

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

*Third Monthly EM&A Report*

13 September 2018

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*Third Monthly EM&A Report*

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Client:  Gammon		Project No:  0463091			
Summary:  This document presents the Third Monthly EM&A Report for Tuen Mun – Chek Lap Kok Link – Northern Connection Tunnel Buildings, Electrical and Mechanical Works.		Date: 13 September 2018			
		Approved by:   Mr Craig Reid Partner			
		Certified by:   Dr Jasmine Ng ET Leader			
	Third Monthly EM&A Report	VAR	JN	CAR	13/09/18
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>			
		 			

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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 Third Monthly EM&A report presenting the EM&A works carried out during the period from 1 to 31 August 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***

- Site preparation works, bar bending, timber formwork and concreting at Toll Control Building;
- Architectural, Builder’s Work and Finishing at Ventilation Plant Room;
- ER’s and the Contractor’s site offices erection at WA18;
- Electrical and Mechanical Works at Northern Ventilation Building;
- Socket H-pilling at Administration Building; and
- Additional land ground investigation (GI) at Maintenance Depot, trial pits and laboratory testing.

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

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*

Two (2) 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 September 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;
- Socket H-pilling at Administration Building;
- Additional land ground investigation (GI) and socket H-pilling at Maintenance Depot, trial pits and laboratory testing.

#### **Future Key Issues**

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

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

## 1.1

## BACKGROUND

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

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

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

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

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

## 1.2 SCOPE OF REPORT

This is the Third 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 August 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*

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

## 1.4 SUMMARY OF CONSTRUCTION WORKS

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

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

### *Land-based Works*

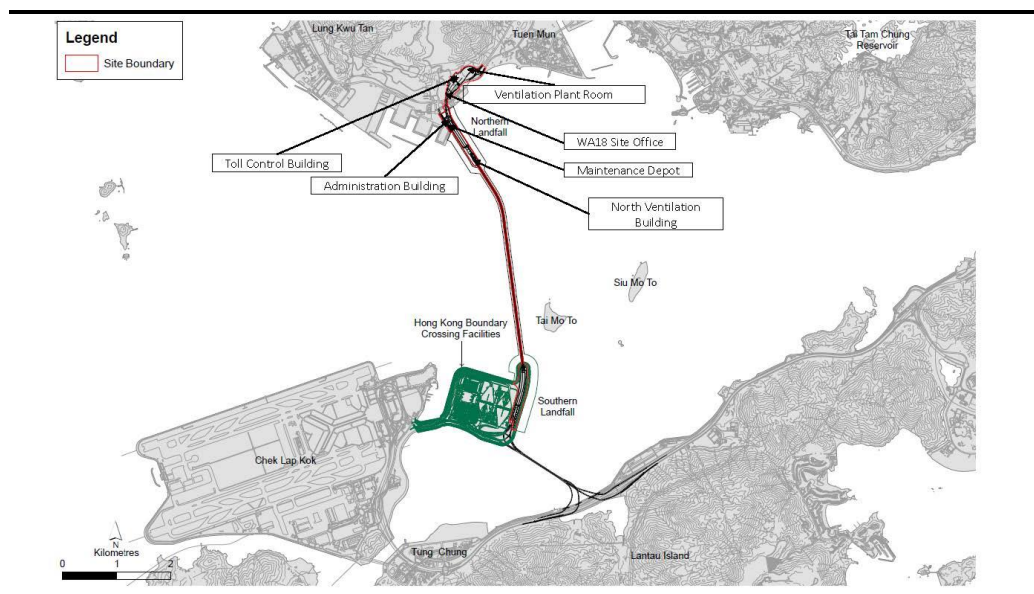
- Site preparation works, bar bending, timber formwork and concreting at Toll Control Building;
- Architectural, Builder's Work and Finishing at Ventilation Plant Room;
- ER's and the Contractor's site offices erection at WA18;

- Electrical and Mechanical Works at Northern Ventilation Building;
- Socket H-piling at Administration Building; and
- Additional land ground investigation (GI) at Maintenance Depot, trial pits and laboratory testing.

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*



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

## 2.1 AIR QUALITY

### 2.1.1 Monitoring Requirements and Equipment

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

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

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

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

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

Monitoring Station	Monitoring Dates	Location	Description	Parameters & Frequency
ASR1	2, 5, 8, 11, 14, 17, 20, 23, 26 and 29 August 2018	Tuen Mun Fireboat Station	Office	TSP monitoring
ASR5		Pillar Point Fire Station	Office	<ul style="list-style-type: none"> <li>1-hour Total Suspended Particulates (1-hour TSP, <math>\mu\text{g}/\text{m}^3</math>), 3 times in every 6 days</li> <li>24-hour Total Suspended Particulates (24-hour TSP, <math>\mu\text{g}/\text{m}^3</math>), daily for 24-hour in every 6 days</li> </ul>
AQMS1		Previous River Trade Golf	Bare ground	Enhanced TSP monitoring

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

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

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

### 2.1.2 Results and Observations

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

Two (2) Action Level exceedances for 1-hour TSP on 26 and 29 August 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*.

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 3, 10, 17, 24 and 31 August 2018.

Key observations and recommendations during the site inspections in this reporting period are summarized in *Table 2.7*.

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

Inspection Date	Observations	Recommendations/ Remarks
3 August 2018	Administration Building <ul style="list-style-type: none"> <li>Chemical containers were observed not placed in drip tray.</li> </ul>	Administration Building <ul style="list-style-type: none"> <li>The Contractor was reminded to place chemical containers in drip tray.</li> </ul>
10 August 2018	Administration Building <ul style="list-style-type: none"> <li>Chemical containers were observed not placed in drip tray.</li> <li>Checklist should be provided on the wetsep.</li> </ul>	Administration Building <ul style="list-style-type: none"> <li>The Contractor was reminded to place chemical containers in drip tray.</li> <li>The Contractor was reminded to provide wetsep checklist.</li> </ul>

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

Inspection Date	Observations	Recommendations/ Remarks
17 August 2018	Maintenance Depot <ul style="list-style-type: none"> <li>Black smoke was observed near the water pump.</li> </ul>	Maintenance Depot <ul style="list-style-type: none"> <li>The Contractor was reminded to check and repair the water pump before use.</li> </ul>
24 August 2018	Administration Building <ul style="list-style-type: none"> <li>Chemical containers were observed not placed in drip tray.</li> </ul>	Administration Building <ul style="list-style-type: none"> <li>The Contractor was reminded to place chemical containers in drip tray.</li> </ul>
31 August 2018	Administration Building <ul style="list-style-type: none"> <li>NRMM label should be displayed on the generator.</li> </ul>	Administration Building <ul style="list-style-type: none"> <li>The Contractor was reminded to display NRMM label on the generator.</li> </ul>

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

### 2.3 LANDFILL GAS HAZARD MONITORING

Landfill gas hazard monitoring was undertaken by the Safety Officer on combustible gas (include methane as part of the component) and oxygen to monitor the risk to workers at the excavation area in August 2018. However, it is noted that carbon dioxide and methane which are required under the Updated EM&A Manual were not measured. As such, the monitoring data are not presented in this report.

### 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 2.8*.

**Table 2.3 Quantities of Different Waste Generated in the Reporting Month**

Month/Year	Inert C&D Materials <sup>(a)</sup> (m <sup>3</sup> )	Inert Construction Waste Re-used (m <sup>3</sup> )	Non-inert Construction Waste <sup>(b)</sup> (kg)	Imported Fill (m <sup>3</sup> )	Recyclable Materials <sup>(c)</sup> (kg)	Chemical Wastes (kg)
August 2018	825	0	103,420	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 2.9* below.

**Table 2.4 Summary of Environmental Licensing and Permit Status**

<b>License/ Permit</b>	<b>License or Permit No.</b>	<b>Date of Issue</b>	<b>Date of Expiry</b>	<b>License/ Permit Holder</b>	<b>Remarks</b>
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				GCL	Public Notice has been published on 20 August 2018
WPCO Licence for Buildings at C3 area				GCL	Public Notice has been published on 28 August 2018
Construction Noise Permit	GW-RW0262-18	9 July 2018	9 Jan 2019	GCL	For Toll Control Building, Administration Building 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.

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

Two (2) 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*. 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*.

### 3 *FUTURE KEY ISSUES*

#### 3.1 *CONSTRUCTION ACTIVITIES FOR THE COMING MONTH*

As informed by the Contractor, the major works for the Project in September 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;
- Socket H-pilling at Administration Building;
- Additional land ground investigation (GI) and socket H-pilling at Maintenance Depot, trial pits and laboratory testing.

#### 3.2 *KEY ISSUES FOR THE COMING MONTH*

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

#### 4.1 CONCLUSIONS

This Third Monthly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 31 August 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.

Two (2) 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*. 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.

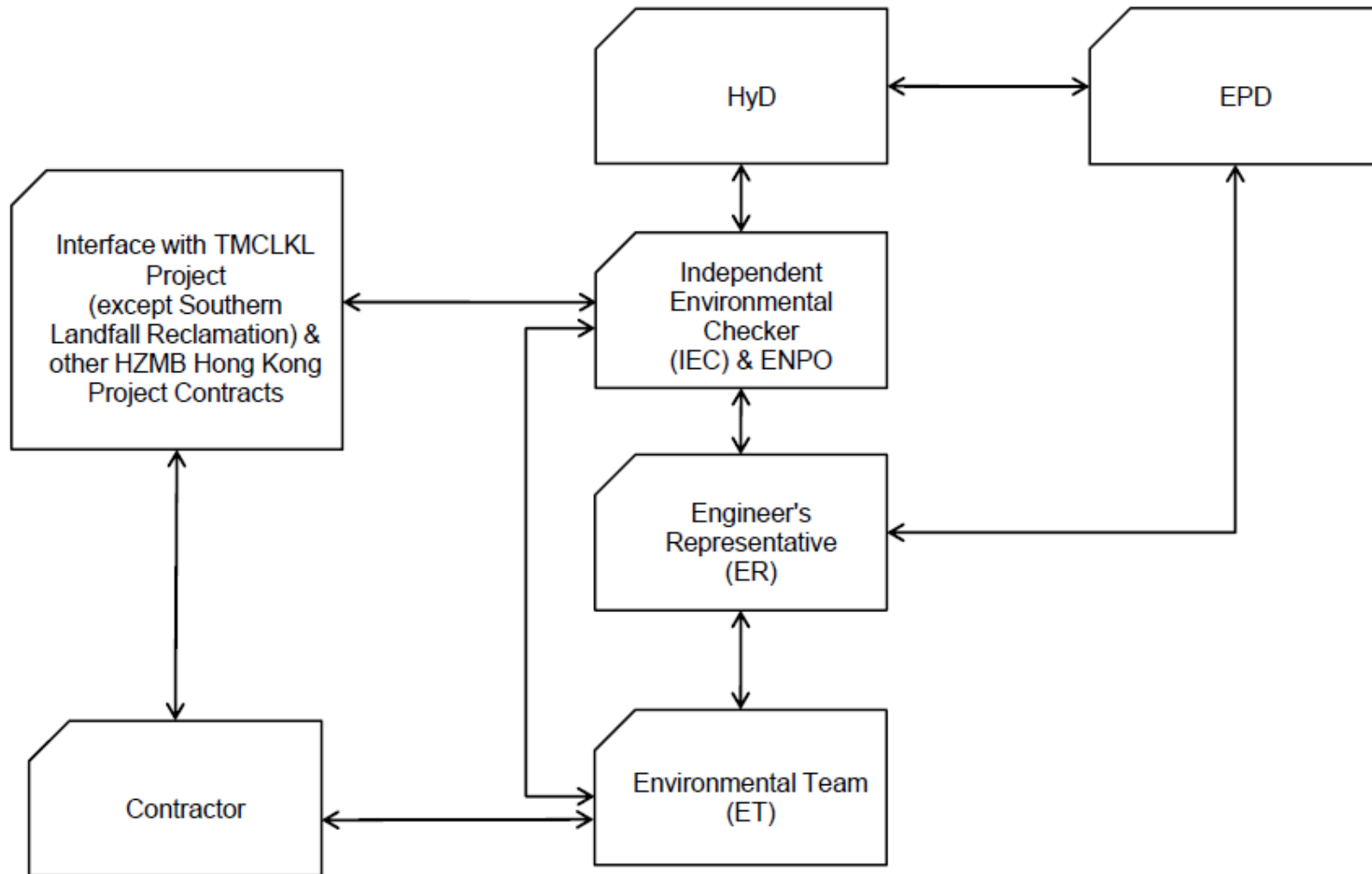
Environmental site inspection was carried out five (5) times in August 2018. Remedial actions recommended for the deficiencies identified during the site audits were properly implemented by the Contractor.

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													
					August					September				October			November	
					23	30	06	13	20	27	03	10	17	24	01	08	15	22
<b>Three Monthly Programme 20/08/18 - 20/11/18</b>																		
<b>Contract Dates</b>																		
<b>Portion Access Dates</b>																		
P190	Access to Portion XVa (Day 161)	0	14/10/18															
P200	Access to Portion XVla (Day 161)	0	14/10/18															
<b>Portion Possession Dates</b>																		
P145	Possession to Portion WA6 (Day 91)	0	05/08/18 A															
P185	Possession to Portion Ve (Day 132)	0	15/09/18															
P195	Possession to Portion XIII (16 Sep 2018)	0	16/09/18*															
<b>General Procurement</b>																		
P1020	Concrete Material	50	07/06/18 A	06/08/18 A														
P1030	Rebar Material	50	07/06/18 A	06/08/18 A														
P1040	Steelfixer	50	07/06/18 A	06/08/18 A														
P1050	Formwork Falsework Erector	50	07/06/18 A	06/08/18 A														
P1060	ABWF Material	70	07/06/18 A	29/08/18														
P1070	ABWF Erector	70	07/06/18 A	29/08/18														
P1080	Cladding	70	07/06/18 A	29/08/18														
<b>Method Statements</b>																		
<b>Plant Room</b>																		
MS1160	ICE & ER Approval of MS for Plant Room (E&M)	12	19/07/18 A	01/08/18 A														
<b>Administration Building</b>																		
MS1200	ICE & ER Approval of MS for Administration Building (E&M)	12	19/07/18 A	01/08/18 A														
<b>Maintenance Depot</b>																		
MS1210	Prepare & Submit MS for Maintenance Depot (E&M)	24	07/07/18 A	03/08/18 A														
MS1220	ICE & ER Approval of MS for Maintenance Depot (E&M)	12	04/08/18 A	17/08/18 A														
<b>Custom &amp; Excise Department Building</b>																		
MS1090	Prepare & Submit MS for C&ED Building (Civil)	24	22/06/18 A	20/07/18 A														
MS1100	ICE & ER Approval of MS for C&ED Building (Civil)	12	21/07/18 A	03/08/18 A														
MS1230	Prepare & Submit MS for C&ED Building (E&M)	24	04/08/18 A	31/08/18														
MS1240	ICE & ER Approval of MS for C&ED Building (E&M)	12	01/09/18	14/09/18														
<b>Fire Services Department Building</b>																		
MS1110	Prepare & Submit MS for Fire Services Building (Civil)	24	21/07/18 A	17/08/18 A														

**THREE MONTHLY ROLLING PROGRAMME**

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

20/08/18 - 20/11/18

P1

Date	Revision	Checked	Approved
20/08/18			





ID	Activity	Days	Start	Finish	2018																		
					August					September				October			November						
					23	30	06	13	20	27	03	10	17	24	01	08	15	22	29	05	12		
C140	NVB -Mechanical Ventilation Capacity Calculation	60	13/09/18*	11/11/18																			
C145	NVB -Mechanical Ventilation Capacity Calculation - Approval	28	12/11/18	09/12/18																			
C150	NVB -Fan Static Pressure Calculation	60	25/10/18*	23/12/18																			
C160	NVB -Acoustic Performance Calculation	60	17/09/18*	15/11/18																			
C165	NVB -Acoustic Performance Calculation - Approval	28	16/11/18	13/12/18																			
C170	NVB -Refrigerant Pipes Sizing Calculation	60	21/09/18*	19/11/18																			
C180	NVB -Staircase Pressurization System Calculation	60	13/09/18*	11/11/18																			
C185	NVB -Staircase Pressurization System Calculation - Approval	28	12/11/18	09/12/18																			
<b>CEDB</b>																							
C250	CEDB -AC Cooling Capacity Calculation	60	09/11/18*	07/01/19																			
<b>FSDB</b>																							
C300	FSDB -AC Cooling Capacity Calculation	60	09/11/18*	07/01/19																			
<b>MD</b>																							
C400	MD -AC Cooling Capacity Calculation	60	13/09/18*	11/11/18																			
C405	MD -AC Cooling Capacity Calculation - Approval	28	12/11/18	09/12/18																			
C410	MD -AHU/PAU Static Pressure Calculation	60	10/10/18*	08/12/18																			
C420	MD -Mechanical Ventilation Capacity Calculation	60	28/08/18*	26/10/18																			
C425	MD -Mechanical Ventilation Capacity Calculation - Approval	28	27/10/18	23/11/18																			
C430	MD -Fan Static Pressure Calculation	60	09/10/18*	07/12/18																			
<b>Vehicle Underpass</b>																							
C450	Vehicle Underpass -Mechanical Ventilation Capacity Calculation	60	18/08/18 A	16/10/18																			
C455	Vehicle Underpass -Mechanical Ventilation Capacity Calculation - Approval	28	17/10/18	13/11/18																			
C460	Vehicle Underpass -Fan Static Pressure Calculation	60	29/09/18*	27/11/18																			
<b>Thermal Insulation</b>																							
C480	Ductwork & Pipework Thermal Insulation Thickness Calculation	60	02/07/18 A	30/08/18																			
C485	Ductwork & Pipework Thermal Insulation Thickness Calculation - Approval	28	31/08/18	27/09/18																			
<b>Section D - Building Services of Electrical System</b>																							
<b>TCB</b>																							
D010	TCB -UPS and Battery Capacity Calculations	60	06/07/18 A	03/09/18																			
D015	TCB -UPS and Battery Capacity Calculations - Approval	30	04/09/18	03/10/18																			
D020	TCB -Electrical Loading Demand Calculation	60	24/07/18 A	21/09/18																			
D025	TCB -Electrical Loading Demand Calculation - Approval	30	22/09/18	21/10/18																			

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Date	Revision	Checked	Approved
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ID	Activity	Days	Start	Finish	2018											
					August				September				October			
					23	30	06	13	20	27	03	10	17	24	01	08
D030	TCB -Lux Level Calculation	60	18/07/18 A	15/09/18	[Gantt bar: 18/07/18 to 15/09/18]											
D035	TCB -Lux Level Calculation - Approval	30	16/09/18	15/10/18	[Gantt bar: 16/09/18 to 15/10/18]											
D040	TCB -Cable Sizing and Voltage Drop Verification	60	07/08/18 A	05/10/18	[Gantt bar: 07/08/18 to 05/10/18]											
D045	TCB -Cable Sizing and Voltage Drop Verification - Approval	30	06/10/18	04/11/18	[Gantt bar: 06/10/18 to 04/11/18]											
D050	TCB -Generator Calculation	60	15/06/18 A	13/08/18 A	[Gantt bar: 15/06/18 to 13/08/18]											
D055	TCB -Generator Calculation - Approval	30	14/08/18 A	12/09/18	[Gantt bar: 14/08/18 to 12/09/18]											
D060	TCB -Fuel Tank Calculation	60	15/06/18 A	13/08/18 A	[Gantt bar: 15/06/18 to 13/08/18]											
D065	TCB -Fuel Tank Calculation - Approval	30	14/08/18 A	12/09/18	[Gantt bar: 14/08/18 to 12/09/18]											
D070	TCB -Cable Containment Calculation	60	04/09/18*	02/11/18	[Gantt bar: 04/09/18 to 02/11/18]											
D075	TCB -Cable Containment Calculation - Approval	30	03/11/18	02/12/18	[Gantt bar: 03/11/18 to 02/12/18]											
D080	TCB -Earthing Resistance Calculation	60	07/08/18 A	05/10/18	[Gantt bar: 07/08/18 to 05/10/18]											
D085	TCB -Earthing Resistance Calculation - Approval	30	06/10/18	04/11/18	[Gantt bar: 06/10/18 to 04/11/18]											
D090	TCB -Power Factor Correction & Harmonic Current AnalysisCalculation	60	07/08/18 A	05/10/18	[Gantt bar: 07/08/18 to 05/10/18]											
D095	TCB -Power Factor Correction & Harmonic Current AnalysisCalculation - Apprc	30	06/10/18	04/11/18	[Gantt bar: 06/10/18 to 04/11/18]											
<b>ADB</b>																
D100	ADB -UPS and Battery Capacity Calculations	60	01/08/18 A	29/09/18	[Gantt bar: 01/08/18 to 29/09/18]											
D105	ADB -UPS and Battery Capacity Calculations - Approval	30	30/09/18	29/10/18	[Gantt bar: 30/09/18 to 29/10/18]											
D110	ADB -Electrical Loading Demand Calculation	60	28/06/18 A	26/08/18	[Gantt bar: 28/06/18 to 26/08/18]											
D115	ADB -Electrical Loading Demand Calculation - Approval	30	27/08/18	25/09/18	[Gantt bar: 27/08/18 to 25/09/18]											
D120	ADB -Lux Level Calculation	60	09/09/18*	07/11/18	[Gantt bar: 09/09/18 to 07/11/18]											
D125	ADB -Lux Level Calculation - Approval	30	08/11/18	07/12/18	[Gantt bar: 08/11/18 to 07/12/18]											
D130	ADB -Cable Sizing and Voltage Drop Verification	60	30/09/18*	28/11/18	[Gantt bar: 30/09/18 to 28/11/18]											
D140	ADB -Generator Calculation	60	11/06/18 A	09/08/18 A	[Gantt bar: 11/06/18 to 09/08/18]											
D145	ADB -Generator Calculation - Approval	30	10/08/18 A	08/09/18	[Gantt bar: 10/08/18 to 08/09/18]											
D150	ADB -Fuel Tank Calculation	60	11/06/18 A	09/08/18 A	[Gantt bar: 11/06/18 to 09/08/18]											
D155	ADB -Fuel Tank Calculation - Approval	30	10/08/18 A	08/09/18	[Gantt bar: 10/08/18 to 08/09/18]											
D160	ADB -Cable Containment Calculation	60	10/10/18*	08/12/18	[Gantt bar: 10/10/18 to 08/12/18]											
D170	ADB -Earthing Resistance Calculation	60	30/09/18*	28/11/18	[Gantt bar: 30/09/18 to 28/11/18]											
D180	ADB -Power Factor Correction & Harmonic Current AnalysisCalculation	60	30/09/18*	28/11/18	[Gantt bar: 30/09/18 to 28/11/18]											
<b>NVB</b>																
D190	NVB -UPS and Battery Capacity Calculations	60	20/06/18 A	18/08/18 A	[Gantt bar: 20/06/18 to 18/08/18]											

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ID	Activity	Days	Start	Finish	2018																	
					August				September				October									
					23	30	06	13	20	27	03	10	17	24	01	08	15	22	29	05	12	
D710	MD -Generator Calculation	60	21/08/18*	19/10/18																		
D715	MD -Generator Calculation - Approval	30	20/10/18	18/11/18																		
D720	MD -Fuel Tank Calculation	60	21/08/18*	19/10/18																		
D725	MD -Fuel Tank Calculation - Approval	30	20/10/18	18/11/18																		
D730	MD -Cable Containment Calculation	60	14/11/18*	12/01/19																		
D740	MD -Earthing Resistance Calculation	60	26/10/18*	24/12/18																		
D750	MD -Power Factor Correction & Harmonic Current Analysis Calculation	60	26/10/18*	24/12/18																		
<b>Section E - Building Services of Fire Services System</b>																						
<b>Tunnel &amp; Service Gallery</b>																						
E010	FS and Sprinkler Water Tanks Effective Volumes Calculation	60	16/10/18*	14/12/18																		
E020	FS Pump Head Calculation for Tunnel	60	14/10/18*	12/12/18																		
E030	FS Pump Head Calculation for Services Gallery	60	14/10/18*	12/12/18																		
E040	Sprinkler Pump Head Calculation for Services Gallery	60	14/10/18*	12/12/18																		
E050	Foam system design calculation for Services Gallery	60	12/06/18 A	10/08/18 A																		
E055	Foam system design calculation for Services Gallery - Approval	30	11/08/18 A	09/09/18																		
<b>TCB</b>																						
E060	TCB -FS Pump Head Calculation	60	13/09/18*	11/11/18																		
E065	TCB -FS Pump Head Calculation - Approval	30	12/11/18	11/12/18																		
E070	TCB -Sprinkler Pump Head Calculation	60	13/09/18*	11/11/18																		
E075	TCB -Sprinkler Pump Head Calculation - Approval	30	12/11/18	11/12/18																		
E080	TCB -Battery Capacity Calculation	60	02/07/18 A	30/08/18																		
E085	TCB -Battery Capacity Calculation - Approval	30	31/08/18	29/09/18																		
E090	TCB -FM200 System Design Calculation	60	22/06/18 A	20/08/18																		
E095	TCB -FM200 System Design Calculation - Approval	30	21/08/18	19/09/18																		
<b>ADB</b>																						
E100	ADB -FS Pump Head Calculation	60	13/09/18*	11/11/18																		
E105	ADB -FS Pump Head Calculation - Approval	30	12/11/18	11/12/18																		
E110	ADB -Sprinkler Pump Head Calculation	60	13/09/18*	11/11/18																		
E115	ADB -Sprinkler Pump Head Calculation - Approval	30	12/11/18	11/12/18																		
E120	ADB -Battery Capacity Calculation	60	29/07/18 A	26/09/18																		
E125	ADB -Battery Capacity Calculation - Approval	30	27/09/18	26/10/18																		

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ID	Activity	Days	Start	Finish	2018															
					August				September				October				November			
					23	30	06	13	20	27	03	10	17	24	01	08	15	22	29	05
E130	ADB -FM200 System Design Calculation	60	22/06/18 A	20/08/18	[Gantt bar: 22/06/18 to 20/08/18]															
E135	ADB -FM200 System Design Calculation - Approval	30	21/08/18	19/09/18	[Gantt bar: 21/08/18 to 19/09/18]															
<b>NVB</b>																				
E140	NVB -FS Pump Head Calculation	60	19/08/18 A	17/10/18	[Gantt bar: 19/08/18 to 17/10/18]															
E145	NVB -FS Pump Head Calculation - Approval	30	18/10/18	16/11/18	[Gantt bar: 18/10/18 to 16/11/18]															
E150	NVB -Sprinkler Pump Head Calculation	60	19/08/18 A	17/10/18	[Gantt bar: 19/08/18 to 17/10/18]															
E155	NVB -Sprinkler Pump Head Calculation - Approval	30	18/10/18	16/11/18	[Gantt bar: 18/10/18 to 16/11/18]															
E160	NVB -Battery Capacity Calculation	60	20/06/18 A	18/08/18 A	[Gantt bar: 20/06/18 to 18/08/18]															
E165	NVB -Battery Capacity Calculation - Approval	30	19/08/18 A	17/09/18	[Gantt bar: 19/08/18 to 17/09/18]															
E170	NVB -FM200 System Design Calculation	60	22/06/18 A	20/08/18	[Gantt bar: 22/06/18 to 20/08/18]															
E175	NVB -FM200 System Design Calculation - Approval	30	21/08/18	19/09/18	[Gantt bar: 21/08/18 to 19/09/18]															
<b>SCB</b>																				
E250	SCB -FM200 System Design Calculation	60	22/10/18*	20/12/18	[Gantt bar: 22/10/18 to 20/12/18]															
<b>MD</b>																				
E330	MD -FS Pump Head Calculation	60	21/08/18*	19/10/18	[Gantt bar: 21/08/18 to 19/10/18]															
E335	MD -FS Pump Head Calculation - Approval	30	20/10/18	18/11/18	[Gantt bar: 20/10/18 to 18/11/18]															
E340	MD -Sprinkler Pump Head Calculation	60	21/08/18*	19/10/18	[Gantt bar: 21/08/18 to 19/10/18]															
E345	MD -Sprinkler Pump Head Calculation - Approval	30	20/10/18	18/11/18	[Gantt bar: 20/10/18 to 18/11/18]															
E350	MD -Battery Capacity Calculation	60	21/08/18*	19/10/18	[Gantt bar: 21/08/18 to 19/10/18]															
E355	MD -Battery Capacity Calculation - Approval	30	20/10/18	18/11/18	[Gantt bar: 20/10/18 to 18/11/18]															
<b>Vehicular Underpass</b>																				
E370	Vehicular Underpass -Foam system design calculation	60	02/07/18 A	30/08/18	[Gantt bar: 02/07/18 to 30/08/18]															
E375	Vehicular Underpass -Foam system design calculation - Approval	30	31/08/18	29/09/18	[Gantt bar: 31/08/18 to 29/09/18]															
<b>Section F - Building Services of Plumbing &amp; Drainage System</b>																				
<b>Tunnel</b>																				
F010	Oil Interceptor Calculation for tunnel	60	12/07/18 A	09/09/18	[Gantt bar: 12/07/18 to 09/09/18]															
F015	Oil Interceptor Calculation for tunnel - Approval	30	10/09/18	09/10/18	[Gantt bar: 10/09/18 to 09/10/18]															
F020	Water Storage Tank Calculation	60	16/10/18*	14/12/18	[Gantt bar: 16/10/18 to 14/12/18]															
<b>TCB</b>																				
F030	TCB - Pump Head Calculation	60	13/10/18*	11/12/18	[Gantt bar: 13/10/18 to 11/12/18]															
F040	TCB - Pressure Vessel Calculation	60	13/10/18*	11/12/18	[Gantt bar: 13/10/18 to 11/12/18]															
F050	TCB - Rainwater Analysis and Pipe Work Calculation	60	01/08/18 A	29/09/18	[Gantt bar: 01/08/18 to 29/09/18]															

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ID	Activity	Days	Start	Finish	2018													
					August						September				October		November	
					23	30	06	13	20	27	03	10	17	24	01	08	15	22
FSD104	Predrilling (No.3)	1	23/10/18	23/10/18														
FSD105	Predrilling (No.4)	1	24/10/18	24/10/18														
FSD106	Predrilling (No.5)	1	25/10/18	25/10/18														
FSD107	Predrilling (No.6)	1	26/10/18	26/10/18														
FSD108	Predrilling (No.7)	1	27/10/18	27/10/18														
FSD109	Predrilling (No.8)	1	29/10/18	29/10/18														
FSD111	Predrilling (No.9)	1	30/10/18	30/10/18														
FSD112	Predrilling (No.10)	1	31/10/18	31/10/18														
FSD113	Predrilling (No.11)	1	01/11/18	01/11/18														
FSD114	Predrilling (No.12)	1	02/11/18	02/11/18														
FSD115	Predrilling (No.13)	1	03/11/18	03/11/18														
FSD116	Predrilling (No.14)	1	05/11/18	05/11/18														
FSD117	Demobilization	3	06/11/18	08/11/18														
FSD140	Socket H-Piles (Pile No. 1-7)	12	09/11/18	22/11/18														
<b>C&amp;ED Building Substructure</b>																		
CED110	Access Portion XVa	0		14/10/18														
CED140	Predrilling (No.1-6)	10	15/10/18	26/10/18														
CED141	Predrilling (No. 7-12)	11	27/10/18	08/11/18														
CED150	Socket H-Piling (No. 1-8)	11	09/11/18	21/11/18														
<b>Key Date 1 - Toll Control Building (TCB) &amp; TCSS Provision</b>																		
<b>Toll Control Building (TCB)</b>																		
TCB150	Ground Floor Slab - Formwork	12	24/07/18 A	06/08/18 A														
TCB152	Ground Floor Slab - Rebar	12	02/08/18 A	15/08/18 A														
TCB154	Ground Floor Slab - Concrete	2	16/08/18 A	17/08/18 A														
TCB155	Ground Floor Slab - Rock Breaking for Subway Area	7	16/08/18 A	23/08/18														
TCB156	Ground Floor Slab - Subway Area	6	24/08/18	30/08/18														
TCB160	Remove G/F Slab Formwork	2	18/08/18 A	20/08/18														
TCB161	Level 1 Columns & Scaffolding	10	21/08/18	31/08/18														
TCB162	Level 1 Slab	12	01/09/18	14/09/18														
TCB171	Remove 1/F Slab Formwork	2	15/09/18	17/09/18														
TCB172	Level 2 Columns & Scaffolding	10	18/09/18	29/09/18														

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Date	Revision	Checked	Approved
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ID	Activity	Days	Start	Finish	2018																		
					August					September				October			November						
					23	30	06	13	20	27	03	10	17	24	01	08	15	22	29	05	12		
MD150	Foundations	10	13/10/18	25/10/18																			
MD160	Ground Floor	14	26/10/18	10/11/18																			
MD170	Roof Slab	24	12/11/18	08/12/18																			
<b>Kiosk N2</b>																							
N2-110	Possess Portion Ve	0		15/09/18																			
N2-120	Site clearance & trial pits	6	15/09/18	21/09/18																			
N2-125	Excavation	6	22/09/18	29/09/18																			
N2-126	Kiosk Structure - Raft	12	02/10/18	15/10/18																			
N2-127	Kiosk Structure - Wall	12	16/10/18	30/10/18																			
N2-128	Kiosk Structure - Roof	12	31/10/18	13/11/18																			
N2-130	ABWF Works to enable TCSS installation	18	14/11/18	04/12/18																			
<b>Key Date 6 - E&amp;M Works for Administration Building, Maintenance Depot, North Vent Building, Kiosk N2</b>																							
<b>E&amp;M Works for North Ventilation Building</b>																							
<b>E&amp;M Works</b>																							
ENVB1	E&M Installation - B2/F	150	01/11/18*	08/05/19																			
<b>Remaining E&amp;M Works for Kiosk N2 (Structure Completed under KD2)</b>																							
EN2110	Kiosk Structure Completed	0		13/11/18																			
EN2120	ABWF Works (Door, windows, tiles)	30	14/11/18	18/12/18																			
<b>Key Date 5 - E&amp;M Works for TCB, Toll Area, Kiosk N1, Underpass, Plant Rm, and Approach Roads</b>																							
<b>E&amp;M Works for TCB</b>																							
ETCB11	First Floor Completed at TCB with Scaffolding Removed	0		29/09/18																			
ETCB11	Remaining Blockwork Walls and Plaster (G/F)	12	02/10/18	15/10/18																			
ETCB12	Blockwork Walls and Plaster (1/F)	12	16/10/18	30/10/18																			
ETCB12	Remaining Blockwork Walls and Plaster	24	31/10/18	27/11/18																			
ETCB13	Remaining ABWF Works	210	14/11/18	01/08/19																			
<b>Power On and Statutory Inspections (except FSD)</b>																							
ETCB1	Liaison with CLP	12	02/10/18	15/10/18																			
ETCB1	E&M Installation in Transformer Room - 1st Fix	12	16/10/18	30/10/18																			
ETCB1	E&M Installation in Transformer Room - 2nd Fix	12	31/10/18	13/11/18																			
ETCB2	CLP Installation Works	82	14/11/18	25/02/19																			
<b>Kiosk N1</b>																							
EN130	Site Clearance and Trial Pits	6	07/08/18 A	13/08/18 A																			

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ID	Activity	Days	Start	Finish	2018																	
					August			September				October			November							
					23	30	06	13	20	27	03	10	17	24	01	08	15	22	29	05	12	
EN131	Trim Formation	2	20/08/18	21/08/18																		
EN132	Cast Concrete Base	6	22/08/18	28/08/18																		
EN133	Steel Structure - Columns	11	29/08/18	10/09/18																		
EN134	Steel Structure - Roof	11	11/09/18	22/09/18																		
EN135	Steel Structure - Panels	12	24/09/18	09/10/18																		
EN140	ABWF Works - 1st Fix	12	10/10/18	24/10/18																		
EN150	E&M works - Stage 1	12	25/10/18	07/11/18																		
EN151	E&M works - Stage 2	12	08/11/18	21/11/18																		
<b>Plant Room</b>																						
<b>Building Structure</b>																						
PR143	Roof - Rebar	12	11/07/18 A	20/07/18 A																		
PR144	Roof - Concrete	1	21/07/18 A	21/07/18 A																		
PR150	Dwarf Wall on Roof Level	12	23/07/18 A	04/08/18 A																		
<b>E&amp;M Works</b>																						
EPR110	Place Mass Concrete Fill & Plinth on G/F	12	23/07/18 A	04/08/18 A																		
EPR120	Blockwork Wall	12	20/08/18	01/09/18																		
PR151	ABWF Works	78	01/11/18*	04/02/19																		
<b>Key Date 7A - E&amp;M Works for Approach Roads at South Side</b>																						
<b>Design and Procurement</b>																						
DP810	Tunnel and Approach Road Lighting System	206	01/11/18*	15/07/19																		
DP820	CMCS System and ELV System	206	01/11/18*	15/07/19																		
DP830	Electrical System	206	01/11/18*	15/07/19																		
DP840	Building Services System	206	01/11/18*	15/07/19																		
DP850	Plumbing and Drainage System (Tunnel and Roads)	206	01/11/18*	15/07/19																		
DP860	Fire Services System	206	01/11/18*	15/07/19																		
DP870	Other Related Works to enable E&M Works	206	01/11/18*	15/07/19																		
<b>Key Date 11 - Landscape Soft Works &amp; Trees Protection</b>																						
<b>Trees Protection</b>																						
SL180	Approval of Tree Protection Plan	15	19/07/18 A	04/08/18 A																		
SL190	Protection of Existing Trees	613	06/08/18 A	28/08/20																		

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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	
<b>Air Quality</b>									
4.8.1	3.8	Watering of the construction sites in Lantau for 8 times/day and in Tuen Mun for 12 times/day to reduce dust emissions by 87.5% and 91.7% respectively and shall be undertaken.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	The Contractor shall, to the satisfaction of the Engineer, install effective dust suppression measures and take such other measures as may be necessary to ensure that at the Site boundary and any nearby sensitive receiver, dust levels are kept to acceptable levels.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	The Contractor shall not burn debris or other materials on the works areas.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	In hot, dry or windy weather, the watering programme shall maintain all exposed road surfaces and dust sources wet.	All unpaved haul roads / throughout construction period in hot, dry or windy weather	Contractor	TMEIA Avoid smoke impacts and disturbance		Y		✓
4.8.1	3.8	Where breaking of oversize rock/concrete is required, watering shall be implemented to control dust. Water spray shall be used during the handling of fill material at the site and at active cuts, excavation and fill sites where dust is likely to be created.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
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		<>

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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		<>
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		✓
<b>WATER QUALITY (LAND WORKS)</b>									
6.10	-	Wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
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		✓

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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		✓
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		✓

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						D	C	O	
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		✓
<b>WASTE</b>									
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		✓

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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		✓
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		✓

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12.6	8.1	<p>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:</p> <p><i>f</i> suitable for the substance to be held, resistant to corrosion, maintained in good conditions and securely closed;</p> <p><i>f</i> Having a capacity of &lt;450L unless the specifications have been approved by the EPD; and</p> <p><i>w</i> Chinese according to the instructions prescribed in Schedule 2 of the Regulations.</p> <p><i>f</i> Clearly labelled and used solely for the storage of chemical wastes;</p> <p><i>f</i> Enclosed with at least 3 sides;</p> <p><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;</p> <p><i>f</i> Adequate ventilation;</p> <p><i>f</i> Sufficiently covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and</p> <p><i>f</i> Incompatible materials are adequately separated.</p>	All areas / throughout construction period	Contractor	TMEIA		Y		<>
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		✓

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						D	C	O	
12.6	8.1	Night soil should be regularly collected by licensed collectors.	All areas / throughout construction period	Contractor	TMEIA		Y		N/A
12.6	8.1	General refuse arising on-site should be stored in enclosed bins or compaction units separately from C&D and chemical wastes. Sufficient dustbins shall be provided for storage of waste as required under the Public Cleansing and Prevention of Nuisances By-laws. In addition, general refuse shall be cleared daily and shall be disposed of to the nearest licensed landfill or refuse transfer station. Burning of refuse on construction sites is prohibited.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	All waste containers shall be in a secure area on hardstanding;	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Office wastes can be reduced by recycling of paper if such volume is sufficiently large to warrant collection. Participation in a local collection scheme by the Contractor should be advocated. Waste separation facilities for paper, aluminium cans, plastic bottles, etc should be provided on-site.	Site Offices/ throughout construction period	Contractor	TMEIA		Y		✓
12.6	Section 8	EM&A of waste handling, storage, transportation, disposal procedures and documentation through the site audit programme shall be undertaken.	All areas / throughout construction period	Contractor	EM&A Manual		Y		✓
<b>LANDSCAPE AND VISUAL</b>									
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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10.9	7.6	Trees unavoidably affected by the works shall be transplanted where practical. Trees will be transplanted straight to their final receptor site and not held in a temporary nursery. A detailed Tree Transplanting Specification shall be provided in the Contract Specification. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme (CM2)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Hillside and roadside screen planting to proposed roads, associated structures and slope works (CM3)	All areas/detailed design/ during construction/ post construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material (in earth tone) (CM4)	All areas/detailed design/ during construction/ post construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Screening of construction works by hoardings around works area in visually unobtrusive colours, to screen works (CM5)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Control night-time lighting and glare by hooding all lights (CM6)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Ensure no run-off into water body adjacent to the Project Area (CM7)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (CM8)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
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

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10.9	7.6	Re-vegetation of affected woodland/shrubland with native species (OM1)	All areas/detailed design/ during construction/ during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by AFCD/HyD/L CSD
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/LCS D
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/LCS D
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

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- <> 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

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Appendix D

## Summary of Action and Limit Levels

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

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

Appendix E

## Event Action Plan

*Appendix L1 Event/ Action Plan for Air Quality*

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

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

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

8. If the exceedance stops, cease  
additional monitoring.

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Abbreviations: ET - Environmental Team, IEC - Independent Environmental Checker, SO - Supervising Office, 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 <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000Kg)	('000Kg)	('000Kg)	('000Kg)	('000Kg)	('000Kg)
Jan	-	0.000	-	-	-	-	-	-	-	-	-	-
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	-	-	-	-
<b>SUB-TOTAL</b>	<b>2.482</b>	<b>0.008</b>	<b>0.000</b>	<b>0.397</b>	<b>2.085</b>	<b>0.000</b>	-	<b>3.750</b>	-	<b>0.000</b>	-	-
Jul	0.830	0.050	-	-	0.830	-	-	15.190	-	-	-	-
Aug	0.825	0.046	-	-	0.825	-	-	103.420	-	-	-	-
Sep	-	0.000	-	-	-	-	-	-	-	-	-	-
Oct	-	0.000	-	-	-	-	-	-	-	-	-	-
Nov	-	0.000	-	-	-	-	-	-	-	-	-	-
Dec	-	0.000	-	-	-	-	-	-	-	-	-	-
<b>TOTAL</b>	<b>4.137</b>	<b>0.104</b>	<b>-</b>	<b>0.397</b>	<b>3.740</b>	<b>-</b>	<b>-</b>	<b>122.360</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

**Notes :**

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

Appendix 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	2	2
	Limit	0	0
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 (August 2018)	0	0	0
Total No. received since project commencement	0	0	0

Email  
message

Environmental  
Resources  
Management

**To** Ramboll Hong Kong Limited (ENPO)

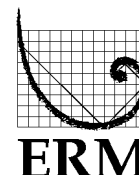
**From** ERM- Hong Kong, Limited

**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** 06 September 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



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Dear Sir/ Madam,

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

**Action Level Exceedance**  
**0215660\_26 August 2018\_1hrTSP\_Station ASR1**

A total of one (1) exceedance was recorded on 26 August 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**

<b>Log No.</b>	<p><u>Action Level Exceedance</u> 0215660_26 February 2018_1hrTSP_Station ASR1</p> <p>[Total No. of Exceedances = 1]</p>	
<b>Date</b>	<p>26 August 2018 (Measured) 05 September 2018 (Results obtained from ENPO Website)</p>	
<b>Monitoring Station</b>	ASR1, ASR5, ASR6, ASR10, AQMS1	
<b>Parameter(s) with Exceedance(s)</b>	1-hr TSP	
<b>Action Levels</b>	1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	ASR1 = 331 ASR5 = 340 ASR6 = 338 ASR10 = 335 AQMS1 = 337
<b>Limit Levels</b>	1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	500
<b>Measured Levels</b>	<p><u>Action Level Exceedance</u> 1. 1-hr TSP at ASR1 during 10:57a.m.-11:57a.m.</p>	
<b>Works Undertaken (at the time of monitoring event)</b>	<p>Works undertaken under this Contract on 26 August 2018 included:</p> <ul style="list-style-type: none"> <li>• Erection of formwork at Toll Control Building, and</li> <li>• ER's and the Contractor's site offices erection at WA18.</li> </ul>	
<b>Possible Reason for Action or Limit Level Exceedance(s)</b>	<p>The exceedance is unlikely to be due to the Project, in view of the following:</p> <ul style="list-style-type: none"> <li>• No construction works was undertaken in vicinity of ASR1. Construction works were carried out at Toll Control Building and WA18, which were far away (&gt;700m) from ASR1.</li> <li>• Apart from one 1 hour TSP (10:57a.m.-11:57a.m.) 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.</li> <li>• No Action and Limit Level exceedance was recorded at air quality monitoring stations nearby the works area under this Contract on the same day, i.e. ASR5, AQMS1 and ASR6.</li> <li>• Watering record provided by the Contractor was reviewed. Watering was maintained on unpaved and dry road on 26 August 2018.</li> <li>• According to ET's site inspection on 24 and 31 August 2018, no particular findings was observed (<i>refer to ET's Site Inspection Photo</i>). Unpaved roads were in wet condition. No debris or other materials was burnt within the site area.</li> <li>• With reference to the weather report issued by Hong Kong Observatory, local weather on 26 August 2018 was mainly associated with heavy raining (total rainfall of &lt;80mm was recorded at Hong Kong Observatory). Considered the distance between the works area and ASR1 and natural dust suppression by rain, we considered that construction impact on air quality monitoring is minor.</li> </ul> <p>Based on the above, the exceedance is unlikely to be due to the Project.</p>	
<b>Actions Taken/ To Be Taken</b>	<p>The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area including water spraying at unpaved road/stockpiles and use of tarpaulin for stockpiles covering. The ET will monitor for future trends in exceedances.</p>	

<b>Dust Remarks</b>	The monitoring results on 26 August 2018 and locations of air quality monitoring stations are attached. Works area under this Contract is attached. The attached wind data on 26 August 2018 is sourced from <i>Contract No. HY/2012/08</i> for reference.
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Results of Air Quality Monitoring

Project	Works	Date (yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Parameter	Results	Unit
TMCLKL	HY/2012/08	2018-08-26	AQMS1	9:04	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2018-08-26	AQMS1	10:06	1-hour TSP	50	ug/m3
TMCLKL	HY/2012/08	2018-08-26	AQMS1	11:08	1-hour TSP	120	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR1	8:53	1-hour TSP	169	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR1	9:55	1-hour TSP	200	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR1	10:57	1-hour TSP	417	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR10	8:20	1-hour TSP	63	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR10	9:22	1-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR10	10:24	1-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR5	8:42	1-hour TSP	177	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR5	9:44	1-hour TSP	86	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR5	10:46	1-hour TSP	103	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR6	8:30	1-hour TSP	121	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR6	9:32	1-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR6	10:34	1-hour TSP	49	ug/m3
TMCLKL	HY/2012/08	2018-08-26	AQMS1	12:10	24-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR1	11:59	24-hour TSP	90	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR10	11:26	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR5	11:48	24-hour TSP	54	ug/m3
TMCLKL	HY/2012/08	2018-08-26	ASR6	11:36	24-hour TSP	57	ug/m3

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

Photo 1 - Unpaved roads were in wet condition (24 August 2018)



Photo 2 - No debris or other materials was burnt within the site area (31 August 2018)



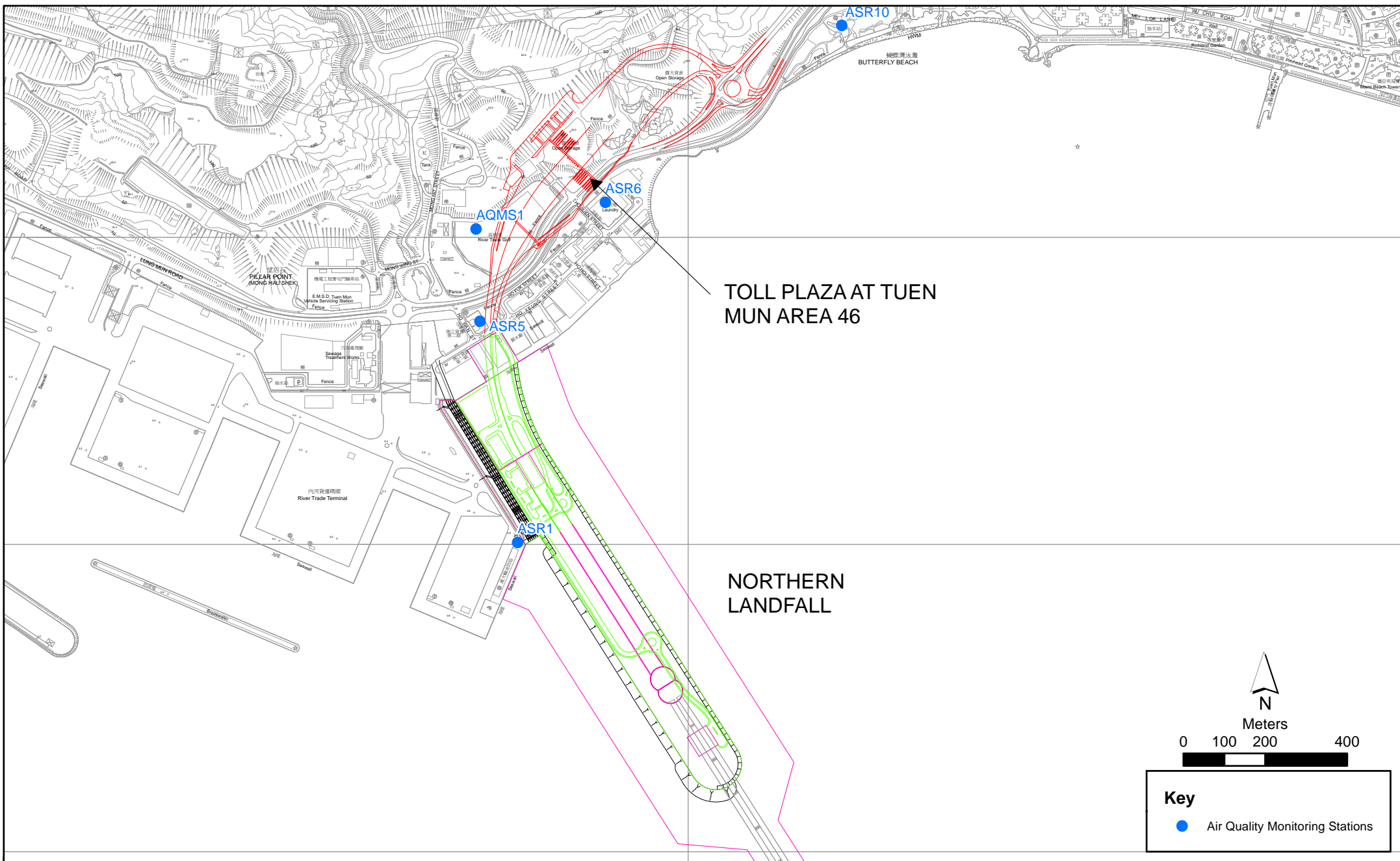
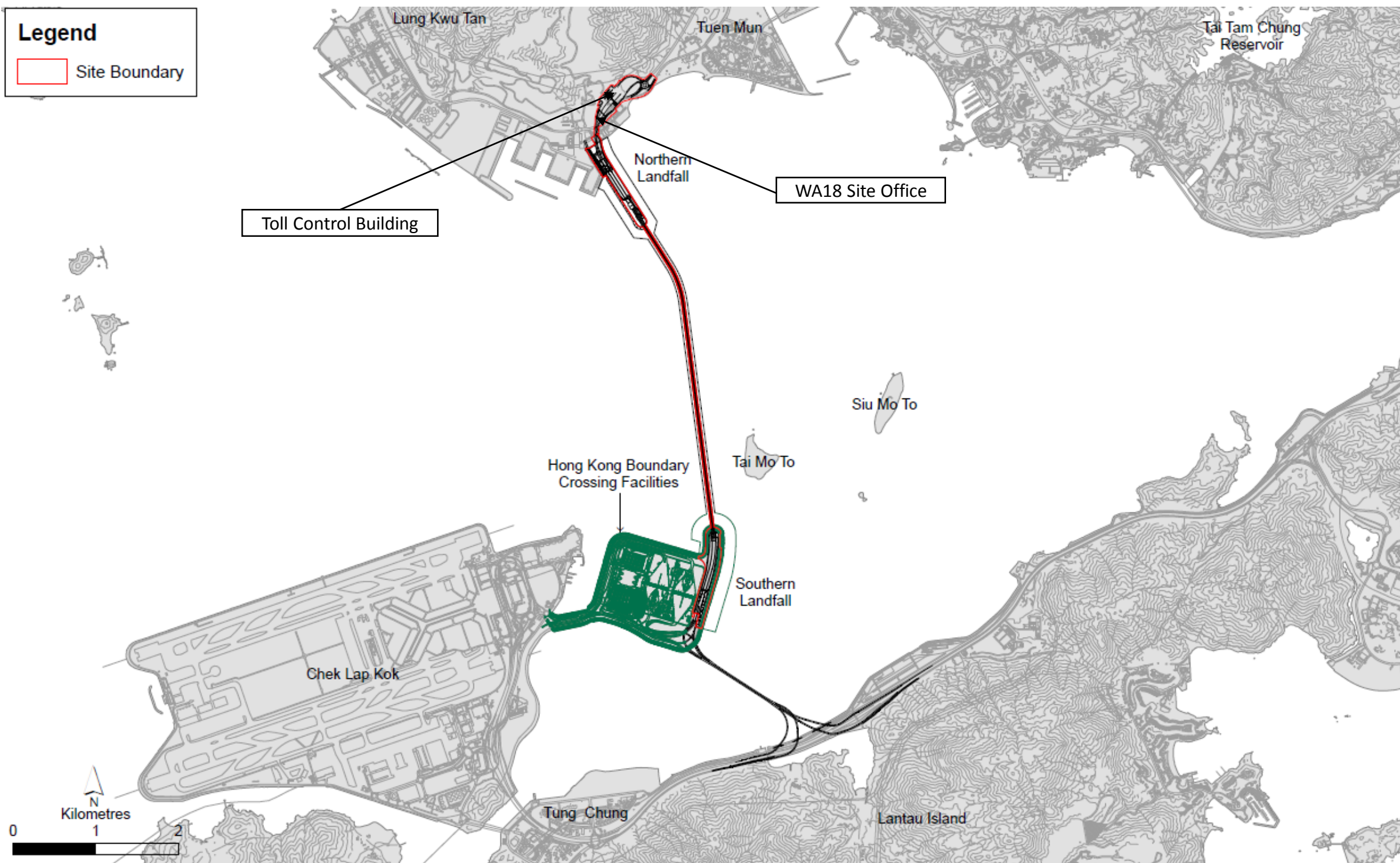


Figure 2.1

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

# Legend

 Site Boundary



<b>Meteorological Data for Impact Monitoring in the reporting period*</b>			
<b>Date (yy-mm-dd)</b>	<b>Time (24hrs)</b>	<b>Average of Wind Speed (m/s)</b>	<b>Average of Wind Direction(degree)</b>
18/08/26	0:00	1.3	281
18/08/26	1:00	0.9	301
18/08/26	2:00	0.9	287
18/08/26	3:00	0.9	316
18/08/26	4:00	1.3	326
18/08/26	5:00	0.9	298
18/08/26	6:00	0.4	305
18/08/26	7:00	0	-
18/08/26	8:00	0.9	16
18/08/26	9:00	0.9	3
18/08/26	10:00	1.3	20
18/08/26	11:00	2.7	18
18/08/26	12:00	2.2	311
18/08/26	13:00	1.8	297
18/08/26	14:00	2.2	287
18/08/26	15:00	1.3	290
18/08/26	16:00	0.9	231
18/08/26	17:00	1.3	126
18/08/26	18:00	2.2	96
18/08/26	19:00	2.2	83
18/08/26	20:00	1.8	91
18/08/26	21:00	2.2	91
18/08/26	22:00	0.9	88
18/08/26	23:00	1.3	92

\*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)

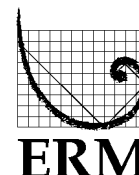
**From** ERM- Hong Kong, Limited

**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** 12 September 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**  
**0215660\_29 August 2018\_1hrTSP\_Station ASR1**

A total of one (1) exceedance was recorded on 29 August 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**

<b>Log No.</b>	<p><u>Action Level Exceedance</u> 0215660_29 February 2018_1hrTSP_Station ASR1</p> <p>[Total No. of Exceedances = 1]</p>	
<b>Date</b>	<p>29 August 2018 (Measured) 12 September 2018 (Results obtained from ENPO Website)</p>	
<b>Monitoring Station</b>	ASR1, ASR5, ASR6, ASR10, AQMS1	
<b>Parameter(s) with Exceedance(s)</b>	1-hr TSP	
<b>Action Levels</b>	1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	ASR1 = 331 ASR5 = 340 ASR6 = 338 ASR10 = 335 AQMS1 = 337
<b>Limit Levels</b>	1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	500
<b>Measured Levels</b>	<p><u>Action Level Exceedance</u> 1. 1-hr TSP at ASR1 during 13:36 -14:36</p>	
<b>Works Undertaken (at the time of monitoring event)</b>	<p>Works undertaken under this Contract on 29 August 2018 included:</p> <ul style="list-style-type: none"> <li>• Socket H-pilling at Administration Building, and</li> <li>• Predrilling works at Maintenance Depot</li> </ul>	
<b>Possible Reason for Action or Limit Level Exceedance(s)</b>	<p>The exceedance is unlikely to be due to the Project, in view of the following:</p> <ul style="list-style-type: none"> <li>• Apart from one 1 hour TSP (13:36 - 14:36) 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.</li> <li>• With reference to the weather report issued by Hong Kong Observatory, local weather on 29 August 2018 was mainly associated with heavy raining. In view of the natural dust suppression by rain, we considered that construction impact on air quality monitoring is minor.</li> <li>• According to ET's site inspection on 24 and 31 August 2018, no particular findings was observed (<i>refer to ET's Site Inspection Photo</i>). Unpaved roads were in wet condition. No debris or other materials was burnt within the site area.</li> </ul> <p>Based on the above, the exceedance is unlikely to be due to the Project.</p>	
<b>Actions Taken/ To Be Taken</b>	<p>The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area including water spraying at unpaved road/stockpiles and use of tarpaulin for stockpiles covering. The ET will monitor for future trends in exceedances.</p>	
<b>Dust Remarks</b>	<p>The monitoring results on 29 August 2018 and locations of air quality monitoring stations are attached. Works area under this Contract is attached. The attached wind data on 29 August 2018 is sourced from <i>Contract No. HY/2012/08</i> for reference.</p>	

Results of Air Quality Monitoring

Project	Works	Date (yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Parameter	Results	Unit
TMCLKL	HY/2012/08	2018-08-29	AQMS1	13:48	1-hour TSP	158	ug/m3
TMCLKL	HY/2012/08	2018-08-29	AQMS1	14:50	1-hour TSP	60	ug/m3
TMCLKL	HY/2012/08	2018-08-29	AQMS1	15:52	1-hour TSP	57	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR1	13:36	1-hour TSP	403	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR1	14:38	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR1	15:40	1-hour TSP	72	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR10	13:02	1-hour TSP	129	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR10	14:04	1-hour TSP	54	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR10	15:06	1-hour TSP	46	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR5	13:24	1-hour TSP	327	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR5	14:26	1-hour TSP	64	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR5	15:28	1-hour TSP	46	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR6	13:13	1-hour TSP	125	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR6	14:15	1-hour TSP	69	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR6	15:17	1-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2018-08-29	AQMS1	16:54	24-hour TSP	46	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR1	16:42	24-hour TSP	58	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR10	16:08	24-hour TSP	35	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR5	16:30	24-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2018-08-29	ASR6	16:19	24-hour TSP	62	ug/m3

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

Photo 1 - Unpaved roads were in wet condition (24 August 2018)



Photo 2 - No debris or other materials was burnt within the site area (31 August 2018)



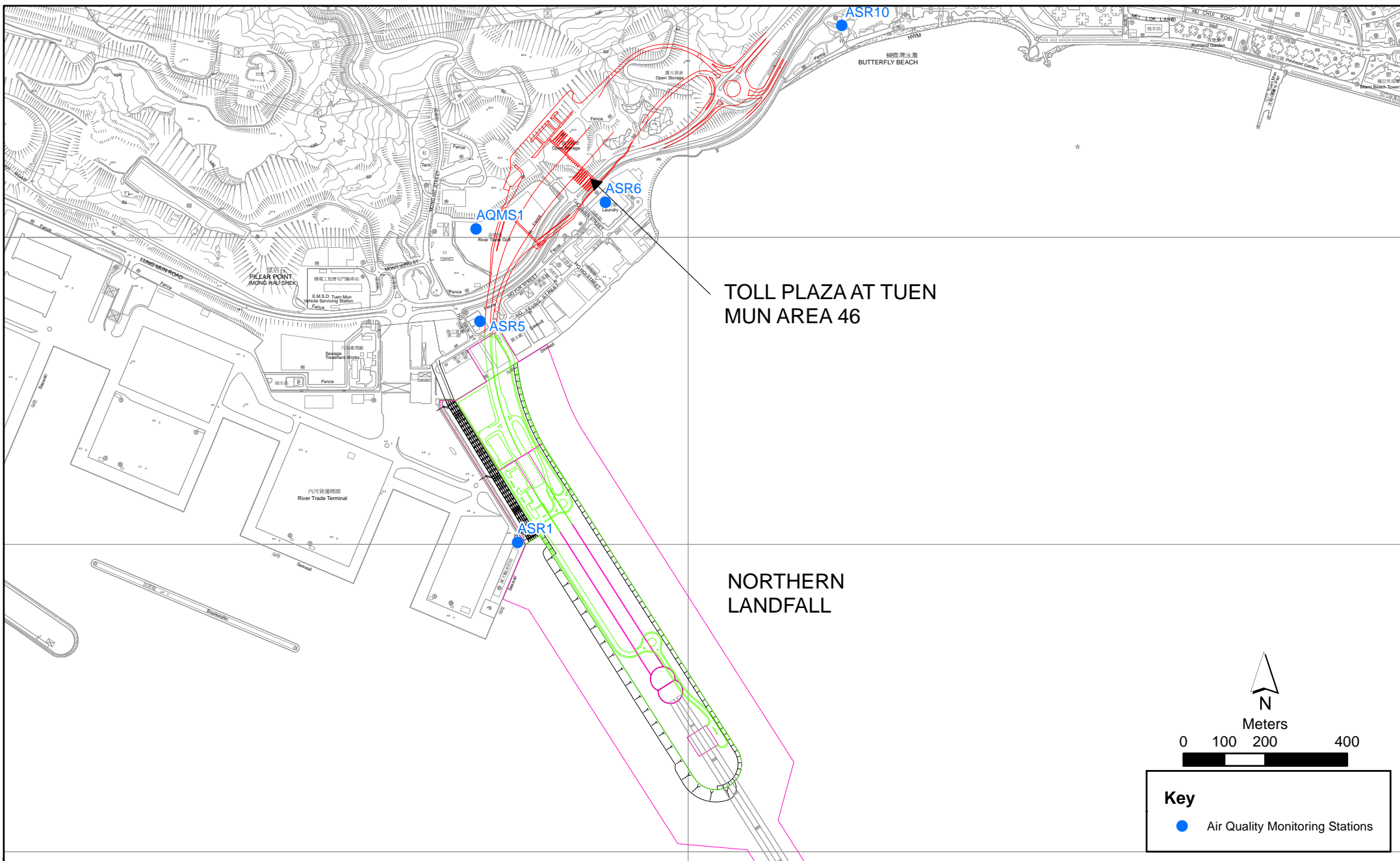
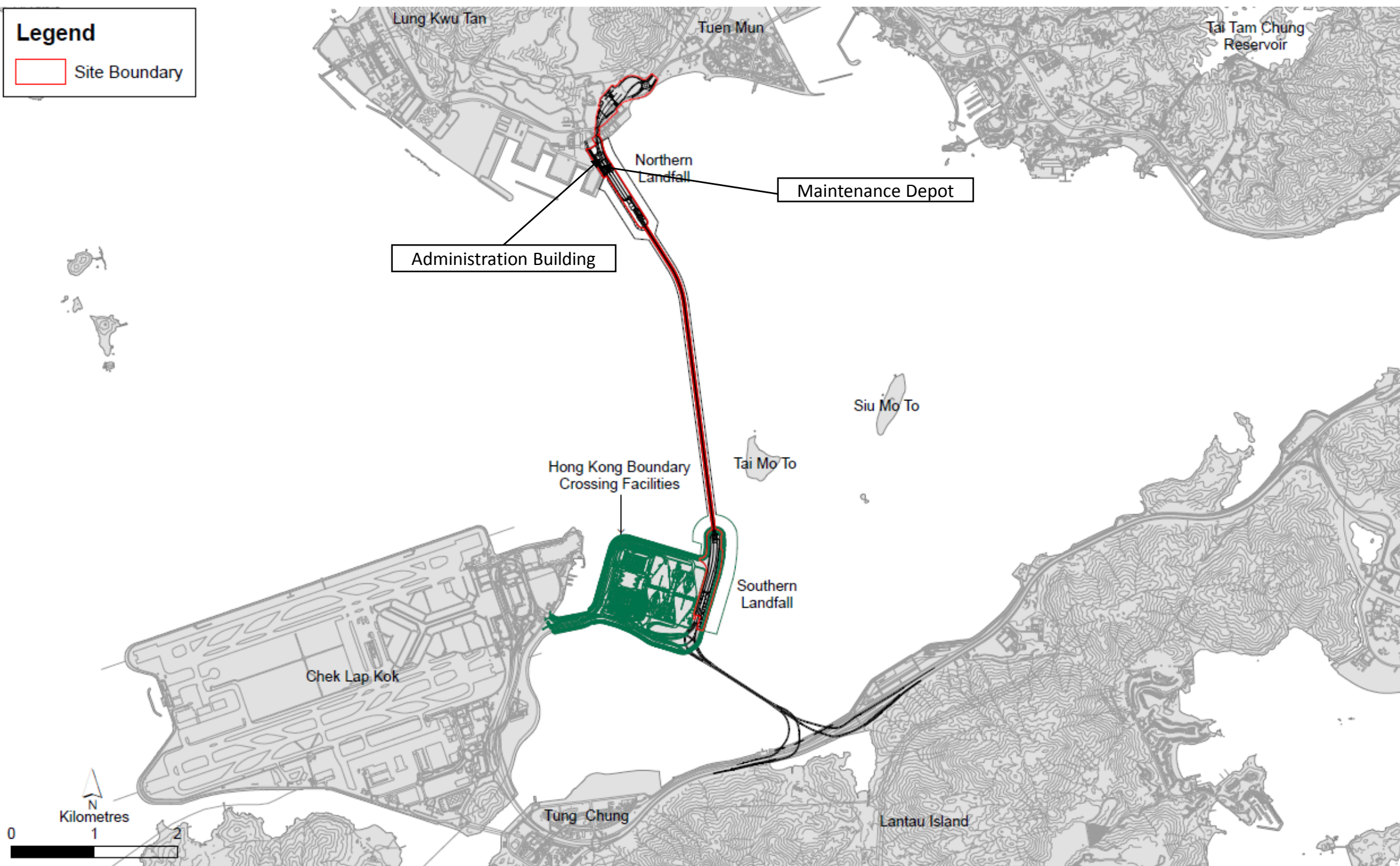


Figure 2.1

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

# Legend

 Site Boundary



<b>Meteorological Data for Impact Monitoring in the reporting period*</b>			
<b>Date (yy-mm-dd)</b>	<b>Time (24hrs)</b>	<b>Average of Wind Speed (m/s)</b>	<b>Average of Wind Direction(degree)</b>
18/08/29	0:00	1.3	132
18/08/29	1:00	1.3	133
18/08/29	2:00	1.3	140
18/08/29	3:00	0.4	351
18/08/29	4:00	1.3	126
18/08/29	5:00	0.4	1
18/08/29	6:00	0.4	3
18/08/29	7:00	0	-
18/08/29	8:00	1.8	199
18/08/29	9:00	0.9	235
18/08/29	10:00	0.9	220
18/08/29	11:00	1.3	224
18/08/29	12:00	1.8	290
18/08/29	13:00	0.9	140
18/08/29	14:00	2.2	214
18/08/29	15:00	1.8	200
18/08/29	16:00	1.8	284
18/08/29	17:00	0.9	294
18/08/29	18:00	0.9	2
18/08/29	19:00	0.9	344
18/08/29	20:00	0.9	339
18/08/29	21:00	0.4	294
18/08/29	22:00	0.4	299
18/08/29	23:00	0.9	147

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