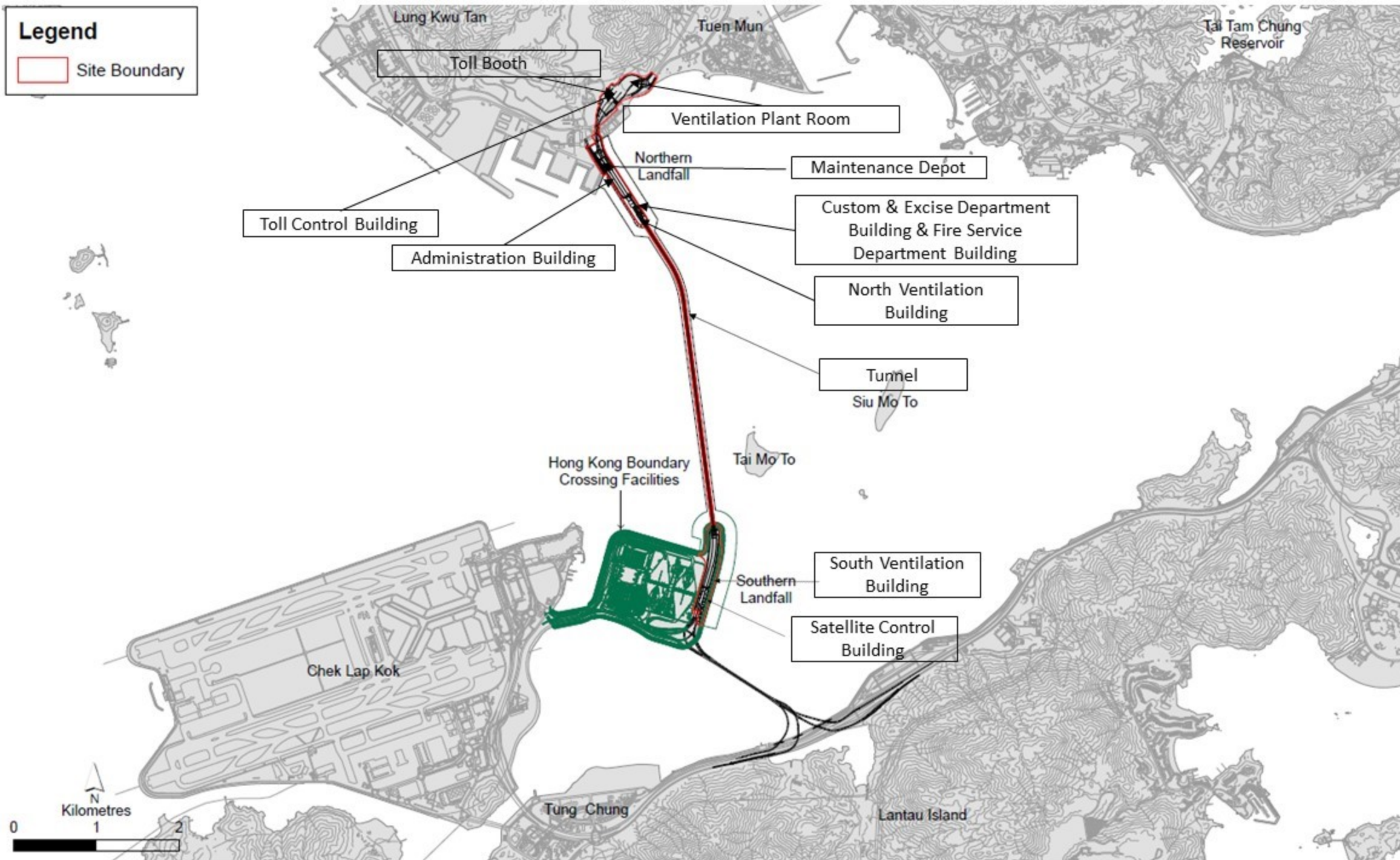


Figure 2.1

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

Legend

Site Boundary



Appendix A

Site Photo



Photo 1 - Construction works at Administration Building



Photo 2 - Construction works at Maintenance Depot



Photo 3 - Construction works at Toll Control Building



Photo 4 - Watering was applied at Administration Building

Appendix B

Watering Record on 28
November 2019

| 28 th Nov | | Location AdB | |
|----------------------|----|------------------------|-------|
| Period | | Time | Sign |
| 7-8 | | | |
| 8-9 | / | 8:02 | Jerry |
| 9-10 | / | 9:00 | Jerry |
| 10-11 | / | 10:00 | Jerry |
| 11-12 | // | 11:04 11:50 | Jerry |
| 12-13 | / | 12:55 | Jerry |
| 13-14 | / | 13:40 | Jerry |
| 14-15 | / | 14:30 | Jerry |
| 15-16 | // | 15:10 15:50 | Jerry |
| 16-17 | / | 16:30 | Jerry |
| 17-18 | / | 17:30 | Jerry |
| 18-19 | | | |

Appendix C

ET site inspection on 29
November 2019

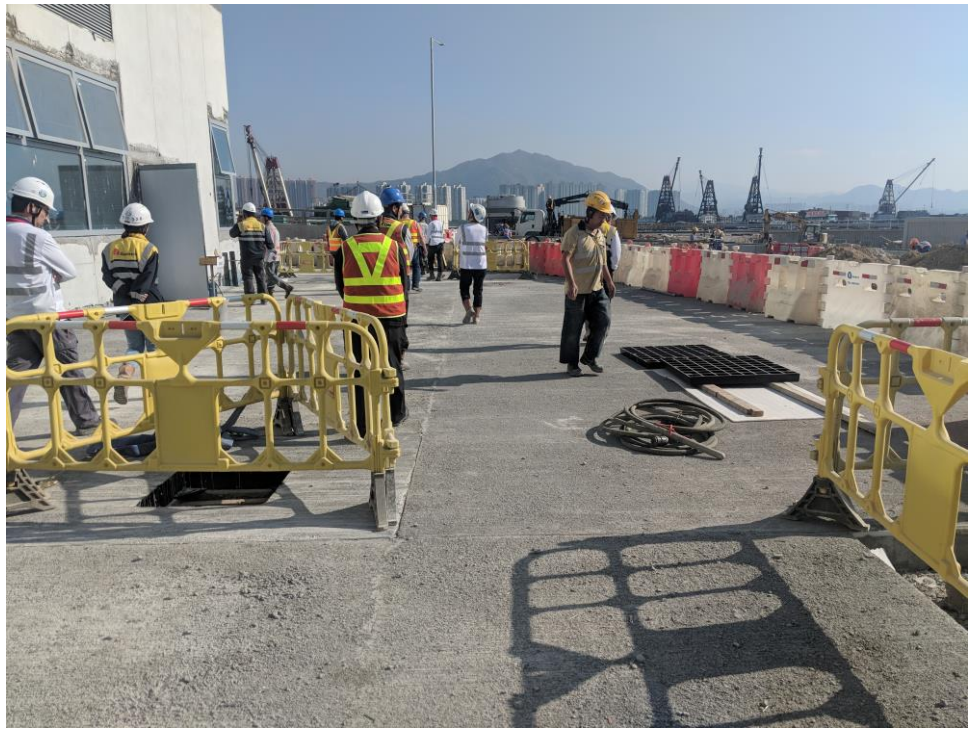


Photo 1 - Site condition at Maintenance Depot



Photo 2 - Site condition at Administration Building