

AUES JOB No.: TCS00715/14



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

4th QUARTERLY ENVIRONMENTAL MONITORING &
AUDIT SUMMARY REPORT –
(August to October 2015)

PREPARED FOR

CRBC AND KADEN JOINT VENTURE

Quality Index

Date	Reference No.	Prepared By	Certified By
26 November 2015	TCS00715/14/600/R0150v1	 Ben Tam (Environmental Consultant)	 T.W. Tam (Environmental Team Leader)

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Ref.: HYDHZMBEEM00_0_3628L.15

27 November 2015

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

By Fax (2293 6300) and By Post

Attention: Mr. Roger Man

Dear Roger,

**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
The Fourth Quarterly EM&A Report (August to October 2015)**

Reference is made to the Quarterly Environmental Monitoring and Audit Report (August to October 2015) (AUES reference: TCS00715/14/600/R0150v2 dated 26 November 2015) certified by the ET Leader and provided to us via e-mail on 26 November 2015.

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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AUES – Mr. T. W. Tam (By Fax: 2959 6079)
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EXECUTIVE SUMMARY

ES.01. This is the 4th Quarterly EM&A Summary 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 August to 31 October 2015** (hereinafter “Reporting Period”).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.02. Environmental monitoring activities under the EM&A programme in the Reporting Period are summarized in the following table.

Environmental Aspect	Environmental Monitoring Parameters / Inspection	Total Occasions
Air Quality	1-hour TSP	450
	24-hour TSP	150
Cultural heritage inspection	Grave G1	13
Landfill Gas Monitoring	Oxygen; Methane & Carbon Dioxide	75 days
Landscape & Visual	Landscape & Visual Monitoring	13
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	13

BREACHES OF ACTION/LIMIT LEVELS

ES.03. In the Reporting Period, no exceedance was recorded for the measured parameter under the Contract. The summary of breach of monitoring performance is shown below.

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

ES.04. In the Reporting Period, two (2) environmental complaints were received on 3 August and 2 September 2015 regarding the soil/ muddy water caused by frequent dump trucks in Lung Mun Road and River Trade Terminal and milky water discharged from the drainage outlet near the Butterfly Beach, Tuen Mun. Investigation for the complaints has been conducted by the ET and the corresponding investigation reports for the complaint have been submitted to relevant parties.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.05. No environmental summons or successful prosecutions were recorded in the Reporting Period.

REPORTING CHANGES

ES.06. No reporting changes were made in the Reporting Period.

FUTURE KEY ISSUES

ES.07. During dry season, air quality mitigation measures such as watering of site area for 12 times per day and covering of exposed slopes should be fully implemented to reduce construction dust impact as recommended in the EMIS.

ES.08. Moreover, muddy water or other water pollutants from site surface runoff into the public areas will be key environment issue. Special attention should be paid on the water quality mitigation measures to prevent surface runoff flow to public area.

ES.09. It was reminded that good housekeeping practice should be maintained. Mosquito control measures should be properly implemented to prevent mosquito breeding on site especially after rain.

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1. INTRODUCTION

1.1. PROJECT 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). The TM-CLK Link Project is a designated project under Environmental Permit number EP-354/2009D issued on 13 March 2015. The layout Plan of the Project and the Contract are showed in [Appendix A](#) and [B](#) respectively.
- 1.1.2. The construction works of the Contract mainly include:-
- construction of an approximately 5.4 hectares toll plaza and an associated footbridge;
 - 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;
 - site formation for the construction of the toll plaza, including associated slope works and natural terrain hazard mitigation measures;
 - modification and realignment of the existing Lung Mun Road and Lung Fu Road; and
 - associated waterworks, drainage, sewerage and landscaping works, etc..
- 1.1.3. Action-United Environmental Services & Consulting has been commissioned as an Independent ET to implement the relevant EM&A program in accordance with the approved EM&A Manual, as well as the associated duties.
- 1.1.4. This is the 4th Quarterly EM&A Summary Report covering the period from **1 August to 31 October 2015**.

1.2 REPORT STRUCTURE

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

- Section 1 Introduction*
- Section 2 Contract Organization and Construction Progress*
- Section 3 Summary of Impact Monitoring Requirements*
- 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 Site Inspections*
- Section 11 Environmental Complaints and Non-Compliance*
- Section 12 Implementation Status of Mitigation Measures*
- Section 13 Conclusions and Recommendations*

2 CONTRACT ORGANIZATION AND CONSTRUCTION PROGRESS

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 is enclosed in [Appendix D](#).

August 2015

- Instrumentation and Monitoring
- Site Formation – Retaining Structure for 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 Upgrading Works
- Toll Plaza Decking TD1, TD2
- Toll Plaza Footbridge-Section 1
- Retaining Structure RW_B-Section 1, RW_A
- Bridge G1, G2, Bridge H1
- Sewer Culvert 1 (TBM) – Stage 4, Culvert 2 & Culvert 3 and Existing Box Culvert
- Natural Terrain Hazard Mitigation Measures
- Vehicular Underpass TN-01
- Road and Drainage Works for Lung Fu Road Roundabout

September 2015

- Instrumentation and Monitoring
- Site Formation – Retaining Structure for 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 Upgrading Works
- Toll Plaza Decking TD1, TD2
- Toll Plaza Footbridge-Section 1
- Retaining Structure RW_B-Section 1, RW_A
- Bridge G1, G2, Bridge H1
- Sewer Culvert 1 (TBM) – Stage 4, Culvert 2 & Culvert 3 and Existing Box Culvert
- Natural Terrain Hazard Mitigation Measures
- Vehicular Underpass TN-01
- Road and Drainage Works for Lung Fu Road Roundabout

October 2015

- Dismantling of HY/2012/04 Project Office at WA6
- Instrumentation and Monitoring
- Site Formation – Retaining Structure for 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 Upgrading Works
- Toll Plaza Decking TD1, TD2
- Toll Plaza Footbridge-Section 1
- Retaining Structure RW_B-Section 1, RW_A
- Bridge G1, G2, Bridge H1
- Sewer Culvert 1 (TBM) – Stage 4, Culvert 2 & Culvert 3 and Existing Box Culvert
- Natural Terrain Hazard Mitigation Measures
- Vehicular Underpass TN-01
- Road and Drainage Works for Lung Fu Road Roundabout

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 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 for the Project of each contracts are presented in **Table 2-1**.

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

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	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	21-07-2014	7020460	01-08-2014	N/A
5	CNP for Multiple Task	24-04-2015	GW-RW0225-15	13-05-2015	04-11-2015
6	CNP for MH5	05-05-2015	GW-RW0226-15	18-05-2015	17-11-2015
7	Permission to Transplant Pitcher Plant	15-6-2015	(30) in AF CON 11/13 pt.4	23-6-2015	22-12-2015
8	Variation of Effluent Discharge License	19-08-2015	Pending for approval		

3 SUMMARY OF IMPACT MONITORING REQUIREMENTS

3.1 GENERAL

3.1.1 The major construction activities under the Contract are land-based and no marine work will be involved. In accordance with the Project EM&A Manual requirements, the environmental aspects under the Contract shall be included air quality, ecological, cultural heritage, landscape and visual, landfill gas and site inspection during construction period. In addition, 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

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

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

3.3 MONITORING LOCATIONS

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 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

3.4.1 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.

3.4.2 The air quality monitoring requirements for the Contract is summarized 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	<u>Northern Connection</u> During excavation works for launching shaft, excavation work for Cut

Condition	Monitoring Parameter	Monitoring Location	Frequency	Monitoring Requirement
	24-hour TSP	ASR1, ASR5, AQMS1, ASR6, ASR10	Daily every three days	and Cover Tunnel and Cut and Cover Tunnel Construction <u>Toll Plaza</u> During excavation, slope works, construction of road and superstructures and wind erosion from open sites and stockpiling areas <u>Tunnel Buildings</u> During excavation, foundation works, construction of superstructures and wind erosion from open sites and stockpiling areas

3.5 MONITORING EQUIPMENT

- 3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*.
- 3.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory. A high volume sampler in compliance with the following specifications shall be used for carrying out the 1-hr and 24-hr TSP monitoring:
- (i) 0.6-1.7 m³/min (20-60 SCFM) adjustable flow range;
 - (ii) equipped with a timing/control device with +/- 5 minutes accuracy for 24 hours operation;
 - (iii) installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;
 - (iv) capable of providing a minimum exposed area of 406 cm² (63 in²);
 - (v) flow control accuracy: +/- 2.5% deviation over 24-hr sampling period;
 - (vi) equipped with a shelter to protect the filter and sampler;
 - (vii) incorporated with an electronic mass flow rate controller or other equivalent devices;
 - (viii) equipped with a flow recorder for continuous monitoring;
 - (ix) provided with a peaked roof inlet;
 - (x) equipped with a manometer;
 - (xi) able to hold and seal the filter paper to the sampler housing in a horizontal position;
 - (xii) easy to change the filter; and
 - (xiii) capable of operating continuously for 24-hr period.
- 3.5.3 Calibration of dust monitoring equipment shall be conducted by the ET upon installation and in bi-monthly intervals during construction phase. The transfer standard shall be traceable to the internationally recognized primary standard and be calibrated annually. The calibration data shall be properly documented for future reference by concerned parties, such as the IEC. All the data shall be converted into standard temperature and pressure condition.
- 3.5.4 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.
- 3.5.5 If the ET proposes to use a direct reading dust meter to measure 1-hr TSP levels on an ad hoc basis, he shall submit sufficient information to the IEC to prove that the instrument is capable of achieving a comparable result as that the High Volume Sampler (HVS) and may be used for the

1-hr sampling. The instrument should also be calibrated regularly and the 1-hr sampling shall be checked periodically by the HVS to check the validity and accuracy of the results measured by the direct reading method.

- 3.5.6 According to the Project EM&A Manual, wind data monitoring equipment shall also be provided and set up for logging wind speed and wind direction near the dust monitoring locations. The equipment installation location shall be proposed by the ET and agreed with the IEC. For installation and operation of wind data monitoring equipment, the following points shall be observed:
- (i) the wind sensors should be installed on masts at an elevated level 10 m above ground so that they are clear of obstructions or turbulence caused by the buildings;
 - (ii) the wind data should be captured by a data logger to be down-loaded for processing at least once a month;
 - (iii) the wind data monitoring equipment should be re-calibrated at least once every six months; and
 - (iv) wind direction should be divided into 16 sectors of 22.5 degrees each.

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

- 3.6.1 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 Action and Limit Levels for impact dust monitoring are shown in *Tables 3-3*.

Table 3-3 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

- 3.6.2 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*.

3.7 OTHER ENVIRONMENTAL ASPECTS

Noise

- 3.7.1 The TM-CLKL EIA study stated that no existing noise sensitive receiver (NSR) was identified within the Study Area at Tuen Mun. Therefore, no noise monitoring is required for the construction phase of the Contract.
- 3.7.2 Regular site inspections and audits will be carried out during the construction phase in order to confirm the construction works under the Contract comply with the regulatory noise requirements.

Water Quality

- 3.7.3 No marine works will be undertaken under the Contract. Therefore, no water quality monitoring is required for the construction phase of the Contract.

Ecology

- 3.7.4 No marine works will be undertaken under the Contract and generated marine ecological impact, no dolphin monitoring is required for the construction phase of the Contract.

- 3.7.5 During construction phase, the ET will perform Pitcher Plants inspection at least once every week to report the growth condition and protection measures.

Landscape and Visual

- 3.7.6 Measures 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 in accordance with the EM&A Manual.

Cultural Heritage

- 3.7.7 Grave G1 as a heritage resource 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.

Landfill Gas

- 3.7.8 During EIA study, landfill gas hazards are likely to be generated from the Pillar Point Valley (PPV) Landfill. Landfill gas monitoring is recommended during construction of the Contract to ensure the works area is free of landfill gas before the worker entered the concerned area.

4 AIR QUALITY MONITORING

4.1 GENERAL

4.1.1 The air quality impact monitoring and enhanced Total Suspended Particulates (TSP) level monitoring at five proposed locations are currently carried out 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. The Contract is not required to conduct its own dust monitoring exercise until the Contract HY/2012/08 ends.

4.2 SUMMARY OF MONITORING RESULTS

4.2.1 In the Reporting Period, 1- hour and 24-hour TSP monitoring at the five proposed locations are continued to perform by the ET of Contract HY/2012/08. Therefore, no air quality monitoring was conducted by the ET of Contract HY/2013/12. Details information of air quality monitoring results could be referred to the Monthly EM&A Reports of the Contract HY /2012 /08 (*August 2015, September 2015 and October 2015*).

4.3 ACTION AND LIMIT (A/L) LEVELS EXCEEDANCE

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 in the Reporting Period 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.

5.2 PITCHER PLANTS INSPECTION

5.2.1 In the Reporting Period, inspections for implementation status of mitigation measures for the Pitcher Plants were carried out by the ET on **4th, 11th, 18th, 25th August 2015 and 1st, 8th, 15th, 22nd, 29th September 2015 and 6th, 14th, 20th and 27th October 2015**. Trial transplantation of pitcher plant from the nursery site to final receptor site was carried out on 15 April 2015 and transplantation of remaining 95% was carried out in **9th and 10th September 2015**.

5.2.2 During weekly site inspection at the nursery zone before the transplantation to the receptor site, the transplanted Pitcher Plants in the nursery zone were observed in fair to poor condition. No construction activities were conducted nearby the nursery zone and the Pitcher Plants were protected properly. Moreover, no repair or maintenance is required for the protected facilities such as scaffold structure and chain link fence.

5.2.3 All the pitcher plant had been transplanted to the final receptor site which is located near Zone 9 and Zone 10. Random checking was performed for the protected areas Zones 8, 9 and 10 during the weekly site inspections. The Pitcher Plants at the protected areas was protected properly and the growth also was in fair to poor condition. Moreover, no construction activities were carried out nearby the protected areas of Pitcher Plants. The condition of chain link fence is good and no repair or maintenance is required.

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 to prevent any possible damage to the grave and to ensure the 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 the Reporting Period, site inspection for the Grave G1 was undertaken on 4th, 11th, 18th, 25th August 2015 and 1st, 8th, 15th, 22nd, 29th September 2015 and 6th, 14th, 20th and 27th October 2015. During site inspection, buffer zone between the working area and the Grave was maintained and no construction material or equipment was stored nearby the Grave.

6.2.2 Mitigation measures undertaken by the Contractor has fully implemented the EM&A Manual requirements.

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 the Reporting Period, site inspection for landscape and visual mitigation measures was undertaken by the Registered Landscape Architect on **7th, 14th, 21st and 28th August 2015** and **4th, 11th, 18th, 25th September 2015** and **2nd, 9th, 16th, 23rd and 30th October 2015**.

7.2.2 Most of the landscape works such as planting was not yet commenced. The detailed inspection checklists can be referred to the Monthly EM&A Reports (August 2015, September 2015 and October 2015) 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.

8.2 LANDFILL GAS MONITORING RESULT

8.2.1 In the Reporting Period, landfill gas monitoring was conducted at the construction of Retaining Wall B and Retaining Wall F and the locations are illustrated in [Appendix E](#). A BIOGAS 5000 gas analyser was used for the landfill gas monitoring.

8.2.2 There were total 75 workings days monitoring were carried by the Safety Officer or an approved and qualified persons in this reporting period. **Table 8-1** is summarized landfill gas measurement results. Moreover, graphical plot are attached in [Appendix G](#).

Table 8-1 Summary of Landfill Gas Measurement Results in Reporting Period

Landfill Gas Parameter	Action Level	Limit Level	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)	0%	0.2%	0%	0.2%
Oxygen	<19%	<18%	21.0%	21.1%	21.0%	21.1%
Carbon Dioxide	>0.5%	>1.5%	0%	0.2%	0%	0.2%

- 8.2.3 The measurement results shown that slightly methane concentration was detected and all oxygen concentration were over 21.0% 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.

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 Whenever possible, materials were reused on-site as far as practicable. The quantities of waste for disposal in the Reporting Period are summarized in *Tables 9-1* and *9-2* and the Waste Flow Table is presented in *Appendix H*.

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

Type of Waste	Quantity			Disposal Location
	Aug 15	Sep 15	Oct 15	
Reused in this Project (Inert) (in '000 m ³)	21.142	12.275	12.486	-
Reused in other Projects (Inert) (in '000 m ³)	0	2.185	9.752	<ul style="list-style-type: none"> • Lam Tei Quarry • Eco Park K.wah Recycle Facilities • Lung Kwu Tan Tailor Recycled Aggregates • Laintang BCP • TM-CLKL C2
Disposal as Public Fill (Inert) (in '000 m ³)	6.293	6.723	3.333	Tuen Mum Area 38

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

Type of Waste	Quantity			Disposal Location
	Aug 15	Sep 15	Oct 15	
Recycled Metal (in '000kg)	0	0	0	-
Recycled Paper / Cardboard Packing (in '000kg)	0	0	0	-
Recycled Plastic (in '000kg)	0	0	0	-
Chemical Wastes (in '000kg)	0	0	0	-
General Refuses (in '000m ³)	0.08	0.013	0.038	WENT

9.2.3 To control the site performance on waste management, the Contractor shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge license and the chemical waste producer registration. The Contractor is also reminded to implement the recommended environmental mitigation measures according to the Environmental Monitoring and Audit Manual.

10 SITE INSPECTIONS**10.1 REQUIREMENTS**

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

10.1.2 During the Reporting Period, **13** events of the joint site inspections were undertaken to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in *Tables 10-1 and 10-2*.

Table 10-1 Site Observations for the Contract for the Reporting Period

Date	Findings / Deficiencies	Follow-Up Status
4 August 2015	<ul style="list-style-type: none"> Housekeeping should be improved at the works area near fire station. Also, sand bags and de-silting facilities should be provided to divert and treat the surface runoff before discharge from site. It was reminded that all discharge points should be maintained properly to prevent any discharge of turbid water. It was reminded that water spraying should be increased for dusty construction activities to reduce dust impact. 	<ul style="list-style-type: none"> Housekeeping at the concerned works area was improved. Not required for reminder. Not required for reminder.
11 August 2015	<ul style="list-style-type: none"> Sand bags should be provided to prevent overflow of cumulated stagnant water into the storm water drainage. Free standing chemical containers without drip tray was observed. (Central Devider) It was reminded that earth bund should be provided to divert the surface runoff to the de-silting facilities. Also, the de-silting facilities should be installed ASAP. (Works area near fire station) 	<ul style="list-style-type: none"> The cumulated stagnant water was cleared. Free standing chemical containers without drip tray were removed. Not required for reminder.
18 August 2015	<ul style="list-style-type: none"> Discharge of turbid water at the discharge point near site office was observed. The Contractor should improve the de-silting facilities and ensure the discharge water is complied with discharge license requirement. Sediment cumulated inside the storm water drainage near gate 2 was observed, the Contractor was reminded to clear the sediment to avoid flushing from site during rainstorm. 	<ul style="list-style-type: none"> No turbidity water discharged from the de-silting facilities was observed. Not required for reminder.
25 August 2015	<ul style="list-style-type: none"> Free standing chemical containers without drip tray was observed. (Retaining Wall B) It was reminded that dust mitigation measures should be provided for the temporary stock pile area to reduce dust impact. 	<ul style="list-style-type: none"> Drip tray was provided for the oil drums. Not required for reminder.

Date	Findings / Deficiencies	Follow-Up Status
	<ul style="list-style-type: none"> It was reminded that Sediment cumulated inside the discharge point should be cleaned more frequency. 	<ul style="list-style-type: none"> Not required for reminder.
1 September 2015	<ul style="list-style-type: none"> Earth bund or sand bags should be provided for the manhole to prevent loose material discharge into the storm water system. Also, the Contractor was reminded to replace broken sand bags to maintain the earth bund functional. (Central Devider) 	<ul style="list-style-type: none"> Sediment cumulated inside the gully was cleared and geotextile was provided to prevent loose material discharged into the manhole.
8 September 2015	<ul style="list-style-type: none"> Sediment cumulated inside the discharge point was observed. The contractor should maintain the discharge system properly to prevent discharge of muddy water. Chemical container without drip tray was observed. (Retaining Wall B) Oil layer was observed cumulated inside the wheel washing bay. The contractor should clean up immediately to prevent contamination. The contractor is recommended to undertake daily checking at the discharge point to make sure all the discharge water comply with the discharge license requirement. 	<ul style="list-style-type: none"> Earth bund was provided for the casgate to prevent turbid water discharge. Free standing chemical without drip tray was removed. Oil layer inside the wheel washing bay was cleared. Not required for reminder.
15 September 2015	<ul style="list-style-type: none"> Oil drum without drip tray was observed. Discharge system at stream B should be improved. Discharge water after treatment should not contaminated by exposed soil. It was reminded that water spraying for the haul road and excavating / breaking activities to minimize dust generation. 	<ul style="list-style-type: none"> Oil drum without drip tray was removed. Discharge water at Stream B was visual clear, sand bags and geotextile was installed at the downstream. Not required for reminder.
22 September 2015	<ul style="list-style-type: none"> Drainage system at stream B should be improved. Discharge water after treatment should not contaminated by exposed soil. Also, sediment accumulated inside the stream should cleaned frequently. 	<ul style="list-style-type: none"> Discharge water at Stream B was visual clear, sand bags and geotextile was installed at the downstream.
29 September 2015	<ul style="list-style-type: none"> Oil drum without drip tray was observed near east portal. It was reminded that tree protection zone should be installed and improved for retaining trees area near east portal. 	<ul style="list-style-type: none"> Oil drum without drip tray at east portal was removed. Not required for reminder.

Date	Findings / Deficiencies	Follow-Up Status
6 October 2015	<ul style="list-style-type: none"> Bypass stream water contaminated by exposed surface was observed. Tarpaulin sheets should be provided to prevent the storm water contact with the exposed soil. (East Portal) Stagnant water cumulated inside the drip tray was observed after the rainstorm. The contractor should clean the water to maintain the drip tray is functional. (Near Retaining Wall B) Turbid water discharged from Stream A & B was observed. All discharge from site should comply with the discharge license requirement. (Stream A and Stream B) 	<ul style="list-style-type: none"> Tarpaulin was provided to prevent storm water contaminated by exposed surface. Stagnant water cumulated inside the drip tray was cleared Sand bags were provided to prevent muddy water discharged into the outlet before de-silting. (Stream A) Bypass pipe and tarpaulin sheet was installed and no turbid water discharge was observed. (Stream B)
14 October 2015	<ul style="list-style-type: none"> Stagnant water cumulated inside the drip tray near contractor's office was observed. As a reminder, water spraying should be applied for the haul road during the dry season and under the contract requirement water spraying should at least 12 times per day. 	<ul style="list-style-type: none"> Stagnant water cumulated inside the drip tray was removed. Not required for reminder.
20 October 2015	<ul style="list-style-type: none"> Stagnant water cumulated on site was observed near Retaining Wall B, the contractor should remove the stagnant water to prevent mosquito breeding. The Contractor was reminded that proper label should be provided for the chemical containers storage on site. 	<ul style="list-style-type: none"> Stagnant water cumulated near retaining wall B was removed. Not required for reminder.
27 October 2015	<ul style="list-style-type: none"> No adverse environmental issue was observed. 	NA

Table 10-2 Summary of Reminders/Observations of Site Inspection

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
August 2015	4 th , 11 th , 18 th and 25 th August 2015	11	Completed
September 2015	1 st , 8 th , 15 th , 22 nd and 29 th September 2015	11	Completed
October 2015	6 th , 14 th , 20 th and 27 th October 2015	7	Completed

10.1.3 In the Reporting Period, no non-compliance was recorded, however, 29 observations/ reminders were recorded during the site inspections. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

Inspection Checklist for Vulnerable to Contaminated Water Discharge

10.1.4 Follow to the complain about discharge of milky water to Bufferfully Beach on 28 July 2015. The

Contractor proposed to carry out bi-weekly inspections (weekly Safety and Environmental inspections plus weekly inspections by inspectorate team) for site areas that are vulnerable to incidental contaminated water discharge, such as wastewater treatment facilities and associated discharge points, drainage system inlets and outfalls. The inspection for vulnerable to contaminated water discharge was conducted by the Contractor on 28 August 2015. As requested by the EPD, the associated inspection checklist were presented in the Monthly EM&A Report – August 2015.

- 10.1.5 Following to the complain 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. The inspection for vulnerable to contaminated water discharge was conducted by the Contractor from 9 September 2015. As requested by the EPD, the associated inspection checklist were presented in the Monthly EM&A Report – September 2015 and October 2015.
- 10.1.6 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 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE**11.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION**

11.1.1 For the Contract, no summons and prosecution were received in the Reporting Period. Moreover, no exceedances of the environmental performance limit (Action and Limit Level) were recorded. However, two (2) environmental complaints were received on 3 August and 2 September 2015 regarding the soil/ muddy water caused by frequent dump trucks in Lung Mun Road and River Trade Terminal and milky water discharged from the drainage outlet near the Butterfly Beach, Tuen Mun.

11.1.2 Follow up actions have been undertaken by the Contractor to resolve the deficiencies. Investigation for the complaints has been conducted by the ET and the corresponding investigation reports for the complaint have been submitted to relevant parties and presented in the Monthly EM&A Report (August 2015 and September 2015). 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 / Parameter	Environmental Performance	Event Exceedance		
			Reporting Period	Previous Periods	Cumulative
1 August 2015 – 31 October 2015	Air Quality - 1-hr TSP	Action Level	0	4	4
		Limit Level	0	0	0
	Air Quality - 24-hr TSP	Action Level	0	0	0
		Limit Level	0	0	0

Table 11-2 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
23 October 2014 – 31 July 2015	1	1	Water
1 August 2015 – 31 October 2015	2	3	Water (2) Dust (1)

Table 11-3 Statistical Summary of Environmental Summons

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
23 October 2014 – 31 July 2015	0	0	NA
1 August 2015 – 31 October 2015	0	0	NA

Table 11-4 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
23 October 2014 – 31 July 2015	0	0	NA
1 August 2015 – 31 October 2015	0	0	NA

12 IMPLEMENTATION STATUS OF MITIGATION MEASURES

12.1 GENERAL REQUIREMENTS

12.1.1 The environmental mitigation measures that recommended in the Environmental Mitigation and Enhancement Measures Implementation Schedule (EMIS) for in the Project EM&A Manual covered the issues of air quality, cultural heritage, ecology, landfill gas hazard, landscape & visual, noise, water and waste. The updated EMIS for the Contract is shown in [Appendix I](#).

12.1.2 The Contractor shall implement the required environmental mitigation measures according to the EM&A Manual as subject to the site condition. The environmental mitigation measures implemented by the Contract in this Reporting Period are summarized in [Table 12-1](#) and [Appendix I](#).

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 4th Quarterly EM&A report presenting the monitoring results and inspection findings for the Reporting Period from **1 August 2015 to 31 October 2015**.
- 13.1.2 No air quality monitoring including 1-hour and 24-hour TSP exceedance was recorded in the Reporting Period. Although air quality monitoring result complied with the performance criteria, the Contractor was reminded to fully implement the dust control measures.
- 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 if the existing condition compliance with the intended aims of the mitigation measures. Most of the landscape works such as planting was not yet commenced.
- 13.1.5 Site inspection was performed for the transplanted Pitcher Plants in the nursery site and protected Zones 8 to 10. The transplanted Pitcher Plant in nursery site was protected by the scaffold structure which surrounded by chain link fencing and the protected Pitcher Plants in Zones 8 to 10 were fenced off by chain link fencing. The condition of the transplanted pitcher plant was in fair to poor condition. No construction activities were found to conduct nearby the nursery site and protection zones.
- 13.1.6 Trial transplantation of pitcher plant from the nursery site to final receptor site was carried out on 15 April 2015 and a total of 5% of pitcher plant was transplanted. Transplantation of remaining 95% was carried out in **9th and 10th September 2015**.
- 13.1.7 Landfill gas monitoring was conducted at the construction of Retaining Wall B and Retaining Wall F by the Safety Officer. The monitoring results shown no exceedances were triggered.
- 13.1.8 In the Reporting Period, two (2) environmental complaints were received on 3 August and 2 September 2015 regarding the soil/ muddy water caused by frequent dump trucks in Lung Mun Road and River Trade Terminal and milky water discharged from the drainage outlet near the Butterfly Beach, Tuen Mun. Investigation for the complaints has been conducted by the ET and the corresponding investigation reports for the complaint have been submitted to relevant parties.
- 13.1.9 No notifications of summons, or successful prosecution were received by the Contractor during the Reporting Period.
- 13.1.10 During the Reporting Period, **13** events of the joint site inspections were undertaken to evaluate the site environmental performance. No adverse environmental impacts were observed during the weekly site inspection and environmental audit of the Reporting Period, indicating the implemented mitigation measures for air quality, construction noise and water quality were effective. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.
- 13.1.11 For cultural heritage, the buffer zone between the working area and the Grave was observed and no construction material or equipment was stored nearby.
- 13.1.12 No documented complaint, notification of summons or successful prosecution is received by the Contract.

13.2 RECOMMENDATIONS

- 13.2.1 During dry season, air quality mitigation measures such as watering of site area for 12 times per day and covering of exposed slopes should be fully implemented to reduce construction dust

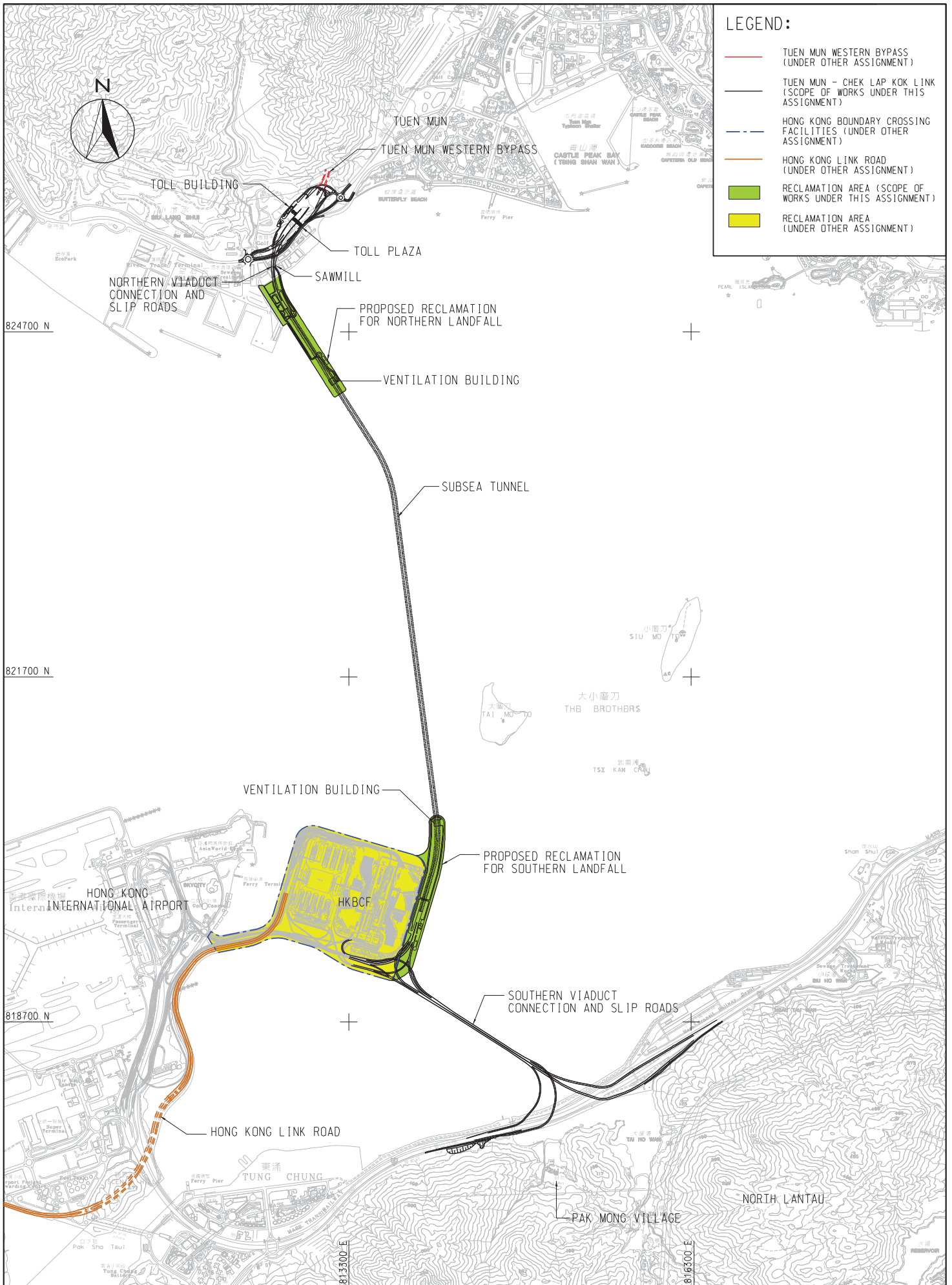
impact as recommended in the EMIS.

- 13.2.2 Moreover, muddy water or other water pollutants from site surface runoff into the public areas will be key environment issue. Special attention should be paid on the water quality mitigation measures to prevent surface runoff flow to public area.
- 13.2.3 Moreover, good practice for daily housekeeping is reminded. In addition, clean-up of the waste skips and wastewater treatment system should be increased to ensure these facilities functional and effective.
- 13.2.4 Stagnant water should be removed as soon as possible after rain to prevent mosquito breeding on site.

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Appendix A

Layout plan of the Project



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

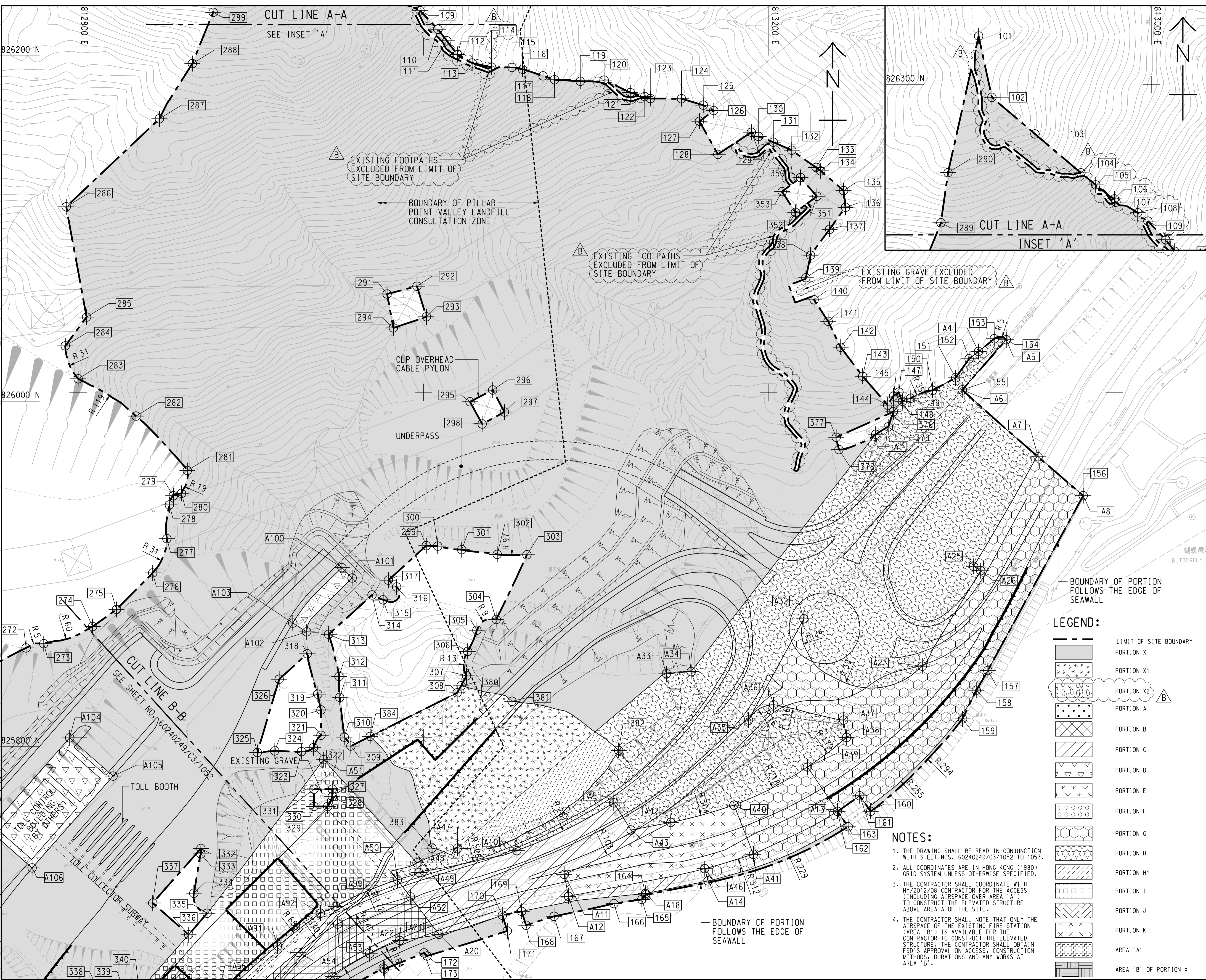
AGREEMENT NO. CE 52/2007(HY)
 TUEN MUN - CHEK LAP KOK LINK - INVESTIGATION
 GENERAL LAYOUT OF TM-CLKL

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 2014/03/19 PATH: P:\Projects\60240249\DRAWING\CONTRACT\C3\1005C3_05E1.dgn



- 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'.

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

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
港務處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

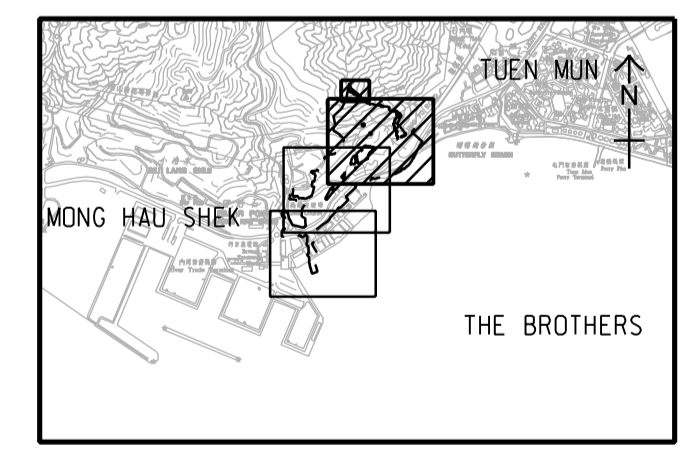
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B	MAR. 14	TENDER ADDENDUM NO. 2	CWN
A	FEB. 14	TENDER ADDENDUM NO. 1	CWN
-	JAN. 14	TENDER DRAWING	CWN

STATUS
階段

SCALE
比例

DIMENSION UNIT
尺寸單位

A1:1:1000	METRES
KEY PLAN 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

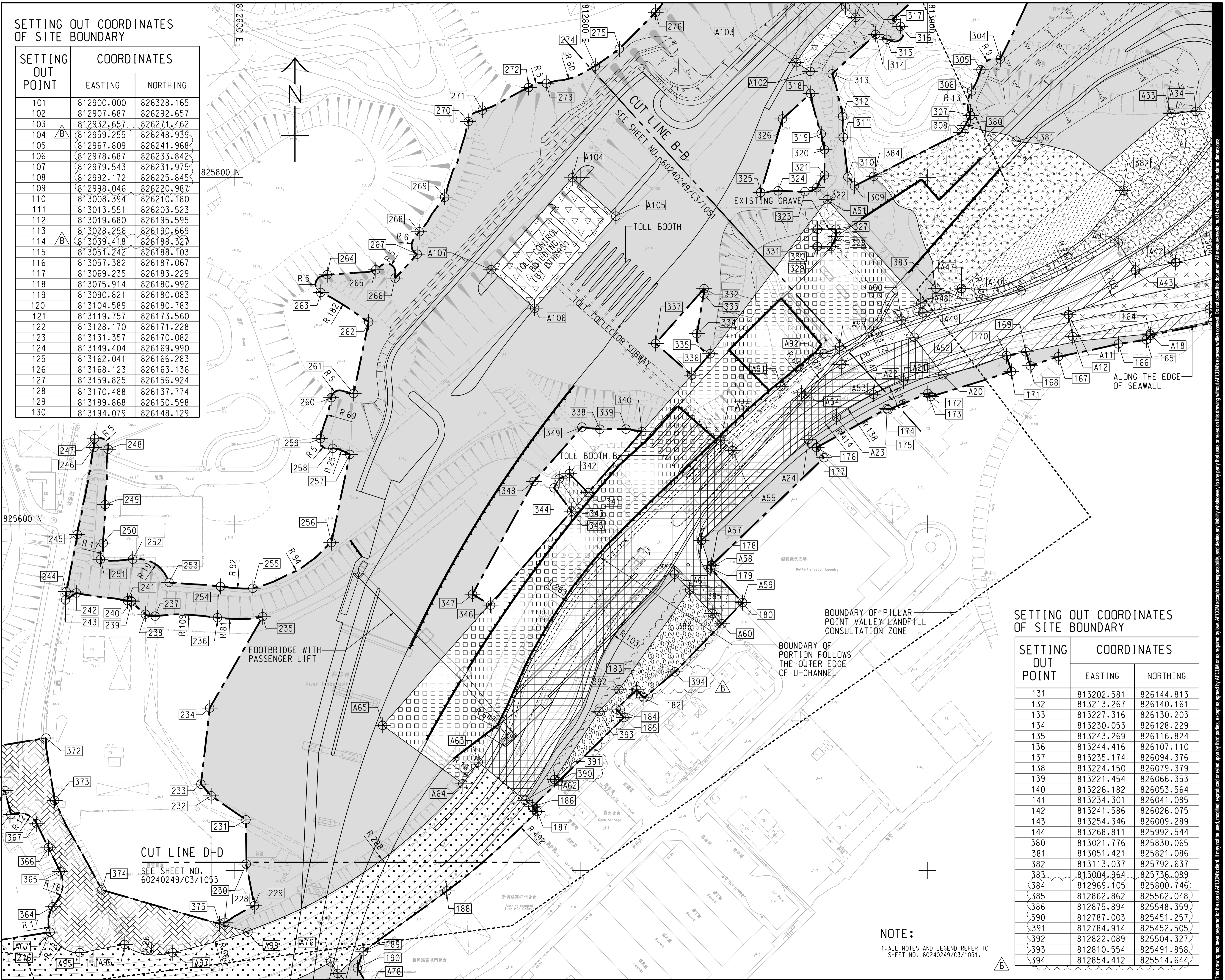
SHEET NUMBER
圖紙編號
60240249/C3/1051B

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

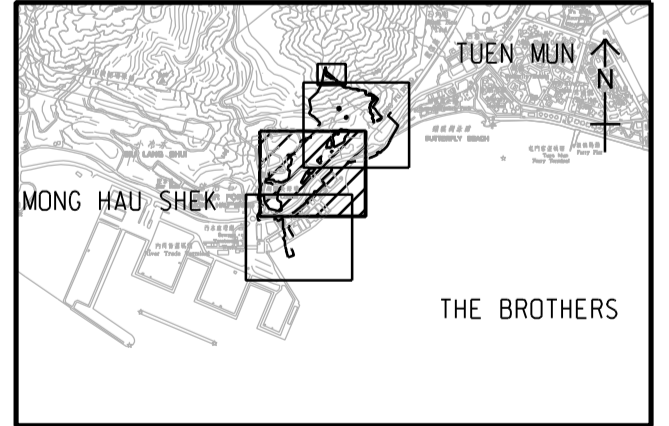
SUB-CONSULTANTS
分列工程顧問公司

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
備核

SCALE
比例: A1 1:1000
DIMENSION UNIT
尺寸單位: METRES

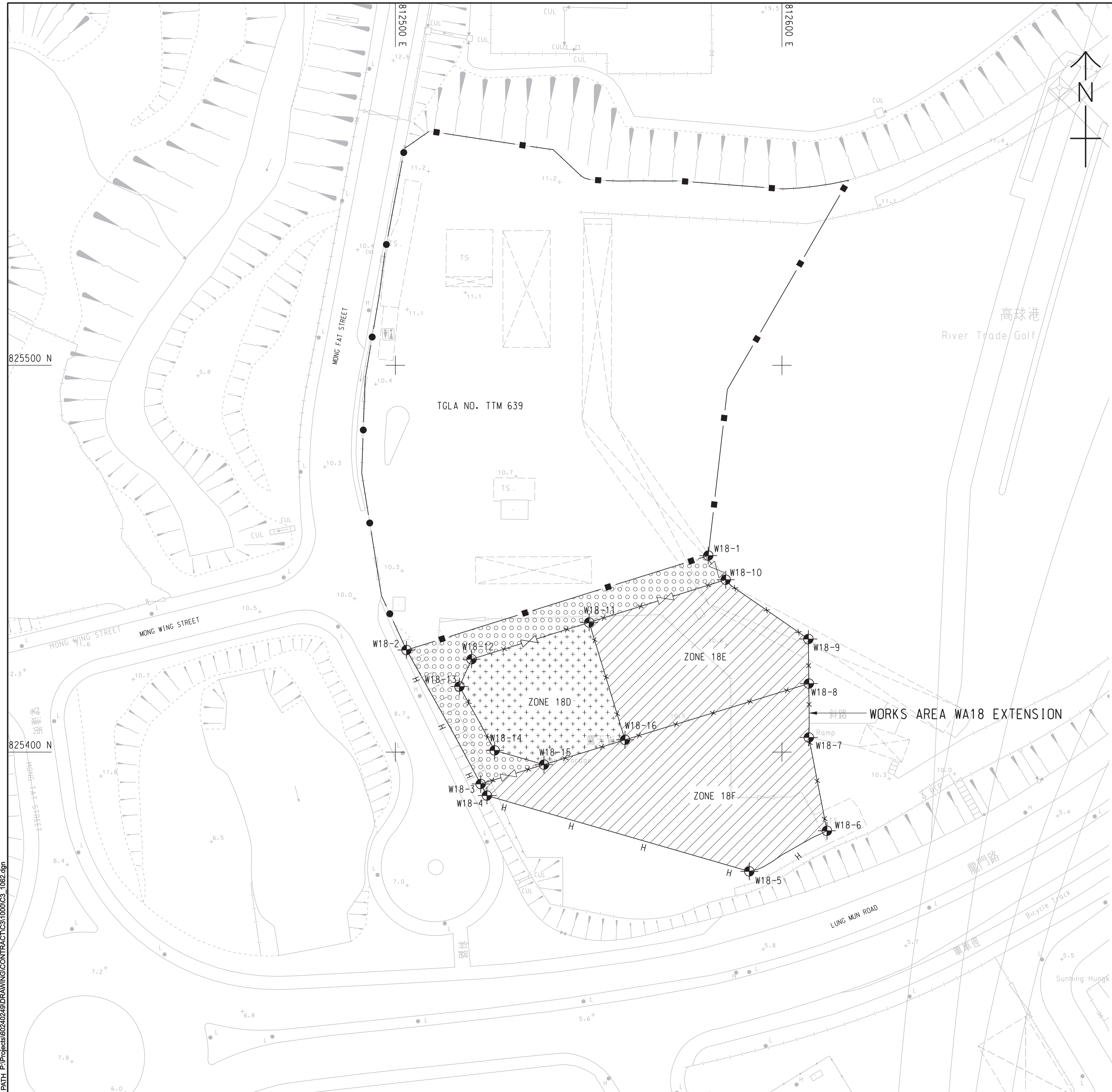


PROJECT NO. 60240249
CONTRACT NO. HY/2013/12

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

REV	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 1:500

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

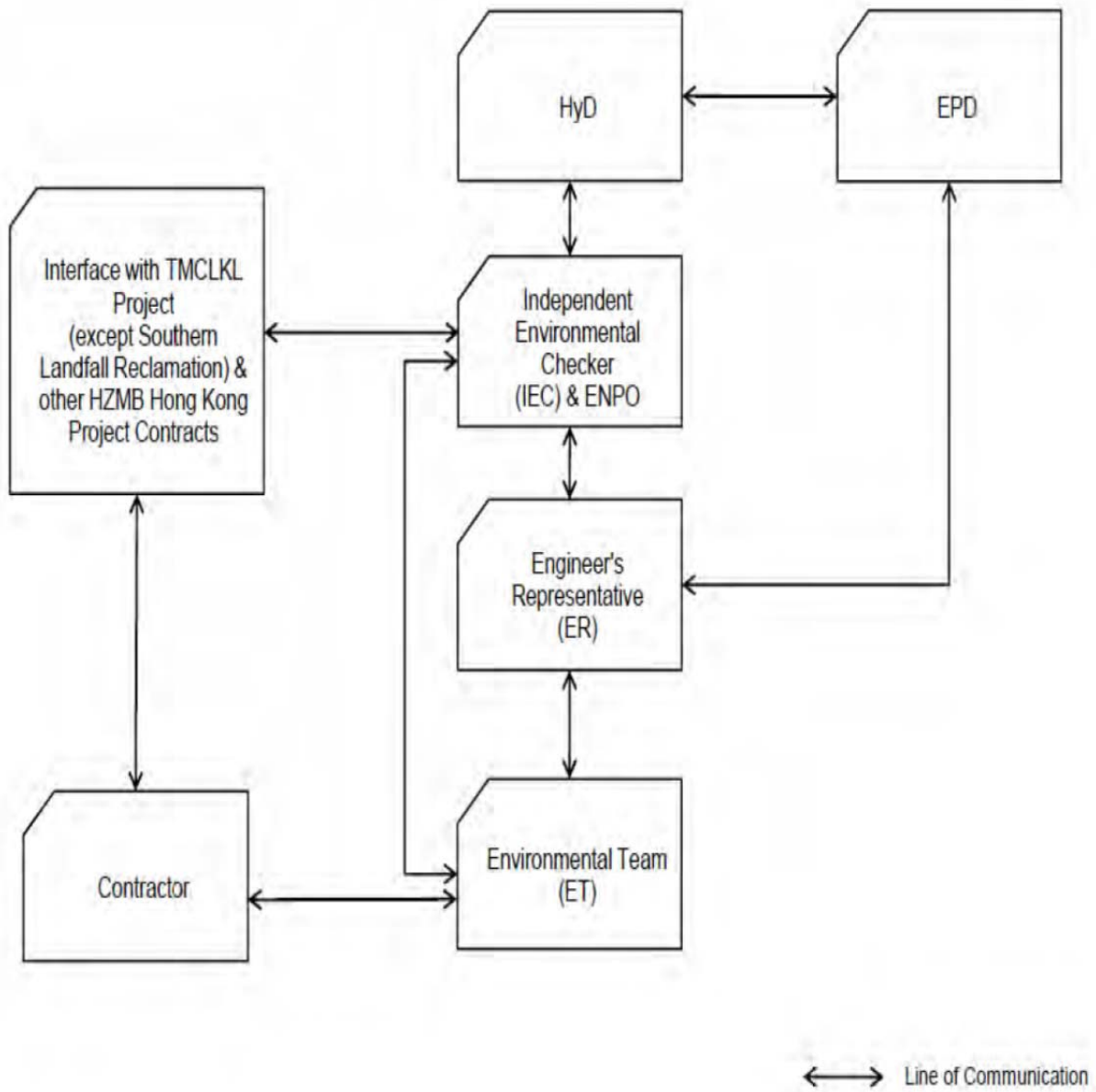
SHEET TITLE
 圖紙名稱
WORKS AREA AND HOARDING PLAN

SHEET NUMBER
 圖紙編號
 60240249/C3/1062B

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Appendix C

Environmental Management Organization Chart



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 2888	3465 2899
Ramboll Environ	Independent Environmental Checker (IEC)	Dr. FC Tsang	3465 2828	3465 2899
CKJV	Project Manager	Mr. Simon Tong	2253 8300	2253 8399
CKJV	Site Agent	Mr. John Wong	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 (ENPO and IEC) - Ramboll Environ Hong Kong Limited**AUES (ET) – Action-United Environmental Services & Consulting**HKL(RLA) – Hong Kong Landscape*

Appendix D

Master Construction Programme

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	Timeline (2014-2020)																							
							Q3	Q4	Q1	Q2	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	23-Oct-14																								
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																														
		45	23-Sep-14	18-Sep-14	06-Nov-14	23-Oct-14																								

- 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	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 21-Dec-16]																							
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 06-Feb-15]																							
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 02-May-15]																							
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(Precast 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
 Primary Baseline █ Critical Remaining Work
█ Actual Work ◆ ◆ Milestone

Date	Revision	Checked	Approved
20-Apr-15	3		

Activity ID	Activity Name	Original Duration	Start	Actual Start	Finish	Actual Finish	Performance % Complete	Total Float	2015			2016				2017				2018							
									Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3						
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		241	01-Jan-15 A	01-Jan-15	25-Nov-15		0%	228																			
Excavation		68	01-Jan-15 A	01-Jan-15	26-May-15		0%	219																			
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)		241	08-Jan-15 A	08-Jan-15	25-Nov-15		0%	228																			
Bay 1-7		241	08-Jan-15 A	08-Jan-15	25-Nov-15		0%	228																			
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																			
Bay12-13		32	26-May-15	08-Jul-15	08-Jul-15		0%	219																			
RWB10160	Foundation works Bay 12-13	32	26-May-15		08-Jul-15		0%	219																			
Bridge G2		237	18-Feb-15 A	18-Feb-15	21-Nov-15		0%	199																			
Stage 2		237	18-Feb-15 A	18-Feb-15	21-Nov-15		0%	199																			
Temporary Works Design (TWD) Submission and Approval		175	18-Feb-15 A	18-Feb-15	16-Jun-15		0%	289																			
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		17	20-Apr-15		09-May-15		0%	151																			
BG23230	MSS for pier construction	17	20-Apr-15		09-May-15		0%	151																			
Field Works		184	04-Apr-15 A	04-Apr-15	21-Nov-15		0%	100																			
Foundation Works		184	04-Apr-15 A	04-Apr-15	21-Nov-15		0%	100																			
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		438	18-Feb-15 A	18-Feb-15	23-Jun-15		0%	512																			
Stage 2		438	18-Feb-15 A	18-Feb-15	23-Jun-15		0%	512																			
Design Submission and Approval		438	18-Feb-15 A	18-Feb-15	23-Jun-15		0%	512																			
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		48	08-May-15		06-Jul-15		0%	237																			
Stage 1		48	08-May-15		06-Jul-15		0%	237																			
Temporary Works Design (TWD) Submission and Approval		48	08-May-15		06-Jul-15		0%	237																			
BH11020	TWD -Formwork design for abutment	48	08-May-15		06-Jul-15		0%	237																			
Bridge H1-Section 2		160	18-Feb-15 A	18-Feb-15	11-Jun-15		0%	449																			
Stage 2		160	18-Feb-15 A	18-Feb-15	11-Jun-15		0%	449																			
Design Submission and Approval		131	18-Feb-15 A	18-Feb-15	10-Jun-15		0%	367																			
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		65	11-Apr-15 A	11-Apr-15	11-Jun-15		0%	255																			
Foundation Works & Pier construction		65	11-Apr-15 A	11-Apr-15	11-Jun-15		0%	255																			
Foundation Works		65	11-Apr-15 A	11-Apr-15	11-Jun-15		0%	255																			
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		173	04-Mar-15 A	04-Mar-15	17-Oct-15		0%	21																			
Field Works		173	04-Mar-15 A	04-Mar-15	17-Oct-15		0%	21																			
TBM Driving		66	20-Apr-15		16-Jul-15		0%	2																			
CUL13120	TBM driving	66	20-Apr-15		16-Jul-15		0%	2																			

Date	Revision	Checked	Approved
20-Apr-15	3		

▬ Remaining Level of Effort
 ▬ Remaining Work
 ▬ Summary
▬ Primary Baseline
 ▬ Critical Remaining Work
▬ Actual Work
 ◆ Milestone

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



Date	Revision	Checked	Approved
20-Apr-15	3		

Activity ID	Activity Name	Original Duration	Start	Actual Start	Finish	Actual Finish	Performance % Complete	Total Float	Gantt Chart											
									Q3	Q4	2015				2016				2017	
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											

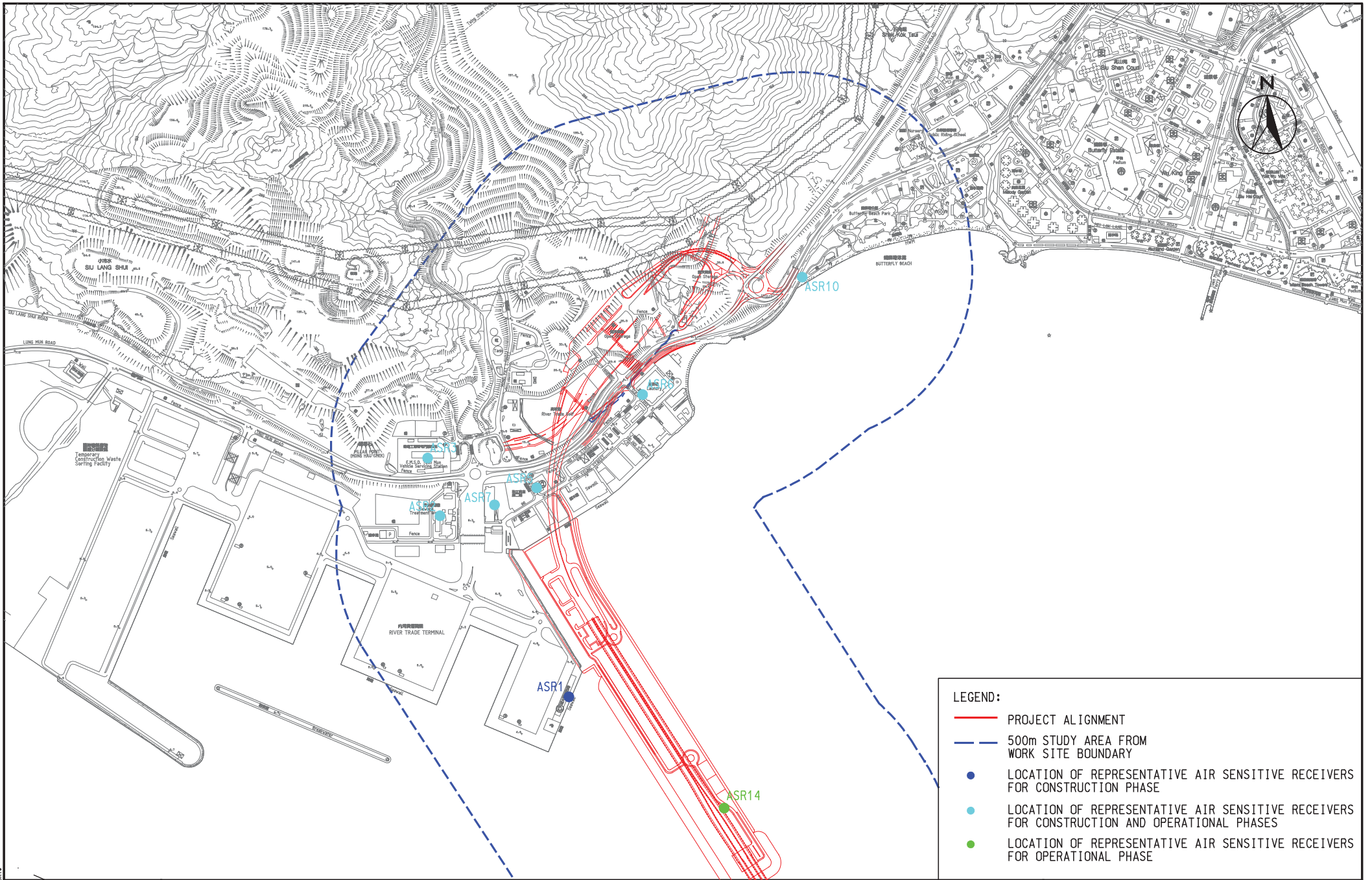
█ Remaining Level of Effort
 █ Remaining Work
 Summary
 Primary Baseline
 █ Critical Remaining Work
 Actual Work
 ◆ Milestone

CRBC - Kaden JV
2 Months Rolling Programme Report Update 20-Apr-15

Date	Revision	Checked	Approved
20-Apr-15	3		

Appendix E

Monitoring Locations / Sensitive Receivers for the Contract

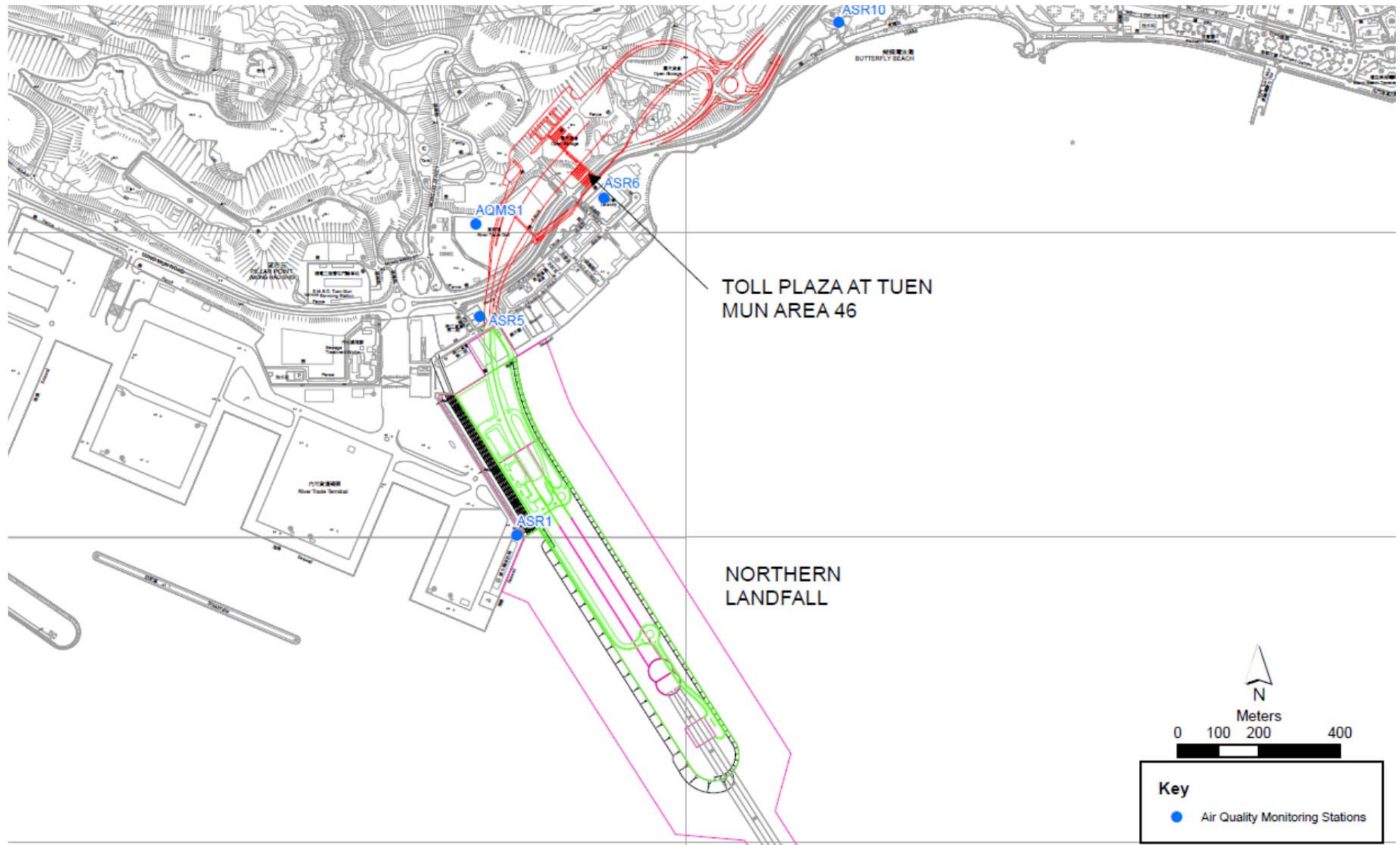


LEGEND:

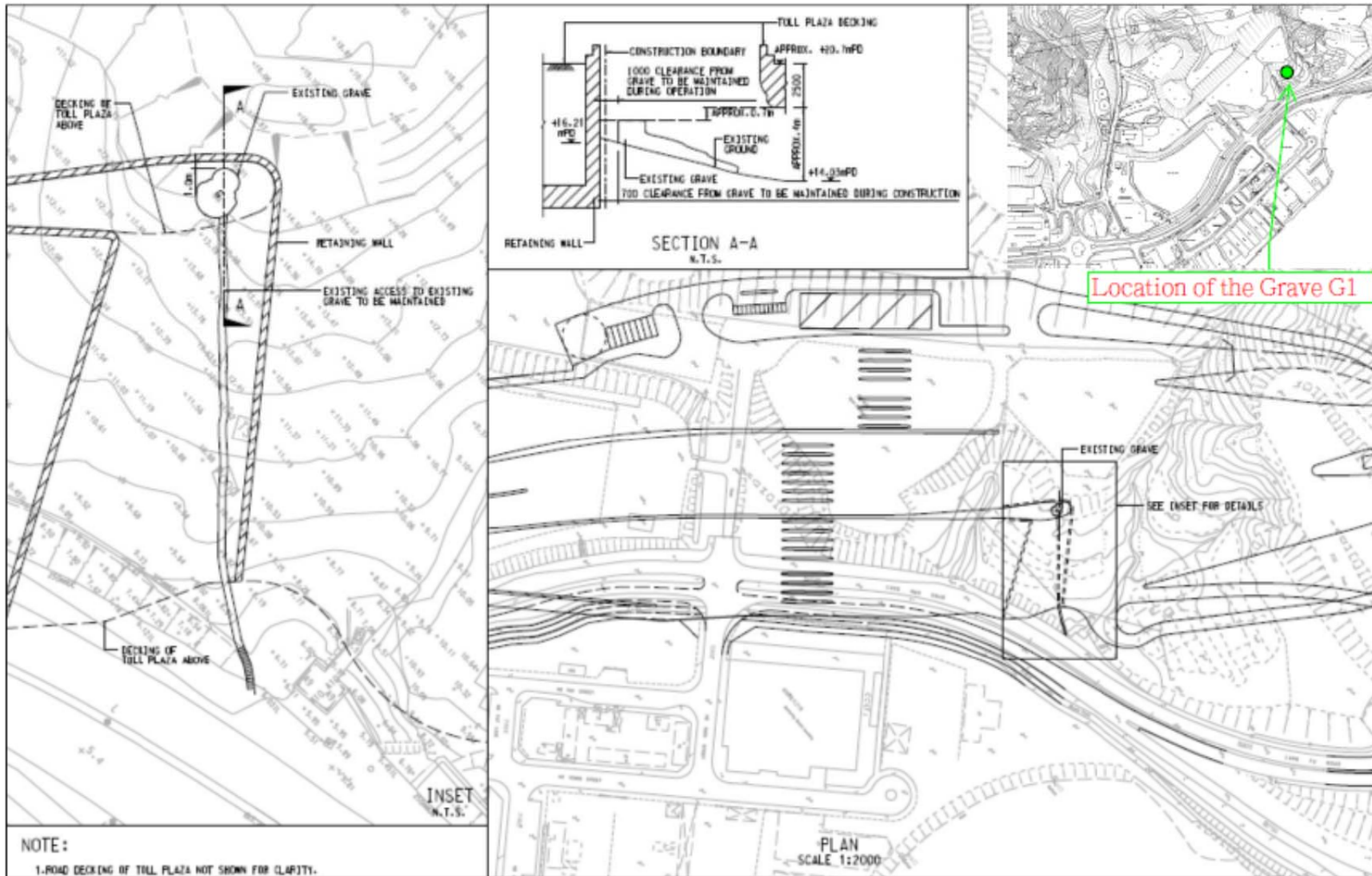
- PROJECT ALIGNMENT
- - - 500m STUDY AREA FROM WORK SITE BOUNDARY
- LOCATION OF REPRESENTATIVE AIR SENSITIVE RECEIVERS FOR CONSTRUCTION PHASE
- LOCATION OF REPRESENTATIVE AIR SENSITIVE RECEIVERS FOR CONSTRUCTION AND OPERATIONAL PHASES
- LOCATION OF REPRESENTATIVE AIR SENSITIVE RECEIVERS FOR OPERATIONAL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

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

SCALE	1 : 10 000	DATE	
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Air Quality Monitoring Location

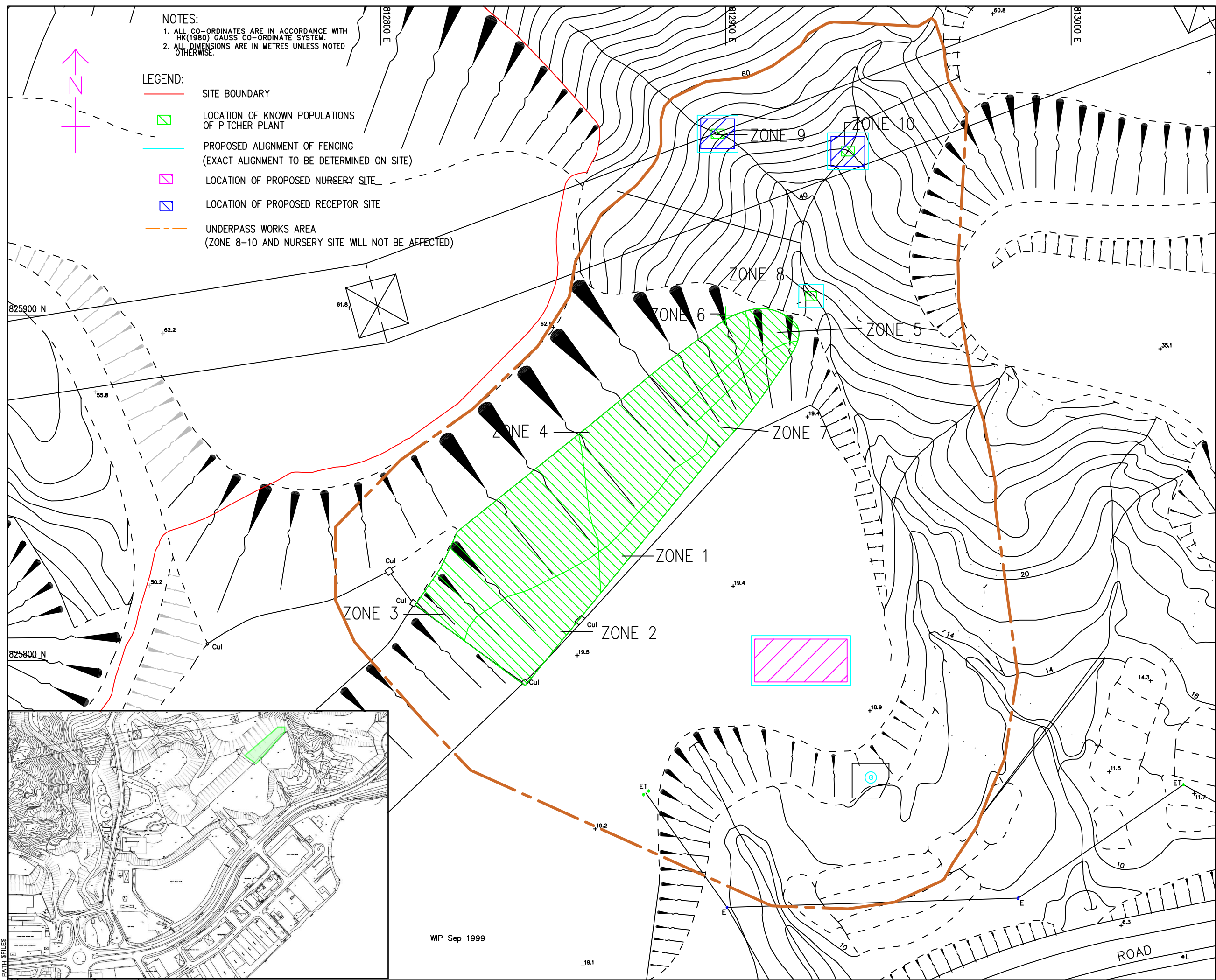


Location of the Grave G1

Project Management Initials: Designer: NCCS Checker: ALCF Approver: CWN
 ISO A1 594mm x 841mm
 Plot File by: SUSERS SDATES
 PATH: SEILES

NOTES:
 1. ALL CO-ORDINATES ARE IN ACCORDANCE WITH HK(1980) GAUSS CO-ORDINATE SYSTEM.
 2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

- LEGEND:**
- SITE BOUNDARY
 - LOCATION OF KNOWN POPULATIONS OF PITCHER PLANT
 - PROPOSED ALIGNMENT OF FENCING (EXACT ALIGNMENT TO BE DETERMINED ON SITE)
 - LOCATION OF PROPOSED NURSERY SITE
 - LOCATION OF PROPOSED RECEPTOR SITE
 - UNDERPASS WORKS AREA (ZONE 8-10 AND NURSERY SITE WILL NOT BE AFFECTED)



WP Sep 1999



PROJECT
 TUEN MUN - CHEK LAP KOK LINK

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

CLIENT
HIGHWAYS DEPARTMENT
 香港路政署
 Hong Kong - Zhuhai - Macao Bridge
 Hong Kong Project Management Office

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

SUB-CONSULTANTS

ISSUE/REVISION

NO.	DATE	DESCRIPTION	CHK.
A	FEB.14	TENDER ADDENDUM NO. 1	CWN
-	JAN.14	TENDER DRAWING	CWN

STATUS
 PRELIMINARY

SCALE
 A1 1 : 500
DIMENSION UNIT
 METRES

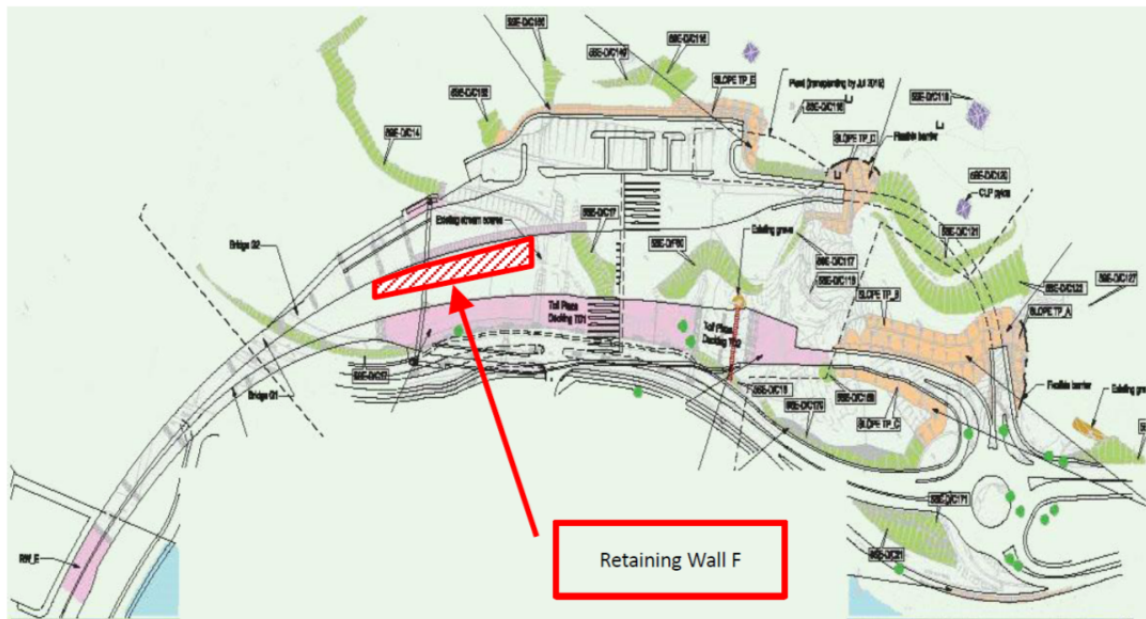
KEY PLAN

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

SHEET TITLE
 LOCATION OF KNOWN POPULATION OF PITCHER PLANT AND PROPOSED TM-CLKL SITE BOUNDARY

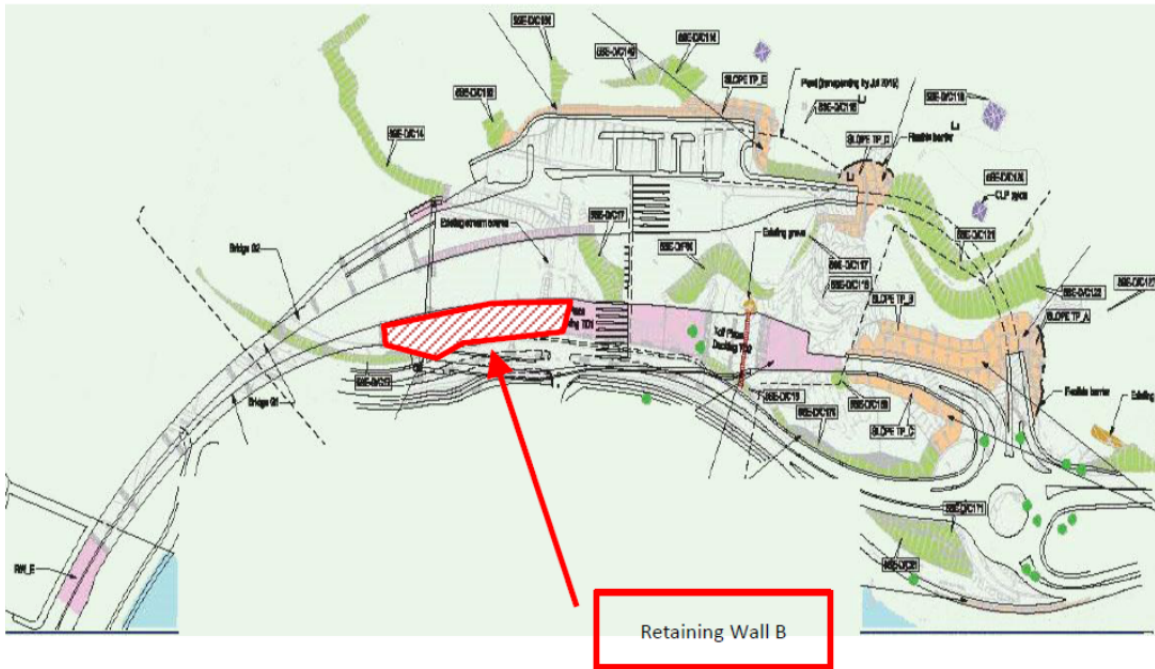
SHEET NUMBER
 60240249/C3/6503A

Retaining Wall F



Location of the Retaining Wall F

Retaining Wall B



Location of the Retaining Wall B

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	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.	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.	1 Confirm receipt of notification of failure in writing. 2 Notify the Contractor. 3 Ensure remedial measures properly implemented.	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	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.	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.	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.	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

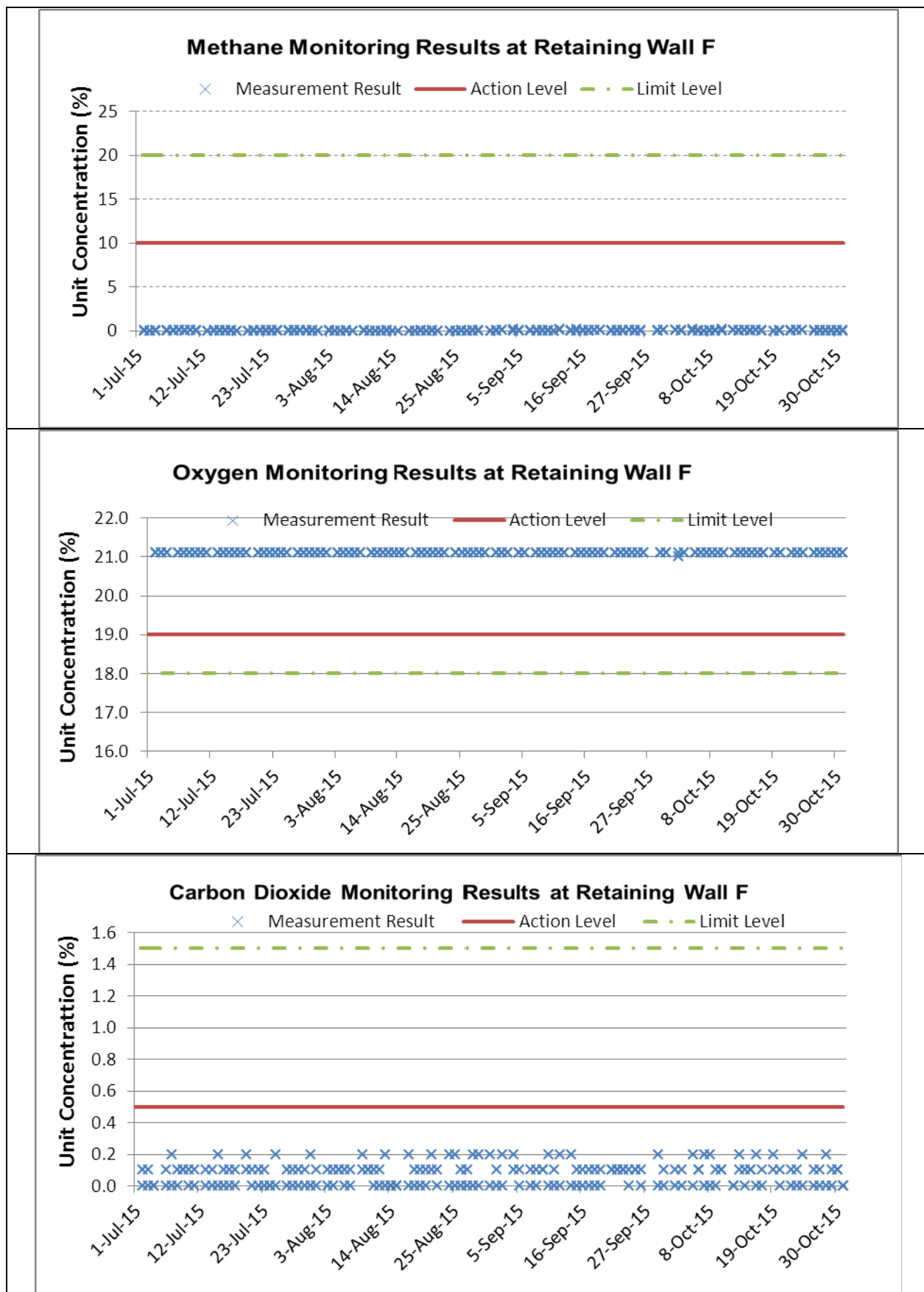
Note: ET – Environmental Specialist, IC(E) – Independent Checker (Environmental), ER – Engineer's Representative

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

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

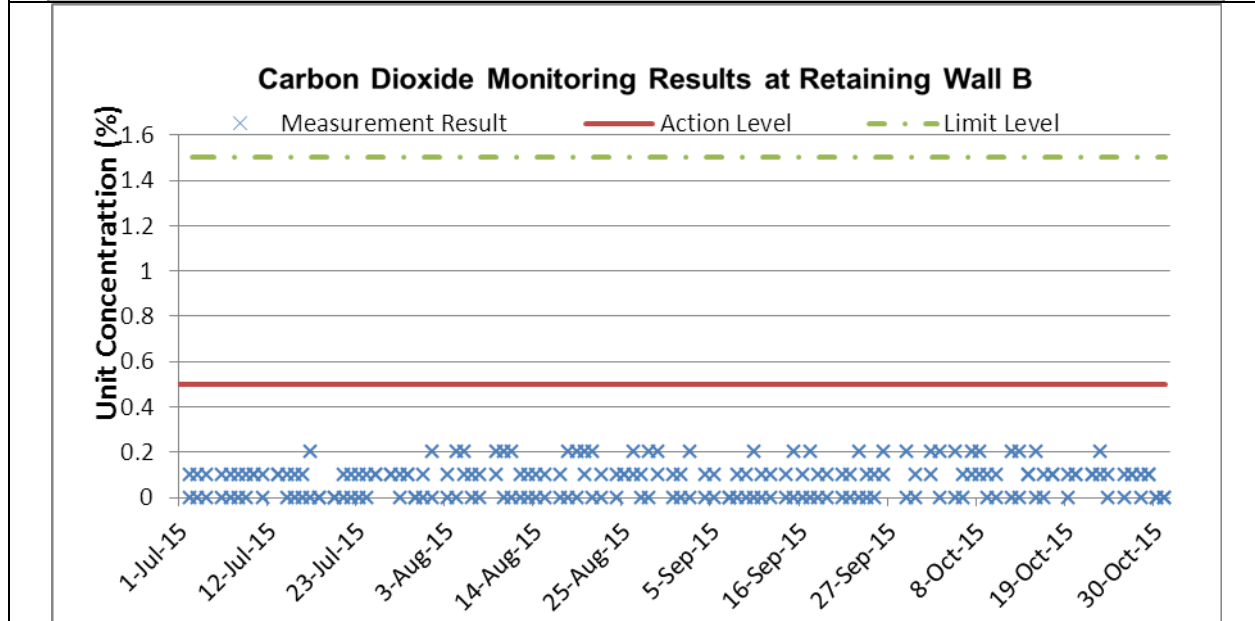
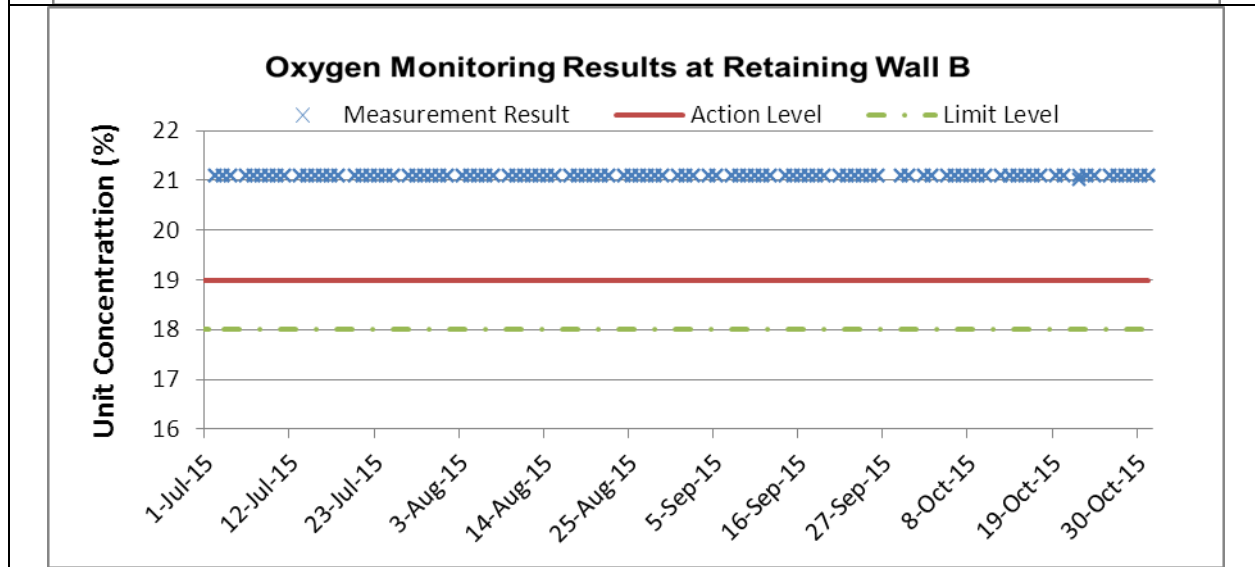
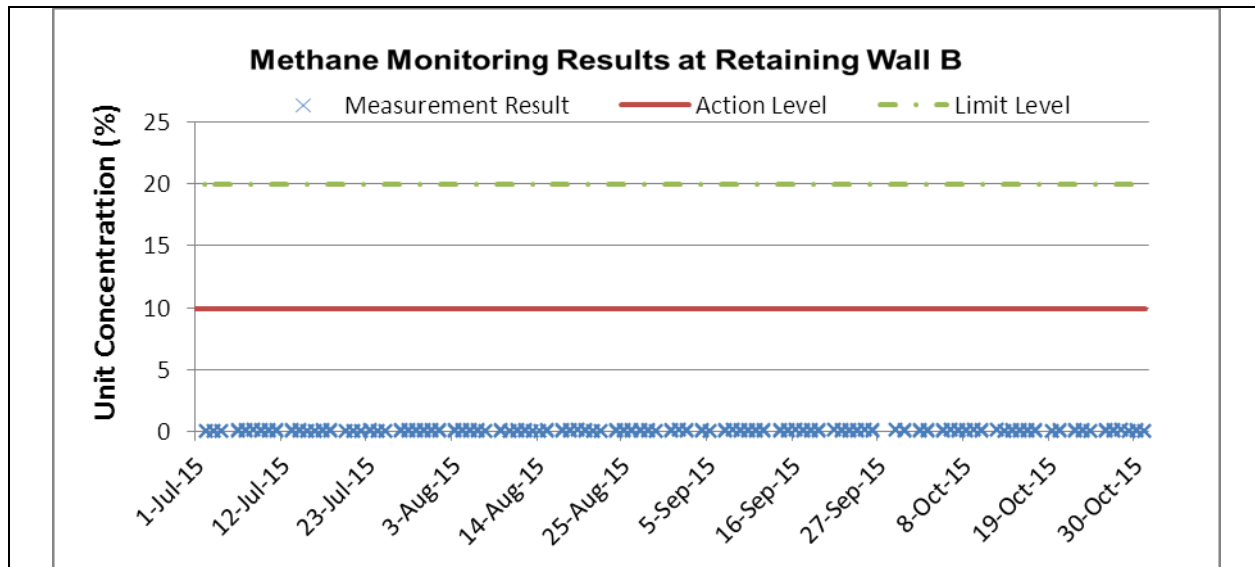
Appendix G

Landfill Gas Monitoring Graphical Plots



Annotation:

During 1 July to 31 October 2015, 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 July to 31 October 2015, 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.

Appendix H

Waste Flow Table

Monthly Waste Flow Table

Monthly Summary Waste Flow Table for 2015 (year)

Month	Annual Quantities of Inert C&D Materials Generated Monthly						Annual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / cardboard packaging	Plastics (see note 2)	Chemical Waste	Others (general refuse)
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
Jan	40.959	0.000	11.915	23.31	5.664	0	0.000	0.000	0.000	0.000	0.07
Feb	50.363	0.000	24.411	25.313	0.629	0	0.000	0.000	0.000	0.000	0.01
Mar	42.223	0.000	13.473	26.648	2.042	0	0.000	0.050	0.000	0.000	0.01
Apr	29.037	0.000	8.06	11.209	9.765	0	0.000	0.000	0.000	0.000	0.003
May	30.547	0.000	4.626	18.857	7.024	0	0.000	0.000	0.000	0.000	0.04
June	31.313	0.000	17.48	9.577	4.234	0	0.000	0.000	0.000	0.000	0.022
Sub-total	224.442	0.000	79.965	114.914	29.358	0.000	0.000	0.050	0.000	0.000	0.155
July	34.021	0.000	19.216	9.037	5.668	0	0.000	0.000	0.000	0.000	0.1
Aug	27.515	0.000	21.142	0	6.293	0	0.000	0.000	0.000	0.000	0.08
Sept	21.196	0.000	12.275	2.185	6.723	0	0.000	0.000	0.000	0.000	0.013
Oct	25.609	0.000	12.486	9.752	3.333	0	0.000	0.000	0.000	0.000	0.038
Nov	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-
Total	332.783	0.000	145.084	135.888	51.375	0.000	0.000	0.050	0.000	0.000	0.386

Notes:

- 1 The waste flow table shall also include C&D materials that are specified in the contract to be imported for use at the Site.
- 2 Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging materials.
- 3 Broken concrete for recycling into aggregates.

Appendix I

Implementation Schedule for Environmental Mitigation Measures

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	

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**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

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

		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