

AUES JOB No.: TCS00715/14

TUEN MUN - CHEK LAP KOK LINK



CONTRACT NO. HY/2013/12 –

NORTHERN CONNECTION TOLL PLAZA AND
ASSOCIATED WORKS

2ND ANNUAL ENVIRONMENTAL MONITORING AND
AUDIT (EM&A) REVIEW REPORT – NOVEMBER 2015
TO OCTOBER 2016

PREPARED FOR

CRBC AND KADEN JOINT VENTURE

Date	Reference No.	Prepared By	Certified By
3 March 2017	TCS00715/14/600/R0261v3	 Ben Tam (Environmental Consultant)	 T.W. Tam (Environmental Team Leader)

Ref.: HYDHZMBEEM00_0_5124L.17

03 March 2017

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

By Fax (2218 7299) and By Post

Attention: Mr. Albert Yu

Dear Mr. Yu,

**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**

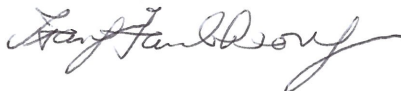
**Contract No. HY/2013/12 TM-CLKL Northern Connection Toll Plaza and
Associated Works
Second Annual EM&A Review Report**

Reference is made to the 2nd Annual Environmental Monitoring and Audit (EM&A) Review Report (AUES reference: TCS00715/14/600/R0261v3 dated 3 March 2017) certified by the ET Leader and provided to us via e-mail on 3 March 2017.

Please be informed that we have no adverse comments on the captioned report.

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 – Mr. Stephen Chan (By Fax: 3188 6614)
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AECOM – Mr. Conrad Ng (By Fax: 3922 9797)
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EXECUTIVE SUMMARY

ES01 In August 2014, CRBC-Kaden Joint Venture (*hereafter “CRBC-Kaden JV”*) has been awarded the Contract No. HY/2013/12 -Northern Connection Toll Plaza and Tunnel Section of the Tuen Mun – Chek Lap Kok Link (*hereinafter called “the Contract”*) by the Highways Department (HyD). The construction phase of the Contract was commenced on **23 October 2014**.

ES02 Before the Contract commencement, the baseline air quality monitoring was carried out by the ET of HY/2012/08 from **16th to 31st October 2013**. A set of Action and Limit Levels (A/L Levels) of air quality performance criteria was proposed by ET of HY/2012/08 which has been verified by IEC and endorsed by EPD. The Action and Limit Levels of the air quality adopted for the Contract is shown in *Table ES-01*.

Table ES-01 Action and Limit Levels of Air Quality Monitoring

Monitoring Station	24-hour TSP, ($\mu\text{g}/\text{m}^3$)		1-hour TSP, ($\mu\text{g}/\text{m}^3$)	
	Action Level	Limit Level	Action Level	Limit Level
ASR1	213	260	331	500
ASR5	238	260	340	500
AQMS1	213	260	335	500
ASR6	238	260	338	500
ASR10	214	260	337	500

ES03 In September 2013, baseline survey for Pitcher Plant has been conducted within the project area by a suitably qualified ecologist. In mid-September 2014, Contract HY/2013/12 has also conducted a one-off survey to confirm the number of existing Pitcher Plant. For cultural heritage, a condition survey for the grave was conducted on **23 September 2014**. The Baseline Monitoring Report for the Contract was submitted on **7 October 2014** for IEC’s verification and **25 November 2014** for EPD’s endorsement.

ES04 This is the **2nd** Annual EM&A Review Report for the “Tuen Mun - Chek Lap Kok Link - Northern Connection Toll Plaza and Associated Works” under Environmental Permit No. EP-354/2009/D (*hereinafter “the EP”*), covering the period from **1 November 2015 to 31 October 2016** (*hereinafter “Reporting Period”*).

SUMMARY OF EM&A ACTIVITIES FOR THE REPORTING PERIOD

ES05 In the Reporting Period, the EM&A activities is summarized in *Table ES-02*.

Table ES-02 Summary EM&A Activities Undertaken in the Reporting Period

Environmental Aspect	Environmental Monitoring Parameters / Inspection	Sub-total Occasions				Total
		1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	
Air Quality	1-hour TSP	465	435	465	435	1800
	24-hour TSP	155	145	155	145	600
Cultural heritage inspection	Grave G1	13	13	13	13	52
Landfill Gas Monitoring	Oxygen; Methane & Carbon Dioxide	75 days	70 days	75 days	75 days	295 days
Landscape & Visual	Landscape & Visual Monitoring	13	13	13	13	52
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	13	13	13	13	52

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES06 In according with the air quality measurement results by the ET of Contract HY/2012/08 in the

Reporting Period, no exceedances in 24-hour and 1-hour TSP were recorded.

ES07 For landfill gas monitoring, the concentration of all parameters were detected within the acceptable levels. Moreover, no noise complaint was received in the Reporting Period. *Table ES-03* is summarized breach of environmental performance criteria.

Table ES-03 Action and Limit (A/L) Levels Breach Summarized in the Reporting Period

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	0	0
	24-hour TSP	0	0	0	0	0
Landfill Gas Monitoring	Oxygen	0	0	0	0	0
	Methane	0	0	0	0	0
	Carbon Dioxide	0	0	0	0	0

ENVIRONMENTAL COMPLAINT

ES08 In the First Quarter of Reporting Period, no environmental complaints were received by either the RE or ENPO or HyD or the Main Contractor. However, one (1) environmental complaint which received the Second Quarter of Reporting Period on 28 April 2016 regarding to dust and smoke emission from a drilling rig was observed on the slope near Pillar Point, Tuen Mun. An also, two (2) environmental complaints which regarding to white color effluent discharging outfall behind sawmill at Ho Yeung Street, Tuen Mun, were received on 9 May and 7 July 2016 at the Third Quarter of Reporting Period. In the Fourth Quarter of Reporting period, one (1) environmental complaint which regarding to muddy water entering the drainage system near site entrance-Hand-key attendance system at Pillar Point, Tuen Mun at around 03:00 to 04:00 after the rainstorm, were received on 3 October 2016. The statistical of environmental complaint is listed in *Table ES-04*.

Table ES-04 Statistical Summary of Environmental Complaints

Reporting Period	Complaint Nature			Total Registered
	Water Quality	Construction Dust	Construction Noise	
1 November 2015 – 31 October 2016	<ul style="list-style-type: none"> • 9 May 2016 • 7 July 2016 • 3 October 2016 	<ul style="list-style-type: none"> • 28 April 2016 	NA	4

ES09 Complaint investigation has conducted by the Contractor or ET and the corresponding investigation reports for the complaint have been submitted to relevant parties. Based on investigation results, the contractor has enhanced the management to comply the Contract requirements.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES10 No environmental summons or successful prosecutions were recorded in the Reporting Period.

SITE INSPECTION

ES11 For past twelve months, total 52 occasions joint site inspection were carried out by the RE, IEC, ET and the Contractor. For joint site inspections, no non-compliance was observed. However, 102 observations/reminders were recorded within the past twelve months.

ES12 During each occasion of site inspection, Pitcher Plants of ecology and grave of culture heritage were also to inspect and audit.

FUTURE KEY ISSUES

ES13 Construction dust emission would be a key environmental issue during construction work of the Contract at dry season. Dust mitigation measures such as watering at least 12 times per day on all

exposed soil within the Project site and associated work areas in Tuen Mun area throughout the construction period should be implemented in accordance with the EP requirement.

- ES14 Muddy water or other water pollutants from sites surface flow to public area should properly avoided. Water quality mitigation measures to prevent surface runoff to impact public areas should be fully implemented.

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1 INTRODUCTION

1.1 CONTRACT BACKGROUND

1.1.1 CRBC-Kaden Joint Venture (hereafter “CRBC-Kaden JV”) is commissioned by the Highways Department (HyD) as the Main Contractor of the Contract No. HY/2013/12 – Northern Connection Toll Plaza and Tunnel Section ((hereafter “the Contract”) and this Contract is part of the Tuen Mun – Chek Lap Kok Link (TM-CLK Link Project). TM-CLK Link Project is a Designated Project under the latest Environmental Permit number VEP-354/2009D issued on 13 March 2015. The layout Plan of the Project and the Contract are showed in [Appendix A](#) and [Appendix B](#) respectively.

1.1.2 The works of the Contract mainly include:-

- a. construction of an approximately 5.4 hectares toll plaza and an associated footbridge;
- b. construction of associated carriageways including approximately 0.74 kilometre land viaducts, and an approximately 230 metres vehicular underpass to connect the toll plaza and the roundabout at Lung Mun Road/Lung Fu Road;
- c. site formation for the construction of the toll plaza, including associated slope works and natural terrain hazard mitigation measures;
- d. modification and realignment of the existing Lung Mun Road and Lung Fu Road; and
- e. associated waterworks, drainage, sewerage and landscaping works, etc..

1.1.3 AECOM Asia Company Limited as the Resident Engineer (RE) and Ramboll Environ Hong Kong Limited as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) were employed by the HyD. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, CRBC-Kaden JV has appointed Action-United Environmental Services & Consulting (AUES) as the Environmental Team (ET) to responsible relevant environmental monitoring work.

1.1.4 Construction phase of the Contract was commenced on **23 October 2014**. This is the Second (2nd) Annual EM&A Review Report to summarize the monitoring results and inspection findings with the Contractor performance from **1 November 2015** to **31 October 2016** (hereinafter “Reporting Period”) for the past twelve months.

1.2 REPORT STRUCTURE

1.2.1 The Annual Environmental Monitoring and Audit (EM&A) Review Report is structured into the following sections:-

Section 1 Introduction

Section 2 Contract Organization and Construction Progress and Environmental Submissions

Section 3 Summary of Impact Monitoring Requirements under the Contract

Section 4 Air Quality Monitoring

Section 5 Ecology Monitoring

Section 6 Cultural Heritage

Section 7 Landscape and Visual

Section 8 Landfill gas hazard Monitoring

Section 9 Waste Management

Section 10 Inspection and Auditing

Section 11 Environmental Complaint and Non-Compliance

Section 12 Implementation Status of Mitigation Measures

Section 13 Conclusions and Recommendations

2 CONTRACT ORGANIZATION AND CONSTRUCTION PROGRESS AND ENVIRONMENTAL SUBMISSIONS

2.1 CONTRACT ORGANIZATION

2.1.1 The Contract organization and contact details of key personnel are shown in [Appendix C](#).

2.2 CONSTRUCTION PROGRESS

2.2.1 In the Reporting Period, the major construction activity conducted under the Contract is summarized in below. Moreover, the master construction program of the Contract is enclosed in [Appendix D](#).

- Instrumentation and Monitoring
- Site Formation – Retaining Structure for RW_A, Slope TP_F, TP_G, TP_A and Associated Works, TP_B and Associated Works, TP_C and Associated Works, TP_D and Associated Works, TP_E and Associated Works and Slope Upgrading Works
- Site Formation – Earthwork on Slope D and E; surface drainage on slope C, D & E and Portion H
- Toll Plaza Decking TD1, TD2
- Toll Plaza Footbridge
- Retaining Structure RW_B, RW_F, RW_F and Slope TP_F”
- Bridge G1, G2, Bridge H1
- Toll Collector Subway & Associated Works – Section 1
- Sewer Culvert 1 (TBM) – Stage 4, Culvert 2 & Culvert 3
- Natural Terrain Hazard Mitigation Measures
- Vehicular Underpass TN-01
- Blasting and Excavation of Underpass from East Portal
- Road and Drainage Works for Lung Fu Road Roundabout
- Sewer Culvert at FC1 and FC2, and the existing Box Culvert
- Road and Drainage Works at Butterfly Bay, +11mPD, +19mPD and Portion H
- Construction of Bored pile at central median
- Box-culvert construction near MH2
- Sewer culvert by hand shield method at FC1, FC2, MH6, MH3 and MH7
- Cascade A construction
- Portal beam formwork erection at Lung Mun Road Central medium
- Concreting for portal beam at Lung Mun Road Central medium
- Precast Beam installation at Lung Mun Road
- Precast Panel Installation at RW_B & TD 1
- Fabrication of form traveler at fire station
- Assembly of Form Traveller at Bridge H1E and load test.
- Stitching of TD1 decking
- Waterproofing and lining at Vehicular Underpass
- Construction of Retaining Wall A and B
- Blast door installation at West Portal

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.3.1 In according to the EP, the required documents have submitted to EPD for retention which listed in below:

- Monitoring Plan on construction dust (submission refer to Contract HY/2012/08)
- Landscape and Visual Plan (not yet endorsed by EPD)
- Waste Management Plan (endorsed by the EPD on 16 March 2015)
- Baseline Monitoring Report (not yet endorsed by EPD)

2.3.2 Summary of the relevant permits, licenses, and/or notifications on environmental protection as obtained by the Contract in the past twelve months is presented in [Table 2-1](#).

Table 2-1 Status of Environmental Licenses and Permits of the Contract

No.	Type of Permit/ License	Submission Date	Reference/ License No.	Date of Issue	Date of Expiry
1	Air pollution Control (Construction Dust) Regulation	06-08-2014	377719	06-08-2014	N/A
2	Chemical Waste Producer Registration - Waste Producers Number	06-08-2014	5117422C389301	03-09-2014	N/A
3	Water Pollution Control Ordinance - Discharge License	13-08-2014	WT00020065-2014	29-09-2014	30-09-2019
4	Variation of Effluent Discharge License	22-08-15	WT00023973-2016	14-03-16	30-09-2019
5	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	21-07-2014	7020460	01-08-2014	N/A
6	Permission to Transplant Pitcher Plant	15-6-2015	(30) in AF CON 11/13 pt.4	23-6-2015	22-12-2015
7	CNP for Multiple Task	24-04-2015	GW-RW0225-15	13-05-2015	04-11-2015
		7-10-2015	GW-RW0520-15	05-11-2015	04-05-2016
		21-04-2016	GW-RW0520-16	05-05-2016	04-11-2016
8	CNP for MH5	05-05-2015	GW-RW0226-15	18-05-2015	17-11-2015
		23-10-2015	GW-RW0563-15	18-11-2015	17-05-2016
		25-04-2016	GW-RW0563-16	18-05-2016	17-11-2016
9	CNP for Tunnel	13-11-2015	GW-RW0582-15	23-11-2015	22-05-2016
		25-04-2016	GW-RW0582-16	23-05-2016	22-11-2016
10	CNP for falsework erection	01-02-2016	GW-RW0076-16	15-02-2016	21-04-2016
		07-04-2016	GW-RW0215-16	26-04-2016	21-06-2016
		18-05-2016	GW-RW0289-16	22-06-2016	19-08-2016
		27-07-2016	GW-RW0472-16	22-08-2016	21-12-2016

Note: CNP is Control Noise Permit

3 SUMMARY OF IMPACT MONITORING REQUIREMENTS UNDER THE CONTRACT

3.1 GENERAL

3.1.1 In view of the construction works under the Contract, the major construction activities are land-based. In accordance with the Project EM&A Manual requirements, environmental aspect monitoring should be conducted including air quality, ecological (Pitcher plant), cultural heritage and site inspections during construction period. In addition, landscape and visual (L&V) monitoring, landfill gas monitoring and audit of the contractor's implementation of the construction noise and land-based water quality pollution control measures are also required for the Contract.

3.1.2 A summary of construction phase EM&A requirements are presented in the sub-sections below.

3.2 AIR QUALITY MONITORING PARAMETERS

3.2.1 The construction phase air quality monitoring shall cover the following parameters:

- 1-hour TSP; and
- 24-hour TSP

3.3 MONITORING LOCATION

3.3.1 The air quality monitoring stations for impact monitoring are listed in *Table 3.1* and illustrated in *Appendix E*.

Table 3-1 Designated Air Quality Monitoring Stations under the Contract

ID	Location	Air monitoring station Description
ASR1	Tuen Mun Fireboat Station	EM&A Manual
ASR5	Pillar Point Fire Station	EM&A Manual
AQMS1	Previous River Trade Golf	Enhanced TSP Level under EP condition 2.4
ASR6	Butterfly Beach Laundry	Enhanced TSP Level under EP condition 2.4
ASR10	Butterfly Beach Park	Enhanced TSP Level under EP condition 2.4

3.4 MONITORING FREQUENCY

General Requirement

3.4.1 For regular impact monitoring, the sampling frequency of at least once in every six days shall be strictly observed at five of the designated monitoring stations for 24-hr TSP monitoring. For 1-hr TSP monitoring, the sampling frequency of at least three times in every six days should be undertaken at five locations when the highest dust impact occurs. The stations to be monitored should be selected based on the prevailing wind direction and their proximity to the active construction works.

Special Requirement

3.4.2 As per Condition 2.4 of the EP of TM-CLKL, an enhanced monitoring plan on TSP level at Tuen Mun ("the Enhanced TSP Monitoring Plan") is required to be submitted to the DEP for approval at least 1 month before the commencement of construction of the Project. Details of the Enhanced TSP Monitoring Plan under Contract No. HY/2012/08 could be found from the project website. The air quality monitoring work under this Contract will follow the monitoring requirement of enhanced TSP monitoring under the project.

3.4.3 The air quality monitoring requirements for the Contract is shown in *Table 3-2*.

Table 3-2 Enhanced TSP Monitoring Plan – Construction Phase

Condition	Monitoring Parameter	Monitoring Location	Frequency	Monitoring Requirement
General	1-hour TSP	ASR1, ASR5, AQMS1, ASR6, ASR10	3 times per day every six days	Throughout the Northern Connection, toll plaza and tunnel buildings construction works
	24-hour TSP	ASR1, ASR5, AQMS1, ASR6, ASR10	Daily every six days	
Special	1-hour TSP	ASR1, ASR5, AQMS1, ASR6, ASR10	3 times per day every three days	<p><u>Northern Connection</u> During excavation works for launching shaft, excavation work for Cut and Cover Tunnel and Cut and Cover Tunnel Construction</p> <p><u>Toll Plaza</u> During excavation, slope works, construction of road and superstructures and wind erosion from open sites and stockpiling areas</p> <p><u>Tunnel Buildings</u> During excavation, foundation works, construction of superstructures and wind erosion from open sites and stockpiling areas</p>
	24-hour TSP	ASR1, ASR5, AQMS1, ASR6, ASR10	Daily every three days	

3.5 DERIVATION OF ACTION/LIMIT (A/L) LEVELS

3.5.1 The baseline monitoring results formed the basis for determining the air quality criteria for the impact monitoring. The ET shall compare the impact monitoring results with air quality criteria set up for 24-hour TSP and 1-hour TSP. Based on results of the approved Baseline Monitoring Report of HyD Contract HY/2012/08, the proposed Action and Limit Levels are shown in *Tables 3-3*.

Table 3-3 TSP Action and Limit Levels for Impact Air Quality Monitoring

Air Quality Monitoring Stations	24-hour TSP ($\mu\text{g}/\text{m}^3$)		1-hour TSP ($\mu\text{g}/\text{m}^3$)	
	Action Level	Limit Level	Action Level	Limit Level
ASR1	213	260	331	500
ASR5	238	260	340	500
AQMS1	213	260	335	500
ASR6	238	260	338	500
ASR10	214	260	337	500

3.5.2 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan which presented in *Appendix F*.

3.6 OTHER ENVIRONMENTAL ASPECTS

Noise

3.6.1 The TM-CLKL EIA study concluded that no existing noise sensitive receiver (NSR) was identified within the Study Area at Tuen Mun. Therefore, no planned NSR designated at the

Project sites of Tuen Mun. Based upon this, no noise monitoring is necessary for construction phase under the Contract.

- 3.6.2 Regular site inspections and audits will be carried out during the construction phase in order to confirm compliance with the regulatory requirements and conformity of the Contractor with regard to noise control and contract conditions.

Water Quality

- 3.6.3 No marine works will be undertaken under the Contract. Based upon this, no water quality monitoring is necessary for construction phase.

Ecology

- 3.6.4 Since the Works of the Contract would not be to generate the marine ecological impact, no dolphin monitoring under the Contract to conduct.
- 3.6.5 During construction phase, the ET will perform Pitcher Plants inspection at least once every week to report the growth condition (only undertaken at Establish period) and protection measures.

Landscape and Visual

- 3.6.6 According to EIA recommendation, site inspection and audit shall be required to be undertaken in the operation stage. Measures to mitigate landscape and visual impacts during construction should be checked and monitored by a Registered Landscape Architect to ensure compliance with the intended aims of the mitigation measures in accordance with the EM&A Manual.

Cultural Heritage

- 3.6.7 Grave G1 of heritage resources is situated near the proposed toll plaza in Tuen Mun. Site inspections should be undertaken at least once per week throughout the construction period to ensure compliance with the intended aims of recommended mitigation measures.

Monitoring and Measurement of Landfill Gas

- 3.6.8 During EIA study, landfill gas hazards are likely to be generated from the Pillar Point Valley (PPV) Landfill. Hence, regular landfill gas monitoring is recommended during construction of the proposed toll plaza. Safety Officer or an approved and appropriated qualified person should be carried out the monitoring works to make sure the area free of landfill gas before any man enters in the area.
- 3.6.9 Depending on the results of the measurements, actions required will vary and should be set down by the Safety Officer or other appropriately qualified person. As a minimum these should encompass those actions specified as follow:

Table 3-4 Actions in the Event of Landfill Gas being Detected in Excavation / Confined Area

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

Parameter	Measurement	Action
Dioxide	> 1.5%	<ul style="list-style-type: none">- Stop work- Evacuate personnel / prohibit entry- Increase ventilation to restore to < 0.5%

4 AIR QUALITY MONITORING

4.1 GENERAL

4.1.1 According to the Updated EM&A Manual and the Enhanced Total Suspended Particulates (TSP) Monitoring Plan, the air quality impact monitoring was conducted at the five air quality monitoring stations during the Reporting Period by the ET of Contract HY/2012/08. Sharing of impact air quality monitoring data between HY/2012/08 and HY/2013/12 is agreed by all relevant parties. Therefore the Contract is not required to conduct its own dust monitoring exercise until the Contract HY/2012/08 is ended.

4.2 AIR QUALITY MONITORING RESULTS IN REPORTING PERIOD

4.2.1 In the Reporting Period, total 1,800 of 1-hr TSP measurements and 600 events of 24-hours TSP monitoring at five proposed locations were carried out by the ET of Contract HY/2012/08. Detailed air quality monitoring results and statistical analysis of the trends of air quality data during the Reporting Period can be referred to the Monthly EM&A Reports (from November 2015 to October 2016) and the Third Annual EM&A Review Report (November 2015 to October 2016) prepared by the ET of Contract HY/2012/08.

4.3 SUMMARY OF ACTION AND LIMIT (A/L) LEVELS EXCEEDANCE (NON-COMPLIANCE)

4.3.1 According to the air quality monitoring result provided by Contract HY/2012/08, no exceedances in 1-hour and 24-hour TSP were recorded in the Reporting Period. No Notification on Exceedances (NOEs) was issued by the ET of Contract HY/2012/08. The summary of air quality exceedance is shown in *Table 4-1*.

Table 4-1 Summary of Air Quality Monitoring Exceedance

Date of Exceedance	Monitoring Station	Air Quality Parameter	Result	Exceed
NA	NA	NA	--	--

4.4 AIR QUALITY EXCEEDANCE INVESTIGATION

4.4.1 No investigation for exceedance is required for the Reporting Period.

5 ECOLOGY MONITORING

5.1 GENERAL

5.1.1 According to the EM&A Manual requirements, regularly inspection for Pitcher Plants at least once every week to report its growth and protection measure situation shall be conducted during construction period.

5.1.2 Total 181 pitcher plants were transplanted to final receptor site and the rest of the Pitcher Plant individuals (certified dead by the specialist) were not transplanted and were treated as general refuse. All the transplantation of pitcher plant from the nursery site to final receptor site was completed on 10th September 2015.

5.2 PITCHER PLANTS INSPECTION

5.2.1 A total **52** occasions of inspection were carried out by the Contractor and ET in the past twelve months.

5.2.2 During each inspection, the transplanted pitcher plant was performed random checking at the final receptor area. It was observed that the transplanted pitcher plants were properly protected and the growth was normally in fair condition except three individuals which appeared poor condition in May 2016 were certified dead by the specialist. It is considered that the Pitcher Plant were establishing after transplanting shock and adapting to the condition of the Final Receptor Site and frequent watering is recommended. Besides, no construction activities were observed to be carried out at the surrounding of the final receptor area. The condition of chain link fence is good and no repair or maintenance is required.

5.2.3 Establish period for the pitcher plants was completed at the end of September 2016, therefore the joint site completion of establish period visit with AFCD was undertaken on 23 September 2016 and the advance copy of final pitcher report was submitted to AFCD on 11 November 2016. Therefore after 23 September 2016, only the integrity of the protection fence was checked to fulfil the EIA requirement.

5.2.4 No matters the completion of establish period, the Contractor should properly maintain the fencing along the receptor area to avoid disturbance to the pitcher plants under the EIA requirement.

6 CULTURAL HERITAGE

6.1 GENERAL

6.1.1 According to the EM&A Manual requirements, regular inspection for heritage resource Grave G1 shall be audited by the ET at least once every week to ensure recommended mitigation measures implemented during construction period. The aim of the survey is prevention of any possible damage to the grave and to ensure that proposed mitigation measures are implemented. The broad scope of the audit will involve supervision of the following:

- Non-contact effects of the engineering works, such as vibration from pneumatic drills which could cause damage, such as foundation or wall cracks and loosening of tiles or fixtures; and
- Contact between the historic structures and equipment and materials associated with the engineering works.

6.1.2 Specifically, the monitoring programme will entail the following tasks:

- The extent of the agreed works areas should be regularly checked during the construction phase to ensure the buffer is being maintained; and
- Ensure no stockpiling or equipment storage is affecting the structure.

6.1.3 In the event of non-compliance the responsibilities of the relevant parties is detailed in the Event/ Action Plan in [Appendix F](#).

6.2 GRAVE INSPECTION

6.2.1 In this Reporting Period, there are total **52 occasions** to carry out the Grave G1 inspection. During site inspection, buffer zone was observed between the working area and the Grave and no construction material or equipment was stored nearby the Grave.

6.2.2 Mitigation measures had been fully implemented by the Contractor in accordance with the requirements of the EM&A Manual.

7 LANDSCAPE AND VISUAL

7.1 GENERAL

7.1.1 According to EM&A Manual requirements, monitoring of Contractor's operations during construction period to report on Contractor's compliance should be carried out on weekly basis. Measure to mitigate landscape and visual impact during construction should be checked and monitored by a Registered Landscape Architect to ensure compliance with the intended aims of the mitigation measures. Moreover, the progress of the engineering works shall be regularly reviewed on site to identify the earliest practical opportunities for the landscape works to be undertaken.

7.2 LANDSCAPE AND VISUAL INSPECTION

7.2.1 In this Reporting Period, Registered Landscape Architect with the Contractor had undertaken a total of **52** occasions of inspection.

7.2.2 In the past twelve months, most of the landscape work such as planting was not yet commenced, existing tree on boundary of the project area was properly protected and no damage of the existing tree was record in this reporting period. Felled tree under construction was collected by license collected for recycling. The detailed inspection checklists can be referred to relevant Monthly EM&A Reports of the Contract.

8 LANDFILL GAS HAZARD MONITORING

8.1 GENERAL

- 8.1.1 During EIA study, landfill gas hazards are likely to be generated from the Pillar Point Valley (PPV) Landfill. Hence, regular landfill gas monitoring is recommended during construction of the proposed toll plaza.
- 8.1.2 During construction, a Safety Officer should be appointed to carry out the monitoring works. The monitoring frequency and areas to be monitored should be set down prior to commencement of ground-works either by the Safety Officer or an approved and appropriated qualified person. The routine monitoring should be carried out in all excavations, manholes, chambers, relocation of monitoring wells and any other confined spaces that may have been created. All measurements in excavations should be made with the extended monitoring tube located not more than 10 mm from the exposed ground surface. Monitoring should be performed properly to make sure that the area is free of landfill gas before any man enters in the area.
- 8.1.3 For excavations deeper than 1m, measurements should be carried out:
- at the ground surface before excavation commences;
 - immediately before any worker enters the excavation;
 - at the beginning of each working day for the entire period the excavation remains open; and
 - periodically through the working day whilst workers are in the excavation.
- 8.1.4 For excavations between 300mm and 1m deep, measurements should be carried out:
- directly after the excavation has been completed; and
 - periodically whilst the excavation remains open
- 8.1.5 For excavations less than 300mm deep, monitoring may be omitted, at the discretion of the Safety Officer or other appropriately qualified person.
- 8.1.6 To ensure the accuracy of the monitoring data, zeroing of the gas analyser shall be undertaken at the start of each day's monitoring. As part of the QA/QC, calibration of the gas analyser shall be conducted at least once every two weeks according to the specification of the manufacturer's operation manual.
- 8.1.7 The landfill consultation zone was divided into 6 monitoring zones. The landfill gas monitoring zones are summarized in Table 8-1 and the layout plan for the monitoring zone is illustrated in [Appendix E](#).

Table 8-1 Landfill Gas Monitoring Zone

ID	Location
TD1	TD1, Retaining Wall A and Subway
RW-B	Retaining Wall B
RW-F	Retaining Wall F
S&U	Slope and Underpass
BW	Bridge Works
LMR	Lung Mun Road

8.2 LANDFILL GAS MONITORING RESULT

- 8.2.1 In the past twelve months, landfill gas monitoring was conducted at monitoring zone RW-B & RW-F between November 2015 and September 2016. For October 2016 landfill gas monitoring was conducted at the zone TD1 and LMR due to the excavated area have been backfilled at the end of September 2016 for zone RW-B & RW-F. A BIOGAS 5000 gas analyser was used for the landfill gas monitoring.

8.2.2 There were total 295 monitoring days carried out by the Safety Officer or an approved and qualified persons. Landfill gas measurement results in the past twelve months are summarized in Table 8-2 & 8-3. Moreover, graphical plot are attached in [Appendix G](#).

Table 8-2 Summary of Landfill Gas Measurement Results in this Annual for RW-B & RW-F

Para.	Action Level	Limit Level	In Period	Detectable at Retaining Wall B		Detectable at Retaining Wall F	
				Min	Max	Min	Max
Methane	>10% LEL (>0.5% v/v)	>20% LEL (>1% v/v)	Nov 2015 to Jan 2016	0%	0.1%	0%	0.1%
			Feb 2016 to Apr 2016	0%	0.2%	0%	0.1%
			May 2016 to Jul 2016	0%	0.1%	0%	0.1%
			Aug 2016 to Sep 2016	0.0%	0.2%	0.0%	0.2%
Oxygen	<19%	<18%	Nov 2015 to Jan 2016	21.0%	21.2%	21.0%	21.2%
			Feb 2016 to Apr 2016	21.0%	21.1%	21.0%	21.1%
			May 2016 to Jul 2016	21.0%	21.2%	21.0%	21.1%
			Aug 2016 to Sep 2016	21.0%	21.1%	21.0%	21.1%
Carbon Dioxide	>0.5%	>1.5%	Nov 2015 to Jan 2016	0%	0.2%	0%	0.2%
			Feb 2016 to Apr 2016	0.1%	0.2%	0.1%	0.2%
			May 2016 to Jul 2016	0.1%	0.2%	0.1%	0.2%
			Aug 2016 to Sep 2016	0.1%	0.2%	0.1%	0.2%

Table 8-3 Summary of Landfill Gas Measurement Results in this Annual for TD1 & LMR

Para.	Action Level	Limit Level	In Period	Detectable at Retaining Wall B		Detectable at Retaining Wall F	
				Min	Max	Min	Max
Methane	>10% LEL (>0.5% v/v)	>20% LEL (>1% v/v)	Oct 2016	0.1%	0.1%	0.1%	0.1%
Oxygen	<19%	<18%	Oct 2016	21.0%	21.1%	21.0%	21.1%
Carbon Dioxide	>0.5%	>1.5%	Oct 2016	0.1%	0.2%	0.1%	0.2%

8.2.3 The measurement results shown that slightly methane concentration was detected and all oxygen concentration was measured between 21.0% and 21.2% and Carbon Dioxide was between 0 and 0.2%. No corrective action was required accordingly.

9 WASTE MANAGEMENT

9.1 GENERAL WASTE MANAGEMENT

9.1.1 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time. The effective management of waste arisings during the construction phase will be monitored through the site audit programme. The aims of the waste audit are:

- to ensure the waste arising from the works are handled, stored, collected, transferred and disposed of in an environmentally acceptable manner; and
- to encourage the reuse and recycling of material.

9.1.2 In addition to the site inspections, the ET shall review the documentation procedures prepared by the Waste Coordinator once a week to ensure proper records are being maintained and procedures undertaken in accordance with the Waste Management Plan.

9.2 RECORDS OF WASTE QUANTITIES

9.2.1 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

9.2.2 In the past twelve months, total quantities of waste disposal are summarized in *Tables 9-1* and *9-2*.

Table 9-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Quantity				Total	Disposal Location
	Nov 2015 – Jan 2016	Feb 2016 – Apr 2016	May 2016 – Jul 2016	Aug 2016 – Oct 2016		
Reused in this Contract (Inert) (‘000m ³)	35.186	39.413	31.747	15.353	121.699	-
Reused in other Projects (Inert) (‘000m ³)	73.010	17.086	8.727	26.678	125.501	<ul style="list-style-type: none"> • TM-CLKL C2 HY/2012/08 • Lam Tei Quarry • Eco Park K.wah Recycle Facilities • Lung Kwu Tan Tailor Recycled Aggregates • Laintang BCP
Disposal as Public Fill (Inert) (‘000m ³)	3.989	1.603	1.539	0.487	7.618	Tuen Mum Area 38

Table 9-2 Summary of Quantities of C&D Wastes

Type of Waste	Quantity				Total	Disposal Location
	Nov 2015 – Jan 2016	Feb 2016 – Apr 2016	May 2016 – Jul 2016	Aug 2016 – Oct 2016		
Recycled Metal (‘000kg)	0	0	0	0	0	-
Recycled Paper / Cardboard Packing (‘000kg)	0.07	0	0	0	0.07	Recycle Collector
Recycled Plastic (‘000kg)	0	0	0	0	0	-
Chemical Wastes (‘000kg)	0	0	0	0	0	-
General Refuses (‘000m ³)	0.257	0.309	0.283	0.401	1.250	WENT

9.2.3 Whenever possible, materials were reused on-site as far as practicable.

10 INSPECTION AND AUDITING

10.1 SITE INSPECTION

10.1.1 According to the approved EM&A Manual, the environmental site inspection shall be formulated by ET Leader. Weekly environmental site inspections should carry out to confirm the environmental performance.

Findings / Deficiencies During Reporting Period

10.1.2 In the past twelve months, total 52 events of joint site inspection to evaluate site environmental performance has been carried out by the RE, ET and the Contractor. Moreover, IEC or ENPO attended total 12 occasions' joint site inspection. The quantity of reminders/observations is summarized in **Table 10-1**.

Table 10-1 Summary of Reminders/Observations of Site Inspection for the Annual

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
November 2015	3 rd , 10 th , 17 th and 24 th November 2015	9	Completed
December 2015	1 st , 8 th , 15 th , 22 nd and 29 th December 2015.	14	Completed
January 2016	5 th , 12 th , 19 th and 26 th January 2016	8	Completed
February 2016	2 nd , 12 th , 16 th and 23 rd February 2016	5	Completed
March 2016	1 st , 8 th , 15 th , 22 nd and 29 th March 2016.	12	Completed
April 2016	6 th , 12 th , 19 th and 26 th April 2016	3	Completed
May 2016	3 rd , 10 th , 17 th , 24 th and 31 st May 2016	7	Completed
June 2016	8 th , 15 th , 21 st and 28 th June 2016	6	Completed
July 2016	6 th , 12 th , 20 th and 26 th July 2016	6	Completed
August 2016	3 rd , 9 th , 16 th , 23 rd and 30 th August 2016	11	Completed
September 2016	6 th , 13 th , 21 st and 27 th September 2016	8	Completed
October 2016	4 th , 12 th , 18 th and 25 th October 2016	13	Completed

10.1.3 In the past twelve months, there are no non-compliance recorded, however, **102** observations/reminders were recorded during the site inspections. The minor deficiencies found in the weekly site inspections were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

11 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

11.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

11.1.1 For the Contract, no summons and prosecution was received in the Reporting Period. However, there are four environmental complaints and no exceedances of action / limit levels recorded during the Reporting Period. The statistical summary table of environmental exceedance, complaint, summons and prosecution is presented in *Tables 11-1, 11-2, 11-3 and 11-4*.

Table 11-1 Statistical Summary of Environmental Exceedance

Reporting Period	Environmental Aspect		Exceedance Statistics	
			Action	Limit
1 November 2015 – 31 October 2016	Air Quality	1-hour TSP	0	0
		24-hour TSP	0	0
	Landfill Gas	Methane	0	0
		Oxygen	0	0
		Carbon Dioxide	0	0

Table 11-2 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics			
	Cumulative	Complaint Nature		
		Air	Noise	Water
1 November 2015 – 31 October 2016	4	<ul style="list-style-type: none"> 28 April 2016 	NA	<ul style="list-style-type: none"> 9 May 2016 7 July 2016 3 October 2016

Table 11-3 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics			
	Cumulative	Complaint Nature		
		Air	Noise	Water
1 November 2015 – 31 October 2016	0	NA	NA	NA

Table 11-4 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics			
	Cumulative	Complaint Nature		
		Air	Noise	Water
1 November 2015 – 31 October 2016	0	NA	NA	NA

11.2 SUMMARY RECORD OF ALL COMPLAINTS, ACTION AND WORKING PROCEDURES

11.2.1 During the complaint investigation work, the Contractor was co-operated with the ET in providing all the necessary information and assistance for completion of the investigation. Investigation reports for the complaints have completed by the ET and submitted to all relevant parties and they are summarized in below.

- 28 April 2016 - A complaint was received from the EPD on 28 April 2016. The complainant complained that dust and smoke emission from a drilling rig was observed on the slope near Pillar Point, Tuen Mun. It was suspected that the heavy dust was generated from the construction activities under the Contractor.
- 9 May 2016 - A complaint was received from the EPD on 9 May 2016. The complainant complained that white color effluent discharging outfall behind sawmill at Ho Yeung Street, Tuen Mun. It cannot confirm the source of the white color effluent

therefore it considered that the above complaint is not related to the project.

- 7 June 2016 - A complaint was received from the EPD on 7 June 2016. The complainant complained that white color effluent discharging outfall at storm outfall of No.33 Ho Yeung Street, Tuen Mun at around 18:00 and this is a follow up of the complaint EP/RW/0000368066 which received on 9 May 2016 and defecated as not project related complain. EPD visit the upstream area and open the cover of manhole at Ho Fuk Street on 21 June 2016. No water discharge was observed and the manhole was clean and dry in condition. During the joint investigation and inspection by EPD, Aecom and the Contractor, it was found that the white water might come from other facilities or site located at Ho Yeung Street which is not related to this project.
- 3 October 2016 - A complaint was received via EPD hotline on 3 October 2016, claimed that muddy water entering the drainage system near site entrance-Hand-key attendance system Pillar Point, Tuen Mun at around 03:00 to 04:00 after the rainstorm. Refer to tele-conversation with EPD and Contractor, the complaint was actually mentioning the muddy water entering the drainage system was occurred on 1 October 2016 03:00 to 04:00 at the bus station nearby the site entrance. According to the site record, the works carried out during the concerned time period was maintenance works of TTA include maintenances of flashlight, water barrier and road marking, there is no ponding water was observed nearby the concerned locations. Also during the weekly site inspection on 4 October 2016, no water discharged from site and ponding at the bus station nearby the site entrance was observed. Earth bund was also provided at the slope near the site entrance to divert the surface run-off to the de-silting system. Moreover, the record from the Hong Kong Observatory also stated there was no rainfall recorded at Tuen Mun between 30 September 2016 and 1 October 2016 04:45 a.m. Therefore for the above result, it is considered that the above complaint is not related to the project.

Inspection Checklist for Vulnerable to Contaminated Water Discharge

- 11.2.2 Following to the complaint about discharge of milky water to Bufferfuly Beach on 2 September 2015. The Contractor proposed to carry out daily inspection of wastewater treatment facilities, concerned discharge points, drainage inlets and outlets during typhoon or wet season.
- 11.2.3 In addition, specific inspections would also be conducted before and after adverse weather to ensure necessary remedial works would be carried out timely. Should incidental contaminated water discharge be found at the inlet of the associated drainage system, a specific inspection of the relevant drainage pipes would be conducted for traces of deposit, and follow up actions would be taken when necessary.
- 11.2.4 The daily inspection for vulnerable to contaminated water discharge was conducted by the Contractor between 1 to 30 November 2015 and 11 April to 31 October 2016 . As requested by the EPD, the associated inspection checklist should be presented in the respective Monthly EM&A Report.

12 IMPLEMENTATION STATUS OF MITIGATION MEASURES

12.1 GENERAL REQUIREMENTS

12.1.1 The environmental mitigation measures that recommended in the Environmental Mitigation Measures Implementation Schedule (EMMIS) in the Project EM&A Manual covered the issues of Air Quality, Cultural Heritage, Ecology, Landfill Gas Hazard, Landscape & Visual, Noise, Water and Waste and they are presented in [Appendix I](#).

12.1.2 In the past twelve months, environmental mitigation measures generally implemented by the Contract are listed in [Table 12-1](#).

Table 12-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Air Quality	<ul style="list-style-type: none"> • Maintain damp / wet surface on access road • Keep slow speed in the sites • All vehicles must use wheel washing facility before off site • Sprayed water during rock breaking works • During transportation by truck, materials loaded lower than the side and tail boards, and covered before transport • Compacted all soil stockpiles • Part of the exposed slopes covered geotextile net
Cultural Heritage	<ul style="list-style-type: none"> • Set a buffer zone between the working area and the Grave • All construction materials and equipment store far from the Grave • Inspection the Grave to ensure provision mitigation measures effective
Ecology	<ul style="list-style-type: none"> • Wire fencing provided for temporary protect Pitcher Plants • Undertake weekly inspection of Pitcher Plants
Landfill Gas Hazard	<ul style="list-style-type: none"> • Landfill Gas measurement undertake during trench excavation
Water Quality	<ul style="list-style-type: none"> • Temporary drainage system provide for surface runoff prevent discharge to public area • Wastewater to be treated by sedimentation tank before discharge.
Noise	<ul style="list-style-type: none"> • Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. • Keep good maintenance of plants • The noisy plants or works provide mobile noise barriers • Shut down the plants when not in used
Waste and Chemical Management	<ul style="list-style-type: none"> • On-site sorting prior to disposal • Follow requirements and procedures of the “Trip-ticket System” • Predict required quantity of concrete accurately • Collect the unused fresh concrete at designated locations in the sites for subsequent disposal
General	<ul style="list-style-type: none"> • The site was generally kept tidy and clean.

13 CONCLUSIONS AND RECOMMENDATIONS

13.1 CONCLUSIONS

- 13.1.1 This is 2nd Annual EM&A Review Report presenting the monitoring results and inspection findings for the Reporting Period from **1 November 2015** to **31 October 2016**.
- 13.1.2 No air quality monitoring including 1-hour and 24-hour TSP exceedance was recorded in the Reporting Period.
- 13.1.3 In this Reporting Period, no noise complaint was received by RE, the Contractor, ENPO or HyD. No Action Level exceedances were triggered and no NOE or the associated corrective actions were therefore issued.
- 13.1.4 Site inspection for landscape and visual was conducted on weekly basis by the Landscape Architect to ensure the compliance of the intended aims of the mitigation measures. Most of the landscape works such as planting was not yet commenced.
- 13.1.5 Landfill gas monitoring was conducted at RW-B & RW-F between November 2015 and September 2016 and at the TD1 and Lung Mun Road works area on October 2016 by the Safety Officer. The monitoring results shown no exceedances were triggered.
- 13.1.6 No notifications of summons or successful prosecution were received during the Reporting Period. However, three complaints about the water quality issues and one complaint about the air quality issues were received during the Reporting Period. Investigations were conducted and the follow-up actions corresponding to the mitigation measures recommended were undertaken by the Contractor to resolve the environmental deficiencies
- 13.1.7 Joint site inspection by the RE, ET and CRBC-Kaden JV was carried in accordance with the EM&A Manual. Moreover, the IEC attended a total of **12** joint site inspections during the Reporting Period. No non-compliance was recorded during the site inspection but **total 102** observations/reminders were recorded in the past twelve months. All the deficiencies were rectified before next site inspection date.
- 13.1.8 A total **52** occasions of Pitcher Plant inspection were carried out by the Contractor and ET in the past twelve months at the final receptor site. It was observed that the transplanted pitcher plants were properly protected and the growth was normally in fair condition except three individuals which appeared poor condition in May 2016 were certified dead by the specialist. It is considered that the Pitcher Plant were establishing after transplanting shock and adapting to the condition of the Final Receptor Site and establish period for the pitcher plants was completed at the end of September 2016.
- 13.1.9 For cultural heritage in the past twelve months, the buffer zone between the working area and the Grave was observed and no construction material or equipment was stored nearby.

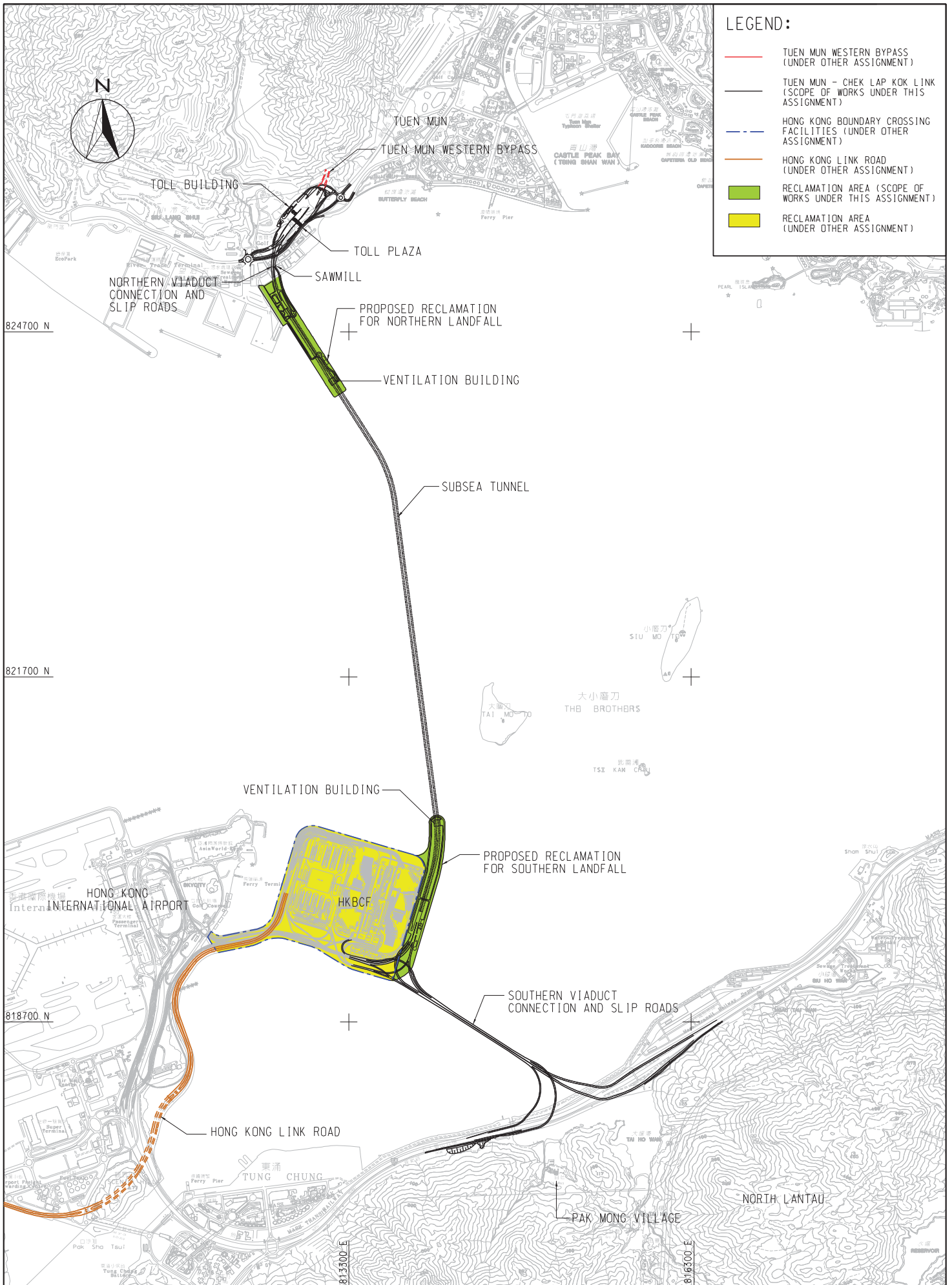
13.2 RECOMMENDATIONS

- 13.2.1 The construction phase monitoring programme ensured that any environmental impact to the receivers would be readily detected and timely actions could be taken to rectify any non-compliance. Assessment and analysis of monitoring results collected demonstrated the environmental acceptability of the Project. The regular site inspection and waste audit ensured that all the mitigation measures on waste management were effectively implemented.
- 13.2.2 The EM&A programme effectively monitored the environmental impacts from the construction phase of the Project and no particular recommendation was advised for the improvement of the programme.

- 13.2.3 It is considered that the environmental acceptability of the Contract in the past twelve months was satisfactory and acceptable.

Appendix A

Project Layout Plan



LEGEND:

- TUEN MUN WESTERN BYPASS (UNDER OTHER ASSIGNMENT)
- TUEN MUN - CHEK LAP KOK LINK (SCOPE OF WORKS UNDER THIS ASSIGNMENT)
- - - HONG KONG BOUNDARY CROSSING FACILITIES (UNDER OTHER ASSIGNMENT)
- HONG KONG LINK ROAD (UNDER OTHER ASSIGNMENT)
- RECLAMATION AREA (SCOPE OF WORKS UNDER THIS ASSIGNMENT)
- RECLAMATION AREA (UNDER OTHER ASSIGNMENT)

PROJECT NO. 60044963

AECOM

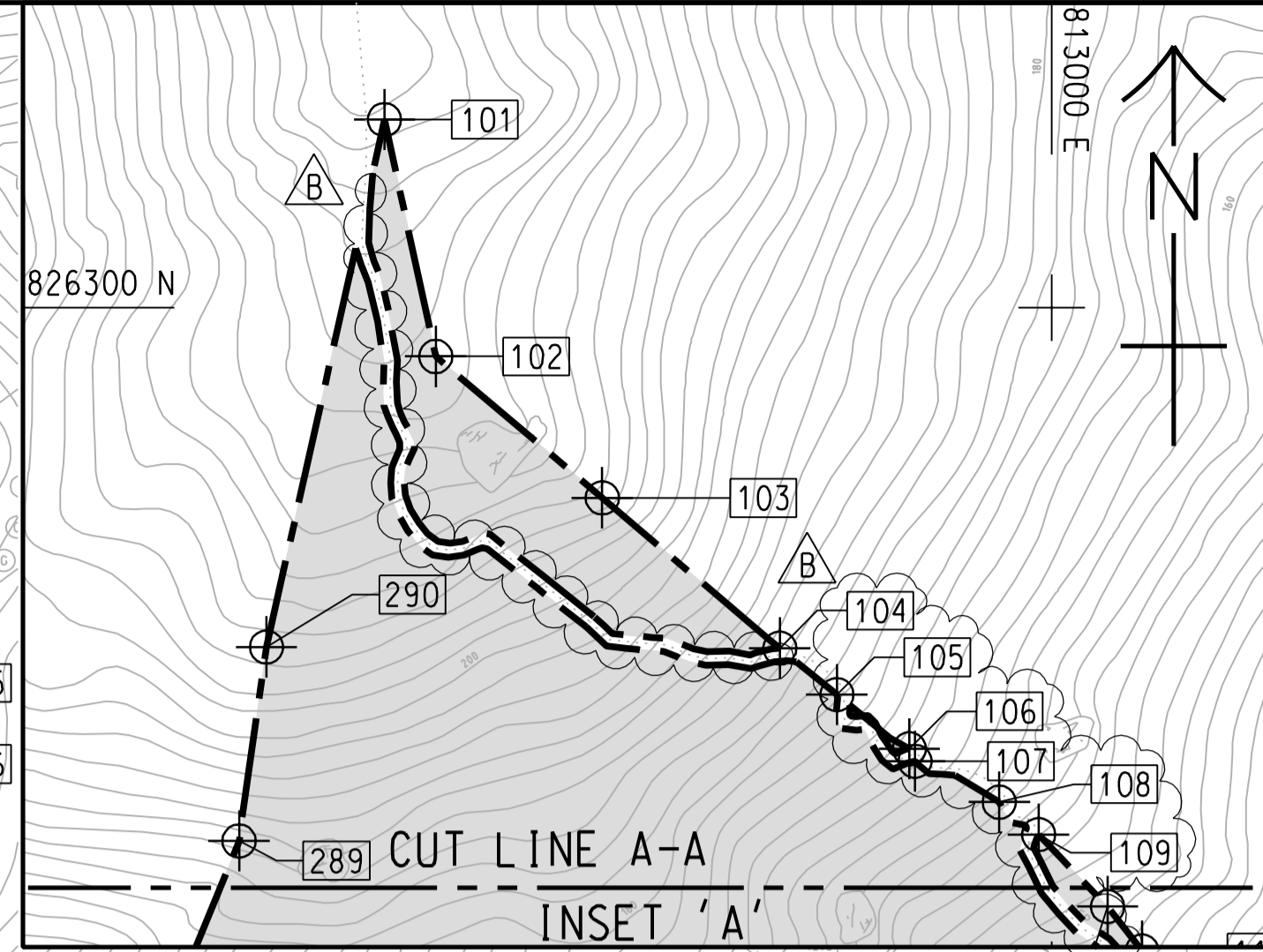
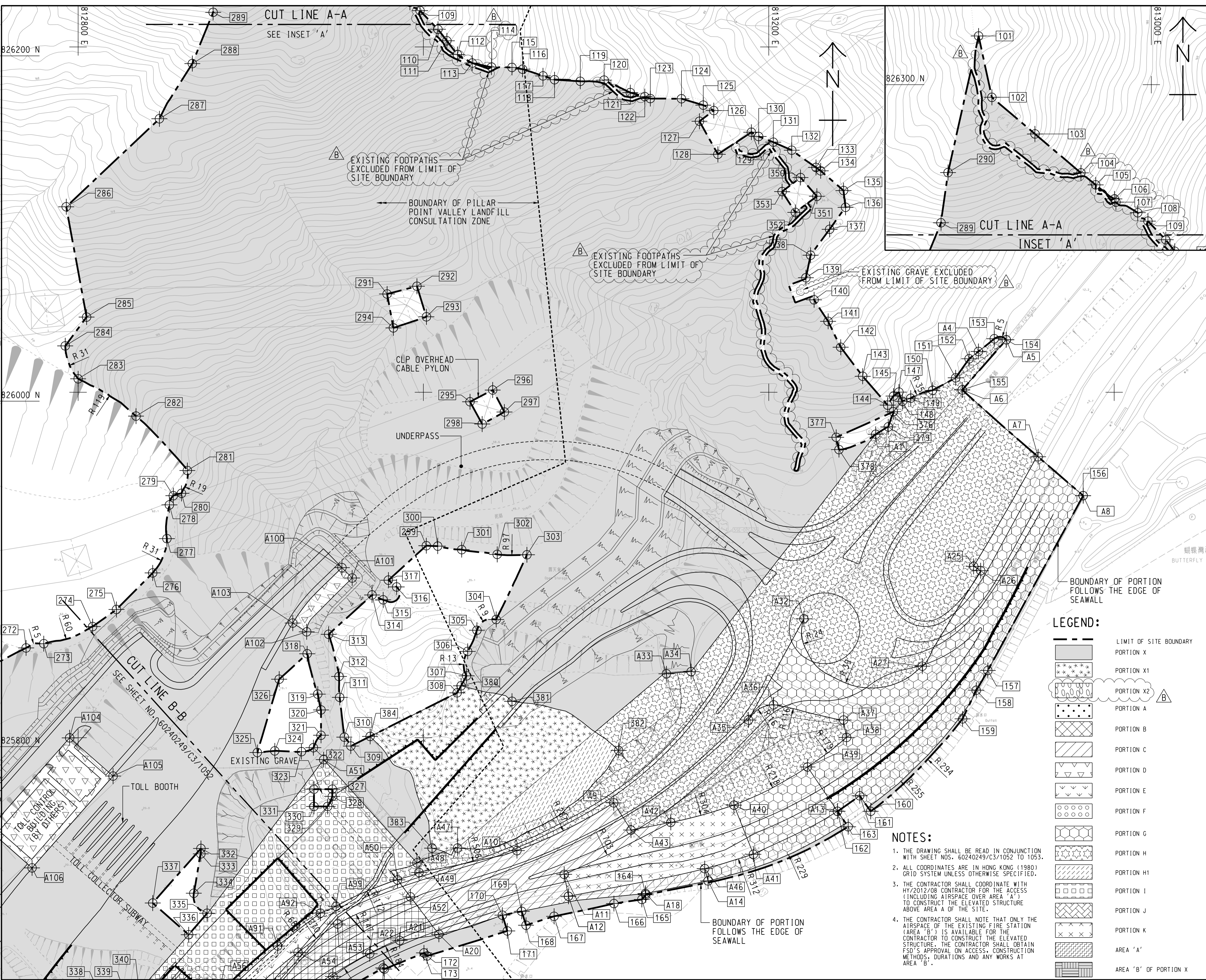
AGREEMENT NO. CE 52/2007(HY)
 TUEN MUN - CHEK LAP KOK LINK - INVESTIGATION
 GENERAL LAYOUT OF TM-CLKL

SCALE	A3 1:30000	DATE	JUL. 2009
CHECK	--	DRAWN	WYP
JOB NO.	60044963	DRAWING NO.	Fig 2.1
		REV	A

Appendix B

Layout Plan of the Contract

Project Management Initials: Designer: PI Checked: ALCF Approved: CWN ISO A1 594mm x 841mm
 Plot File by: LINDO 2014/05/19 PATH: P:\Projects\60240249\DRAWING\CONTRACT\C3\10051\051.dgn



LEGEND:

	LIMIT OF SITE BOUNDARY
	PORTION X
	PORTION X1
	PORTION X2
	PORTION A
	PORTION B
	PORTION C
	PORTION D
	PORTION E
	PORTION F
	PORTION G
	PORTION H
	PORTION H1
	PORTION I
	PORTION J
	PORTION K
	AREA 'A'
	AREA 'B' OF PORTION X

- NOTES:**
1. THE DRAWING SHALL BE READ IN CONJUNCTION WITH SHEET NOS. 60240249/C3/1052 TO 1053.
 2. ALL COORDINATES ARE IN HONG KONG (1980) GRID SYSTEM UNLESS OTHERWISE SPECIFIED.
 3. THE CONTRACTOR SHALL COORDINATE WITH HY/2012/08 CONTRACTOR FOR THE ACCESS (INCLUDING AIRSPACE OVER AREA 'A') TO CONSTRUCT THE ELEVATED STRUCTURE ABOVE AREA A OF THE SITE.
 4. THE CONTRACTOR SHALL NOTE THAT ONLY THE AIRSPACE OF THE EXISTING FIRE STATION (AREA 'B') IS AVAILABLE FOR THE CONTRACTOR TO CONSTRUCT THE ELEVATED STRUCTURE. THE CONTRACTOR SHALL OBTAIN FSD'S APPROVAL ON ACCESS, CONSTRUCTION METHODS, DURATIONS AND ANY WORKS AT AREA 'B'.

AECOM

PROJECT
項目
TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE
TUEN MUN - CHEK LAP KOK LINK - NORTHERN CONNECTION TOLL PLAZA AND ASSOCIATED WORKS

CLIENT
業主
路政署
HIGHWAYS DEPARTMENT
港務大樓香港工程管理局
Hong Kong - Zhuhai - Macao Bridge
Hong Kong Project Management Office

CONSULTANT
工程顧問公司
AECOM Asia Company Ltd.
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SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION
修訂

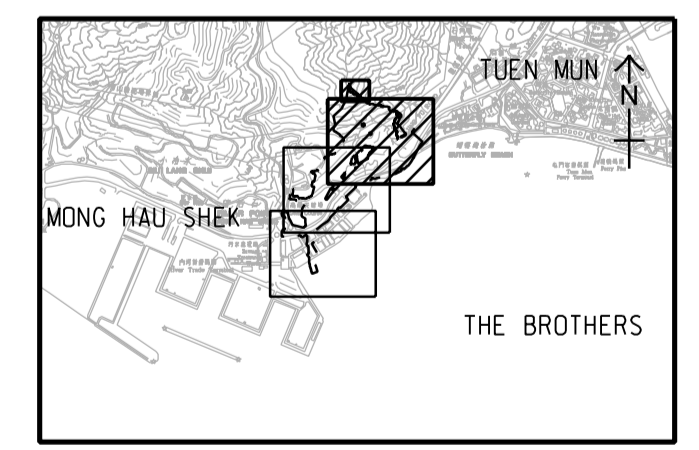
I/R	DATE	DESCRIPTION	CHK.
B	MAR. 14	TENDER ADDENDUM NO. 2	CWN
A	FEB. 14	TENDER ADDENDUM NO. 1	CWN
-	JAN. 14	TENDER DRAWING	CWN

STATUS
階段

SCALE
比例
A1 1:1000

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN
索引圖
1:50000



PROJECT NO.
項目編號
60240249

CONTRACT NO.
合約編號
HY/2013/12

SHEET TITLE
圖紙名稱
PORTIONS OF SITE AND SITE BOUNDARY SETTING OUT PLAN

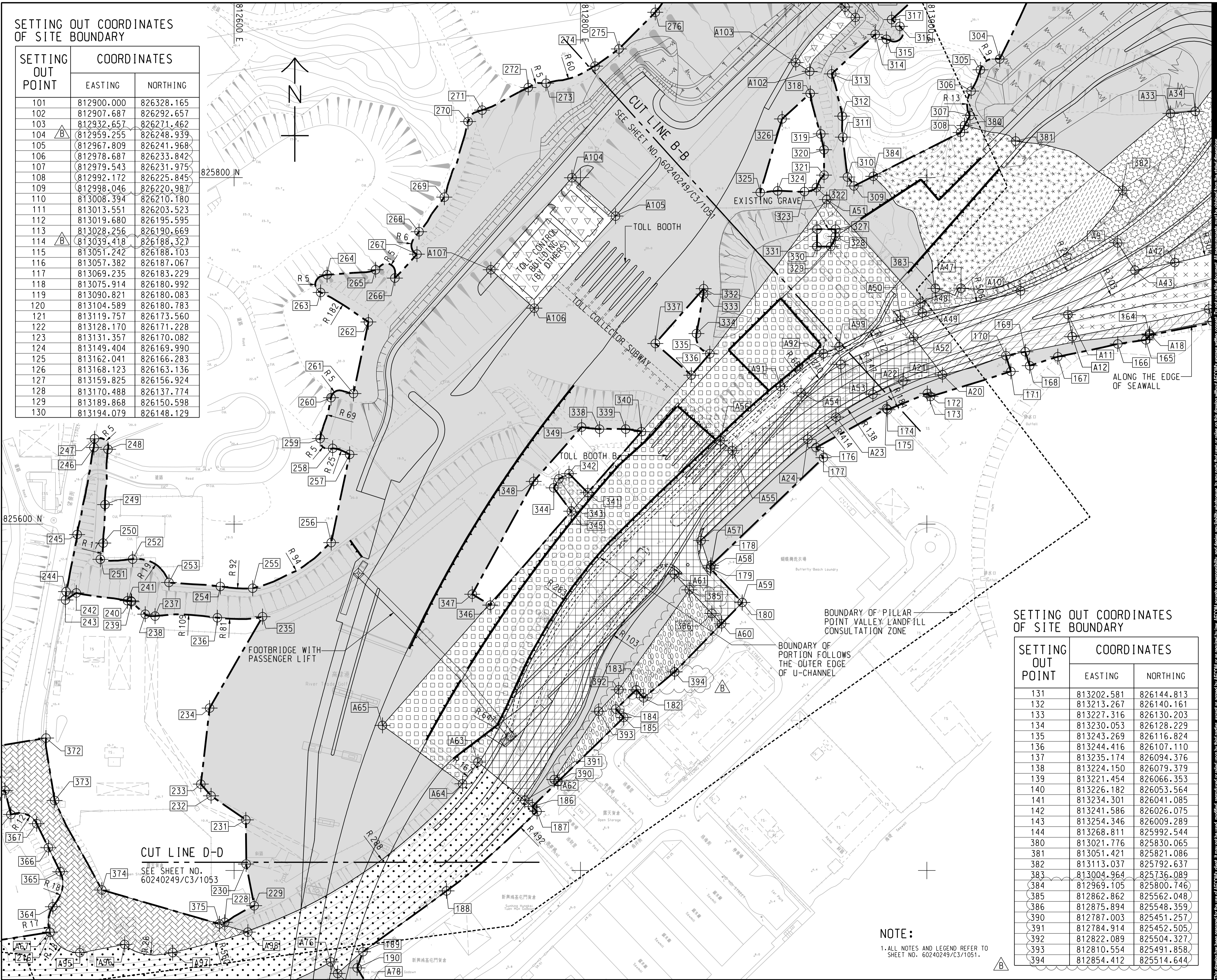
SHEET NUMBER
圖紙編號
60240249/C3/1051B

SHEET 1 OF 3

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SETTING OUT COORDINATES OF SITE BOUNDARY

SETTING OUT POINT	COORDINATES	
	EASTING	NORTHING
101	812900.000	826328.165
102	812907.687	826292.657
103	812932.657	826271.462
104	812959.255	826248.939
105	812967.809	826241.968
106	812978.687	826233.842
107	812979.543	826231.975
108	812992.172	826225.845
109	812998.046	826220.987
110	813008.394	826210.180
111	813013.551	826203.523
112	813019.680	826195.595
113	813028.256	826190.669
114	813039.418	826188.327
115	813051.242	826188.103
116	813057.382	826187.067
117	813069.235	826183.229
118	813075.914	826180.992
119	813090.821	826180.083
120	813104.589	826180.783
121	813119.757	826173.560
122	813128.170	826171.228
123	813131.357	826170.082
124	813149.404	826169.990
125	813162.041	826166.283
126	813168.123	826163.136
127	813159.825	826156.924
128	813170.488	826137.774
129	813189.868	826150.598
130	813194.079	826148.129



SETTING OUT COORDINATES OF SITE BOUNDARY

SETTING OUT POINT	COORDINATES	
	EASTING	NORTHING
131	813202.581	826144.813
132	813213.267	826140.161
133	813227.316	826130.203
134	813230.053	826128.229
135	813243.269	826116.824
136	813244.416	826107.110
137	813235.174	826094.376
138	813224.150	826079.379
139	813221.454	826066.353
140	813226.182	826053.564
141	813234.301	826041.085
142	813241.586	826026.075
143	813254.346	826009.289
144	813268.811	825992.544
380	813021.776	825830.065
381	813051.421	825821.086
382	813113.037	825792.637
383	813004.964	825736.089
384	812969.105	825800.746
385	812862.862	825562.048
386	812875.894	825548.359
390	812787.003	825451.257
391	812784.914	825452.505
392	812822.089	825504.327
393	812810.554	825491.858
394	812854.412	825514.644

NOTE:
1. ALL NOTES AND LEGEND REFER TO SHEET NO. 60240249/C3/1051.



PROJECT
TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE
TUEN MUN - CHEK LAP KOK LINK - NORTHERN CONNECTION TOLL PLAZA AND ASSOCIATED WORKS

CLIENT
路政署
HIGHWAYS DEPARTMENT
港務大樓香港工程管理局
Hong Kong - Zhuhai - Macao Bridge
Hong Kong Project Management Office

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分列工程顧問公司

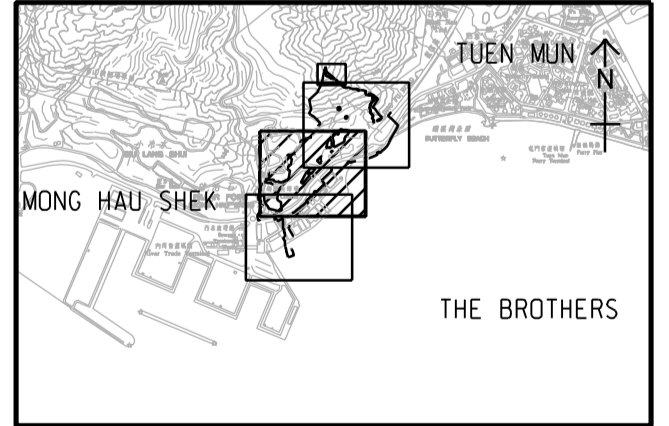
ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK.
B	MAR. 14	TENDER ADDENDUM NO. 2	CWN
A	FEB. 14	TENDER ADDENDUM NO. 1	CWN
-	JAN. 14	TENDER DRAWING	CWN

STATUS

SCALE
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DIMENSION UNIT
METRES

KEY PLAN
1:50000

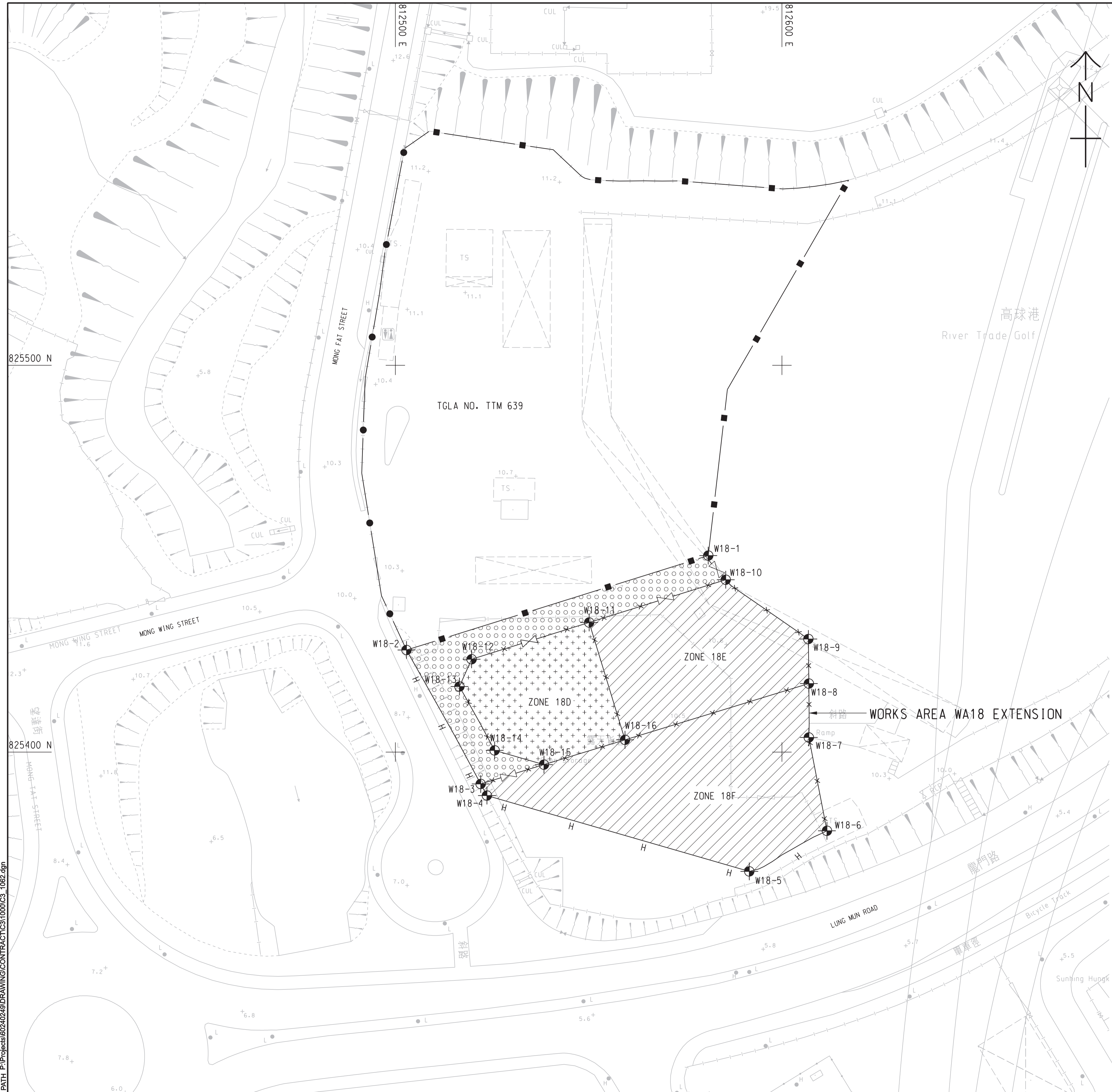


PROJECT NO.
60240249
CONTRACT NO.
HY/2013/12

SHEET TITLE
PORTIONS OF SITE AND SITE BOUNDARY SETTING OUT PLAN

SHEET NUMBER
60240249/C3/1052B

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NOTES:

- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE WORKS AREA KEY PLAN IN SHEET NO. 60240249/C3/1000.
- DEMARCATON OF THE WORKS AREA SHALL BE DETERMINED ON SITE.
- REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NOS. H6110 AND H6111 FOR DETAILS OF HOARDING.
- REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NOS. H6121 AND H6122 FOR DETAILS OF CHAIN LINK FENCE.
- REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NO. H6121 FOR DETAILS OF GATE.
- CHAIN LINK FENCE SHALL BE ERRECTED ALONG THE WORKS AREA BOUNDARY. THE ALIGNMENT AND EXTENT OF HOARDING AND CHAIN LINK FENCE SHOWN ARE INDICATIVE ONLY AND SHALL BE CONFIRMED BY THE ENGINEER.
- THE LOCATION AND WIDTH OF GATE SHOWN ARE INDICATIVE ONLY AND SHALL BE CONFIRMED BY THE ENGINEER.
- THE SETTING OUT INFORMATION AND WORKS AREA CONDITIONS SHOWN IN THIS DRAWING ARE FOR REFERENCE ONLY. THE WORKS AREA BOUNDARY SHALL BE IN ACCORDANCE WITH THE ENGINEERING CONDITIONS FOR TEMPORARY GOVERNMENT LAND ALLOCATION NO. GLA-TM 639. IN CASE OF DISCREPANCY BETWEEN THE BOUNDARY SHOWN ON THIS DRAWING AND THE BOUNDARY INDICATED ON THE ENGINEERING CONDITIONS, THE LATTER SHALL PREVAIL.
- THE WORKS AREAS SHOWN ON THIS DRAWING ARE TO BE SHARED-USED AMONG THE TM-CLKL RELATED CONTRACTS. THE AREAS HATCHED WITH ARE TENTATIVELY ALLOCATED FOR THE USE BY THE CONTRACT.
- THE COMMON AREA SHALL BE CONCRETE PAVED BY THE CONTRACTOR.
- ZONE 18F SHALL BE USED FOR THE SITE ACCOMMODATION OF THE ENGINEER. ZONE 18E SHALL BE USED FOR SITE ACCOMMODATION OF THE CONTRACTOR.
- ZONE 18D IS TO BE USED BY THE CONTRACTOR OF CONTRACT NO. HY/2012/08-TUEN MUN-CHEK LAP KOK LINK-NORTHERN CONNECTION SUB-SEA TUNNEL SECTION TO STORE PLANT AND EQUIPMENT ASSOCIATED WITH THE TBM TUNNELS FROM THE DATE FOR COMMENCEMENT OF THE WORKS TO 126 DAYS FROM THE DATE FOR COMMENCEMENT OF THE WORKS. THE CONTRACTOR SHALL LIAISE AND PROVIDE FREE AND UNOBSTRUCTED 24-HOUR ACCESS FOR THE CONTRACTOR OF CONTRACT NO. HY/2012/08 TO ZONE 18D. THE CONTRACTOR SHALL BE GIVEN THE POSSESSION OF ZONE 18D IN ACCORDANCE WITH APPENDIX TO FORM OF TENDER-P.3.

LEGEND:

- WORKS AREA FOR THE CONTRACT
- COMMON AREA (MAINTAINED UNDER THE CONTRACT) TO BE SHARED-USED WITH OTHER CONTRACTS
- AREA TO BE USED BY THE CONTRACTOR OF CONTRACT NO. HY/2012/08 AND WORKS AREA FOR THIS CONTRACT TO BE EARLY HANDED OVER BY THE CONTRACTOR (SEE NOTES NO. 12 ABOVE)
- HOARDING AND GATE (TO BE ERRECTED AND MAINTAINED UNDER THIS CONTRACT)
- EXISTING CHAIN LINK FENCE MAINTAINED BY OTHERS
- CHAIN LINK FENCE AND GATE (TO BE ERRECTED AND MAINTAINED UNDER THIS CONTRACT)
- EXISTING HOARDING AND GATE MAINTAINED BY OTHERS

SETTING OUT CO-ORDINATES OF WORKS AREA WA18 EXTENSION

POINT	CO-ORDINATES	
	EASTING	NORTHING
W18-1	812580.934	825450.791
W18-2	812502.880	825426.380
W18-3	812522.068	825391.750
W18-4	812523.679	825388.756
W18-5	812591.556	825369.151
W18-6	812611.638	825379.647
W18-7	812606.954	825403.769
W18-8	812606.951	825417.705
W18-9	812606.832	825429.231
W18-10	812585.456	825444.557
W18-11	812550.126	825433.508
W18-12	812519.715	825423.997
W18-13	812516.580	825416.947
W18-14	812525.682	825400.438
W18-15	812538.435	825396.754
W18-16	812559.404	825403.166



PROJECT
 項目
TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE
 TUEN MUN - CHEK LAP KOK LINK - NORTHERN CONNECTION TOLL PLAZA AND ASSOCIATED WORKS

CLIENT
 業主
 路政署
HIGHWAYS DEPARTMENT
 港務處大樓香港工程發展處
 Hong Kong - Zhuhai - Macao Bridge
 Hong Kong Project Management Office

CONSULTANT
 工程師有限公司
AECOM Asia Company Ltd.
 www.aecom.com

SUB-CONSULTANTS
 分判工程師有限公司

ISSUE/REVISION

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B	MAR. 14	TENDER ADDENDUM NO. 2	CWN
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-	JAN. 14	TENDER DRAWING	CWN

STATUS
 階段

SCALE
 比例
 A1 1:500

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN
 索引圖

PROJECT NO.
 項目編號
 60240249

CONTRACT NO.
 合約編號
 HY/2013/12

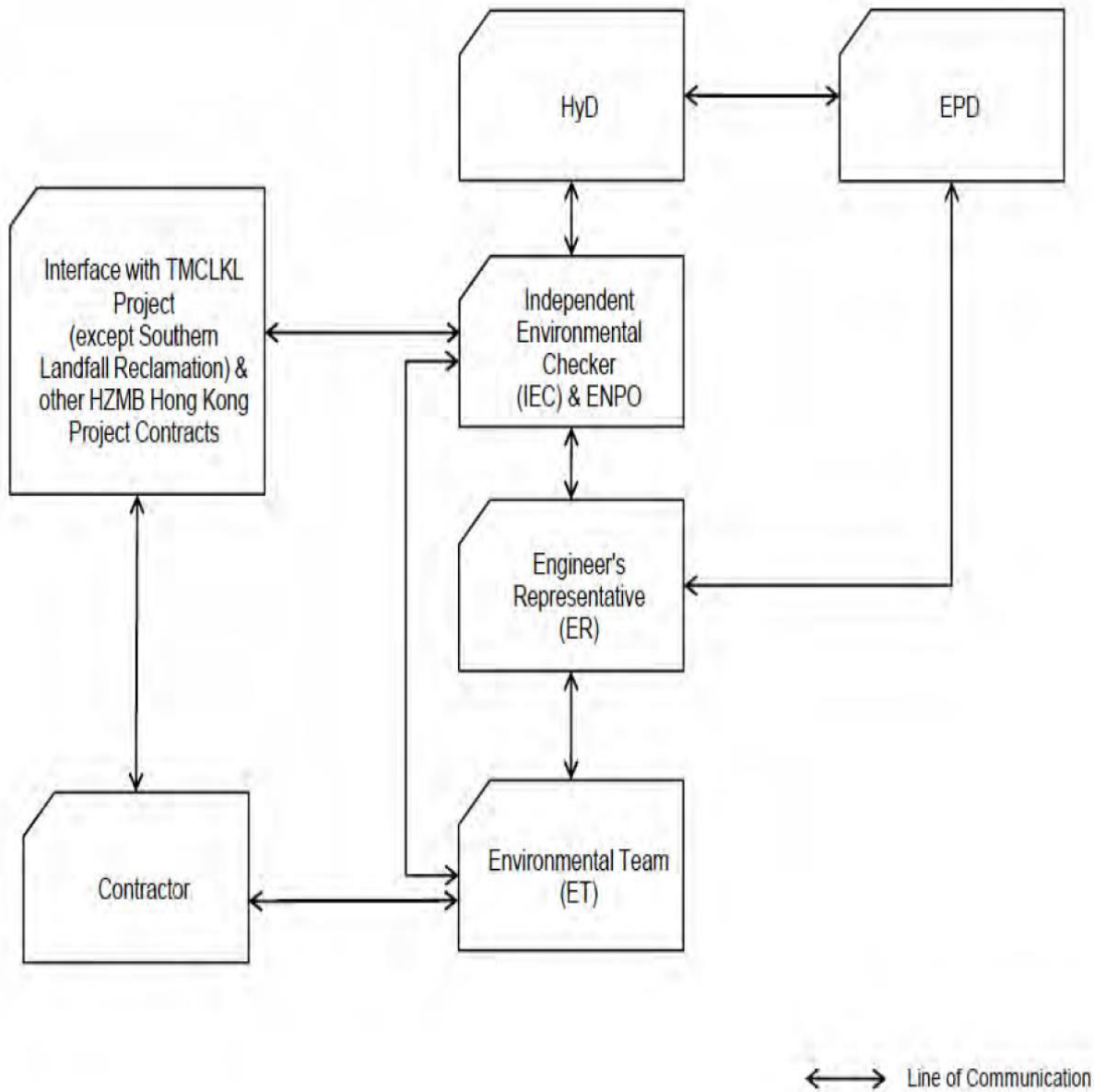
SHEET TITLE
 圖紙名稱
WORKS AREA AND HOARDING PLAN

SHEET NUMBER
 圖紙編號
 60240249/C3/1062B

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Appendix C

Organization of the Contract



Project Organization chart

Organization chart of the Contractor

Contact Details of Key Personnel for the Contract HY/2013/12

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
HyD	Employer	Mr. Stephen W.C. Chan	2762 3669	3188 6614
AECOM	Principal Resident Engineer	Mr. S.W. Fok	2218 7209	2218 7399
AECOM	Chief Resident Engineer	Mr. Roger Man	2218 7288	2218 7399
AECOM	Resident Engineer (S&E)	Mr. Kelvin Yeung	22187289	2218 7399
Ramboll Environ	Environmental Project Office (ENPO)	Mr. YH Hui	3465 2850	3465 2899
Ramboll Environ	Independent Environmental Checker (IEC)	Dr. FC Tsang	3465 2851	3465 2899
CKJV	Deputy Project Manager	Mr. Raymond Suen	2253 8309	2253 8399
CKJV	Site Agent	Mr. Wilson Lau	2253 8300	2253 8399
KJV	Environmental Officer	Mr. HY Tang	2253 8300	2253 8399
CKJV	Environmental Supervisor	Miss Melody Tong	2253 8300	2253 8399
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Miss Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Mr. Ben Tam	2959 6059	2959 6079
HKL	Registered Landscape Architect	Kenneth Ng	2866 3903	--

Legend:

HyD (Employer) –Highways Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

CKJV (Main Contractor) – CRBC-Kaden Joint Venture

Ramboll Environ (IEC and ENPO) – Ramboll Environ Hong Kong Limited

AUES (ET) – Action-United Environmental Services & Consulting

HKL(RLA) – Hong Kong Landscape

Appendix D

Master Construction Program

HY/2013/12 TM-CLKL Northern Connection Toll Plaza and Associated Works



CRBC - KADEN Joint Venture

Activity ID	Activity Name	Original Duration	Planned Start	Actual Start	Planned Finish	Actual Finish	Timeline (2014-2020)																			
							Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
HY/2013/12 Northern Connection Toll Plaza and Associated Works																										
IWP (Rev.02)																										
Site Formation - Retaining Structure for Slope TP_F																										
Stage 3																										
Temporary Works Design Submission and Approval																										
RWF11000	Haul road design submission and approval	30	29-Aug-14	29-Aug-14	27-Sep-14	27-Sep-14																				
RWF11050	Open cut excavation design submission and approval	30	18-Sep-14	18-Sep-14	18-Oct-14	18-Oct-14																				
RWF11100	Formwork design submission and approval	45	27-Sep-14	27-Sep-14	11-Nov-14	11-Nov-14																				
Method Statement Submission and Approval																										
RWF21000	Method Statement Submission and Approval for Open cut excavation	30	18-Oct-14	18-Oct-14	15-Nov-14	15-Nov-14																				
RWF21050	Method Statement Submission and Approval for Retaining Wall Construction	30	21-Oct-14	21-Oct-14	18-Nov-14	21-Oct-14																				
Retaining Structure for Slope TP_F																										
RWF31000	Form Access Road	24	27-Sep-14	26-Sep-14	30-Oct-14	30-Oct-14																				
RWF31050	Excavation of Soil (5,400m3)	43	18-Nov-14	17-Nov-14	10-Jan-15																					
RWF31100	Excavation of Rock Grade IV (4,320m3)	70	10-Jan-15	10-Jan-15	10-Apr-15																					
RWF31300	Construct Retaining Wall Bay 7 to Bay 20	168	09-Mar-15		17-Oct-15																					
RWF31325	Construct Retaining Wall Bay 4 to Bay 6 adjacent to abutment G2e	50	17-Dec-15		20-Feb-16																					
RWF31350	Construct Retaining Wall Bay 21 to Bay 28	96	04-Nov-16		03-Mar-17																					
RWF31400	Backfilling (51,449m3)	504	17-Oct-15		29-Jul-17																					
Site Formation - Slope TP_A & Associated Works																										
Stage 3																										
Temporary Works Design Submission and Approval																										
TPA11000	Haul road design submission for TP_A,B&C	45	09-Oct-14	01-Sep-14	20-Nov-14	18-Sep-14																				
Method Statement Submission and Approval																										
TPA21050	Method Statement Submission for TP_A,B&C	45	23-Oct-14	18-Sep-14	04-Dec-14	21-Oct-14																				
Slope Feature - Slope TP_A																										
TPA31030	Tree felling works	24	06-Feb-15	03-Sep-14	10-Mar-15																					
TPA31040	Form Access Road	24	10-Mar-15	03-Sep-14	11-Apr-15	01-Oct-14																				
TPA31050	Site Clearance	24	11-Apr-15	11-Sep-14	13-May-15																					
TPA31100	Excavation of Soil (23,933m3)	48	03-Jun-15	23-Oct-14	05-Aug-15																					
TPA31150	Excavation of Rock Grade IV (2,314m3)	18	05-Aug-15	01-Nov-14	27-Aug-15																					
TPA31200	Excavation of Rock Grade II/III (6,539m3)	60	29-Jul-15		14-Oct-15																					
TPA31250	Forming East Portal Formation and temporary ground drainage works	60	16-Oct-15		29-Dec-15																					
TPA31300	Construct Cascade A	60	30-Dec-15		12-Mar-16																					
Site Formation - Slope TP_B & Associated Works																										
Stage 3																										
Slope Feature - Slope TP_B																										
TPB31000	Form Access Road	24	17-Sep-15	03-Sep-14	19-Oct-15	01-Oct-14																				
TPB31050	Site Clearance and Tree Felling	24	20-Oct-15	11-Sep-14	18-Nov-15																					
TPB31100	Excavation of Soil (49,155m3)	72	19-Nov-15	30-Oct-14	17-Feb-16																					
TPB31150	Excavation of Rock Grade IV (15,049m3)	80	18-Feb-16	01-Nov-14	01-Jun-16																					
TPB31210	Excavation of Rock II/III	28	23-Mar-16		29-Apr-16																					
TPB31260	Forming road formation and temporary ground drainage works	11	26-May-16		10-Jun-16																					
Site Formation - Slope TP_C & Associated Works																										
Stage 3																										
Slope Feature - Slope TP_C																										
TPC31015	Form Access Road	24	17-Sep-15	03-Sep-14	19-Oct-15	01-Oct-14																				
TPC31030	Site Clearance and Tree Felling	24	20-Oct-15	02-Oct-14	18-Nov-15	23-Oct-14																				
TPC31060	Excavation of Soil (12,000m3)	24	18-Jan-16	30-Oct-14	17-Feb-16																					
TPC31100	Excavation of Rock II/III (12,964m3)	115	14-Dec-15		11-May-16																					
TPC31160	Forming road formation and temporary ground drainage works	11	11-May-16		26-May-16																					
Site Formation - Slope TP_D & Associated Works																										
Stage 3																										
Temporary Works Design Submission and Approval																										
TPD21000	Haul road design submission	30	08-Sep-14	01-Sep-14	09-Oct-14	18-Nov-14																				
Method Statement Submission and Approval																										
TPD11050	Method Statement Submission and Approval for TP_D Slope Site Formation	30	23-Sep-14	18-Sep-14	23-Oct-14	21-Oct-14																				
Slope Feature - Slope TP_D																										
TPD31000	Form Access Road	24	08-Sep-14	21-Aug-14	19-Jun-15	01-Oct-14																				
TPD31025	Site Clearance and Tree Felling	24	24-Nov-14	24-Nov-14	22-Dec-14	30-Nov-14																				
TPD31035	G.I works	17	22-Dec-14		14-Jan-15																					
TPD31100	Excavation of Soil (4,570m3)	12	14-Jan-15		28-Jan-15																					
TPD31150	Excavation of Rock Grade IV (999m3)	12	28-Jan-15		11-Feb-15																					
TPD31200	Excavation of Rock II/III (12,196m3)	92	11-Feb-15		13-Jun-15																					
TPD31250	Forming West Portal Formation and temporary ground drainage works	4	13-Jun-15		19-Jun-15																					
Site Formation - Slope TP_E & Associated Works																										
Stage 3																										
Temporary Works Design Submission and Approval																										
TPE11000	Haul road design submission	30	08-Sep-14	01-Sep-14	09-Oct-14	18-Sep-14																				
Method Statement Submission and Approval																										

■ Actual Work
■ Remaining Work
■ Critical Remaining Work
◆ Milestone
▶ Summary

CRBC - Kaden JV
Programme & Progress

Date	Revision	Checked	Approved
30-Nov-14	Draft		

HY/2013/12 TM-CLKL Northern Connection Toll Plaza and Associated Works



Activity ID	Activity Name	Original Duration	Planned Start	Actual Start	Planned Finish	Actual Finish	Gantt Chart (2015-2020)																			
							Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
TPE21000	Method Statement Submission for TP_E Slope Site Formation	45	23-Sep-14	18-Sep-14	06-Nov-14	23-Oct-14	[Gantt bar: 23-Sep-14 to 23-Oct-14]																			
Slope Feature - Slope TP_E at Toll Control Building Area							[Gantt bar: 09-Oct-14 to 21-Dec-16]																			
TPE31000	Form Access Road	72	09-Oct-14	01-Sep-14	21-Dec-16	23-Oct-14	[Gantt bar: 09-Oct-14 to 23-Oct-14]																			
TPE31050	Site Clearance, Tree Transplanting and Felling	72	11-Nov-14	12-Sep-14	06-Feb-15	23-Oct-14	[Gantt bar: 11-Nov-14 to 23-Oct-14]																			
TPE31100	Excavation of Soil (Max. 200m3/n/d; 13,958m3)	72	28-Jan-15	24-Oct-14	04-May-15		[Gantt bar: 28-Jan-15 to 04-May-15]																			
TPE31150	Excavation of Rock Grade IV (55m3/n/d; 2,810m3)	44	13-Mar-15	25-Oct-14	12-May-15		[Gantt bar: 13-Mar-15 to 12-May-15]																			
TPE31200	Excavation of Rock Grade III (45m3/n/d; 17,388m3)	129	12-May-15	31-Oct-14	29-Oct-15		[Gantt bar: 12-May-15 to 29-Oct-15]																			
TPE31250	Excavation of Rock Grade II (35m3/n/d; 85,388m3)	337	24-Aug-15	01-Nov-14	04-Nov-16		[Gantt bar: 24-Aug-15 to 04-Nov-16]																			
TPE31300	Hand Over of Portion D	13	08-Dec-16		21-Dec-16		[Gantt bar: 08-Dec-16 to 21-Dec-16]																			
Slope Feature - Slope TP_E Remaining Section							[Gantt bar: 18-Oct-14 to 21-Jul-17]																			
TPE41000	Preservation of Existing Pitcher Plants before Translocation	154	18-Oct-14	02-Oct-14	02-May-15	31-Oct-14	[Gantt bar: 18-Oct-14 to 31-Oct-14]																			
TPE41020	Translocation of Pitcher Plants	67	02-May-15		29-Jul-15		[Gantt bar: 02-May-15 to 29-Jul-15]																			
TPE41100	Excavation of Soil (Max. 200m3/n/d; 12,159m3)	40	29-Jul-15		18-Sep-15		[Gantt bar: 29-Jul-15 to 18-Sep-15]																			
TPE41150	Excavation of Rock Grade IV (55m3/n/d; 6,408m3)	60	18-Sep-15		04-Dec-15		[Gantt bar: 18-Sep-15 to 04-Dec-15]																			
TPE41200	Excavation of Rock Grade III (45m3/n/d; 14,000m3)	160	04-Dec-15		29-Jun-16		[Gantt bar: 04-Dec-15 to 29-Jun-16]																			
TPE41250	Excavation of Rock Grade II (35m3/n/d; 15,226m3)	250	29-Jun-16		19-May-17		[Gantt bar: 29-Jun-16 to 19-May-17]																			
TPE41300	Construct Cascade C	48	19-May-17		21-Jul-17		[Gantt bar: 19-May-17 to 21-Jul-17]																			
Site Formation - Slope Upgrading Works							[Gantt bar: 17-Dec-14 to 13-Aug-18]																			
Stage 3							[Gantt bar: 17-Dec-14 to 13-Aug-18]																			
Temporary Works Design Submission and Approval							[Gantt bar: 17-Dec-14 to 06-Oct-14]																			
SUW11000	General temporary works design for slope works	30	17-Dec-14	02-Oct-14	17-Jan-15	06-Oct-14	[Gantt bar: 17-Dec-14 to 06-Oct-14]																			
Method Statement Submission and Approval							[Gantt bar: 17-Dec-14 to 06-Oct-14]																			
SUW21000	General method statement for Slope Upgrading Works (soil nails, rock dowels, etc.)	45	17-Dec-14	02-Oct-14	31-Jan-15	06-Oct-14	[Gantt bar: 17-Dec-14 to 06-Oct-14]																			
Slope Feature - Slope SSE-D/C170							[Gantt bar: 06-Jan-15 to 19-Jan-15]																			
SUW31000	Implementation of TTA	14	06-Jan-15		19-Jan-15		[Gantt bar: 06-Jan-15 to 19-Jan-15]																			
SUW31050	Site Clearance and Tree Felling	15	19-Jan-15		05-Feb-15		[Gantt bar: 19-Jan-15 to 05-Feb-15]																			
SUW31100	Prepare Access Road	7	19-Jan-15		27-Jan-15		[Gantt bar: 19-Jan-15 to 27-Jan-15]																			
SUW31150	Excavation of Soil (1,240m3)	14	31-Jan-15		17-Feb-15		[Gantt bar: 31-Jan-15 to 17-Feb-15]																			
SUW31200	Excavation of Rock Grade IV (350m3)	9	17-Feb-15		03-Mar-15		[Gantt bar: 17-Feb-15 to 03-Mar-15]																			
SUW31250	Slope Works (Recompaction; Soil Nail 45 nr) and Drainage System	45	03-Mar-15		02-May-15		[Gantt bar: 03-Mar-15 to 02-May-15]																			
Other Slope Features							[Gantt bar: 31-Jan-15 to 07-May-15]																			
SUW41000	Hydroseeding SSE-D/C152	72	31-Jan-15		07-May-15		[Gantt bar: 31-Jan-15 to 07-May-15]																			
SUW42000	Hydroseeding and Erosion Control Mat SSE-D/C121	36	13-Jun-15		01-Aug-15		[Gantt bar: 13-Jun-15 to 01-Aug-15]																			
SUW43000	Hydroseeding and Erosion Control Mat SSE-D/C122	36	13-Jun-15		01-Aug-15		[Gantt bar: 13-Jun-15 to 01-Aug-15]																			
SUW45000	Hydroseeding SSE-D/C150	72	31-Jan-15		07-May-15		[Gantt bar: 31-Jan-15 to 07-May-15]																			
SUW46000	Slope Modification Works SSE-D/C14	72	29-Jul-17		02-Nov-17		[Gantt bar: 29-Jul-17 to 02-Nov-17]																			
SUW47000	Hydroseeding SSE-D/C151	72	31-Jan-15		07-May-15		[Gantt bar: 31-Jan-15 to 07-May-15]																			
SUW47500	Re-compaction, Fill and Hydroseeding SSE-D/C149, 150 and 152	72	31-Jan-15		07-May-15		[Gantt bar: 31-Jan-15 to 07-May-15]																			
SUW48000	Rock Mapping and Stabilization SSE-D/C115	72	31-Jan-15		07-May-15		[Gantt bar: 31-Jan-15 to 07-May-15]																			
SUW49000	Hydroseeding and Erosion Control Mat SSE-D/C18	136	25-May-17		18-Nov-17		[Gantt bar: 25-May-17 to 18-Nov-17]																			
SUW50000	Hydroseeding and Erosion Control Mat SSE-D/C117	148	26-Jun-17		03-Jan-18		[Gantt bar: 26-Jun-17 to 03-Jan-18]																			
SUW51000	Slope Cut SSE-D/C165 (1E - 50m3/n/d, 210m3; Soil Nail 47 nr., each 8m Long)	196	30-Mar-16		09-Dec-16		[Gantt bar: 30-Mar-16 to 09-Dec-16]																			
SUW52000	Slope Modification Works D/C21	48	02-Nov-17		30-Dec-17		[Gantt bar: 02-Nov-17 to 30-Dec-17]																			
SUW53000	Slope Modification Works D/C171	48	30-Dec-17		01-Mar-18		[Gantt bar: 30-Dec-17 to 01-Mar-18]																			
SUW54000	Drainage Hydroseeding and Erosion Control Mat SSE-D/C16	120	08-Mar-18		13-Aug-18		[Gantt bar: 08-Mar-18 to 13-Aug-18]																			
SUW55000	Slope Re-compaction SSE-D/F60	96	26-Oct-17		24-Feb-18		[Gantt bar: 26-Oct-17 to 24-Feb-18]																			
SUW56000	Slope Modification Works D/C158	48	30-Dec-17		01-Mar-18		[Gantt bar: 30-Dec-17 to 01-Mar-18]																			
SUW57000	Hydroseeding and Erosion Control Mat SSE-D/C17	48	10-Apr-18		11-Jun-18		[Gantt bar: 10-Apr-18 to 11-Jun-18]																			

Activity ID	Activity Name	Original Duration	Start	Actual Start	Finish	Actual Finish	Performance % Complete	Total Float	Gantt Chart											
									2014 Q3	2014 Q4	2015 Q1	2015 Q2	2015 Q3	2015 Q4	2016 Q1	2016 Q2	2016 Q3	2016 Q4	2017 Q1	2017 Q2
HY/2013/12 DWP Rev.3									[Gantt Chart Summary]											
Instrumentation and Monitoring									[Gantt Chart Summary]											
Ground Settlement Marker									[Gantt Chart Summary]											
IM10090	Installation of GSM11,GSM45-46(Outside site boundary)	8	25-Sep-14 A	25-Sep-14	05-Feb-18		45%	230	[Gantt Chart Summary]											
Utility Settlement Marker									[Gantt Chart Summary]											
IM60020	Installation of USM-Remain USM	90	22-Nov-14 A	22-Nov-14	02-Sep-15		20%	218	[Gantt Chart Summary]											
Piezometer/Standpipe									[Gantt Chart Summary]											
IM50025	GI for PADH13-15 and installation piezometer	7	04-Nov-14 A	04-Nov-14	03-Nov-17		66%	110	[Gantt Chart Summary]											
Toll Plaza Decking TD1-Section 1									[Gantt Chart Summary]											
Stage 1									[Gantt Chart Summary]											
Design Submission and Approval									[Gantt Chart Summary]											
TD120100	Prepare & submit draft DDA Drawings w/ICE cert(Pre-cast beam)	24	27-Apr-15		23-Jun-15		0%	337	[Gantt Chart Summary]											
TD120110	Engineer's comments	23	27-May-15		23-Jun-15		0%	337	[Gantt Chart Summary]											
TD120180	TWD -Formwork design for Pier	24	27-Apr-15		26-May-15		0%	116	[Gantt Chart Summary]											
Method Statement Submission and Approval									[Gantt Chart Summary]											
TD120300	MSS for pier construction	24	27-Apr-15		26-May-15		0%	116	[Gantt Chart Summary]											
TD120310	Engineer's comments and approval	24	27-May-15		24-Jun-15		0%	116	[Gantt Chart Summary]											
Field Works									[Gantt Chart Summary]											
Foundation & Substructure at Northern Side of Lung Mun Road									[Gantt Chart Summary]											
Pile cap and Pier									[Gantt Chart Summary]											
TD120520	Pile cap and Pier A2-E3	91	16-Mar-15 A	16-Mar-15	25-Sep-15		20%	107	[Gantt Chart Summary]											
Foundation & Substructure at Southern Side of Lung Mun Road									[Gantt Chart Summary]											
Pile cap & Pier									[Gantt Chart Summary]											
TD120630	Pile cap & Pier E1-C1	54	27-May-15		05-Aug-15		0%	166	[Gantt Chart Summary]											
Foundation & Substructure at Central Divider of Lung Mun Road									[Gantt Chart Summary]											
GI									[Gantt Chart Summary]											
TD121060	Trial pit and monitoring point installation	10	07-Mar-15 A	07-Mar-15	21-Apr-15		80%	95	[Gantt Chart Summary]											
Bored Pile									[Gantt Chart Summary]											
TD121300	Bored Piles A1-E2(5 Nos)	61	21-Apr-15		09-Jul-15		0%	95	[Gantt Chart Summary]											
Pile cap and Pier									[Gantt Chart Summary]											
TD120540	Pile cap A1-E2	55	29-May-15		11-Aug-15		0%	141	[Gantt Chart Summary]											
Toll Plaza Decking TD2-Section 1									[Gantt Chart Summary]											
Field Works									[Gantt Chart Summary]											
G.I and Piling Works									[Gantt Chart Summary]											
DWP-G.I									[Gantt Chart Summary]											
TD220380	G.I for P1-P5	16	10-Oct-14 A	10-Oct-14	04-Nov-15 A	04-Nov-15	0%		[Gantt Chart Summary]											
Toll Plaza Footbridge-Section 1									[Gantt Chart Summary]											
Stage 1									[Gantt Chart Summary]											
Method Statement Submissions and Approval									[Gantt Chart Summary]											
TFB1060	MSS for Pile cap and pier construction	30	13-Feb-15 A	13-Feb-15	10-Sep-15		50%	152	[Gantt Chart Summary]											
Field Works									[Gantt Chart Summary]											
Pile Cap Construction									[Gantt Chart Summary]											
TFB1240	Construct pile cap for Pier P2	20	28-Mar-15 A	28-Mar-15	02-Nov-15		10%	420	[Gantt Chart Summary]											
Retaining Structure RW_B-Section 1									[Gantt Chart Summary]											
Site Formation - Retaining Structure RW_B									[Gantt Chart Summary]											
Stage 1									[Gantt Chart Summary]											
Design Submission and Approval									[Gantt Chart Summary]											
RWB10330	Alternative Design for RW_B structure submission	21	16-Mar-15 A	16-Mar-15	23-Apr-15		85%	158	[Gantt Chart Summary]											
RWB10340	Engineer's approval	21	23-Apr-15		19-May-15		0%	158	[Gantt Chart Summary]											

█ Remaining Level of Effort █ Remaining Work Summary
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Date	Revision	Checked	Approved
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Activity ID	Activity Name	Original Duration	Start	Actual Start	Finish	Actual Finish	Performance % Complete	Total Float	Timeline														
									Q3	Q4	2015				2016				2017				2018
RWB10390	Falsework design submission	21	20-Apr-15		14-May-15		0%	140															
RWB10400	Engineer's comments and approval	21	15-May-15		09-Jun-15		0%	140															
Retaining Structure RW_B									Retaining Structure RW_B														
Excavation									Excavation														
RWB10530	Predrilling works remaining works	68	01-Jan-15 A	01-Jan-15	26-May-15		60%	219															
Structure(Base Slab, Wall, Colum, Top Slab)									Structure(Base Slab, Wall, Colum, Top Slab)														
Bay 1-7									Bay 1-7														
RWB10028	Half span blinding Layer for Bay 2-7	30	08-Jan-15 A	08-Jan-15	25-Apr-15		83.3%	164															
RWB10030	Half span base slab-Bay 2 to Bay 7	90	10-Feb-15 A	10-Feb-15	21-Jul-15		66.6%	130															
RWB10040	Half span wall and colum-Bay2 to Bay 7	90	01-Apr-15 A	01-Apr-15	29-Sep-15		5%	130															
RWB10060	Bay 1 including blinder layer	40	13-Mar-15 A	13-Mar-15	25-Nov-15		33%	228															
Bay 12-13									Bay 12-13														
RWB10160	Foundation works Bay 12-13	32	26-May-15		08-Jul-15		0%	219															
Bridge G2									Bridge G2														
Stage 2									Stage 2														
Temporary Works Design (TWD) Submission and Approval									Temporary Works Design (TWD) Submission and Approval														
BG23180	TWD -Formwork design for footing	24	20-Apr-15		18-May-15		0%	74															
BG23190	TWD -Falsework design for portal construction	24	19-May-15		16-Jun-15		0%	74															
BG23580	Engineer's approval	17	18-Feb-15 A	18-Feb-15	23-Apr-15		80%	165															
BG23610	DDA for superstructure submission	17	22-May-15		12-Jun-15		0%	293															
Method Statement Submissions and Approval									Method Statement Submissions and Approval														
BG23230	MSS for pier construction	17	20-Apr-15		09-May-15		0%	151															
Field Works									Field Works														
Foundation Works									Foundation Works														
BG23300	Excavation for G2d	15	20-Apr-15		08-May-15		0%	85															
BG23310	Excavation for G2b	15	09-May-15		28-May-15		0%	149															
BG23320	Excavation for G2a	20	29-May-15		24-Jun-15		0%	174															
BG23350	Pad footing construction at G2d-1	20	19-May-15		12-Jun-15		0%	78															
BG23410	Pad footing G2e	60	04-Apr-15 A	04-Apr-15	21-Nov-15		30%	100															
Bridge G1									Bridge G1														
Stage 2									Stage 2														
Design Submission and Approval									Design Submission and Approval														
BG112260	Engineer's approval	21	18-Feb-15 A	18-Feb-15	02-May-15		50%	512															
BG112290	DDA for superstructure submission	21	02-May-15		28-May-15		0%	512															
BG112300	Engineer's approval	21	28-May-15		23-Jun-15		0%	512															
Bridge H1-Section 1									Bridge H1-Section 1														
Stage 1									Stage 1														
Temporary Works Design (TWD) Submission and Approval									Temporary Works Design (TWD) Submission and Approval														
BH11020	TWD -Formwork design for abutment	48	08-May-15		06-Jul-15		0%	237															
Bridge H1-Section 2									Bridge H1-Section 2														
Stage 2									Stage 2														
Design Submission and Approval									Design Submission and Approval														
BH12680	TWD -Formwork design for pier	24	13-May-15		10-Jun-15		0%	306															
BH12690	TWD -Pierhead construction	24	13-May-15		10-Jun-15		0%	306															
BH12820	Engineer's approval	17	18-Feb-15 A	18-Feb-15	29-Apr-15		50%	268															
BH12850	DDA for superstructure submission	17	29-Apr-15		20-May-15		0%	368															
BH12860	Engineer's approval	17	20-May-15		09-Jun-15		0%	368															
Field Works									Field Works														
Foundation Works & Pier construction									Foundation Works & Pier construction														
Foundation Works									Foundation Works														
BH12580	Bored piles and Foundation for H1d	65	11-Apr-15 A	11-Apr-15	11-Jun-15		50%	255															
Culvert 1(TBM)-Stage 4									Culvert 1(TBM)-Stage 4														
Field Works									Field Works														
TBM Driving									TBM Driving														
CUL13120	TBM driving	66	20-Apr-15		16-Jul-15		0%	2															

■ Remaining Level of Effort ■ Remaining Work Summary
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CRBC - Kaden JV
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20-Apr-15	3		

Activity ID	Activity Name	Original Duration	Start	Actual Start	Finish	Actual Finish	Performance % Complete	Total Float	Gantt Chart (2015-2018)											
									2015 Q3	2015 Q4	2016 Q1	2016 Q2	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 Q1	2018 Q2
MH7		32	22-Apr-15		03-Jun-15		0%	125	MH7											
CUL13340	Sheetpile installation	21	22-Apr-15		19-May-15		0%	125	Sheetpile installation											
CUL13350	Excavation and removal of existing box culvert	21	07-May-15		03-Jun-15		0%	125	Excavation and removal of existing box culvert											
FC1		51	19-Mar-15 A	19-Mar-15	17-Oct-15		0%	2	FC1											
CUL13410	Excavation and demolishing works	51	19-Mar-15 A	19-Mar-15	17-Oct-15		10%	2	Excavation and demolishing works											
FC2		156	04-Mar-15 A	04-Mar-15	09-Jun-15		0%	61	FC2											
CUL13450	Sheetpile installation for FC2	21	04-Mar-15 A	04-Mar-15	12-May-15		50%	61	Sheetpile installation for FC2											
CUL13460	Excavation and removal of box culvert	21	12-May-15		09-Jun-15		0%	61	Excavation and removal of box culvert											
Site Formation - Retaining Structure for Slope TP_F		354	27-Jan-15 A	27-Jan-15	07-Dec-15		0%	179	Site Formation - Retaining Structure for Slope TP_F											
Stage 3		354	27-Jan-15 A	27-Jan-15	07-Dec-15		0%	179	Stage 3											
Retaining Structure for Slope TP_F		354	27-Jan-15 A	27-Jan-15	07-Dec-15		0%	179	Retaining Structure for Slope TP_F											
RWF313071	Construct Retaining Wall-Wall construction Bay 20	10	10-Apr-15 A	10-Apr-15	20-Apr-15		90%	337	Construct Retaining Wall-Wall construction Bay 20											
RWF31308	Backfilling	50	10-Feb-15 A	10-Feb-15	28-May-15		40%	315	Backfilling											
RWF31325	Construct Retaining Wall-Base slab (Bay 4 to Bay 6)	18	27-Jan-15 A	27-Jan-15	07-Dec-15		33%	179	Construct Retaining Wall-Base slab (Bay 4 to Bay 6)											
Site Formation - Slope TP_A & Associated Works		60	21-Apr-15		10-Jul-15		0%	141	Site Formation - Slope TP_A & Associated Works											
Stage 3		60	21-Apr-15		10-Jul-15		0%	141	Stage 3											
Slope Feature - Slope TP_A		60	21-Apr-15		10-Jul-15		0%	141	Slope Feature - Slope TP_A											
TPA41700	Construct Cascade A	60	21-Apr-15		10-Jul-15		0%	141	Construct Cascade A											
Site Formation - Slope TP_B & Associated Works		207	02-Jan-15 A	02-Jan-15	22-May-15		0%	520	Site Formation - Slope TP_B & Associated Works											
Stage 3		207	02-Jan-15 A	02-Jan-15	22-May-15		0%	520	Stage 3											
Slope Feature - Slope TP_B		207	02-Jan-15 A	02-Jan-15	22-May-15		0%	520	Slope Feature - Slope TP_B											
TPB41100	Excavation of Rock (17,900m3) for slope B3	90	02-Jan-15 A	02-Jan-15	21-Apr-15		98%	520	Excavation of Rock (17,900m3) for slope B3											
TPB41210	U-channel and Berm for slope B3	21	21-Apr-15		19-May-15		0%	520	U-channel and Berm for slope B3											
TPB41220	Laying Erosion Control Mat for slope B3	3	19-May-15		22-May-15		0%	520	Laying Erosion Control Mat for slope B3											
Site Formation - Slope TP_C & Associated Works		159	17-Dec-14 A	17-Dec-14	28-Jul-15		0%	471	Site Formation - Slope TP_C & Associated Works											
Stage 3		159	17-Dec-14 A	17-Dec-14	28-Jul-15		0%	471	Stage 3											
Slope Feature - Slope TP_C		159	17-Dec-14 A	17-Dec-14	28-Jul-15		0%	471	Slope Feature - Slope TP_C											
TPC50500	Excavation of Rock (11,950m3) for slope C1	88	17-Dec-14 A	17-Dec-14	24-Apr-15		95%	134	Excavation of Rock (11,950m3) for slope C1											
TPC50700	U-channel and Berm for slope C1	25	18-Dec-14 A	18-Dec-14	09-May-15		54%	471	U-channel and Berm for slope C1											
TPC50800	Laying Erosion Control Mat for slope C1	15	16-Mar-15 A	16-Mar-15	29-May-15		50%	471	Laying Erosion Control Mat for slope C1											
TPC51160	Remaining excavation works and forming road formation	45	29-May-15		28-Jul-15		0%	471	Remaining excavation works and forming road formation											
Site Formation - Slope TP_D & Associated Works		88	01-Feb-15 A	01-Feb-15	04-Jun-15		0%	82	Site Formation - Slope TP_D & Associated Works											
Stage 3		88	01-Feb-15 A	01-Feb-15	04-Jun-15		0%	82	Stage 3											
Slope Feature - Slope TP_D		88	01-Feb-15 A	01-Feb-15	04-Jun-15		0%	82	Slope Feature - Slope TP_D											
TPD51400	Excavation of Rock (4,670m3) for slope D3a, D3b and D4	25	01-Feb-15 A	01-Feb-15	29-Apr-15		66%	82	Excavation of Rock (4,670m3) for slope D3a, D3b and D4											
TPD51450	U-channel and Berm for slope D3a, D3b and D4	15	01-Feb-15 A	01-Feb-15	18-May-15		10%	82	U-channel and Berm for slope D3a, D3b and D4											
TPD51500	Excavation of Soil (3,260m3) for slope D5	10	29-Apr-15		13-May-15		0%	82	Excavation of Soil (3,260m3) for slope D5											
TPD51550	Excavation of Rock (3,080m3) for slope D5	16	13-May-15		04-Jun-15		0%	82	Excavation of Rock (3,080m3) for slope D5											
Site Formation - Slope TP_E & Associated Works		203	31-Dec-14 A	31-Dec-14	29-Jun-15		0%	81	Site Formation - Slope TP_E & Associated Works											
Stage 3		203	31-Dec-14 A	31-Dec-14	29-Jun-15		0%	81	Stage 3											
Slope Feature - Slope TP_E at Toll Control Building Area		193	31-Dec-14 A	31-Dec-14	29-Jun-15		0%	31	Slope Feature - Slope TP_E at Toll Control Building Area											
TPE61170	Excavation of Rock for slope E2b - stage 2	75	31-Dec-14 A	31-Dec-14	19-May-15		70%	38	Excavation of Rock for slope E2b - stage 2											
TPE61180	Mapping & Dowelling	15	19-May-15		08-Jun-15		0%	38	Mapping & Dowelling											
TPE61300	Excavation of Rock (2,200m3) for slope E1c	30	14-Jan-15 A	14-Jan-15	23-May-15		10%	31	Excavation of Rock (2,200m3) for slope E1c											
TPE61350	Excavation of Rock (2,000m3) for slope E1b	30	30-Jan-15 A	30-Jan-15	29-Jun-15		10%	31	Excavation of Rock (2,000m3) for slope E1b											
Slope Feature - Slope TP_E Remaining Section and 5SE-D/C116		179	31-Jan-15 A	31-Jan-15	08-Jun-15		0%	97	Slope Feature - Slope TP_E Remaining Section and 5SE-D/C116											
TPE62160	Soil Nail RowB (22nos) Level + 35.00 for 5SE-D/C-116 (Install and grouting)	24	31-Jan-15 A	31-Jan-15	05-May-15		50%	97	Soil Nail RowB (22nos) Level + 35.00 for 5SE-D/C-116 (Install and grouting)											
TPE62170	Soil Nail RowA (24nos) Level + 33.00 for 5SE-D/C116 (Install and grouting)	26	06-May-15		08-Jun-15		0%	97	Soil Nail RowA (24nos) Level + 33.00 for 5SE-D/C116 (Install and grouting)											
Site Formation - Slope Upgrading Works		110	09-Jan-15 A	09-Jan-15	24-Dec-16		0%	333	Site Formation - Slope Upgrading Works											
Stage 3 (Other Slope Features)		110	09-Jan-15 A	09-Jan-15	24-Dec-16		0%	333	Stage 3 (Other Slope Features)											
Slope Feature - 5SE-D/C122		55	09-Jan-15 A	09-Jan-15	24-Dec-16		0%	333	Slope Feature - 5SE-D/C122											
SFW10320	Drainage, U-channel (420m) and Handrailing	45	09-Jan-15 A	09-Jan-15	16-Dec-16		50%	333	Drainage, U-channel (420m) and Handrailing											
SFW10330	Hydroseeding and Erosion Control Mat	10	30-Jan-15 A	30-Jan-15	24-Dec-16		30%	333	Hydroseeding and Erosion Control Mat											

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Activity ID	Activity Name	Original Duration	Start	Actual Start	Finish	Actual Finish	Performance % Complete	Total Float	Gantt Chart (2015-2018)											
									Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Slope Feature - 5SE-D/C149									Slope Feature -5SE-D/C149											
SFW10390	Slope Modification	10	16-Jan-15 A	16-Jan-15	20-Dec-16		10%	144	Slope Modification											
Vehicular Underpass TN-01									Vehicular Underpass TN-01											
Stage 3									Stage 3											
Blasting Related Submission									Blasting Related Submission											
Method Statment Submission and Approval									Method Statment Submission and Approval											
UDP30650	Method statement for Lining Construction	72	26-May-15		19-Aug-15		0%	413	Method statement for Lining Construction											
Road and Drainage Work at for Lung Fu Road Roundabout									Road and Drainage Work at for Lung Fu Road Roundabout											
Section 3									Section 3											
Road and drainage works under LFR R/A TTA stage 2a									Road and drainage works under LFR R/ATTa stage 2a											
LF20050	Slope cut/filled at LMR for the further roundabout	30	20-Apr-15		28-May-15		0%	255	Slope cut/filled at LMR for the further roundabout											
LF20100	Traffic on LMR diverted to LFR junction	7	29-May-15		06-Jun-15		0%	255	Traffic on LMR diverted to LFR junction											

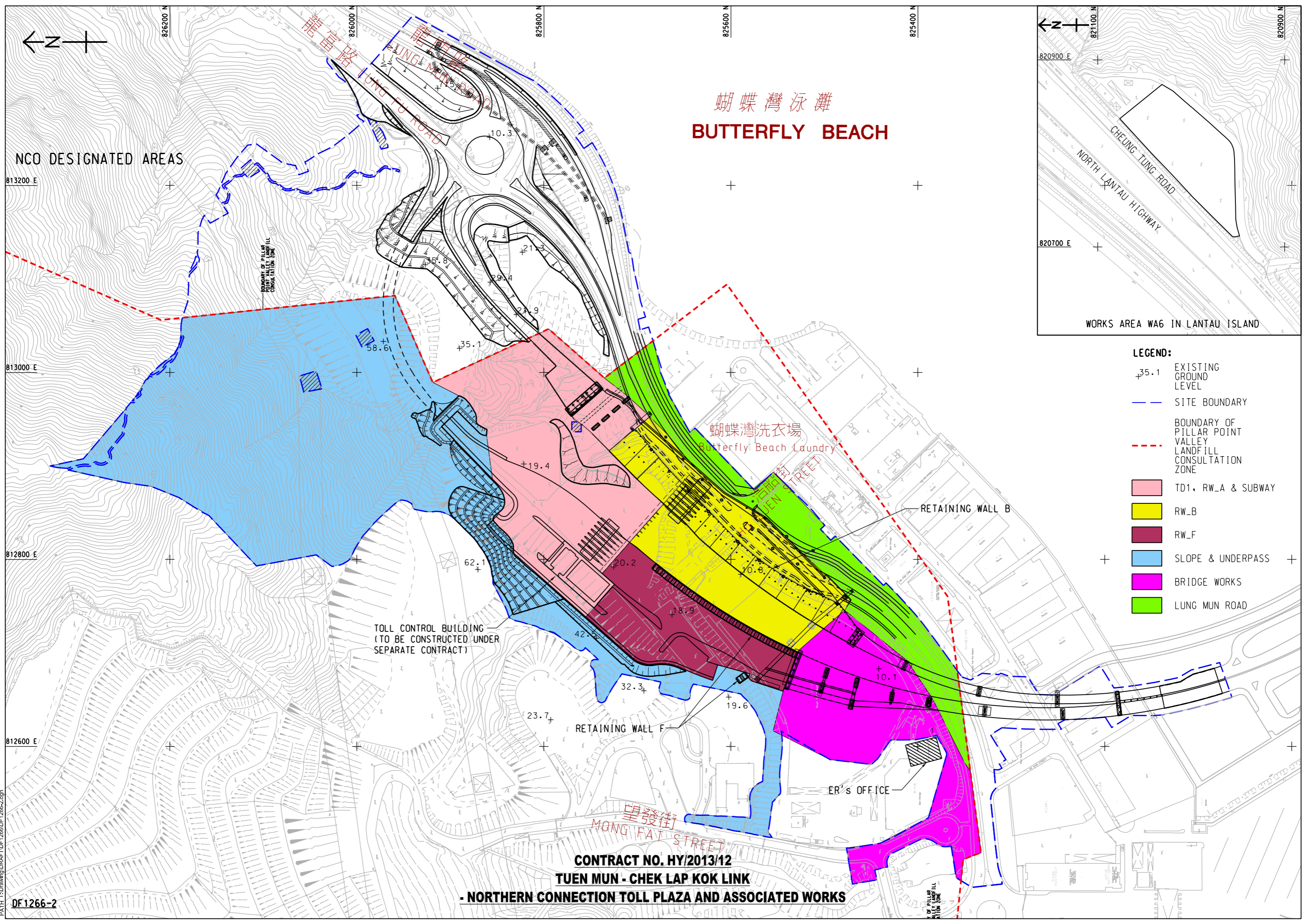
█ Remaining Level of Effort
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CRBC - Kaden JV
2 Months Rolling Programme Report Update 20-Apr-15

Date	Revision	Checked	Approved
20-Apr-15	3		

Appendix E

Monitoring Locations for the Contract



蝴蝶灣泳灘
BUTTERFLY BEACH

NCO DESIGNATED AREAS

WORKS AREA WA6 IN LANTAU ISLAND

- LEGEND:**
- +35.1 EXISTING GROUND LEVEL
 - SITE BOUNDARY
 - BOUNDARY OF PILLAR POINT VALLEY LANDFILL CONSULTATION ZONE
 - TD1, RW_A & SUBWAY
 - RW_B
 - RW_F
 - SLOPE & UNDERPASS
 - BRIDGE WORKS
 - LUNG MUN ROAD

TOLL CONTROL BUILDING
 (TO BE CONSTRUCTED UNDER
 SEPARATE CONTRACT)

RETAINING WALL F

RETAINING WALL B

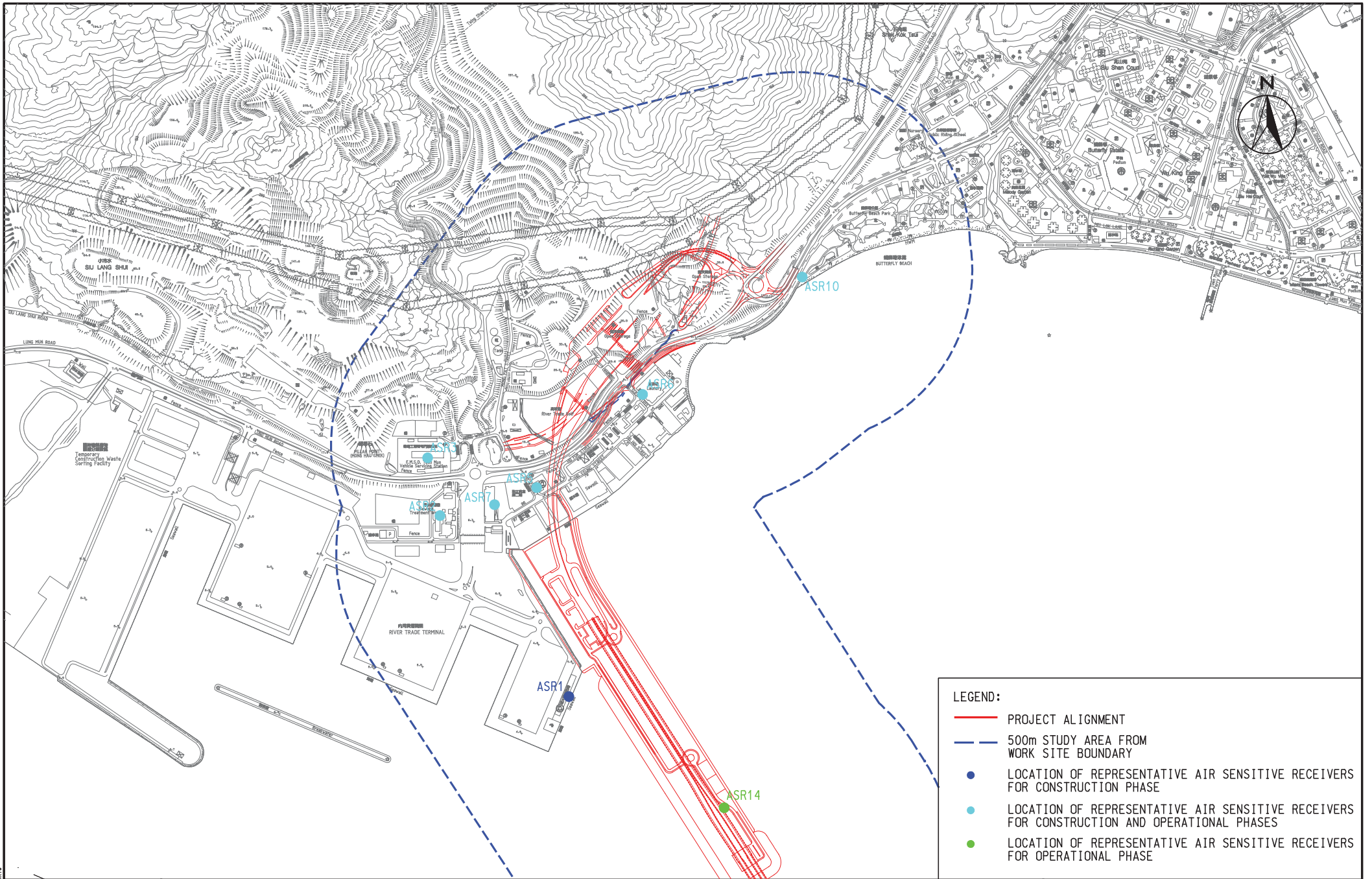
ER'S OFFICE

蝴蝶灣洗衣場
 Butterfly Beach Laundry

CONTRACT NO. HY/2013/12
TUEN MUN - CHEK LAP KOK LINK
- NORTHERN CONNECTION TOLL PLAZA AND ASSOCIATED WORKS

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DF1266-2

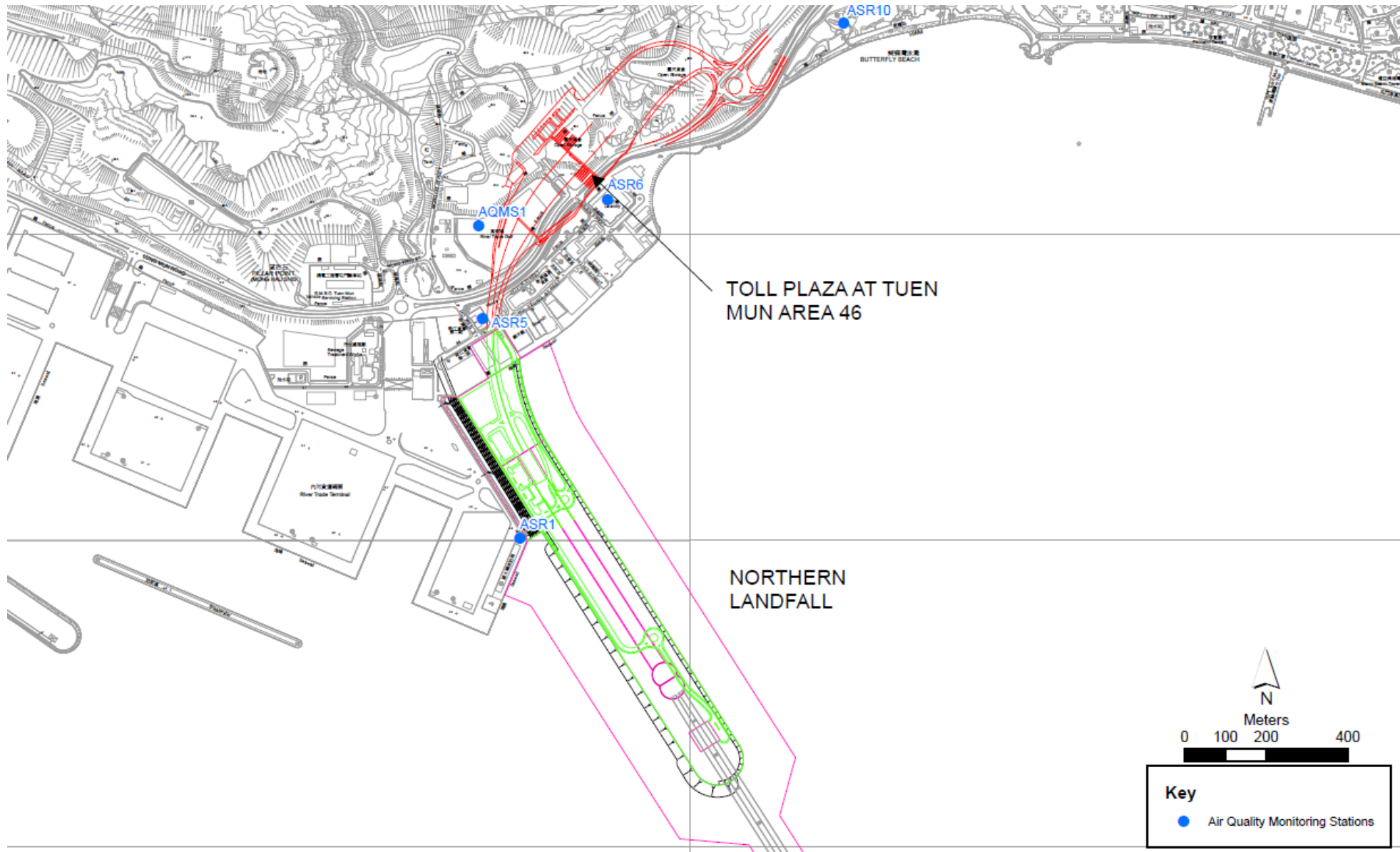


LEGEND:

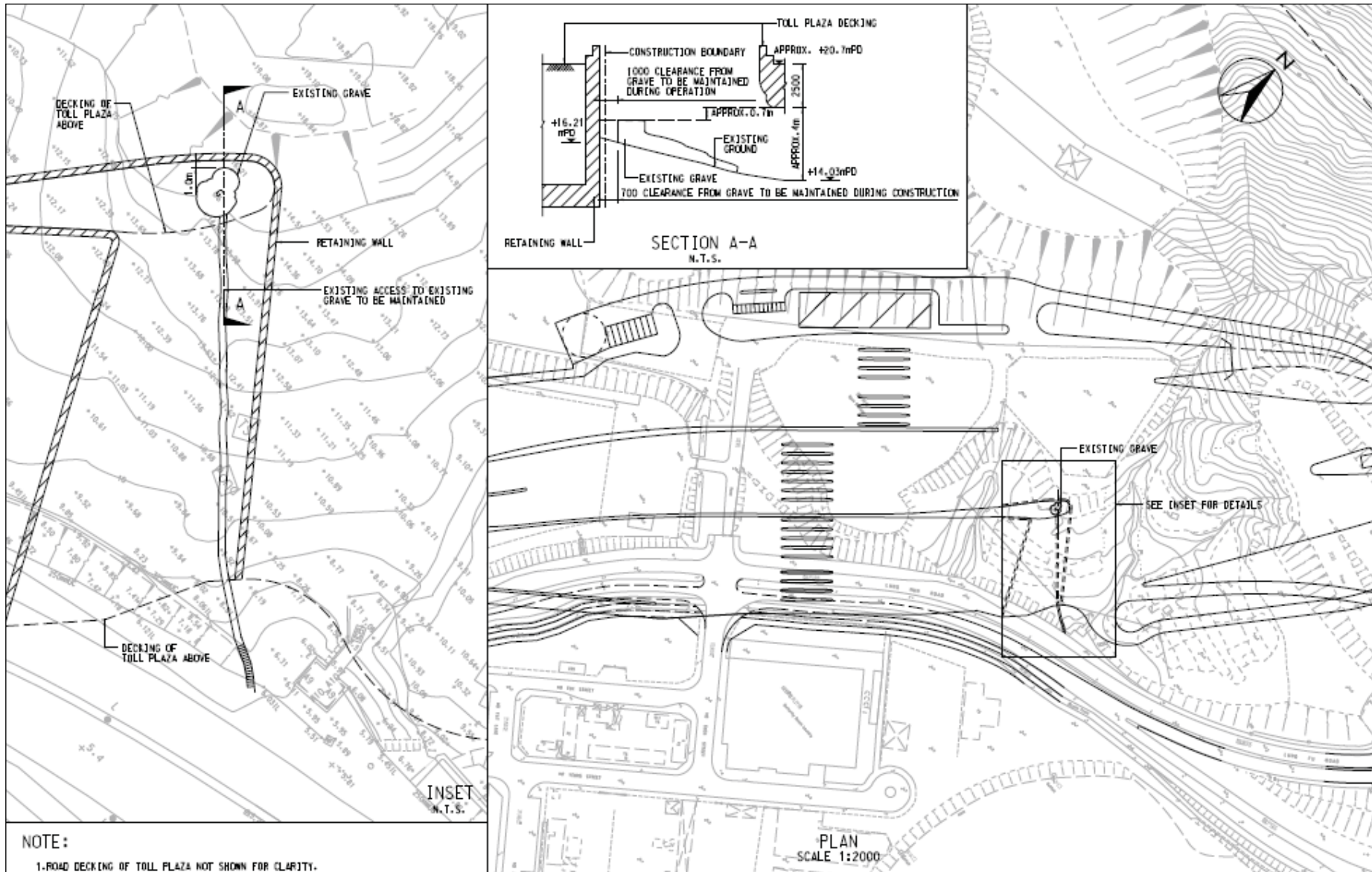
- PROJECT ALIGNMENT
- - - 500m STUDY AREA FROM WORK SITE BOUNDARY
- LOCATION OF REPRESENTATIVE AIR SENSITIVE RECEIVERS FOR CONSTRUCTION PHASE
- LOCATION OF REPRESENTATIVE AIR SENSITIVE RECEIVERS FOR CONSTRUCTION AND OPERATIONAL PHASES
- LOCATION OF REPRESENTATIVE AIR SENSITIVE RECEIVERS FOR OPERATIONAL PHASE

AGREEMENT NO. CE 52/2007(HY)
 TUEN MUN - CHEK LAP KOK LINK - INVESTIGATION
REPRESENTATIVE AIR SENSITIVE RECEIVERS

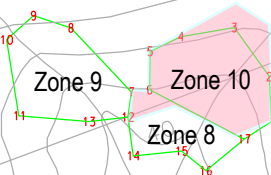
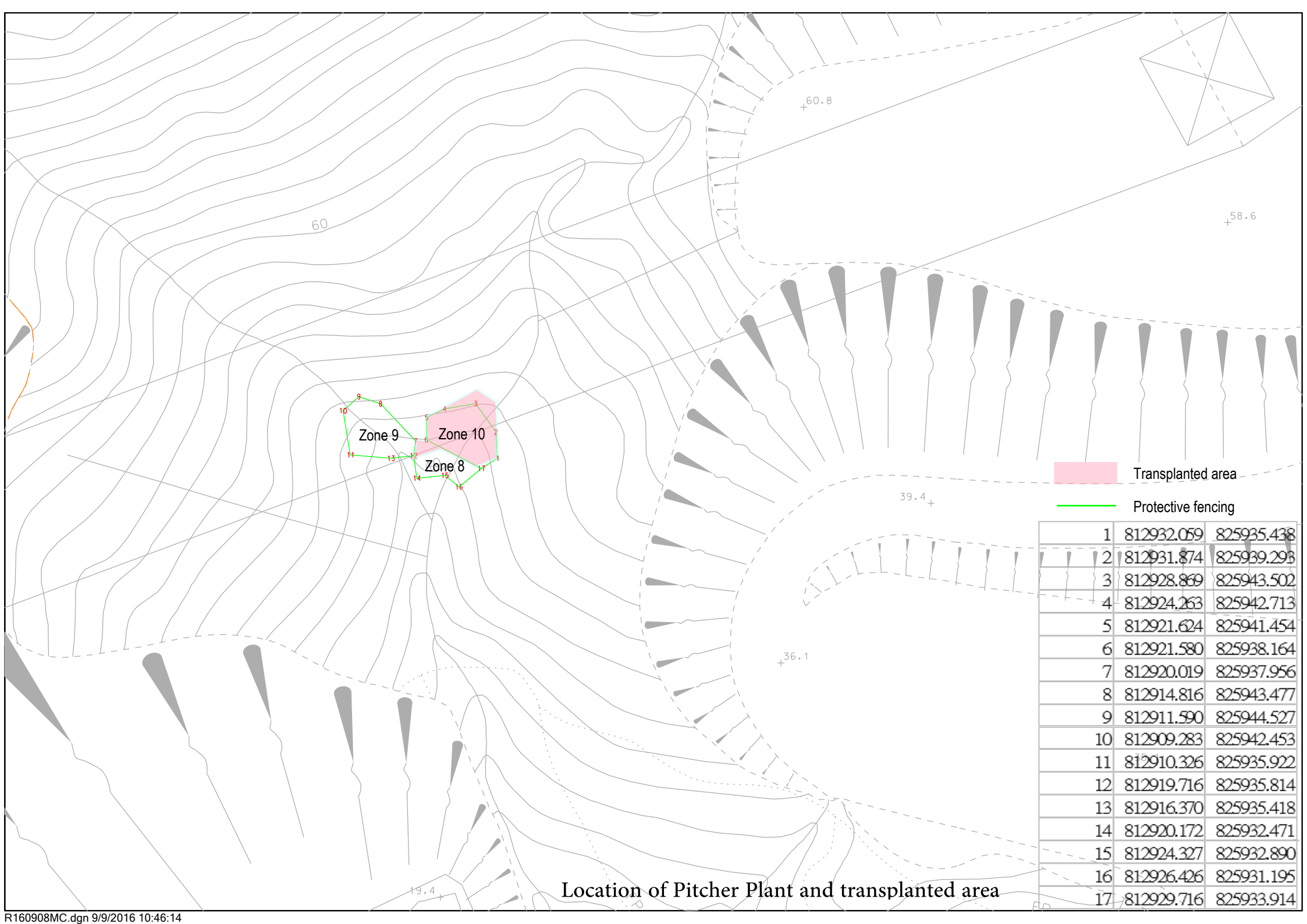
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Air Quality Monitoring Location



Location of the Grave G1



Transplanted area
 Protective fencing

1	812932.059	825935.438
2	812931.874	825939.293
3	812928.869	825943.502
4	812924.263	825942.713
5	812921.624	825941.454
6	812921.580	825938.164
7	812920.019	825937.956
8	812914.816	825943.477
9	812911.590	825944.527
10	812909.283	825942.453
11	812910.326	825935.922
12	812919.716	825935.814
13	812916.370	825935.418
14	812920.172	825932.471
15	812924.327	825932.890
16	812926.426	825931.195
17	812929.716	825933.914

Location of Pitcher Plant and transplanted area

Appendix F

Event and Action Plan

Event and Action Plan for Air Quality

EVENT	ACTION			
	ET ⁽¹⁾	IEC ⁽¹⁾	SOR ⁽¹⁾	Contractor(s)
Action Level				
Exceedance recorded	<ol style="list-style-type: none"> 1 Identify the source. 2 Repeat measurements to confirm findings. If two consecutive measurements exceed Action Level, the exceedance is then confirmed. 3 Inform the IEC and the SOR 4 Investigate the cause of exceedance and check Contractor's working procedures to determine possible mitigation to be implemented. 5 If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily. 6 Discuss with the IEC and the Contractor on remedial actions required. 7 If exceedance continues, arrange meeting with the IEC and the SOR. 8 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 If the exceedance is confirmed to be Project related after investigation, discuss with the ET and the Contractor on possible remedial measures. 4 Advise the SOR on the effectiveness of the proposed remedial measures. 5 Supervisor 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 Rectify any unacceptable practice. 2 Amend working methods if appropriate 3 If the exceedance is confirmed to be Project related, submit proposals for remedial actions to IEC within 3 working days of notification 4 Implement the agreed proposals 5 Amend proposal if appropriate.
Limit Level				
Exceedance recorded	<ol style="list-style-type: none"> 1. Identify the source. 2. Repeat measurement to confirm finding. If two consecutive measurements exceed Limit Level, the exceedance is then confirmed. 3. Inform the IEC, the SOR, the DEP and the Contractor. 4. Investigate the cause of exceedance and check Contractor's working procedures to determine possible mitigation to be implemented. 5. If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily. 6. Carry out analysis of the Contractor's working procedures to determine possible mitigation to be implemented. 7. Arrange meeting with the IEC and the SOR to discuss the remedial actions to be taken. 8. Assess effectiveness of the Contractor's remedial actions and keep the IEC, the DEP and the SOR informed of the results. 9. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1 Check monitoring data submitted by the ET. 2 Check Contractor's working method. 3 If the exceedance is confirmed to be Project related after investigation, discuss with the ET and the Contractor on possible remedial measures. 4 Advise the SOR on the effectiveness of the proposed remedial measures. 5 Supervisor implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. If the exceedance is confirmed to be Project related after investigation, 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 If the exceedance is confirmed to be Project related after investigation, submit proposals for remedial actions to IEC within 3 working days of notification. 3 Implement the agreed proposals. 4 Amend proposal if appropriate. 5 Stop the relevant activity of works as determined by the SOR until the exceedance is abated.

Event and Action Plan for Landscape and Visual Impact

EVENT ACTION LEVEL	ACTION			
	ET	IEC	ER	Contractor
Design Check	<ul style="list-style-type: none"> Check final design conforms to the requirements of EP and prepare report. 	<ul style="list-style-type: none"> Check report. Recommend remedial design if necessary 	<ul style="list-style-type: none"> Undertake remedial design if necessary 	
Non- conformity on one occasion	<ul style="list-style-type: none"> Identify Source Inform IEC and ER Discuss remedial actions with IEC, ER and Contractor Monitor remedial actions until rectification has been completed 	<ul style="list-style-type: none"> Check report Check Contractor's working method Discuss with ET and Contractor on possible remedial measures Advise ER on effectiveness of proposed remedial measures. Check implementation of remedial measures 	<ul style="list-style-type: none"> Notify Contractor Ensure remedial measures are properly implemented 	<ul style="list-style-type: none"> Amend working methods Rectify damage and undertake any necessary replacement
Repeated Non-conformity	<ul style="list-style-type: none"> Identify Source Inform IEC and ER Increase monitoring frequency Discuss remedial actions with IEC, ER and Contractor Monitor remedial actions until rectification has been completed If nonconformity stops, cease additional monitoring 	<ul style="list-style-type: none"> Check monitoring report Check Contractor's working method Discuss with ET and Contractor on possible remedial measures Advise ER on effectiveness of proposed remedial measures Supervise implementation of remedial measures 	<ul style="list-style-type: none"> Notify Contractor Ensure remedial measures are properly implemented 	<ul style="list-style-type: none"> Amend working methods Rectify damage and undertake any necessary replacement

Event / Action Plan for Cultural Heritage

Action Level	ET	IC (E)	ER	Contractor
Non-conformity on one occasion	<ol style="list-style-type: none"> 1. Identify Source 2. Inform the IEC and the ER 3. Discuss remedial actions with the IEC, the ER and the Contractor 4. Monitor remedial actions until rectification has been completed 	<ol style="list-style-type: none"> 1. Check report 2. Check the Contractor's working method 3. Discuss with the ET and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures. 5. Check implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Notify Contractor 2. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Amend working methods 2. Rectify damage and undertake any necessary replacement
Repeated Non-conformity	<ol style="list-style-type: none"> 1. Identify Source 2. Inform the IC(E) and the ER 3. Increase monitoring frequency 4. Discuss remedial actions with the IC(E), the ER and the Contractor 5. Monitor remedial actions until 6. rectification has been completed 7. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Check monitoring report 2. Check the Contractor's working method 3. Discuss with the ES and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Notify the Contractor 2. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Amend working methods 2. Rectify damage and undertake any necessary replacement

Note:

ET – Environmental Specialist, IEC – Independent Environmental Checker, ER – Engineer's Representative

Event / Action Plan for General Ecology

Action Level	ET	IEC	ER	Contractor
Non-conformity on one occasion	<ul style="list-style-type: none"> Identify Source Inform the IEC and the ER Discuss remedial actions with the IEC, the ER and the Contractor Monitor remedial actions until rectification has been completed 	<ul style="list-style-type: none"> Check report Check the Contractor's working method Discuss with the ET and the Contractor on possible remedial measures Advise the ER on effectiveness of proposed remedial measures. Check implementation of remedial measures. 	<ul style="list-style-type: none"> Notify Contractor Ensure remedial measures are properly implemented Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the works in the case of a serious nonconformity until situation rectified. 	<ul style="list-style-type: none"> Amend working methods Rectify damage and undertake any necessary replacement
Repeated Non conformity	<ul style="list-style-type: none"> Identify Source Inform the IC(E) and the ER Increase monitoring frequency Discuss remedial actions with the IC(E), the ER and the Contractor Monitor remedial actions until rectification has been completed If exceedance stops, cease additional monitoring 	<ul style="list-style-type: none"> Check monitoring report Check the Contractor's working method Discuss with the ES and the Contractor on possible remedial measures Advise the ER on effectiveness of proposed remedial measures Supervise implementation of remedial measures 	<ul style="list-style-type: none"> Notify the Contractor Ensure remedial measures are properly implemented Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the works in the case of a serious nonconformity until situation rectified. 	<ul style="list-style-type: none"> Amend working methods Rectify damage and undertake any necessary replacement

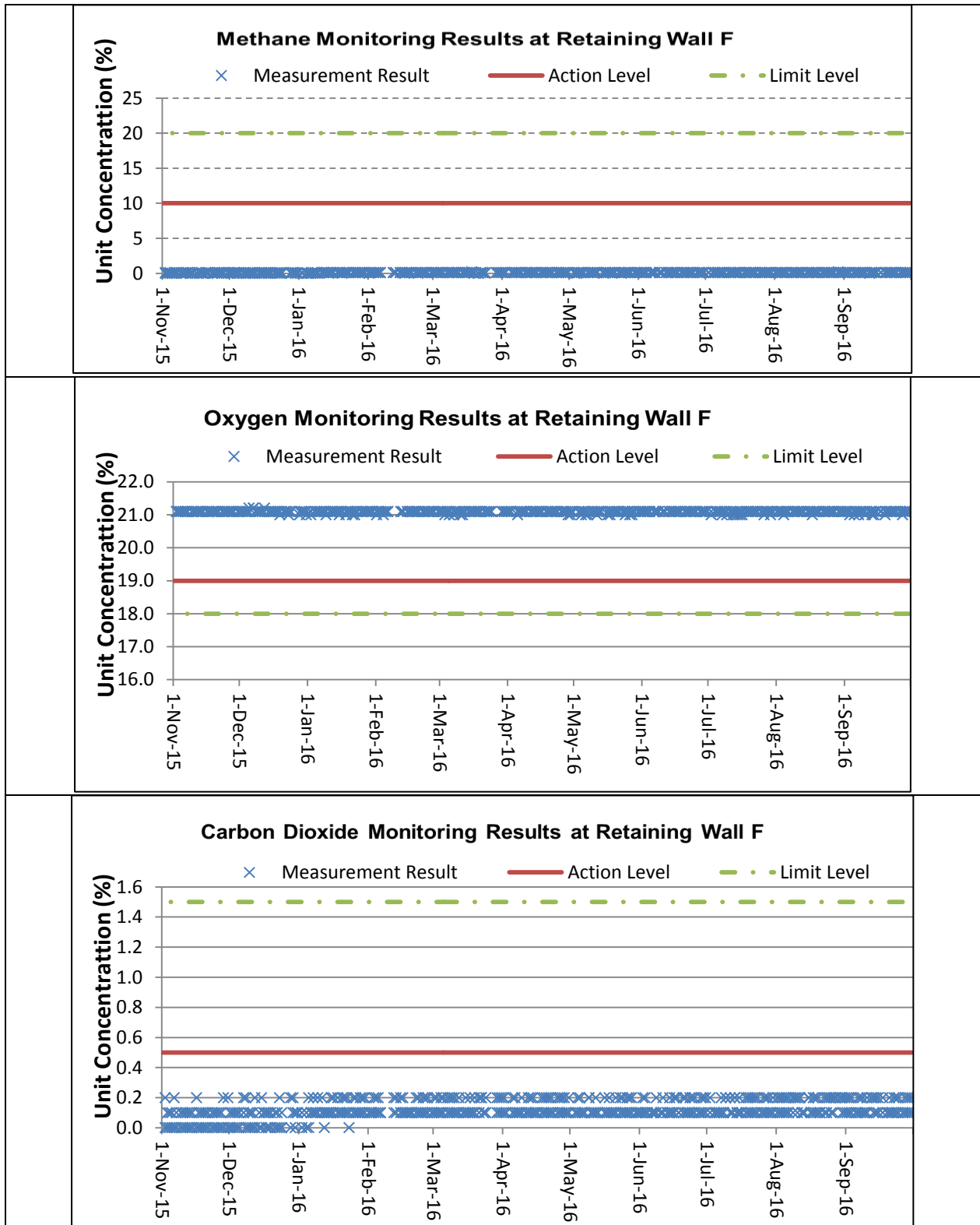
Note: ET – Environmental Specialist, IC(E) – Independent Checker (Environmental), ER – Engineer's Representative

Appendix G

Graphical Plot of Monitoring Results

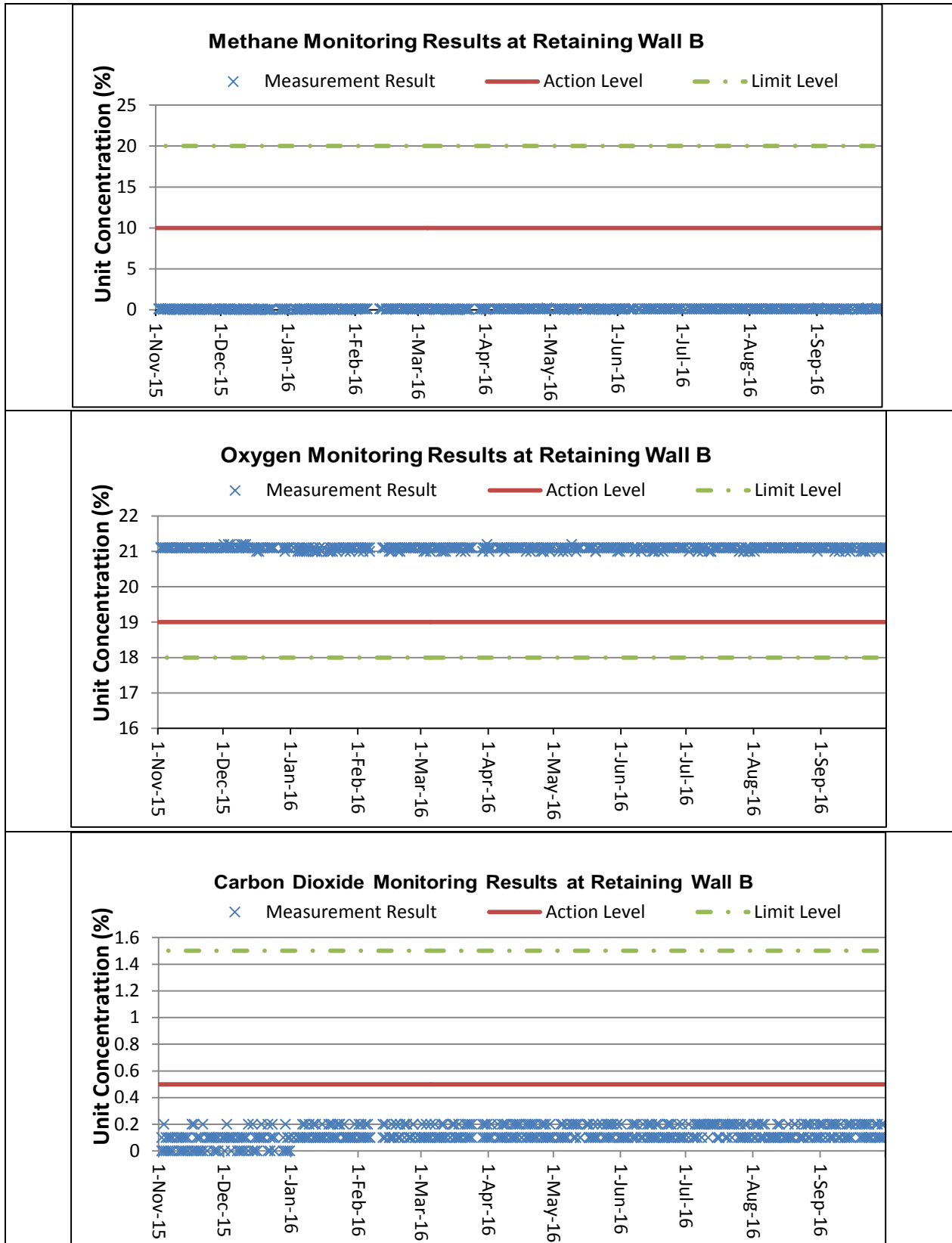
I. Landfill Gas

GRAPHICAL PLOT OF LANDFILL GAS MONITORING RESULTS

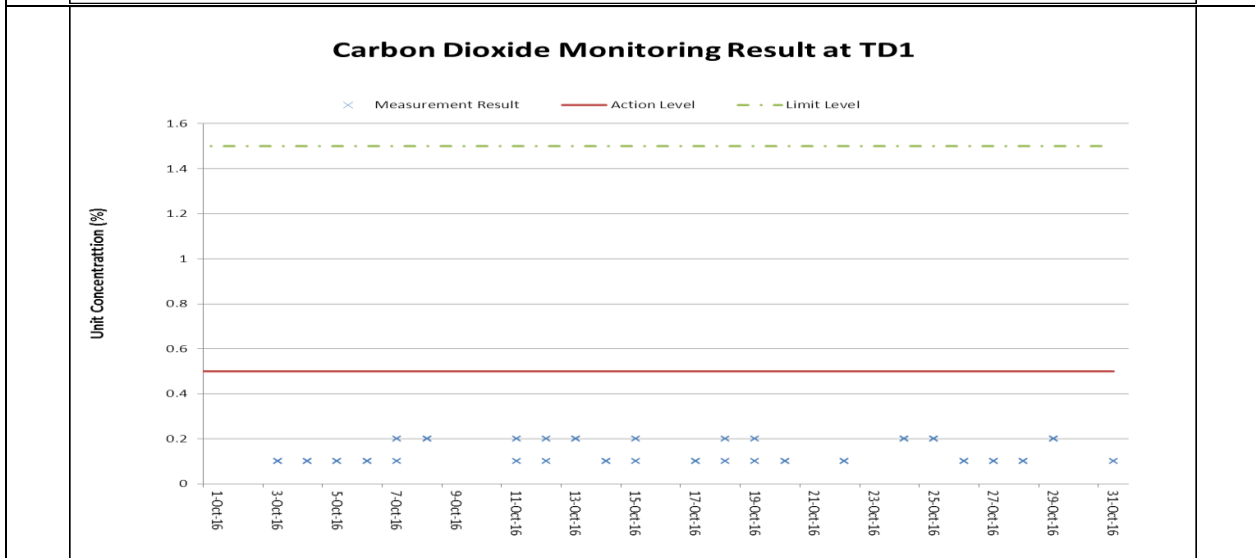
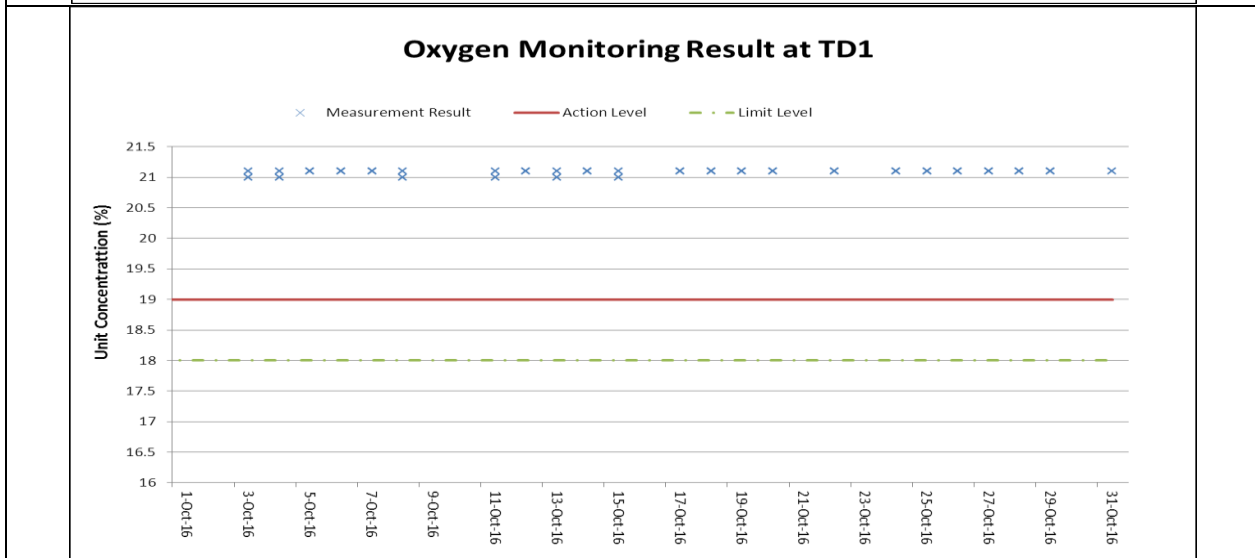
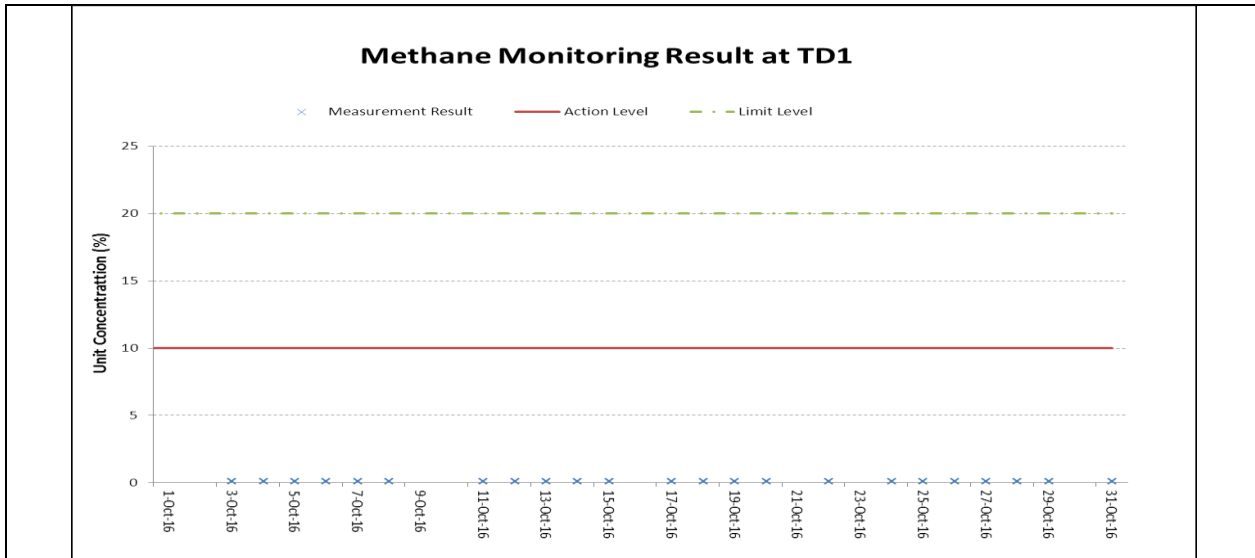


Annotation:

During 1 November 2015 to 30 September 2016, major construction activity was construction of retaining wall F and the specified works included excavation, rock breaking, blinding, formworking, steel-fixing and concreting. The weather condition varied from sunny to rainy. The monitoring data was provided by the Contractor followed to their QA/QC control.

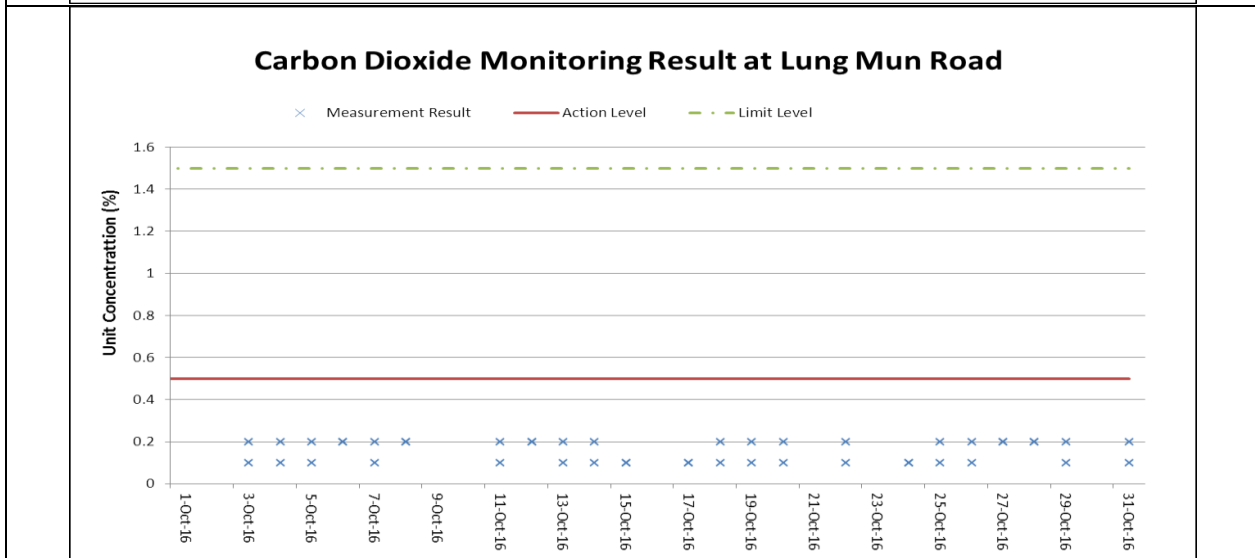
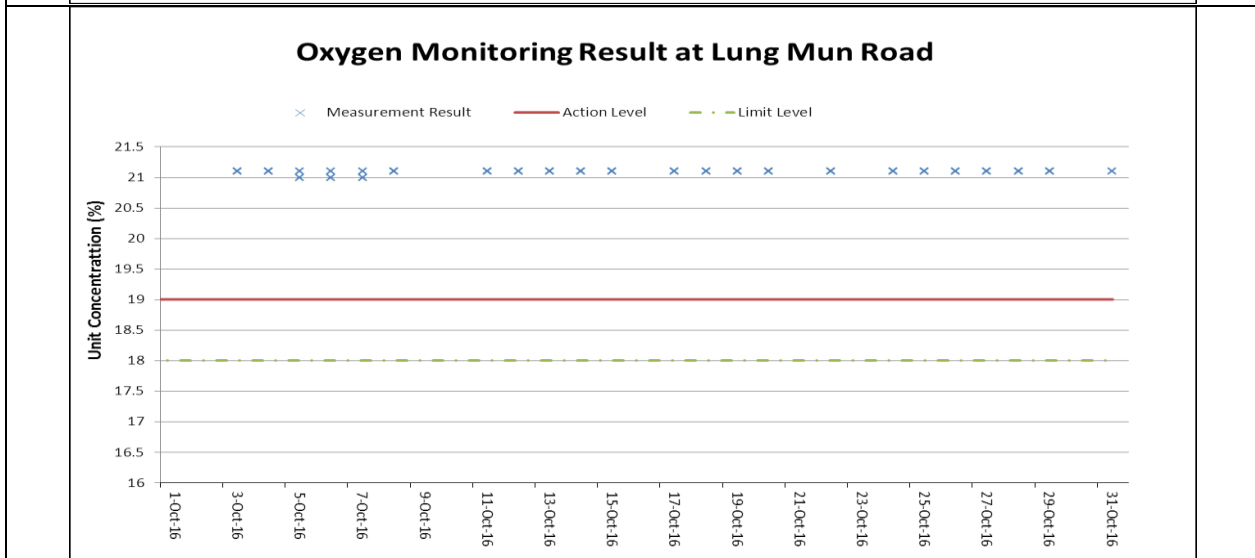
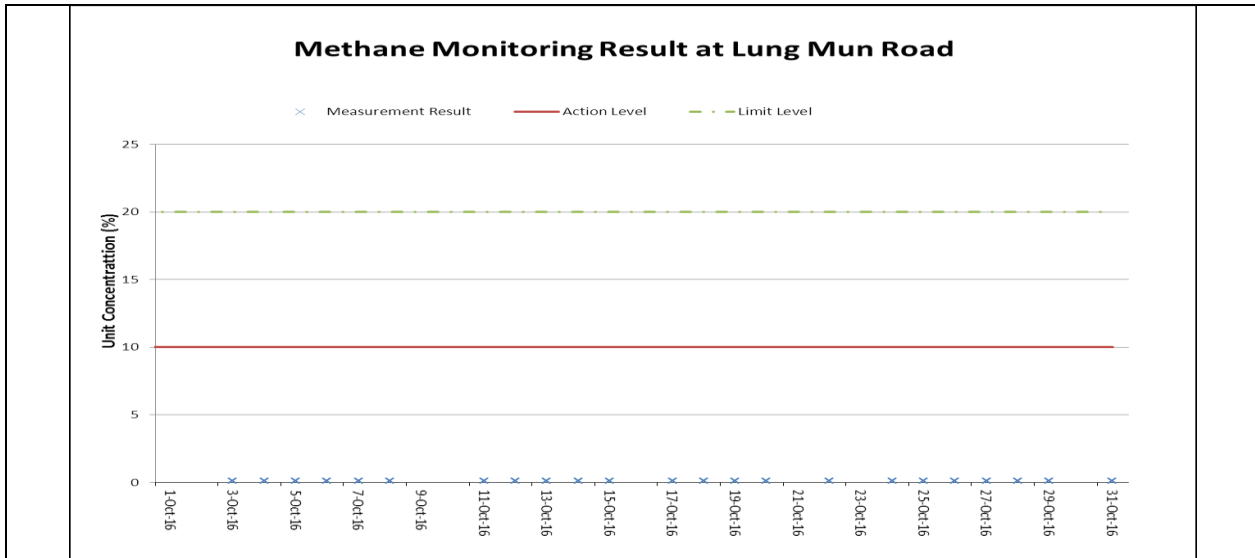


Annotation:
 During 1 November 2015 to 30 September 2016, major construction activity was construction of retaining wall B and the specified works included excavation, rock breaking, blinding, formworking, steel-fixing and concreting. The weather condition varied from sunny to rainy. The monitoring data was provided by the Contractor followed to their QA/QC control.



Annotation:

During 1 to 31 October 2016, major construction activity at TD1 and the specified works included excavation, stitching, blinding, formworking, steel-fixing and concreting. The weather condition varied from sunny to rainy. The monitoring data was provided by the Contractor followed to their QA/QC control.



Annotation:
 During 1 to 31 October 2016, major construction activity at Lung Mun Road and the specified works included excavation, blinding, formworking, steel-fixing and concreting. The weather condition varied from sunny to rainy. The monitoring data was provided by the Contractor followed to their QA/QC control.

Appendix H

Investigation Report for Exceedance

(Not Use)

Appendix I

**Environmental Mitigation Measures Implementation Schedule
(EMMIS)**

CONTRACT NO. HY/2013/12

**TUEN MUN – CHECK LAP KOK LINK – NORTHERN CONNECTION TOLL PLAZA AND ASSOCIATED WORKS
ENVIRONMENTAL MITIGATION AND ENHANCEMENT MEASURE IMPLEMENTATION SCHEDULE**

Air Quality									
EIA reference	EM&A Manual reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
4.8.1	3.8	An effective watering programme of twice daily watering with complete coverage, is estimated to reduce by 50%. This is recommended for all areas in order to reduce dust levels to a minimum;	All areas / throughout construction period	Contractor	TMEIA Avoid smoke impacts and disturbance		Y		✓
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		✓

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**TUEN MUN – CHECK LAP KOK LINK – NORTHERN CONNECTION TOLL PLAZA AND ASSOCIATED WORKS
ENVIRONMENTAL MITIGATION AND ENHANCEMENT MEASURE IMPLEMENTATION SCHEDULE**

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.	construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	Areas of exposed soil shall be minimized 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		✓

Cultural Heritage

EIA reference	EM&A Manual reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
11.8	Section 9	EM&A in the form of audit of the mitigation measures	All areas / throughout construction period	Highways Department	EIAO-TM		Y		✓

Ecology

EIA reference	EM&A Manual reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	

CONTRACT NO. HY/2013/12

**TUEN MUN – CHECK LAP KOK LINK – NORTHERN CONNECTION TOLL PLAZA AND ASSOCIATED WORKS
ENVIRONMENTAL MITIGATION AND ENHANCEMENT MEASURE IMPLEMENTATION SCHEDULE**

7.13#	6.3, 6.5#	Fencing or other physical barriers for protection of Pitcher Plant around Zones 8, 9 and 10 and the temporary nursery site	Tuen Mun Area 46 shrubland/ Detailed/ Prior to construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
7.13	6.5	Audit Pitcher Plant protection measures	Tuen Mun Area 46	Contractor	TMEIA		Y		✓
7.13	6.5	The loss of habitat shall be supplemented by enhancement planting in accordance with the landscape mitigation schedule.	All areas / As soon as accessible	Contractor	TMEIA		Y		✓
7.13	6.5	Spoil heaps shall be covered at all times.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Avoid damage and disturbance to the remaining and surrounding natural habitat	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Placement of equipment in designated areas within the existing disturbed land	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Disturbed areas to be reinstated immediately after completion of the works.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Construction activities should be restricted to the proposed works boundary	All areas / Throughout construction	Contractor	TMEIA		Y		✓

Landfill Gas Hazard Assessment

EIA reference	EM&A Manual reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
14.12.2	14.2	<u>Appointment of Safety Officer</u> Appoint a properly trained safety officer and provide with appropriate equipment to measure and monitor LFG hazard. The monitoring frequency and areas to be monitored should be set down prior to commencement of ground-works either by the Safety Officer or an approved and appropriately qualified person.	Construction Stage	Contractor	EPD/TR8/97 - Landfill Gas Hazard Assessment Guidance Note		Y		✓
14.12.2	-	<u>Safety Measures - Excavation</u>	Construction Stage	Contractor	EPD/TR8/97 -		Y		✓

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**TUEN MUN – CHECK LAP KOK LINK – NORTHERN CONNECTION TOLL PLAZA AND ASSOCIATED WORKS
ENVIRONMENTAL MITIGATION AND ENHANCEMENT MEASURE IMPLEMENTATION SCHEDULE**

		Staff should receive appropriate training on working in areas susceptible to landfill gas, fire and explosion hazards. Excavation procedures and code of practice should be implemented.			Landfill Gas Hazard Assessment Guidance Note				
14.12.2	-	<u>Safety Measures – Welding, Flame- Cutting and Hot works</u> Hot works should be confined to open areas away from any trench or excavation. Should hot works must be carried out in trenches or confined space, “permit to work” procedures should be followed.	Construction Stage	Contractor	EPD/TR8/97 - Landfill Gas Hazard Assessment Guidance Note		Y		✓
14.12.2	-	<u>Safety Measures – Enclosed Spaces</u> Site offices or buildings located within PPV Landfill Consultation Zone which have the capacity to accumulate landfill gas, then they should either be located in an area which has been proven to be free of landfill gas; or be raised clear of the ground by a minimum of 500mm.	Site office, building, tunnel, subway, confined area / Construction Stage	Contractor	EPD/TR8/97 - Landfill Gas Hazard Assessment Guidance Note		Y		✓
14.12.2	-	<u>Safety Measures – Electrical Equipment</u> Any electrical equipment, such as motors and extension cords, should be intrinsically safe.	Construction Stage	Contractor	EPD/TR8/97 - Landfill Gas Hazard Assessment Guidance Note		Y		✓
14.12.2	-	<u>Safety Measures – Piping</u> During piping assembly or conduiting construction, all valves/seals should be closed immediately after installation. As construction progresses, all valves/seals should be closed as installed to prevent the migration of gases through the pipeline/conduit. All piping/conduiting should be capped at the end of each working day.	Services & utilities / Construction Stage	Contractor	EPD/TR8/97 - Landfill Gas Hazard Assessment Guidance Note		Y		✓
14.12.2	-	<u>Safety Measures – Fire Safety</u> Adequate fire safety equipments should be provided on site. Workers and visitors should be notified of the potential fire hazards. Safety notices should be	Construction Stage	Contractor	EPD/TR8/97 - Landfill Gas Hazard Assessment		Y		✓

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TUEN MUN – CHECK LAP KOK LINK – NORTHERN CONNECTION TOLL PLAZA AND ASSOCIATED WORKS
 ENVIRONMENTAL MITIGATION AND ENHANCEMENT MEASURE IMPLEMENTATION SCHEDULE

		posted around the site warning the anger and potential hazards.			Guidance Note				
14.12.1	-	<u>Safety Measures – Confined Spaces</u> Precautionary measures should include ensuring that staff members are aware of the potential hazards of working in confined spaces, and that appropriate monitoring procedures are in place to prevent hazards in confined spaces.	Confined space / Construction Stage	Contractor	EPD/TR8/97 - Landfill Gas Hazard Assessment Guidance Note		Y		✓
14.12.1	-	<u>Monitoring</u> Periodically during ground-works within the Consultation Zone, the works area should be monitored for methane, carbon dioxide and oxygen using appropriately calibrated portable gas detection equipment. Depending on the results of the measurements, actions required will vary. As a minimum these should encompass those actions specified in Table 14.8 of the EIA Report or Table 14.1 of the EM&A Manual.	Construction Stage	Contractor	EPD/TR8/97 - Landfill Gas Hazard Assessment Guidance Note		Y		✓

Landscape and Visual

EIA reference	EM&A Manual reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
10.9	7.6	Existing trees on boundary of the Project Area shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas. (Tree protection measures will be detailed at Tree Removal Application stage) (CM1)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Trees unavoidably affected by the works shall be transplanted where practical. Trees will be	All areas/detailed design/ during	Design Consultant/	TMEIA	Y	Y		NA

CONTRACT NO. HY/2013/12

**TUEN MUN – CHECK LAP KOK LINK – NORTHERN CONNECTION TOLL PLAZA AND ASSOCIATED WORKS
ENVIRONMENTAL MITIGATION AND ENHANCEMENT MEASURE IMPLEMENTATION SCHEDULE**

		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)	construction	Contractor					
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		NA
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		✓
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		<>
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		✓
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		✓
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		✓
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		NA
10.9	7.6	Re-vegetation of affected woodland/shrubland with	All areas/detailed design/ during Construction	Design	TMEIA	Y	Y	Y	N/A

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		native species (OM1)	during Construction/ construction	post	Consultant/ Contractor					
10.9	7.6	Tall buffer screen tree / shrub / climber planting where appropriate should be incorporated to soften hard engineering structures and facilities (OM2)	All areas/detailed design/ during Construction/ construction	post	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
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 minimize unnecessary light spill (OM3)	All areas/detailed design/ during Construction/ construction	post	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
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/ construction	post	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
10.9	7.6	Aesthetically pleasing design (visually unobtrusive and non-reflective) as regard to the form, material and finishes shall be incorporated to all buildings, engineering structures and associated infrastructure facilities (OM5)	All areas/detailed design/ during Construction/ construction	post	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (OM6)	All areas/detailed design/ during Construction/ construction	post	Design Consultant/ Contractor	TMEIA	Y	Y	Y	✓
Waste										
EIA reference	EM&A Manual reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status	
						D	C	O		
12.6		The Contractor shall identify a coordinator for the management of waste.	Contract mobilisation	Contractor	TMEIA		Y		✓	
12.6		The Contractor shall prepare and implement a Waste Management Plan which specifies procedures such	Contract mobilisation	Contractor	TMEIA, Works Branch		Y		✓	

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		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.			Technical Circular No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material				
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 minimize the extent of cutting.	All areas / throughout construction period	Contractor	TMEIA		Y		✓

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12.6	8.1	Inert C&D materials from the toll plaza cut slopes shall be reused for construction of the raised platform for the toll plaza where possible.	Toll Plaza / toll plaza 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		✓
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	All areas / throughout construction period	Contractor	TMEIA		Y		✓

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		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.							
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: <ul style="list-style-type: none"> • suitable for the substance to be held, resistant to corrosion, maintained in good conditions and securely closed; • Having a capacity of <450L unless the specifications have been approved by the EPD; and • Displaying a label in English and Chinese according to the instructions prescribed in Schedule 2 of the Regulations. • Clearly labelled and used solely for the storage of chemical wastes; • Enclosed with at least 3 sides; • 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; • Adequate ventilation; • Sufficiently covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and • Incompatible materials are adequately separated. 	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Waste oils, chemicals or solvents shall not be	All areas / throughout	Contractor	TMEIA		Y		✓

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		disposed of to drain,	construction period						
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		✓
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	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling.	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, aluminum 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		✓
Water Quality									
EIA reference	EM&A Manual reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	

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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 onsite 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	All areas/ throughout construction period	Contractor	TM-EIAO		Y		◇

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		materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers.							
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	-	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		✓
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		◇

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6.10	Section 5	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		✓
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Remarks:

- ✓ Compliance of Mitigation Measures
- <> Compliance of Mitigation Measures but need improvement.
- × Non-compliance of Mitigation Measures
- ▲ Non-compliance of Mitigation Measures but rectified by Contractor
- △ Deficiency of Mitigation Measures but rectified by Contractor
- N/A Not Applicable in Reporting Period
- # Amended against condition 3.13 of EP-354/2009/C

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