

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

Sixth Monthly EM&A Report

14 December 2018

Environmental Resources Management
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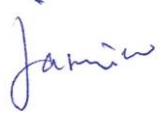


Contract No. HY/2017/10 Tuen Mun – Chek Lap Kok Link – Northern Connection Tunnel Buildings, Electrical and Mechanical Works

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Sixth Monthly EM&A Report

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Client: Gammon		Project No: 0463091			
Summary: This document presents the Sixth Monthly EM&A Report for Tuen Mun – Chek Lap Kok Link – Northern Connection Tunnel Buildings, Electrical and Mechanical Works.		Date: 14 December 2018			
		Approved by: 			
		<i>Mr Craig Reid</i> Partner			
		Certified by: 			
		<i>Dr Jasmine Ng</i> ET Leader			
	Sixth Monthly EM&A Report	CY	JN	CAR	14/12/18
Revision	Description	By	Checked	Approved	Date
<p>This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.</p> <p>We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.</p>		<p>Distribution</p> <p><input type="checkbox"/> Internal</p> <p><input checked="" type="checkbox"/> Public</p> <p><input type="checkbox"/> Confidential</p>			
		 			

Ref.: HYDHZMBEEM00_0_7065L.18

14 December 2018

AECOM
Engineer's Representative's Office
No. 8 Mong Fat Street, Tuen Mun
New Territories, Hong Kong

By Fax (2783 0155) and By Post

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, Electrical and Mechanical Works
Sixth Monthly EM&A Report (November 2018)**

Reference is made to the Sixth Monthly Environmental Monitoring and Audit (EM&A) Report (Nov. 2018) (ET's ref.: "0463091_6th Monthly EM&A_20181214.doc" dated 14 Dec. 2018) certified by the ET Leader and provided to us via e-mail on 14 Dec. 2018.

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

Thank you for your attention. Please do not hesitate to contact the undersigned or the ENPO Leader Mr. Y. H. Hui should you have any queries.

Yours sincerely,



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

c.c. HyD – Mrs. Joanna Kwok Tam Yuk Ying (By Fax: 3188 6614)
HyD – Mr. Tony Pang (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, DF, ENPO Site

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EXECUTIVE SUMMARY

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

The construction phase of the Project 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 Sixth Monthly EM&A report presenting the EM&A works carried out during the period from 1 to 30 November 2018 for the *Contract No. HY/2017/10 Northern Connection Tunnel Buildings, Electrical and Mechanical Works* (the “Project”) 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

- Bar bending, timber formwork and concreting at Toll Control Building;
- Architectural, Builder’s Work and Finishing and Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at Northern Ventilation Building;
- Excavation at Administration Building;
- Excavation at Maintenance Depot;
- Pre-drilling and socket H-piling at Customs & Excise Department Building; and
- Trial pits, pre-drilling and socket H-piling at Fire Service Department 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
Joint Environmental Site Inspection	5 sessions

Summary of Breaches of Action/Limit Levels

Breaches of Action and Limit Levels for Air Quality

Six (6) Action Level exceedances for 1-hour TSP were recorded by the Environmental Team of Contract No. *HY/2012/08* during the reporting period.

Environmental Complaints, Non-compliance & Summons

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

Reporting Change

There was no reporting change in the reporting period.

Upcoming Works for the Next Reporting Month

Works to be undertaken in the next monitoring period of December 2018 include the following:

Land-based Works

- Bar bending, timber formwork and concreting at Toll Control Building;
- Architectural, Builder's Work and Finishing and Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at Northern Ventilation Building;
- Foundation building at Administration Building;
- Foundation building at Maintenance Depot; and
- Socket H-piling at Fire Services Department Building and Customs and Excise Department Building.

Future Key Issues

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

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of December 2018 are mainly associated with dust and waste management issues.

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

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

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

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

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

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

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

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

CLIENT

 路政署 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.
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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


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 Project Management Initials: Designer: WATH Chenweid SYLC Approved: CWN ISO 1194mm x 847mm
 01/7071 01/7072



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PROJECT
 1.3
TUEN MUN - CHEK LAP KOK LINK

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

CLIENT
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Figure 1.2a

ISSUE/REVISION

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

STATUS

SCALE 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	

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PROJECT
 TUEN MUN - CHEK LAP KOK LINK

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

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Figure 1.2b

ISSUE/REVISION

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	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 2)

SHEET NUMBER
 60240249/C4/7062A

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Project Management Initials: Designer: KATH; Checked: SYLC; Approved: CWN ISO A1 554mm x 841mm

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PROJECT
 TUEN MUN - CHEK LAP KOK LINK

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

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Figure 1.2c

ISSUE/REVISION

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	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 3)

SHEET NUMBER
 60240249/C4/7063A

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1.2 SCOPE OF REPORT

This is the Sixth 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 2018.

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

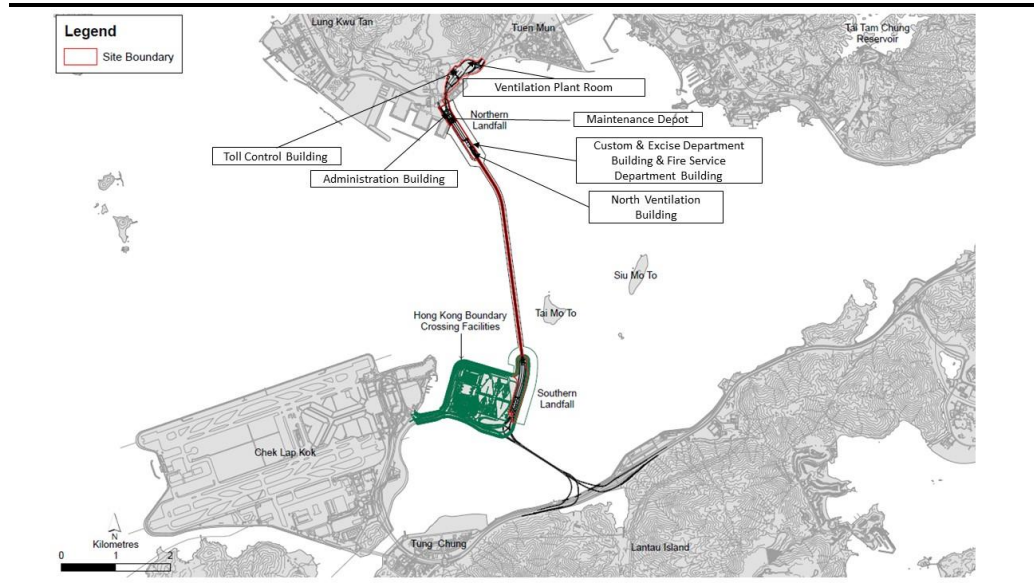
- Bar bending, timber formwork and concreting at Toll Control Building;
- Architectural, Builder's Work and Finishing and Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at Northern Ventilation Building;

- Excavation at Administration Building;
- Excavation at Maintenance Depot;
- Pre-drilling and socket H-piling at Customs & Excise Department Building; and
- Trial pits, pre-drilling and socket H-piling at Fires Service Department Building.

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



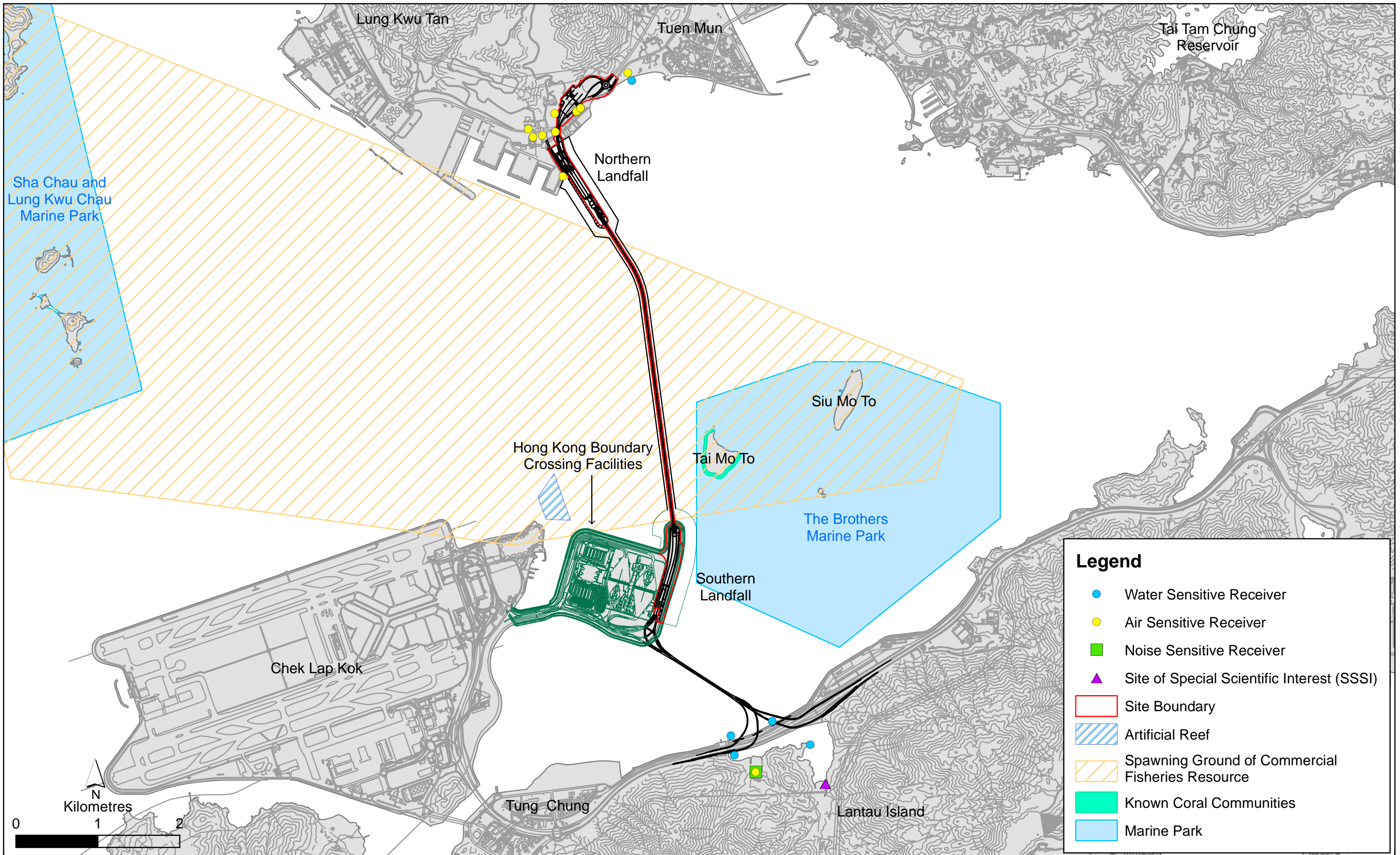


Figure 1.4

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	3, 6, 9, 12, 15, 18, 21, 24, 27 and 30 November 2018	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/>

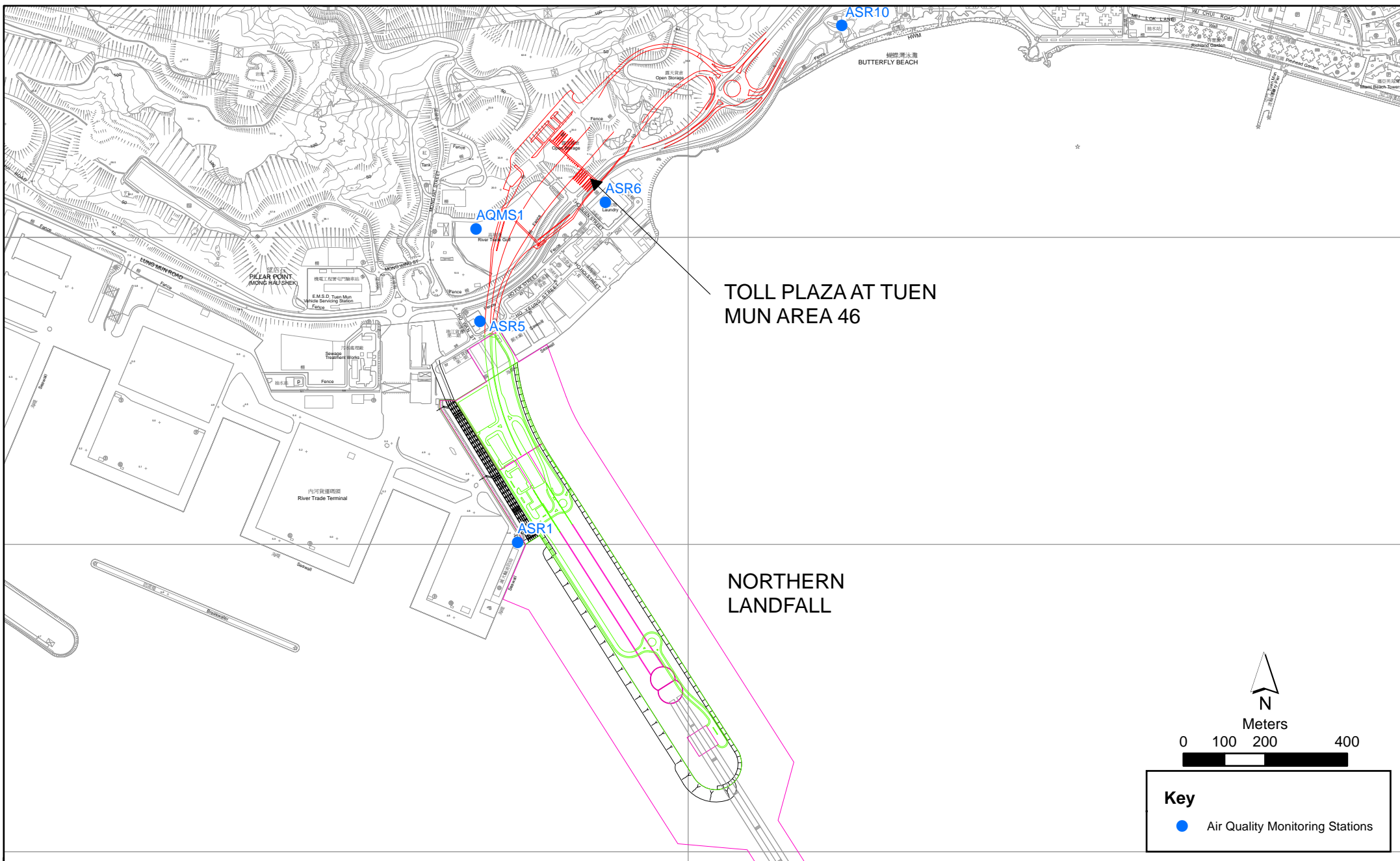


Figure 2.1

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⁾.

Six (6) Action Level exceedances for 1-hour TSP on 6 and 12 November 2018 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 G*. No action is required to be undertaken in accordance with the Event Action Plan as presented in *Appendix E*. The exceedance recorded on 31 October 2018 was under investigation during the preparation of the last Monthly EM&A report, thus the investigation report is also presented in *Appendix G*.

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

2.2 *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 2, 9, 16, 23 and 30 November 2018.

Key observations and recommendations during the site inspections in this reporting period are summarized in *Table 2.2*.

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

Table 2.2 Specific Observations and Recommendations during the Weekly Site Inspection in this Reporting Month

Inspection Date	Observations	Recommendations/ Remarks
2 November 2018	<p>Administration Building</p> <ul style="list-style-type: none"> Stagnant water in drip tray should be cleared. Stagnant water is observed near grouting station. <p>Toll Control Building</p> <ul style="list-style-type: none"> The refuse skip should be cleared regularly to prevent overloading. 	<p>Administration Building</p> <ul style="list-style-type: none"> Clear stagnant water in drip tray Improve the drainage near the works area of the grouting station. <p>Toll Control Building</p> <ul style="list-style-type: none"> The refuse skip should be cleared regularly to prevent overloading.
9 November 2018	<p>Administration Building</p> <ul style="list-style-type: none"> Stockpile of cement bags should be covered with tarpaulin. Stagnant water in drip tray should be discharged. <p>Fire Services Department Building</p> <ul style="list-style-type: none"> Oil leakage was observed in the pipe of the water pump. 	<p>Administration Building.</p> <ul style="list-style-type: none"> The Contractor was reminded to cover stockpile of cement bags with tarpaulin. The Contractor was reminded to discharge stagnant water in drip tray. <p>Fire Services Department Building</p> <ul style="list-style-type: none"> The Contractor has been reminded to fix the oil leakage in the pipe of the water pump.
16 November 2018	<p>Fire Services Department Building</p> <ul style="list-style-type: none"> Decolorized NRMM label should be replaced on the generator. 	<p>Fire Services Department Building</p> <ul style="list-style-type: none"> The Contractor has been reminded to replace NRMM label on the generator.
23 November 2018	<p>Maintenance Depot</p> <ul style="list-style-type: none"> Water should be applied on unpaved road. <p>North Ventilation Building</p> <ul style="list-style-type: none"> Accumulated refuse should be cleared. 	<p>Maintenance Depot</p> <ul style="list-style-type: none"> The Contractor has been reminded to water unpaved road. <p>North Ventilation Building</p> <ul style="list-style-type: none"> The Contractor has been reminded to clear accumulated refuse.
30 November 2018	<p>Toll Control Building</p> <ul style="list-style-type: none"> General refuse and silt should be cleared in the drainage. General refuse bin should be properly placed on the ground. 	<p>Toll Control Building</p> <ul style="list-style-type: none"> The Contractor has been reminded to clear general refuse and silt in the drainage. The Contractor has been reminded to place general refuse bin properly on the ground.

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

2.3 LANDFILL GAS HAZARD MONITORING

No excavation work was conducted at the excavation area in November 2018 and thus landfill gas hazard monitoring was temporary suspended in November 2018.

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 F*). The quantities of different types of wastes are summarized in *Table 2.3*.

Table 2.3 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 2018	253	10	11,720	0	0	0

Notes:

- (a) Inert construction wastes include hard rock and large broken concrete, and materials 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 2.4* below.

Table 2.4 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
WPCO Licence for Buildings at C2 area	WT00031783-2018	22 October 2018	31 October 2023	GCL	Sampling Frequency: Bimonthly
WPCO Licence for Buildings at C3 area	WT00032062-2018	30 October 2018	31 October 2023	GCL	Sampling Frequency: Quarterly
Construction Noise Permit	GW-RW0451-18	2 November 2018	25 April 2019	GCL	For Toll Control Building, Administration Building, Maintenance Depot and WA18

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*

Six (6) Action Level exceedances for 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 G*. The exceedance recorded on 31 October 2018 was under investigation during the preparation of the last Monthly EM&A report, thus the investigation report is also presented in *Appendix G*. No action is required to be undertaken in accordance with the Event Action Plan as presented in *Appendix E*.

No exceedance of 24-hour TSP was recorded in this reporting month.

Cumulative statistics are provided in *Appendix G*.

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 G*.

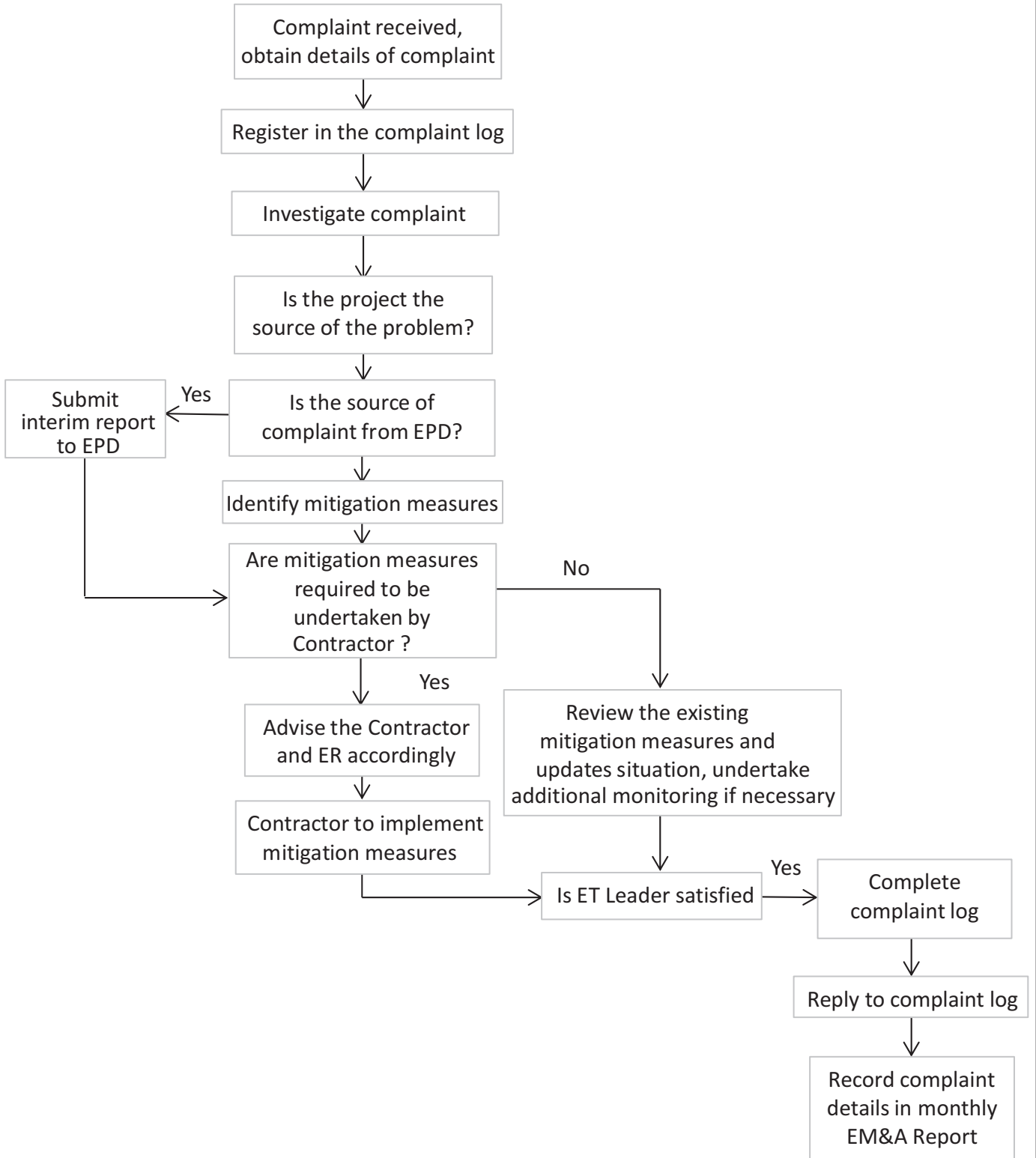


Figure 2.2

Environmental Complaint Handling Procedure

3 *FUTURE KEY ISSUES*

3.1 *CONSTRUCTION ACTIVITIES FOR THE COMING MONTH*

As informed by the Contractor, the major works for the Project in December 2018 will be:

Land-based Works

- Bar bending, timber formwork and concreting at Toll Control Building;
- Architectural, Builder's Work and Finishing and Electrical and Mechanical Works at Ventilation Plant Room;
- Electrical and Mechanical Works at Northern Ventilation Building;
- Foundation building at Administration Building;
- Foundation building at Maintenance Depot; and
- Socket H-piling at Fire Services Department Building and Customs and Excise Department 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 2018 are mainly associated with dust and waste management issues.

4.1 CONCLUSIONS

This Sixth Monthly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 30 November 2018, 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) was carried out in this reporting month.

Six (6) Action Level exceedances for 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 G*. The exceedance recorded on 31 October 2018 was under investigation during the preparation of the last Monthly EM&A report, thus the investigation report is also presented in *Appendix G*. 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.

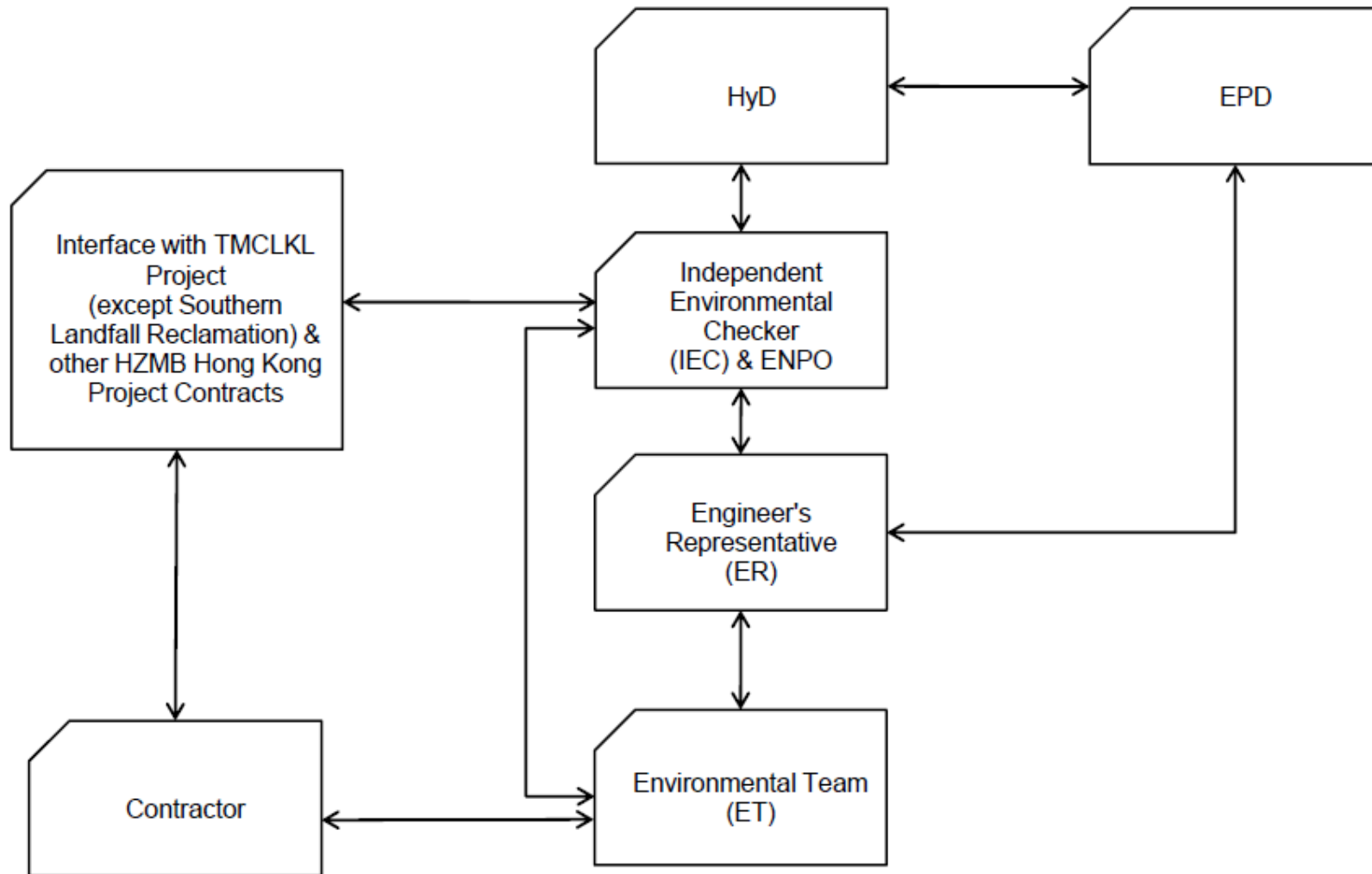
Environmental site inspection was carried out five (5) times in November 2018. Remedial actions recommended for the deficiencies identified during the site audits were properly implemented by the Contractor.

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	Days	Start	Finish	2018												2019					
					November						December						January				February	
					22	29	05	12	19	26	03	10	17	24	31	07	14	21	28	04	11	18
Three Monthly Programme 20/11/18 - 20/02/19																						
Contract Dates																						
Portion Access Dates																						
P230	Access to Portion X (Day 240)	0d	01-Jan-19																			
Portion Possession Dates																						
P205	Possession to Portion XVb (Day 236)	0d	28-Dec-18																			
P215	Possession to Portion XVIb (Day 236)	0d	28-Dec-18																			
P225	Possession to Portion XVa (Day 236)	0d	28-Dec-18																			
P235	Possession to Portion XVIa (Day 236)	0d	28-Dec-18																			
Method Statements																						
Administration Building																						
MS1050	Prepare & Submit MS for Administration Building (Civil)	24d	20-Sep-18 A	20-Oct-18 A																		
MS1060	ICE & ER Approval of MS for Administration Building (Civil)	12d	22-Oct-18 A	03-Nov-18 A																		
MS1190	Prepare & Submit MS for Administration Building (E&M)	24d	16-Oct-18 A	13-Nov-18 A																		
MS1200	ICE & ER Approval of MS for Administration Building (E&M)	12d	14-Nov-18 A	27-Nov-18																		
Maintenance Depot																						
MS1070	Prepare & Submit MS for Maintenance Depot (Civil)	24d	02-Oct-18 A	30-Oct-18 A																		
MS1080	ICE & ER Approval of MS for Maintenance Depot (Civil)	12d	31-Oct-18 A	13-Nov-18 A																		
MS1210	Prepare & Submit MS for Maintenance Depot (E&M)	24d	14-Nov-18 A	11-Dec-18																		
MS1220	ICE & ER Approval of MS for Maintenance Depot (E&M)	12d	12-Dec-18	28-Dec-18																		
Custom & Excise Department Building																						
MS1090	Prepare & Submit MS for C&ED Building (Civil)	24d	31-Oct-18 A	27-Nov-18																		
MS1100	ICE & ER Approval of MS for C&ED Building (Civil)	12d	28-Nov-18	11-Dec-18																		
MS1230	Prepare & Submit MS for C&ED Building (E&M)	24d	12-Dec-18	12-Jan-19																		
MS1240	ICE & ER Approval of MS for C&ED Building (E&M)	12d	14-Jan-19	26-Jan-19																		
Fire Services Department Building																						
MS1110	Prepare & Submit MS for Fire Services Building (Civil)	24d	28-Nov-18	28-Dec-18																		
MS1120	ICE & ER Approval of MS for Fire Services Building (Civil)	12d	29-Dec-18	12-Jan-19																		
MS1250	Prepare & Submit MS for Fire Services Building (E&M)	24d	14-Jan-19	13-Feb-19																		
MS1260	ICE & ER Approval of MS for Fire Services Building (E&M)	12d	14-Feb-19	27-Feb-19																		
Satellite Control Building																						
MS1130	Prepare & Submit MS for Satellite Control Building (Civil)	24d	29-Dec-18	26-Jan-19																		

THREE MONTHLY ROLLING PROGRAMME

HY/2017/10 TM-CLKL - Northern Connection Tunnel Buildings, Electrical and Mechanical Works

20/11/18 - 20/02/19

P1

Date	Revision	Checked	Approved
20/11/18			

ID	Activity	Days	Start	Finish	2018												2019					
					November						December						January				February	
					22	29	05	12	19	26	03	10	17	24	31	07	14	21	28	04	11	18
B015	Design Proposal of Tunnel Lighting System (TLS) - Approval	30d	03-Oct-18 A	01-Nov-18 A																		
B020	Tunnel lighting control	60d	08-Sep-18 A	06-Nov-18 A																		
B025	Tunnel lighting control - Approval	30d	07-Nov-18 A	06-Dec-18																		
B030	TLS -Lux Calculation	60d	08-Sep-18 A	06-Nov-18 A																		
B035	TLS -Lux Calculation - Approval	30d	07-Nov-18 A	06-Dec-18																		
B040	TLS -Structure support design calculation for tunnel lighting	60d	08-Sep-18 A	06-Nov-18 A																		
B045	TLS -Structure support design calculation for tunnel lighting - Approval	30d	07-Nov-18 A	06-Dec-18																		
B050	Design Proposal of Road / Street Lighting System	60d	27-Sep-18 A	25-Nov-18																		
B055	Design Proposal of Road / Street Lighting System - Approval	30d	26-Nov-18	25-Dec-18																		
B060	Road Lighting Lux Calculation	60d	17-Nov-18 A	15-Jan-19																		
B065	Road Lighting Lux Calculation - Approval	30d	16-Jan-19	14-Feb-19																		
Section C - Building Services of MVAC System																						
TCB																						
C015	TCB -AC Cooling Capacity Calculation - Approval	28d	29-Sep-18 A	26-Oct-18 A																		
C030	TCB -Pump head calculation	60d	03-Oct-18 A	01-Dec-18																		
C035	TCB -Pump head calculation - Approval	28d	02-Dec-18	29-Dec-18																		
C055	TCB -Fan Static Pressure Calculation - Approval	28d	27-Sep-18 A	24-Oct-18 A																		
C060	TCB -Acoustic Performance Calculation	60d	30-Sep-18 A	28-Nov-18																		
C065	TCB -Acoustic Performance Calculation - Approval	28d	29-Nov-18	26-Dec-18																		
ADB																						
C080	ADB -AHU/PAU Static Pressure Calculation	60d	07-Sep-18 A	05-Nov-18 A																		
C085	ADB -AHU/PAU Static Pressure Calculation - Approval	28d	06-Nov-18 A	03-Dec-18																		
C090	ADB -Pump head calculation	60d	27-Aug-18 A	25-Oct-18 A																		
C095	ADB -Pump head calculation - Approval	28d	26-Oct-18 A	22-Nov-18																		
C105	ADB -Mechanical Ventilation Capacity Calculation - Approval	28d	24-Sep-18 A	21-Oct-18 A																		
C110	ADB -Fan Static Pressure Calculation	60d	06-Sep-18 A	04-Nov-18 A																		
C115	ADB -Fan Static Pressure Calculation - Approval	28d	05-Nov-18 A	02-Dec-18																		
C120	ADB -Acoustic Performance Calculation	60d	08-Nov-18 A	06-Jan-19																		
C125	ADB -Acoustic Performance Calculation - Approval	28d	07-Jan-19	03-Feb-19																		
NVB																						
C130	NVB -AC Cooling Capacity Calculation	60d	13-Sep-18 A	11-Nov-18 A																		

THREE MONTHLY ROLLING PROGRAMME

HY/2017/10 TM-CLKL - Northern Connection Tunnel Buildings, Electrical and Mechanical Works

20/11/18 - 20/02/19

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Date	Revision	Checked	Approved
20/11/18			

ID	Activity	Days	Start	Finish	2018							2019								
					November			December				January			February					
					22	29	05	12	19	26	03	10	17	24	31	07	14	21	28	04
C415	MD -AHU/PAU Static Pressure Calculation - Approval	28d	09-Dec-18	05-Jan-19																
C420	MD -Mechanical Ventilation Capacity Calculation	60d	28-Aug-18 A	26-Oct-18 A																
C425	MD -Mechanical Ventilation Capacity Calculation - Approval	28d	27-Oct-18 A	23-Nov-18																
C430	MD -Fan Static Pressure Calculation	60d	09-Oct-18 A	07-Dec-18																
C435	MD -Fan Static Pressure Calculation - Approval	28d	08-Dec-18	04-Jan-19																
C440	MD -Acoustic Performance Calculation	60d	11-Dec-18*	08-Feb-19																
C445	MD -Acoustic Performance Calculation - Approval	28d	09-Feb-19	08-Mar-19																
Vehicular Underpass																				
C455	Vehicle Underpass -Mechanical Ventilation Capacity Calculation - Approval	28d	17-Oct-18 A	13-Nov-18 A																
C460	Vehicle Underpass -Fan Static Pressure Calculation	60d	29-Sep-18 A	27-Nov-18																
C465	Vehicle Underpass -Fan Static Pressure Calculation - Approval	28d	28-Nov-18	25-Dec-18																
C470	Vehicle Underpass -Acoustic Performance Calculation	60d	01-Dec-18*	29-Jan-19																
C475	Vehicle Underpass -Acoustic Performance Calculation - Approval	28d	30-Jan-19	26-Feb-19																
Section D - Building Services of Electrical System																				
TCB																				
D025	TCB -Electrical Loading Demand Calculation - Approval	30d	22-Sep-18 A	21-Oct-18 A																
D045	TCB -Cable Sizing and Voltage Drop Verification - Approval	30d	06-Oct-18 A	04-Nov-18 A																
D070	TCB -Cable Containment Calculation	60d	04-Sep-18 A	02-Nov-18 A																
D075	TCB -Cable Containment Calculation - Approval	30d	03-Nov-18 A	02-Dec-18																
D085	TCB -Earthing Resistance Calculation - Approval	30d	06-Oct-18 A	04-Nov-18 A																
D095	TCB -Power Factor Correction & Harmonic Current Analysis Calculation - Apprc	30d	06-Oct-18 A	04-Nov-18 A																
ADB																				
D105	ADB -UPS and Battery Capacity Calculations - Approval	30d	30-Sep-18 A	29-Oct-18 A																
D120	ADB -Lux Level Calculation	60d	09-Sep-18 A	07-Nov-18 A																
D125	ADB -Lux Level Calculation - Approval	30d	08-Nov-18 A	07-Dec-18																
D130	ADB -Cable Sizing and Voltage Drop Verification	60d	30-Sep-18 A	28-Nov-18																
D135	ADB -Cable Sizing and Voltage Drop Verification - Approval	30d	29-Nov-18	28-Dec-18																
D160	ADB -Cable Containment Calculation	60d	10-Oct-18 A	08-Dec-18																
D165	ADB -Cable Containment Calculation - Approval	30d	09-Dec-18	07-Jan-19																
D170	ADB -Earthing Resistance Calculation	60d	30-Sep-18 A	28-Nov-18																
D175	ADB -Earthing Resistance Calculation - Approval	30d	29-Nov-18	28-Dec-18																

THREE MONTHLY ROLLING PROGRAMME

HY/2017/10 TM-CLKL - Northern Connection Tunnel Buildings, Electrical and Mechanical Works

20/11/18 - 20/02/19

P5

Date	Revision	Checked	Approved
20/11/18			

ID	Activity	Days	Start	Finish	2018												2019							
					November						December						January				February			
					22	29	05	12	19	26	03	10	17	24	31	07	14	21	28	04	11	18		
D180	ADB -Power Factor Correction & Harmonic Current AnalysisCalculation	60d	30-Sep-18 A	28-Nov-18	[Gantt bar: 30-Sep-18 to 28-Nov-18]																			
D185	ADB -Power Factor Correction & Harmonic Current AnalysisCalculation - Apprc	30d	29-Nov-18	28-Dec-18	[Gantt bar: 29-Nov-18 to 28-Dec-18]																			
NVB																								
D225	NVB -Cable Sizing and Voltage Drop Verification - Approval	30d	10-Oct-18 A	08-Nov-18 A	[Gantt bar: 10-Oct-18 to 08-Nov-18]																			
D250	NVB -Cable Containment Calculation	60d	19-Sep-18 A	17-Nov-18 A	[Gantt bar: 19-Sep-18 to 17-Nov-18]																			
D255	NVB -Cable Containment Calculation - Approval	30d	18-Nov-18 A	17-Dec-18	[Gantt bar: 18-Nov-18 to 17-Dec-18]																			
D265	NVB -Earthing Resistance Calculation - Approval	30d	10-Oct-18 A	08-Nov-18 A	[Gantt bar: 10-Oct-18 to 08-Nov-18]																			
D275	NVB -Power Factor Correction & Harmonic Current AnalysisCalculation - Apprc	30d	10-Oct-18 A	08-Nov-18 A	[Gantt bar: 10-Oct-18 to 08-Nov-18]																			
D285	NVB -HV Electrical Loading Calculation - Approval	30d	10-Oct-18 A	08-Nov-18 A	[Gantt bar: 10-Oct-18 to 08-Nov-18]																			
SCB																								
D390	SCB -UPS and Battery Capacity Calculations	60d	20-Jan-19*	20-Mar-19													[Gantt bar: 20-Jan-19 to 20-Mar-19]							
D400	SCB -Electrical Loading Demand Calculation	60d	20-Jan-19*	20-Mar-19													[Gantt bar: 20-Jan-19 to 20-Mar-19]							
D430	SCB -Generator Calculation	60d	28-Dec-18*	25-Feb-19													[Gantt bar: 28-Dec-18 to 25-Feb-19]							
D440	SCB -Fuel Tank Calculation	60d	28-Dec-18*	25-Feb-19													[Gantt bar: 28-Dec-18 to 25-Feb-19]							
CEDB																								
D480	CEDB -UPS and Battery Capacity Calculations	60d	04-Jan-19*	04-Mar-19													[Gantt bar: 04-Jan-19 to 04-Mar-19]							
D490	CEDB -Electrical Loading Demand Calculation	60d	13-Nov-18 A	11-Jan-19	[Gantt bar: 13-Nov-18 to 11-Jan-19]																			
D495	CEDB -Electrical Loading Demand Calculation - Approval	30d	12-Jan-19	10-Feb-19													[Gantt bar: 12-Jan-19 to 10-Feb-19]							
D500	CEDB -Lux Level Calculation	60d	22-Jan-19*	22-Mar-19													[Gantt bar: 22-Jan-19 to 22-Mar-19]							
D510	CEDB -Cable Sizing and Voltage Drop Verification	60d	16-Feb-19*	16-Apr-19													[Gantt bar: 16-Feb-19 to 16-Apr-19]							
D520	CEDB -Calculation of Total Electrical Load	60d	13-Nov-18 A	11-Jan-19	[Gantt bar: 13-Nov-18 to 11-Jan-19]																			
D525	CEDB -Calculation of Total Electrical Load - Approval	30d	12-Jan-19	10-Feb-19													[Gantt bar: 12-Jan-19 to 10-Feb-19]							
D530	CEDB -Generator Calculation	60d	15-Dec-18*	12-Feb-19													[Gantt bar: 15-Dec-18 to 12-Feb-19]							
D535	CEDB -Generator Calculation - Approval	30d	13-Feb-19	14-Mar-19													[Gantt bar: 13-Feb-19 to 14-Mar-19]							
D540	CEDB -Fuel Tank Calculation	60d	15-Dec-18*	12-Feb-19													[Gantt bar: 15-Dec-18 to 12-Feb-19]							
D545	CEDB -Fuel Tank Calculation - Approval	30d	13-Feb-19	14-Mar-19													[Gantt bar: 13-Feb-19 to 14-Mar-19]							
D560	CEDB -Earthing Resistance Calculation	60d	16-Feb-19*	16-Apr-19													[Gantt bar: 16-Feb-19 to 16-Apr-19]							
D570	CEDB -Power Factor Correction & Harmonic Current Analysis Calculation	60d	16-Feb-19*	16-Apr-19													[Gantt bar: 16-Feb-19 to 16-Apr-19]							
FSDB																								
D580	FSDB -UPS and Battery Capacity Calculations	60d	26-Dec-18*	23-Feb-19													[Gantt bar: 26-Dec-18 to 23-Feb-19]							
D590	FSDB -Electrical Loading Demand Calculation	60d	13-Nov-18 A	11-Jan-19	[Gantt bar: 13-Nov-18 to 11-Jan-19]																			

THREE MONTHLY ROLLING PROGRAMME

HY/2017/10 TM-CLKL - Northern Connection Tunnel Buildings, Electrical and Mechanical Works

20/11/18 - 20/02/19

P6

Date	Revision	Checked	Approved
20/11/18			

ID	Activity	Days	Start	Finish	2018							2019						
					November				December			January			February			
					22	29	05	12	19	26	03	10	17	24	31	07	14	21
E040	Sprinkler Pump Head Calculation for Services Gallery	60d	14-Oct-18 A	12-Dec-18														
E045	Sprinkler Pump Head Calculation for Services Gallery - Approval	30d	13-Dec-18	11-Jan-19														
TCB																		
E060	TCB -FS Pump Head Calculation	60d	13-Sep-18 A	11-Nov-18 A														
E065	TCB -FS Pump Head Calculation - Approval	30d	12-Nov-18 A	11-Dec-18														
E070	TCB -Sprinkler Pump Head Calculation	60d	13-Sep-18 A	11-Nov-18 A														
E075	TCB -Sprinkler Pump Head Calculation - Approval	30d	12-Nov-18 A	11-Dec-18														
ADB																		
E100	ADB -FS Pump Head Calculation	60d	13-Sep-18 A	11-Nov-18 A														
E105	ADB -FS Pump Head Calculation - Approval	30d	12-Nov-18 A	11-Dec-18														
E110	ADB -Sprinkler Pump Head Calculation	60d	13-Sep-18 A	11-Nov-18 A														
E115	ADB -Sprinkler Pump Head Calculation - Approval	30d	12-Nov-18 A	11-Dec-18														
E125	ADB -Battery Capacity Calculation - Approval	30d	27-Sep-18 A	26-Oct-18 A														
NVB																		
E145	NVB -FS Pump Head Calculation - Approval	30d	18-Oct-18 A	16-Nov-18 A														
E155	NVB -Sprinkler Pump Head Calculation - Approval	30d	18-Oct-18 A	16-Nov-18 A														
SVB																		
E210	SVB -FM200 System Design Calculation	60d	22-Jan-19*	22-Mar-19														
SCB																		
E240	SCB -Battery Capacity Calculation	60d	07-Feb-19*	07-Apr-19														
E250	SCB -FM200 System Design Calculation	60d	22-Oct-18 A	20-Dec-18														
E255	SCB -FM200 System Design Calculation - Approval	30d	21-Dec-18	19-Jan-19														
CEDB																		
E260	CEDB -FS Pump Head Calculation	60d	16-Feb-19*	16-Apr-19														
E270	CEDB -Sprinkler Pump Head Calculation	60d	16-Feb-19*	16-Apr-19														
E280	CEDB -Battery Capacity Calculation	60d	27-Nov-18*	25-Jan-19														
E285	CEDB -Battery Capacity Calculation - Approval	30d	26-Jan-19	24-Feb-19														
E290	CEDB -FM200 System Design Calculation	60d	22-Nov-18*	20-Jan-19														
E295	CEDB -FM200 System Design Calculation - Approval	30d	21-Jan-19	19-Feb-19														
FSDB																		
E300	FSDB -FS Pump Head Calculation	60d	28-Nov-18*	26-Jan-19														
E305	FSDB -FS Pump Head Calculation - Approval	30d	27-Jan-19	25-Feb-19														

THREE MONTHLY ROLLING PROGRAMME

HY/2017/10 TM-CLKL - Northern Connection Tunnel Buildings, Electrical and Mechanical Works

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Date	Revision	Checked	Approved
20/11/18			

ID	Activity	Days	Start	Finish	2018							2019							
					November			December				January			February				
					22	29	05	12	19	26	03	10	17	24	31	07	14	21	28
E310	FSDB -Sprinkler Pump Head Calculation	60d	28-Nov-18*	26-Jan-19															
E315	FSDB -Sprinkler Pump Head Calculation - Approval	30d	27-Jan-19	25-Feb-19															
E320	FSDB -Battery Capacity Calculation	60d	28-Nov-18*	26-Jan-19															
E325	FSDB -Battery Capacity Calculation - Approval	30d	27-Jan-19	25-Feb-19															
MD																			
E335	MD -FS Pump Head Calculation - Approval	30d	20-Oct-18 A	18-Nov-18 A															
E345	MD -Sprinkler Pump Head Calculation - Approval	30d	20-Oct-18 A	18-Nov-18 A															
E355	MD -Battery Capacity Calculation - Approval	30d	20-Oct-18 A	18-Nov-18 A															
E360	MD -FM200 System Design Calculation	60d	22-Nov-18*	20-Jan-19															
E365	MD -FM200 System Design Calculation - Approval	30d	21-Jan-19	19-Feb-19															
Section F - Building Services of Plumbing & Drainage System																			
Tunnel																			
F020	Water Storage Tank Calculation	60d	16-Oct-18 A	14-Dec-18															
F025	Water Storage Tank Calculation - Approval	30d	15-Dec-18	13-Jan-19															
TCB																			
F030	TCB - Pump Head Calculation	60d	13-Oct-18 A	11-Dec-18															
F035	TCB - Pump Head Calculation - Approval	30d	12-Dec-18	10-Jan-19															
F040	TCB - Pressure Vessel Calculation	60d	13-Oct-18 A	11-Dec-18															
F045	TCB - Pressure Vessel Calculation - Approval	30d	12-Dec-18	10-Jan-19															
F055	TCB - Rainwater Analysis and Pipe Work Calculation - Approval	30d	30-Sep-18 A	29-Oct-18 A															
F075	TCB - Hot water system capacity calculation - Approval	30d	07-Oct-18 A	05-Nov-18 A															
ADB																			
F080	ADB - Pump Head Calculation	60d	09-Nov-18 A	07-Jan-19															
F085	ADB - Pump Head Calculation - Approval	30d	08-Jan-19	06-Feb-19															
F090	ADB - Pressure Vessel Calculation	60d	09-Nov-18 A	07-Jan-19															
F095	ADB - Pressure Vessel Calculation - Approval	30d	08-Jan-19	06-Feb-19															
F100	ADB - Rainwater Analysis and Pipe Work Calculation	60d	07-Oct-18 A	05-Dec-18															
F105	ADB - Rainwater Analysis and Pipe Work Calculation - Approval	30d	06-Dec-18	04-Jan-19															
F115	ADB - Hydraulic Analysis of Waste Water Systems - Approval	30d	07-Oct-18 A	05-Nov-18 A															
F125	ADB - Hot water system capacity calculation - Approval	30d	07-Oct-18 A	05-Nov-18 A															
F130	ADB - Drainage Sump Pumps and Pump Pits Calculation	60d	18-Oct-18 A	16-Dec-18															
F135	ADB - Drainage Sump Pumps and Pump Pits Calculation - Approval	30d	17-Dec-18	15-Jan-19															

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ID	Activity	Days	Start	Finish	2018												2019							
					November						December						January				February			
					22	29	05	12	19	26	03	10	17	24	31	07	14	21	28	04	11	18		
FSD109	Predrilling (No.8)	1d	12-Nov-18 A	12-Nov-18 A																				
FSD111	Predrilling (No.9)	1d	13-Nov-18 A	13-Nov-18 A																				
FSD112	Predrilling (No.10)	1d	14-Nov-18 A	14-Nov-18 A																				
FSD113	Predrilling (No.11)	1d	15-Nov-18 A	15-Nov-18 A																				
FSD114	Predrilling (No.12)	1d	16-Nov-18 A	16-Nov-18 A																				
FSD115	Predrilling (No.13)	1d	17-Nov-18 A	17-Nov-18 A																				
FSD116	Predrilling (No.14)	1d	18-Nov-18 A	18-Nov-18 A																				
FSD117	Demobilization	3d	19-Nov-18 A	20-Nov-18 A																				
FSD140	Socket H-Piles (Pile No. 1-7)	12d	20-Nov-18	03-Dec-18																				
FSD141	Socket H-Piles (Pile No. 8-14)	12d	04-Dec-18	17-Dec-18																				
FSD142	Socket H-Piles (Pile No. 15-21)	12d	18-Dec-18	04-Jan-19																				
FSD143	Socket H-Piles (Pile No. 22-28)	12d	05-Jan-19	18-Jan-19																				
FSD144	Socket H-Piles (Pile No. 29-35)	12d	19-Jan-19	01-Feb-19																				
FSD145	Socket H-Piles (Pile No. 36-37)	3d	02-Feb-19	08-Feb-19																				
FSD150	Loading Test	14d	09-Feb-19	25-Feb-19																				
C&ED Building Substructure																								
CED140	Predrilling (No.1-6)	10d	05-Nov-18 A	10-Nov-18 A																				
CED141	Predrilling (No. 7-12)	11d	11-Nov-18 A	20-Nov-18 A																				
CED150	Socket H-Piling (No. 1-8)	11d	20-Nov-18	01-Dec-18																				
CED151	Socket H-Piling (No. 9-16)	11d	03-Dec-18	14-Dec-18																				
CED152	Socket H-Piling (No. 17-24)	11d	15-Dec-18	31-Dec-18																				
CED153	Socket H-Piling (No. 25-32)	11d	02-Jan-19	14-Jan-19																				
CED154	Socket H-Piling (No. 33-40)	11d	15-Jan-19	26-Jan-19																				
CED155	Socket H-Piling (No. 41-48)	11d	28-Jan-19	12-Feb-19																				
CED156	Socket H-Piling (No. 49-52)	10d	13-Feb-19	23-Feb-19																				
Key Date 1 - Toll Control Building (TCB) & TCSS Provision																								
Toll Control Building (TCB)																								
TCB163	Remaining portion of G/F Slab	12d	20-Oct-18 A	05-Nov-18 A																				
TCB164	Remaining portion of 1/F Slab	12d	03-Nov-18 A	24-Nov-18																				
TCB173	Level 2 Slab	12d	15-Nov-18 A	28-Nov-18																				
TCB174	Remove 2/F Slab Formwork	2d	29-Nov-18	30-Nov-18																				

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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		✓
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		✓
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		✓
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		◁▷
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		✓
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		◁▷

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
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						D	C	O	
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		✓
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		✓
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		✓
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		✓
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		✓
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		✓

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						D	C	O	
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		✓
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		✓
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	✓
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		✓

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						D	C	O	
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		✓
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		✓

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						D	C	O	
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 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;	All areas / throughout construction period	Contractor	TMEIA		Y		✓

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						D	C	O	
		f Sufficiently covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and f 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									
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

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						D	C	O	
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 unobstrusive material (in earth tone) (CM4)	All areas/detailed design/ during construction/ post construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
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/Hy D/L CSD

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

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

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

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

*** Remarks:**

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

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

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

Appendix D

Summary of Action and Limit Levels

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

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

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

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 2018 (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	-	0.000	-	-	-	-	-	-	-	-	-	-
Feb	-	0.000	-	-	-	-	-	-	-	-	-	-
Mar	-	0.000	-	-	-	-	-	-	-	-	-	-
Apr	-	0.000	-	-	-	-	-	-	-	-	-	-
May	0.397	0.000	-	0.397	-	-	-	-	-	-	-	-
Jun	2.085	0.008	-	-	2.085	-	-	3.750	-	-	-	-
SUB-TOTAL	2.482	0.008	0.000	0.397	2.085	0.000	-	3.750	-	0.000	-	-
Jul	0.830	0.050	-	-	0.830	-	-	15.190	-	-	-	-
Aug	0.825	0.046	-	-	0.825	-	-	103.420	-	-	-	-
Sep	0.205	-	-	-	0.205	-	-	22.150	-	-	-	-
Oct	0.720	-	-	-	0.720	-	-	26.280	-	-	0.063	-
Nov	0.253	0.011	0.010	-	0.243	-	-	11.720	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	5.315	0.115	0.010	0.397	4.908	-	-	182.510	-	-	0.063	-

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 G

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

Appendix G1 Cumulative Statistics on Exceedances

		Total No. recorded in this reporting month	Total No. recorded since project commencement
1-Hr TSP	Action	6	13
	Limit	0	1
24-Hr TSP	Action	0	0
	Limit	0	0

Appendix G2 Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of Summons	Successful Prosecutions
This Reporting Month (November 2018)	0	0	0
Total No. received since project commencement	0	0	0

Email
message

Environmental
Resources
Management

To Ramboll Hong Kong Limited (ENPO)

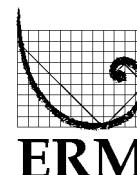
From ERM- Hong Kong, Limited

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 12 November 2018

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_31 October 2018_1hrTSP_Station ASR5

A total of one (1) exceedance was recorded on 31 October 2018.

Regards,

Dr Jasmine Ng
Environmental Team Leader

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ERM-Hong Kong, Limited

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

Air Quality Impact Monitoring

Notification of Exceedance

Log No.	<p><u>Action Level Exceedance</u> 0463091_31 October 2018_1hrTSP_Station ASR5</p> <p>[Total No. of Exceedances = 1]</p>	
Date	<p>31 October 2018 (Measured) 12 November 2018 (Results obtained from ENPO Website)</p>	
Monitoring Station	ASR1, ASR5, ASR6, ASR10, AQMS1	
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
Limit Levels	1-hr TSP ($\mu\text{g}/\text{m}^3$)	500
Measured Levels	Refer to the attached data sheet.	
Works Undertaken (at the time of monitoring event)	<p>Works undertaken under this Contract on 31 October 2018 included:</p> <ul style="list-style-type: none"> ▪ Socket H-piling at Administration Building and Maintenance Depot; and ▪ Erection of formwork and fixing of steer bar at Toll Control Building. 	
Possible Reason for Action or Limit Level Exceedance(s)	<p>The exceedance is unlikely to be due to the Project, in view of the following:</p> <ul style="list-style-type: none"> • Apart from exceedances of 1 hour TSP (13:45 - 14:45) at ASR5, other 1hr-TSP levels and all 24-hr TSP at all monitoring stations were in compliance with the Action and Limit Levels on the same day. • Watering record provided by the Contractor was reviewed. Watering was maintained on unpaved and dry road on 31 October 2018 (refer to Contractor's Photo and watering record). • According to ET's site inspection on 2 November 2018, no particular findings was observed at the works area near ASR5 (refer to ET's Site Inspection Photo). Unpaved roads at the works area were in wet condition. <p>Based on the above, the exceedances are unlikely to be due to the Project.</p>	
Actions Taken/ To Be Taken	The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area including water spraying at unpaved road. The ET will monitor for future trends in exceedances.	
Dust Remarks	The monitoring results on 31 October 2018 and locations of air quality monitoring stations are attached. Works area under this Contract is attached. The attached wind data on 31 October 2018 is sourced from Contract No. HY/2012/08 for reference.	

Results of Air Quality Monitoring

Project	Works	Date (yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Parameter	Results	Unit
TMCLKL	HY/2012/08	2018/10/31	AQMS1	14:08	1-hour TSP	161	ug/m3
TMCLKL	HY/2012/08	2018/10/31	AQMS1	15:10	1-hour TSP	210	ug/m3
TMCLKL	HY/2012/08	2018/10/31	AQMS1	16:12	1-hour TSP	169	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR1	13:57	1-hour TSP	197	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR1	14:59	1-hour TSP	123	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR1	16:01	1-hour TSP	134	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR10	13:22	1-hour TSP	136	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR10	14:24	1-hour TSP	122	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR10	15:26	1-hour TSP	102	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR5	13:45	1-hour TSP	371	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR5	14:47	1-hour TSP	293	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR5	15:49	1-hour TSP	303	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR6	13:33	1-hour TSP	234	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR6	14:35	1-hour TSP	194	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR6	15:37	1-hour TSP	210	ug/m3
TMCLKL	HY/2012/08	2018/10/31	AQMS1	17:14	24-hour TSP	90	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR1	17:03	24-hour TSP	121	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR10	16:28	24-hour TSP	83	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR5	16:51	24-hour TSP	193	ug/m3
TMCLKL	HY/2012/08	2018/10/31	ASR6	16:39	24-hour TSP	130	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 Director (degree)
18/10/31	0:00	2.2	342
18/10/31	1:00	2.2	355
18/10/31	2:00	2.7	346
18/10/31	3:00	3.1	14
18/10/31	4:00	3.1	32
18/10/31	5:00	2.2	37
18/10/31	6:00	1.8	18
18/10/31	7:00	2.2	6
18/10/31	8:00	3.6	33
18/10/31	9:00	3.6	13
18/10/31	10:00	1.8	284
18/10/31	11:00	1.8	36
18/10/31	12:00	3.1	46
18/10/31	13:00	3.6	29
18/10/31	14:00	2.2	27
18/10/31	15:00	1.8	39
18/10/31	16:00	2.2	39
18/10/31	17:00	1.8	22
18/10/31	18:00	2.2	339
18/10/31	19:00	0.9	324
18/10/31	20:00	0.9	118
18/10/31	21:00	2.7	4
18/10/31	22:00	3.1	357
18/10/31	23:00	2.2	334

*Wind data is sourced from Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-sea Tunnel Section

PHOTO BY CONTRACTOR ON 31 OCTOBER 2018

Photo 1 - Watering of unpaved roads to maintain a wet condition (31 October 2018)



PHOTO BY CONTRACTOR ON 31 OCTOBER 2018

PHOTO BY ET ON 2 NOVEMBER 2018

Photo 2 - Unpaved roads were maintained in a wet condition (2 November 2018)



Photo 3 - No dust emission works were conducted at Toll Control Building.



WATERING RECORD ON 31 OCTOBER 2018

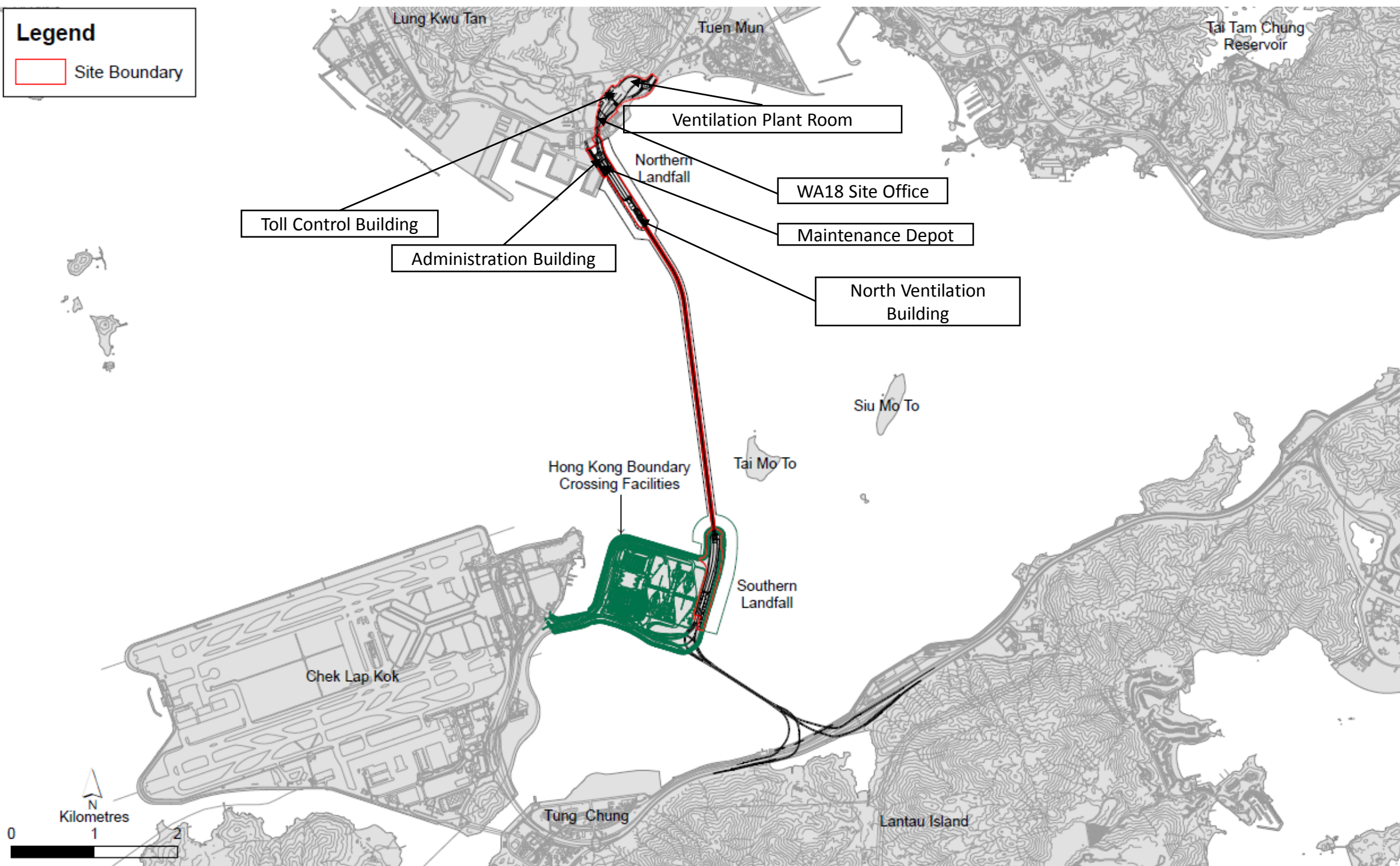
Date: 31st Oct

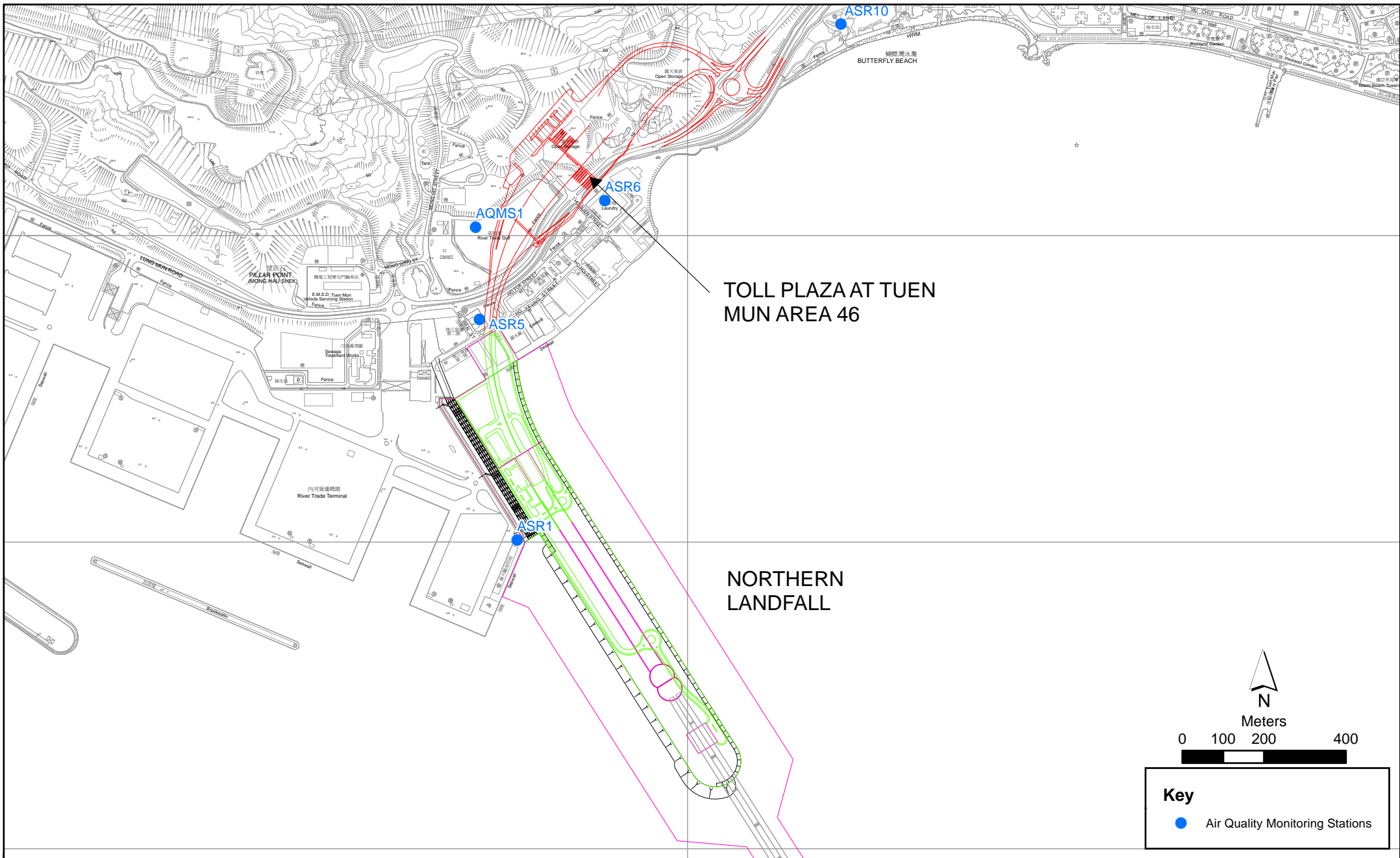
Location: AUB & MD

Period		Watering time	Signature
8-9	✓	8:09	Toby
9-10	✓✓	9:10 9:49	Toby
10-11	✓	10:47	Toby
11-12	✓	11:50	Toby
12-13	✓	12:51	Toby
13-14	✓	13:42	Toby
14-15	✓✓	14:09 14:53	Toby
15-16	✓	15:49	Toby
16-17	✓	16:52	Toby
17-18	✓	17:45	Toby
18-19			

Legend

 Site Boundary





TOLL PLAZA AT TUEN
MUN AREA 46

NORTHERN
LANDFALL



Meters

0 100 200 400



Key

- Air Quality Monitoring Stations

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)

**Environmental
Resources
Management**



Email
message

Environmental
Resources
Management

To Ramboll Hong Kong Limited (ENPO)

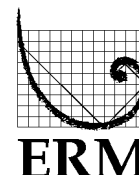
From ERM- Hong Kong, Limited

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 22 November 2018

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_6 November 2018_1hrTSP_Station ASR1

A total of one (1) exceedance was recorded on 6 November 2018.

Regards,

Dr Jasmine Ng
Environmental Team Leader

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ERM-Hong Kong, Limited

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

Air Quality Impact Monitoring

Notification of Exceedance

Log No.	<p><u>Action Level Exceedance</u> 0463091_6 November 2018_1hrTSP_Station ASR1</p> <p>[Total No. of Exceedances = 1]</p>	
Date	<p>6 November 2018 (Measured) 22 November 2018 (Results obtained from ENPO Website)</p>	
Monitoring Station	ASR1, ASR5, ASR6, ASR10, AQMS1	
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
Limit Levels	1-hr TSP ($\mu\text{g}/\text{m}^3$)	500
Measured Levels	Refer to the attached data sheet.	
Works Undertaken (at the time of monitoring event)	<p>Works undertaken under this Contract on 6 November 2018 included:</p> <ul style="list-style-type: none"> ▪ Socket H-piling at Administration Building; and ▪ Formwork at Toll Control Building. 	
Possible Reason for Action or Limit Level Exceedance(s)	<p>The exceedance is unlikely to be due to the Project, in view of the following:</p> <ul style="list-style-type: none"> • Apart from exceedances of 1 hour TSP (14:50 - 15:50) at ASR1, other 1hr-TSP levels and all 24-hr TSP at all monitoring stations were in compliance with the Action and Limit Levels on the same day. • Watering record provided by the Contractor was reviewed. Watering was maintained on unpaved and dry road on 6 November 2018 (refer to Contractor's Photo and watering record). • No outdoor construction works was conducted under this Contract in the wind direction (south-easterly wind) during the time that exceedance was recorded. • According to ET's site inspection on 9 November 2018, no particular findings was observed at the works area near ASR1 (refer to ET's Site Inspection Photo). Unpaved roads at the works area were in wet condition. <p>Based on the above, the exceedances are unlikely to be due to the Project.</p>	
Actions Taken / To Be Taken	The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area including water spraying at unpaved roads. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 6 November 2018 and locations of air quality monitoring stations are attached. The location of the works area under this Contract is attached. The attached wind data on 6 November 2018 is sourced from Contract No. HY/2012/08 for reference.	

Results of Air Quality Monitoring

Project	Works	Date (yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Parameter	Results	Unit
TMCLKL	HY/2012/08	2018/11/06	AQMS1	13:59	1-hour TSP	82	ug/m3
TMCLKL	HY/2012/08	2018/11/06	AQMS1	15:01	1-hour TSP	110	ug/m3
TMCLKL	HY/2012/08	2018/11/06	AQMS1	16:03	1-hour TSP	79	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR1	13:48	1-hour TSP	126	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR1	14:50	1-hour TSP	376	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR1	15:52	1-hour TSP	93	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR10	13:13	1-hour TSP	152	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR10	14:15	1-hour TSP	50	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR10	15:17	1-hour TSP	53	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR5	13:37	1-hour TSP	181	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR5	14:39	1-hour TSP	152	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR5	15:41	1-hour TSP	138	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR6	13:25	1-hour TSP	108	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR6	14:27	1-hour TSP	96	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR6	15:29	1-hour TSP	91	ug/m3
TMCLKL	HY/2012/08	2018/11/06	AQMS1	17:05	24-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR1	16:54	24-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR10	16:19	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR5	16:43	24-hour TSP	90	ug/m3
TMCLKL	HY/2012/08	2018/11/06	ASR6	16:31	24-hour TSP	65	ug/m3

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

PHOTO BY CONTRACTOR ON 6 NOVEMBER 2018

Photo 1 - Watering of unpaved roads near Administration Building and Maintenance Depot to maintain a wet condition (6 November 2018)



Photo 2 - Watering of unpaved roads near Fire Services Department Building and Customs & Excise Department Building to maintain a wet condition (6 November 2018)



Photo 3 - Unpaved roads were maintained in a wet condition (9 November 2018)



WATERING RECORD ON 6 NOVEMBER 2018

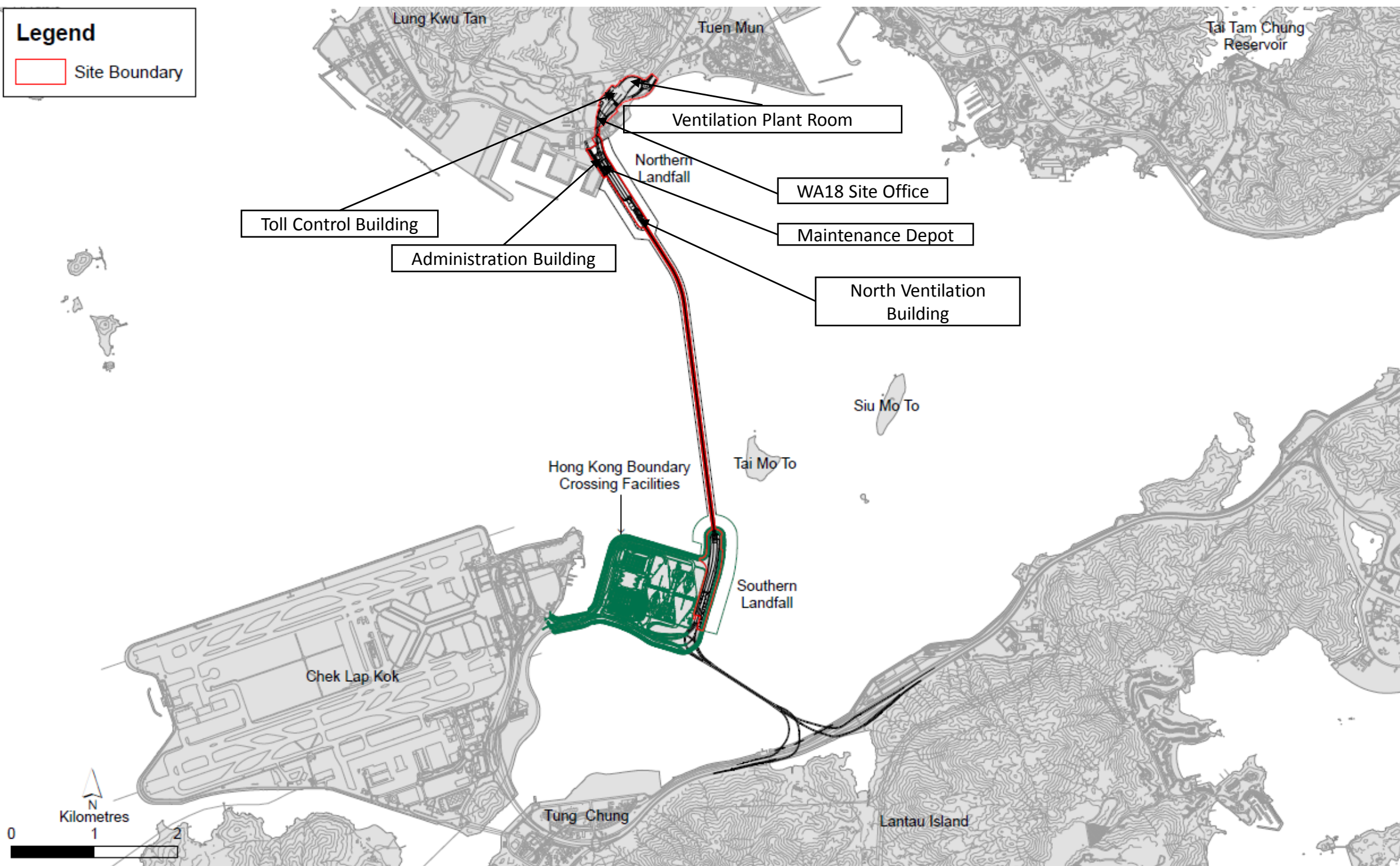
Date: 6th Nov

A/B & M/D

Period	Time of watering	Sign
7-8		
8-9	✓ 8:05	tohy
9-10	✓ 9:06	tohy
10-11	✓ 10:03	tohy
11-12	✓ 11:05	tohy
12-13	✓ 12:06	tohy
13-14	✓ 13:04	tohy
14-15	✓ ✓ 14:01 14:53	tohy
15-16	✓ 15:53	tohy
16-17	✓ 16:45	tohy
17-18	✓ 17:44	tohy
18-19	✓ 18:30	tohy

Legend

Site Boundary



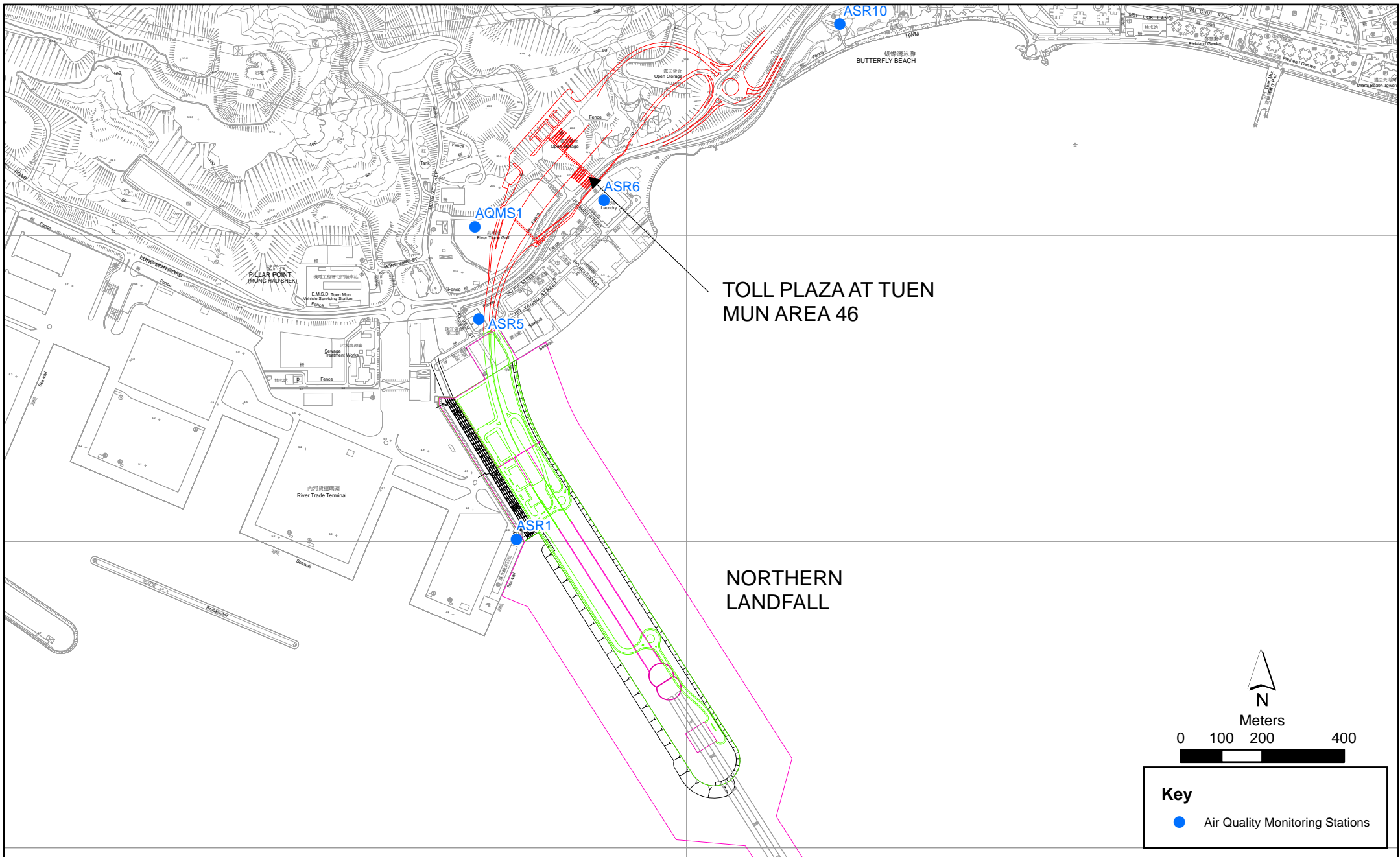


Figure 2.1

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

N
 Meters
 0 100 200 400

Meteorological Data for Impact Monitoring in the reporting period*			
Date (yy-mm-dd)	Time (24hrs)	Average of Wind Speed (m/s)	Average of Wind Director (degree)
18/11/06	0:00	2.7	95
18/11/06	1:00	2.7	93
18/11/06	2:00	2.2	98
18/11/06	3:00	0.9	62
18/11/06	4:00	1.3	95
18/11/06	5:00	0.4	312
18/11/06	6:00	0.9	53
18/11/06	7:00	1.3	51
18/11/06	8:00	1.3	76
18/11/06	9:00	3.1	101
18/11/06	10:00	3.1	132
18/11/06	11:00	4.0	144
18/11/06	12:00	3.6	124
18/11/06	13:00	3.6	143
18/11/06	14:00	2.7	139
18/11/06	15:00	2.2	131
18/11/06	16:00	1.3	120
18/11/06	17:00	1.8	97
18/11/06	18:00	2.2	101
18/11/06	19:00	1.3	121
18/11/06	20:00	1.3	80
18/11/06	21:00	1.3	93
18/11/06	22:00	2.2	93
18/11/06	23:00	1.3	81

*Wind data is sourced from Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-sea Tunnel Section

Email
message

Environmental
Resources
Management

To Ramboll Hong Kong Limited (ENPO)

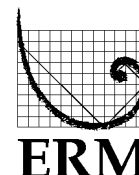
From ERM- Hong Kong, Limited

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 22 November 2018

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_12 November 2018_1hrTSP_Station ASR1
0463091_12 November 2018_1hrTSP_Station ASR5
0463091_12 November 2018_1hrTSP_Station ASR5
0463091_12 November 2018_1hrTSP_Station ASR5
0463091_12 November 2018_1hrTSP_Station ASR6

A total of five (5) exceedances were recorded on 12 November 2018.

Regards,

Dr Jasmine Ng
Environmental Team Leader

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ERM-Hong Kong, Limited

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

Air Quality Impact Monitoring

Notification of Exceedance

Log No.	<u>Action Level Exceedance</u> 0212330_12November2018_1hrTSP_Station ASR1 0212330_12November2018_1hrTSP_Station ASR5 0212330_12November2018_1hrTSP_Station ASR5 0212330_12November2018_1hrTSP_Station ASR5 0212330_12November2018_1hrTSP_Station ASR6 [Total No. of Exceedances = 5]	
Date	12 November 2018 (Measured) 22 November 2018 (Results obtained from ENPO Website)	
Monitoring Station	ASR1, ASR5, ASR6, ASR10, AQMS1	
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
Limit Levels	1-hr TSP ($\mu\text{g}/\text{m}^3$)	500
Measured Levels	Refer to the attached data sheet.	
Works Undertaken (at the time of monitoring event)	Works undertaken under this Contract on 12 November 2018 included: <ul style="list-style-type: none"> ▪ Socket H-piling at Administration Building. ▪ Formwork at Toll Control Building. 	
Possible Reason for Action or Limit Level Exceedance(s)	<p>The exceedances are unlikely to be due to the Project, in view of the following:</p> <ul style="list-style-type: none"> • Although five (5) Action Levels Exceedances of 1-hour TSP were recorded, including exceedances recorded at ASR1 (15:02-16:02), ASR-5 (13:49-14:49; 14:51-15:51; 15:53-16:53) and ASR6 (14:40- 15:40), no works area under this Contract are located upstream of stations ASR1 and ASR5 and only the works area of Toll Control Building (TCB) are located upstream of station ASR6 in the wind direction (ranged between 217° and 304° blowing from a Westerly direction) during the period when 1-hour TSP exceedances were observed. • Only one (1) Action Level Exceedance of 1- hour TSP was recorded at station ASR6 downstream of the TCB when exceedance was recorded, works at TCB were formworks which are not dust generating. • Watering record provided by the Contractor was reviewed. Watering was maintained on unpaved and dry road on 12 November 2018 (<i>refer to Contractor's Photo and watering record</i>). <p>With reference to the recorded wind Based on the above, the exceedances are unlikely to be due to the Project.</p>	
Actions Taken / To Be Taken	The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area including water spraying at unpaved road. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 12 November 2018 and locations of air quality monitoring stations are attached. The location of the works area under this Contract is attached. The attached wind data on 12 November 2018 is sourced from <i>Contract No. HY/2012/08</i> for reference.	

Results of Air Quality Monitoring

Project	Works	Date (yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Parameter	Results	Unit
TMCLKL	HY/2012/08	2018/11/12	AQMS1	14:12	1-hour TSP	311	ug/m3
TMCLKL	HY/2012/08	2018/11/12	AQMS1	15:14	1-hour TSP	272	ug/m3
TMCLKL	HY/2012/08	2018/11/12	AQMS1	16:16	1-hour TSP	292	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR1	14:00	1-hour TSP	148	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR1	15:02	1-hour TSP	395	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR1	16:04	1-hour TSP	193	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR10	13:26	1-hour TSP	242	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR10	14:28	1-hour TSP	164	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR10	15:30	1-hour TSP	197	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR5	13:49	1-hour TSP	371	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR5	14:51	1-hour TSP	425	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR5	15:53	1-hour TSP	377	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR6	13:38	1-hour TSP	262	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR6	14:40	1-hour TSP	343	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR6	15:42	1-hour TSP	259	ug/m3
TMCLKL	HY/2012/08	2018/11/12	AQMS1	17:18	24-hour TSP	80	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR1	17:06	24-hour TSP	63	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR10	16:32	24-hour TSP	64	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR5	16:55	24-hour TSP	136	ug/m3
TMCLKL	HY/2012/08	2018/11/12	ASR6	16:44	24-hour TSP	103	ug/m3

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

Photo 1 - Watering of unpaved roads at works area near Administration Building and Maintenance Depot to maintain a wet condition



Photo 2 - Watering of unpaved roads at works areas near Fire Service Department Building and Customs & Excise Department Building to maintain a wet condition

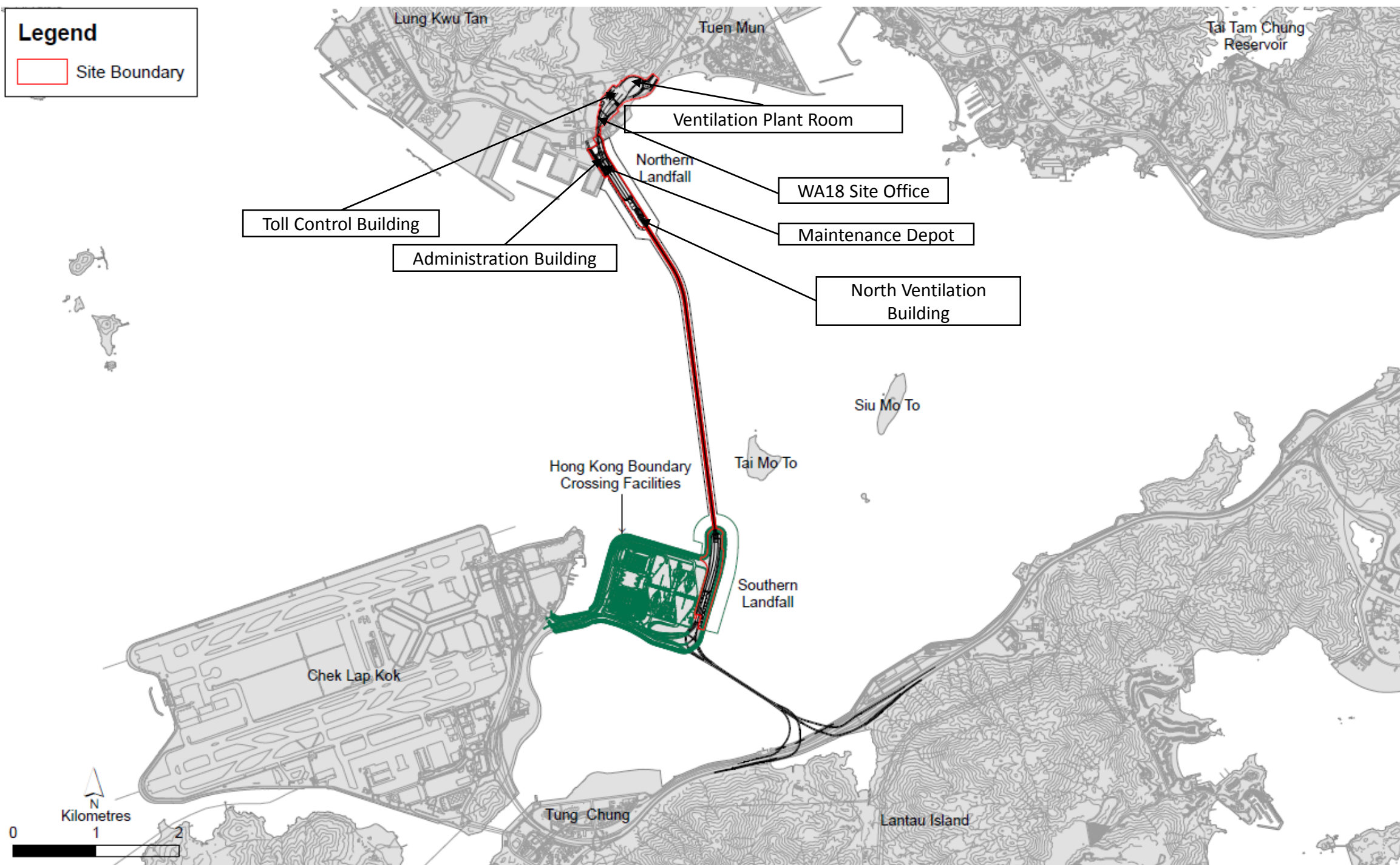


WATERING RECORD ON 12 NOVEMBER 2018

12 th Nov		Add & MD	
Period	Watering time		Sign
7-8	✓ 7:56		Toby
8-9	✓ 8:54		Toby
9-10	✓ 9:40		Toby
10-11	✓ 10:56		Toby
11-12	✓ ✓ 11:10 • 11:55		Toby
12-13	✓ 12:56		Toby
13-14	✓ 13:56		Toby
14-15	✓ 14:50		Toby
15-16	✓ 15:52		Toby
16-17	✓ 16:51		Toby
17-18	✓ 17:54		Toby
18-19			Toby

Legend

Site Boundary



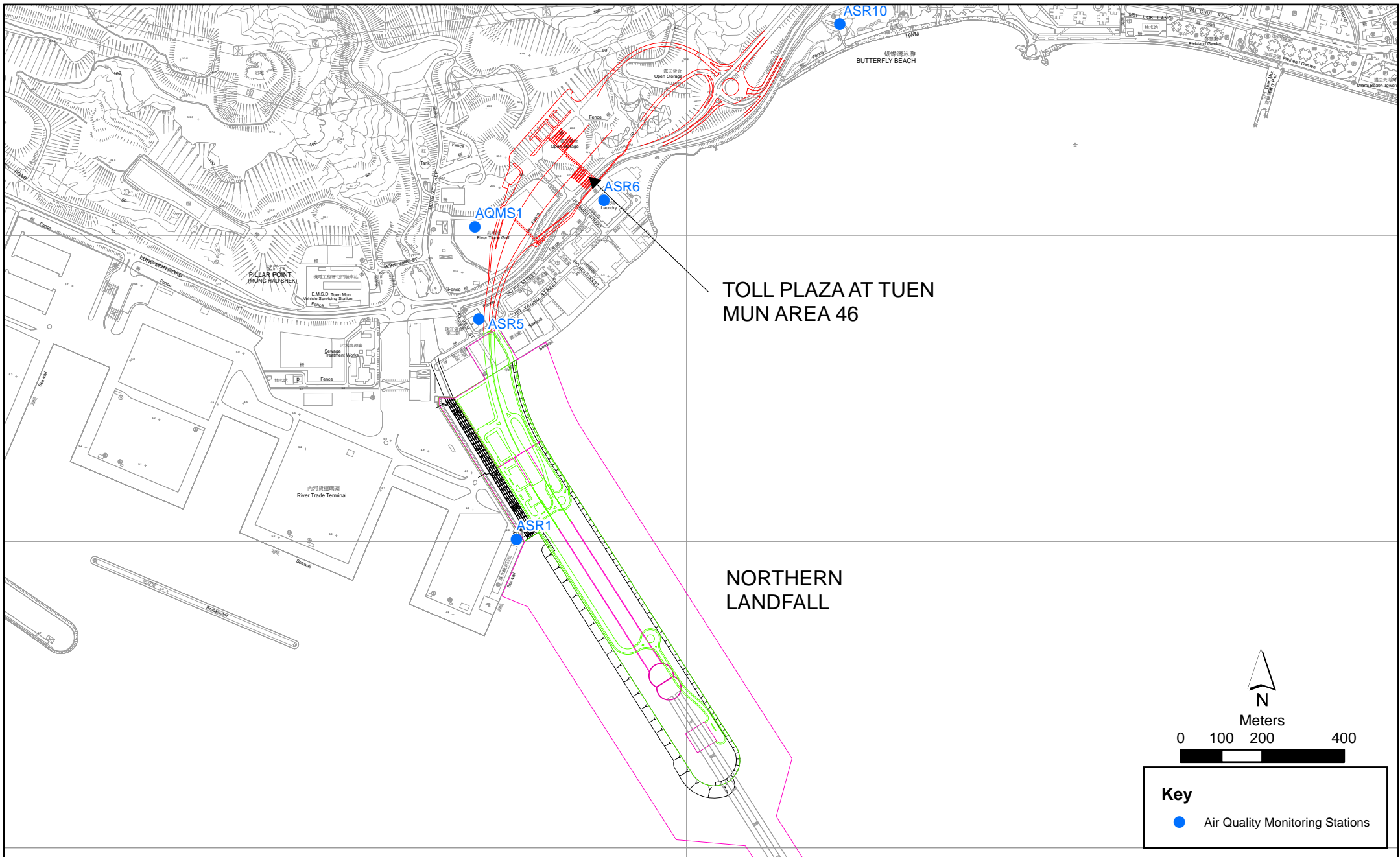



Figure 2.1

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

Key

- Air Quality Monitoring Stations

Environmental Resources Management



Meteorological Data for Impact Monitoring in the reporting period*			
Date (yy-mm-dd)	Time (24hrs)	Average of Wind Speed (m/s)	Average of Wind Director (degree)
18/11/12	0:00	0.4	301
18/11/12	1:00	0.4	285
18/11/12	2:00	0.4	296
18/11/12	3:00	0.9	100
18/11/12	4:00	2.2	94
18/11/12	5:00	1.3	93
18/11/12	6:00	0.9	313
18/11/12	7:00	0.9	329
18/11/12	8:00	0.9	288
18/11/12	9:00	1.3	303
18/11/12	10:00	1.3	133
18/11/12	11:00	1.8	200
18/11/12	12:00	1.3	131
18/11/12	13:00	1.3	217
18/11/12	14:00	1.3	281
18/11/12	15:00	1.8	262
18/11/12	16:00	0.9	291
18/11/12	17:00	0.9	304
18/11/12	18:00	1.3	79
18/11/12	19:00	1.8	93
18/11/12	20:00	1.3	99
18/11/12	21:00	0.9	93
18/11/12	22:00	0.9	68
18/11/12	23:00	0.9	92

*Wind data is sourced from Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-sea Tunnel Section