

AUES JOB No.: TCS00715/14

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

**10th QUARTERLY ENVIRONMENTAL MONITORING &
AUDIT SUMMARY REPORT –
(February to April 2017)**

PREPARED FOR

CRBC AND KADEN JOINT VENTURE

Quality Index

Date	Reference No.	Prepared By	Certified By
1 June 2017	TCS00715/14/600/R0288v2	 Ben Tam (Environmental Consultant)	 T.W. Tam (Environmental Team Leader)

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Ref.: HYDHZMBEEM00_0_5437L.17

02 June 2017

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

By Fax (2218 7299) and By Post

Attention: Mr. Albert Yu

Dear Mr. Yu,

**Re: Agreement No. CE 48/2011 (EP)
Environmental Project Office for the
HZMB Hong Kong Link Road, HZMB Hong Kong Boundary Crossing
Facilities, and Tuen Mun-Chek Lap Kok Link – Investigation**

**Contract No. HY/2013/12 TM-CLKL Northern Connection Toll Plaza and
Associated Works
10th Quarterly EM&A Summary Report (February to April 2017)**

Reference is made to the 10th Quarterly Environmental Monitoring and Audit (EM&A) Summary Report (February to April 2017) (AUES reference: TCS00715/14/600/R0288v2 dated 1 June 2017) certified by the ET Leader and provided to us via e-mail on 1 June 2017.

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

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

Yours sincerely,



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

c.c. HyD – Mr. Stephen Chan (By Fax: 3188 6614)
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EXECUTIVE SUMMARY

ES.01. This is the 10th 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 February to 30 April 2017** (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 Total Suspended Particulates (TSP)	450
	24-hour TSP	150
Cultural heritage inspection	Grave G1	13
Landfill Gas Monitoring	Oxygen; Methane & Carbon Dioxide	72 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, no environmental complaint was received.

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 wet season, 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.08. Although in coming wet 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.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-354/2009/D 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 [10th](#) Quarterly EM&A Summary Report covering the period from [1 February to 30 April 2017](#).

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 and 2-month rolling programme is enclosed in [Appendix D](#).

February 2017

- Instrumentation and Monitoring
- Site Formation – Earthwork on Slope D and E; surface drainage on Slope C, D & E and Portion H;
- Toll Plaza Decking TD1 and TD2;
- Toll Plaza Footbridge;
- Retaining Structure RW_A, RW_B and RW_F;
- Toll Collector Subway, Toll Booth Canopy & Associated Works;
- Bridge G1 and Bridge H1 by Form Traveller;
- Bridge G2
- Sewer Culvert at FC1 and FC2;
- Road and Drainage Works at +11mPD, +19mPD, Portion H, Portion J and Lung Mun Road

March 2017

- Instrumentation and Monitoring
- Site Formation – Earthwork on Slope D and E; surface drainage on Slope C, D & E and Portion H;
- Toll Plaza Decking and TD2;
- Toll Plaza Footbridge;
- Retaining Structure RW_A, RW_B and RW_F;
- Toll Collector Subway & Associated Works;
- Bridge G1, G2 and Bridge H1 by Form Traveller;
- Sewer Culvert at FC1 and FC2;
- Waterproofing and lining at Vehicular Underpass
- Road and Drainage Works at +11mPD, +19mPD and Portion H

April 2017

- Instrumentation and Monitoring
- Site Formation – Earthwork on Slope D and E; surface drainage on Slope C, D & E and Portion H;
- Toll Plaza Decking and TD2;
- Toll Plaza Footbridge;
- Retaining Structure RW_A, RW_B and RW_F;
- Toll Collector Subway & Associated Works;
- Bridge G1, G2 and Bridge H1 by Form Traveller;
- Sewer Culvert at FC1 and FC2;
- Waterproofing and lining at Vehicular Underpass
- Road and Drainage Works at +11mPD, +19mPD and Portion H

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 Contract No. HY/2013/12 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	Variation of Effluent Discharge License	22-08-15	WT00023973-2016	14-03-16	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	18-10-2016	GW-RW0619-16	05-11-2016	04-05-2017
6	CNP for MH5	1-11-2016	GW-RW0650-16	18-11-2016	17-05-2017
7	CNP for Tunnel works	3-11-2016	GW-RW0653-16	23-11-2016	22-05-2017
8	CNP for Flasework Erection	01-12-2016	GW-RW0724-16	28-12-2016	16-03-2017
9	Extend CNP for Flasework Erection	01-12-2016	GW-RW0117-17	09-03-2017	16-06-2017
10	CNP for Portion H Roundabout	21-11-2016	GW-RW0704-16	06-12-2016	21-02-2017
11	Extend CNP for Portion H Roundabout	02-02-2017	GW-RW0049-17	14-02-2017	18-08-2017

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 (only undertaken at Establishment period) 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 (*February 2017, March 2017 and April 2017*).

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

5.2.2 In the Reporting Period, inspections for implementation status of mitigation measures for the Pitcher Plants were carried out by the ET on **2nd, 7th, 14th, 21st, 28th February 2017, 7th, 14th, 21st, 28th March 2017, 3rd, 11th, 18th and 25th April 2017.**

5.2.3 Establishment period for the pitcher plants was completed at the end of September 2016, the joint site completion of Establishment period visit with AFCD was undertaken on 23 September 2016 and the final pitcher plants report was submitted to AFCD on early December 2016. Therefore after 23 September 2016, only the integrity of the protection fence was checked to fulfill the EIA requirement. During each inspection, the protection mitigation measures were checked at the final receptor area to make sure no site activities were undertaken inside the protection zone. Besides, no construction activities were observed to be carried out at the surrounding of the final receptor area. The condition of chain link fence is good and no repair or maintenance is required.

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

6 CULTURAL HERITAGE

6.1 GENERAL

6.1.1 According to the EM&A Manual requirements, regular inspection for heritage resource, Grave G1, shall be audited by the ET at least once every week to ensure recommended mitigation measures implemented during construction period. The aim of the survey is 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 **2nd, 7th, 14th, 21st, 28th February 2017, 7th, 14th, 21st, 28th March 2017, 3rd, 11th, 18th and 25th April 2017**. During these inspections, buffer zone was maintained between the working area and the Grave. The nearby areas were clean, and no construction materials or mechanical equipment were stored within or close to the buffer zone. Moreover protective measures (hoarding and scaffold with protective net above the grave) was provided for constructing Toll Plaza Decking TD2 deck structure.

6.2.2 Accordingly, the Contractor has had fully implemented cultural heritage mitigation measures in accordance with 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 **3rd, 10th, 17th, 24th February 2017, 3rd, 10th, 17th, 24th, 31st March 2017, 7th, 13th, 21st and 28th April 2017.**

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 (**February 2017, March 2017 and April 2017**) of the contract.

8 LANDFILL GAS HAZARD MONITORING

8.1 GENERAL

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

Table 8-1 Landfill Gas Monitoring Zone

ID	Location	Excavation >300mm deep undertaken in this reporting period
TD1	TD1, Retaining Wall A, Grave G1 and Subway	Yes
RW-B	Retaining Wall B	No
RW-F	Retaining Wall F	No
S&U	Slope and Underpass	No
BW	Bridge Works (G2, H1)	No
LMR	Lung Mun Road	Yes

8.2 LANDFILL GAS MONITORING RESULT

- 8.2.1 In the Reporting Period, landfill gas monitoring was conducted at the zone TD1 and LMR which have excavation works was undertaking. A BIOGAS 5000 gas analyser was used for the landfill gas monitoring.

8.2.2 There were total 72 workings days monitoring were carried by the Safety Officer or an approved and qualified persons in this reporting period. **Table 8-2** is summarized landfill gas measurement results. Moreover, graphical plot are attached in *Appendix G*.

Table 8-2 Summary of Landfill Gas Measurement Results in Reporting Period

Landfill Gas Parameter	Action Level	Limit Level	Detectable at TD1		Detectable at LMR	
			Min	Max	Min	Max
Methane	>10% LEL (>0.5% v/v)	>20% LEL (>1% v/v)	0.1%	0.1%	0.1%	0.1%
Oxygen	<19%	<18%	21.0%	21.1%	21.0%	21.1%
Carbon Dioxide	>0.5%	>1.5%	0.1%	0.2%	0.1%	0.2%

8.2.3 The measurement results shown that slightly methane concentration was detected and all oxygen concentration was over 21.0% and Carbon Dioxide was between 0.1 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
	Feb 17	Mar 17	Apr 17	
Reused in this Project (Inert) (in '000 m ³)	1.066	2.116	2.291	-
Reused in other Projects (Inert) (in '000 m ³)	10.617	12.844	7.287	<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)	2.566	3.413	1.099	Tuen Mum Area 38

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

Type of Waste	Quantity			Disposal Location
	Feb 17	Mar 17	Apr 17	
Recycled Metal (in '000kg)	0	0	0	-
Recycled Paper / Cardboard Packaging (in '000kg)	0	0	0	-
Recycled Plastic (in '000kg)	0	0	0	-
Chemical Wastes (in '000kg)	0	0	0	-
General Refuses (in '000m ³)	0.074	0.334	0.162	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
2 February 2017	• Empty bucket cumulated on site should be cleaned. (Retaining Wall A)	• Not required for reminder.
7 February 2017	• Stockpile storage on site should be covered to minimize dust generation.. (Central Divider)	• Not required for reminder.
14 February 2017	• Broken tarpaulin covered on the exposed slope should be replaced. (Bridge H1)	• Broken tarpaulin was replaced.
21 February 2017	• Dust control measures frequency should be increased during dry season to minimize dust impact. (General)	• Not required for reminder.
28 February 2017	• Proper dust mitigation measures should be provided for stockpile on site to minimize dust impact. (Retaining Wall F)	• Not required for reminder.
7 March 2017	• Dust emitted from drilling works was observed. Proper mitigation measures should be provided to reduce dust generation. (slope E)	• Water spraying was provided for the drilling works.
14 March 2017	• Backhoe missing NRMM label was observed. NRMM label should be displayed properly for all NRMM using on site. (Central Divider)	• NRMM label was displayed properly.
	• Stagnant water cumulated on site should be cleaned to prevent mosquito breeding. (Retaining Wall B bay 15)	• Not required for reminder.
	• Construction waste and general refuse cumulated on site should be cleaned more frequency. (General)	• Not required for reminder.
21 March 2017	• Stagnant water cumulated on site should be cleaned to prevent mosquito breeding. (Retaining Wall B Bay 15)	• Stagnant water cumulated on site was removed.
	• C&D waste and general refuse scattered on site was observed. Designated area should be provided for waste disposal and waste should be cleaned frequency. (General)	• C&D waste and general refuse scattered on site was cleared
28 March 2017	• Dusty haul road was observed. Water spraying frequency should be increased to minimize dust generation. According to EP's requirement, water spraying frequency should at least 12 times per day. (General)	• Water spraying for the haul road was observed.
3 April 2017	• General refuse scattered and cumulated on site was observed. The contractor should	• General refuse scattered and cumulated on site was

Date	Findings / Deficiencies	Follow-Up Status
	clear the waste more frequent. (Under Retaining Wall B)	removed.
	<ul style="list-style-type: none"> Drip tray should be provided for all chemical containers storage on-site. (General) 	<ul style="list-style-type: none"> Not required for reminder.
11 April 2017	<ul style="list-style-type: none"> Soil and mud trace was observed at the public road near site exit, mud trace should be cleaned and proper wheel washing facilities should be provided at all site exit. (Site exit near bay 16) 	<ul style="list-style-type: none"> Mud trace at the public was cleared
	<ul style="list-style-type: none"> Dark smoke emitted from the backhoe was observed. Proper maintenance should be provided. (Bay 16) 	<ul style="list-style-type: none"> No dark smoke emitted from the backhoe was observed.
	<ul style="list-style-type: none"> As a reminder, all water discharge from site should be diverted to proper de-silting facilities prior to discharge. (Central Divider) 	<ul style="list-style-type: none"> Not required for reminder.
18 April 2017	<ul style="list-style-type: none"> Proper maintenance should be provided for the earth bund, broken sand bags should be replaced. (Stream B) 	<ul style="list-style-type: none"> Not required for reminder.
	<ul style="list-style-type: none"> As a reminder, proper dust mitigation measures should be provided for breaking or excavating activities to reduce dust impact. 	<ul style="list-style-type: none"> Not required for reminder.
25 April 2017	<ul style="list-style-type: none"> Turbidity water cumulated inside the outlet of the discharge point. The contractor should clean up the turbidity water and make sure all discharge water from site should fully comply with discharge license requirement. (Stream B) 	<ul style="list-style-type: none"> Turbidity water cumulated inside the outlet was removed and the broken sand bags were replaced.

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

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
February 2017	2 nd , 7 th , 14 th , 21 st and 28 th February 2017	5	Completed
March 2017	7 th , 14 th , 21 st and 28 th March 2017	7	Completed
April 2017	3 rd , 11 th , 18 th and 25 th April 2017	8	Completed

10.1.3 In the Reporting Period, no non-compliance was recorded, however, **20** 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 Following to the complaint about discharge of milky water to Butterfly 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.

10.1.5 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.

- 10.1.6 The daily inspection for vulnerable to contaminated water discharge was conducted by the Contractor from **12 to 30 April 2017** during the wet season, the associated inspection checklists of the reporting period were presented in the Monthly EM&A Report – **April 2017**.

11 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

11.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

11.1.1 In the Reporting Period, no environmental complaint, summons and prosecution under the EM&A Programme was lodged. Moreover, no exceedance of the environmental performance (Action / Limit Levels) was recorded for monitoring programme.-

11.1.2 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
23 October 2014 – 31 January 2017	Air Quality - 1-hr TSP	Action Level	0	4	4
		Limit Level	0	0	0
1 February 2017 – 30 April 2017	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 January 2017	7	7	Water (6), Air (1)
1 February 2017 – 30 April 2017	0	7	Water (6), Air (1)

Table 11-3 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
23 October 2014 – 31 January 2017	0	0	NA
1 February 2017 – 30 April 2017	0	0	NA

Table 11-4 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
23 October 2014 – 31 January 2017	0	0	NA
1 February 2017 – 30 April 2017	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"> • No operation of powered mechanical equipment is allowed during restricted hours from 19:00 to 07:00 on the following day and whole day during Sunday and public holiday without a valid construction noise permit (CNP). • 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 10th Quarterly EM&A report presenting the monitoring results and inspection findings for the Reporting Period from 1 February to 30 April 2017.
- 13.1.2 No air quality monitoring including 1-hour and 24-hour TSP exceedance was recorded in the Reporting Period.
- 13.1.3 In this Reporting Period, no noise complaint was received by RE, the Contractor, ENPO or HyD. No Action Level exceedances were triggered and no NOE or the associated corrective actions were therefore issued.
- 13.1.4 Site inspection for landscape and visual was conducted on weekly basis by the Landscape Architect to ensure the compliance of the intended aims of the mitigation measures. Most of the landscape works such as planting was not yet commenced.
- 13.1.5 Establishment period for the pitcher plants was completed at the end of September 2016, the joint site completion of Establishment period visit with AFCD was undertaken on 23 September 2016 and the final pitcher plants report was submitted to AFCD on early December 2016. Therefore after 23 September 2016, only the integrity of the protection fence was checked to fulfil the EIA requirement. During each inspection, the protection mitigation measures were checking at the final receptor area to make sure no site activities was undertaken inside the protection zone. Besides, no construction activities were observed to be carried out at the surrounding of the final receptor area. The condition of chain link fence is good and no repair or maintenance is required.
- 13.1.6 Landfill gas monitoring was conducted at the TD1 and Lung Mun Road works area by the Safety Officer. The monitoring results shown no exceedances were triggered.
- 13.1.7 In the Reporting Period, no environmental complaint was received.
- 13.1.8 No notifications of summons, or successful prosecution were received by the Contractor during the Reporting Period.
- 13.1.9 During the Reporting Period, 13 events of the joint site inspections were undertaken to evaluate the site environmental performance. No non-compliance of environmental impacts were observed, indicating the implemented mitigation measures for air quality, construction noise and water quality were effective. Minor deficiencies found in the weekly site inspection were rectified within the specified deadlines. The environmental performance of the Project was considered satisfactory.
- 13.1.10 For cultural heritage, the buffer zone between the working area and the Grave was observed and no construction material or equipment was stored nearby.
- 13.1.11 No notifications of summons, or successful prosecution were received by the Contractor during the Reporting Period.

13.2 RECOMMENDATIONS

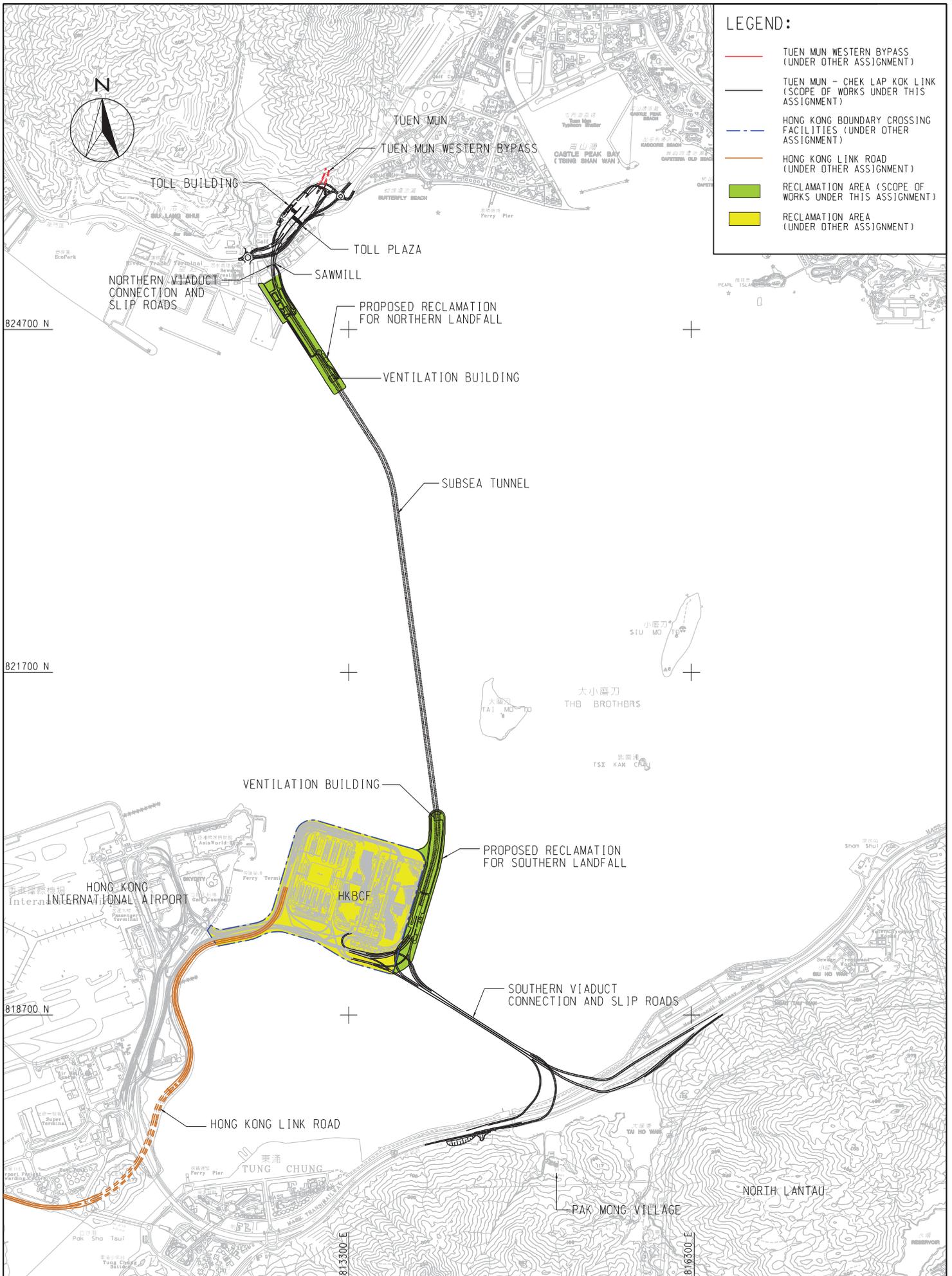
- 13.2.1 Air quality mitigation measures such as watering of site area for 12 times per day and covering of exposed slopes should be fully implemented to reduce construction dust impact as recommended in the EMIS.
- 13.2.2 During the wet season, muddy water or other water pollutants from site surface runoff discharged into public areas would be a potential environmental issue. Special attention should be paid on the water quality mitigation measures to prevent surface runoff flow to public area.
- 13.2.3 Good practice for daily housekeeping is reminded. Clean-up of waste skips and wastewater

treatment system should be increased to ensure these facilities are functioned effectively.

- 13.2.4 Stagnant water should be removed as soon as possible after rain to prevent mosquito breeding on site.

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

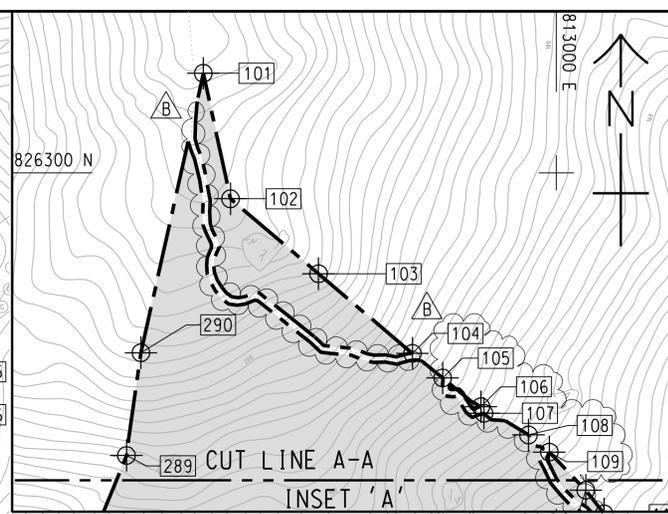
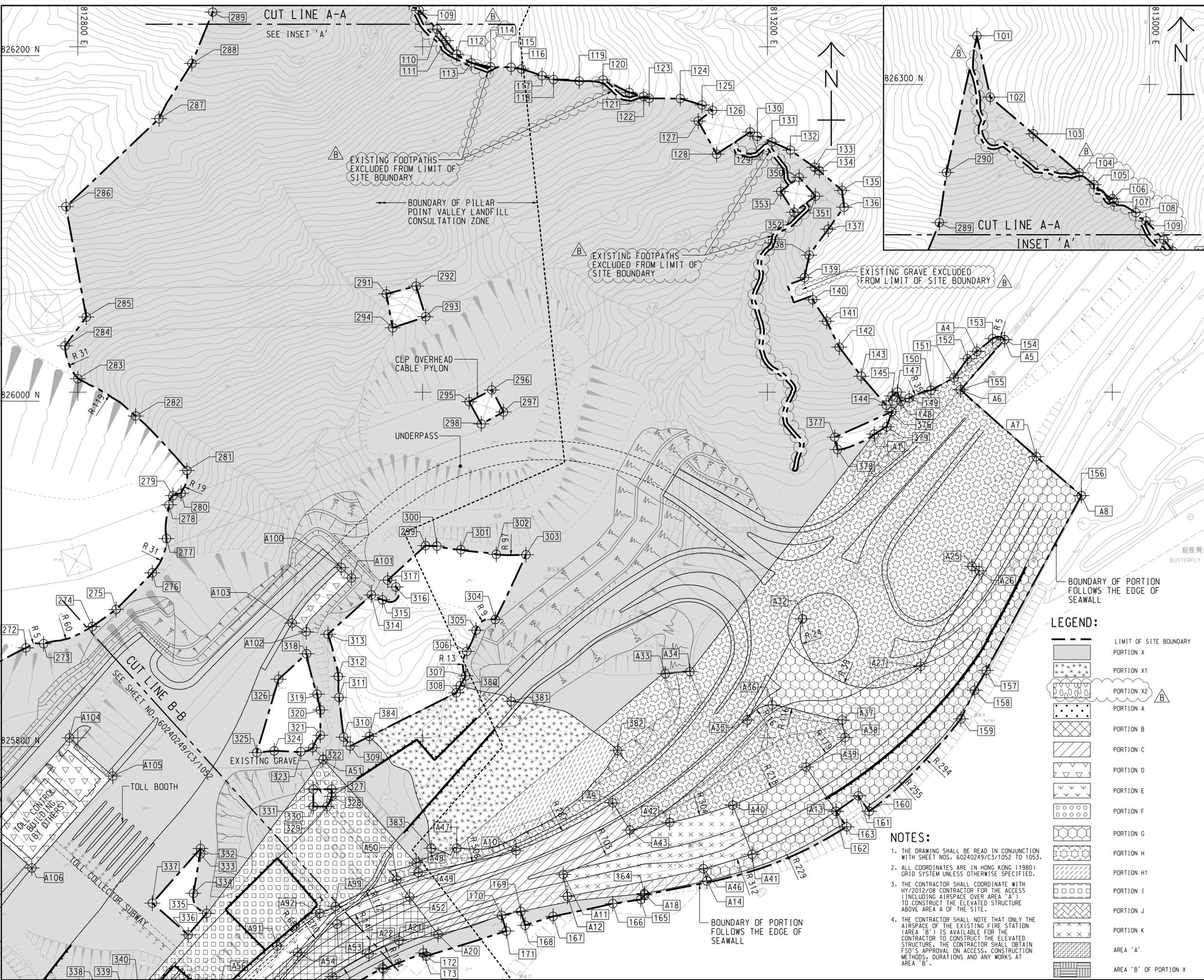
AGREEMENT NO. CE 52/2007(HY)
 TUEN MUN - CHEK LAP KOK LINK - INVESTIGATION
 GENERAL LAYOUT OF TM-CLKL

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\10051\051.dgn



LEGEND:

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

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

AECOM

PROJECT
 項目
TUEN MUN - CHEK LAP KOK LINK

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

CLIENT
 業主

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

CONSULTANT
 工程顧問公司
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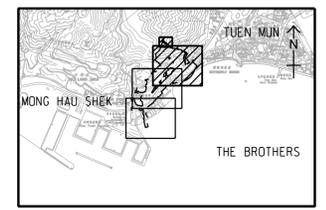
SUB-CONSULTANTS
 分判工程顧問公司

ISSUE/REVISION
 修訂

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

SCALE
 比例
 A1 1:1000

DIMENSION UNIT
 尺寸單位
 METRES



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

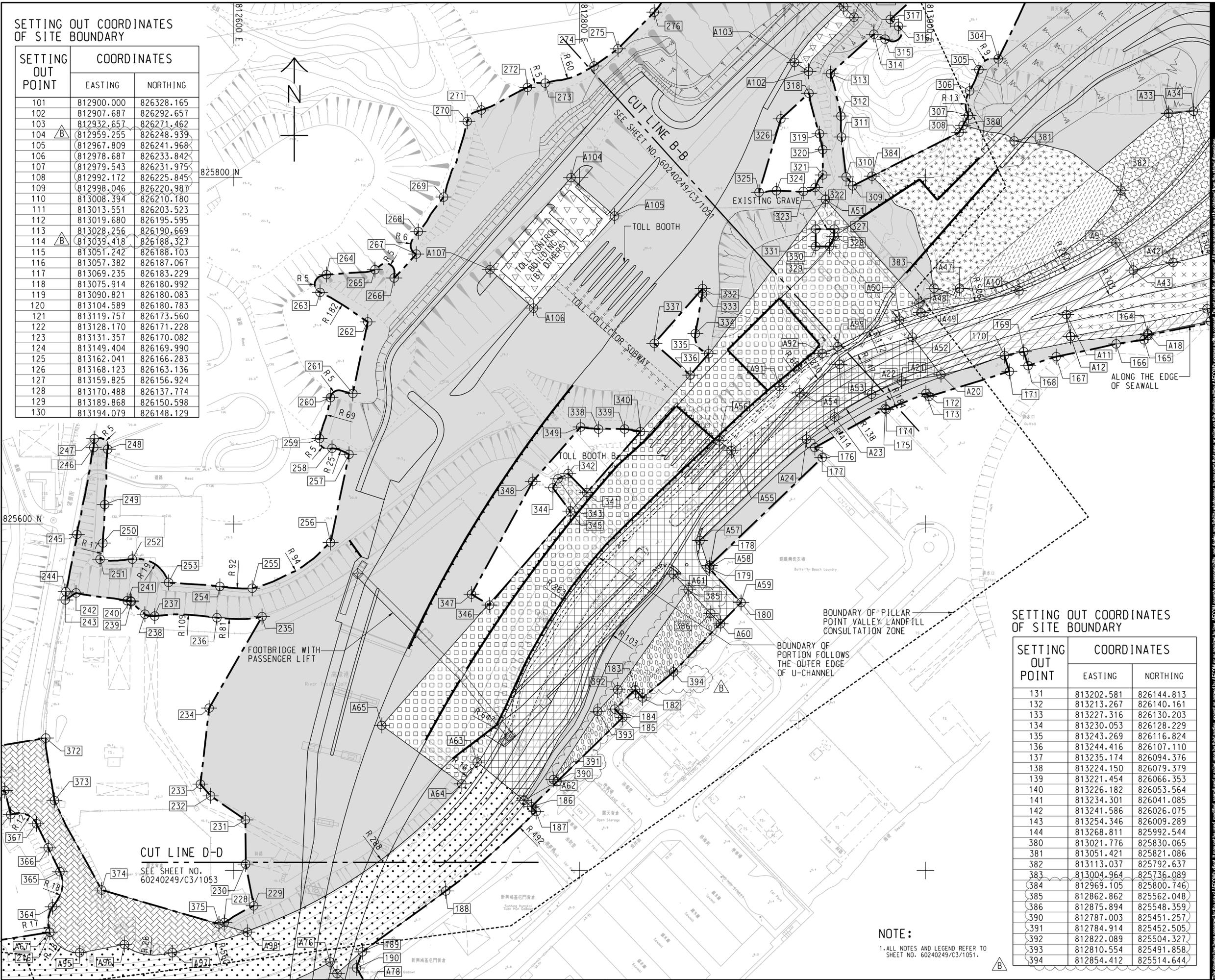
SHEET 1 OF 3

SHEET NUMBER
 圖紙編號
 60240249/C3/1051B

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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

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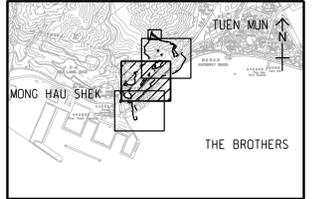
ISSUE/REVISION

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

KEY PLAN
 索引圖: 1:50000



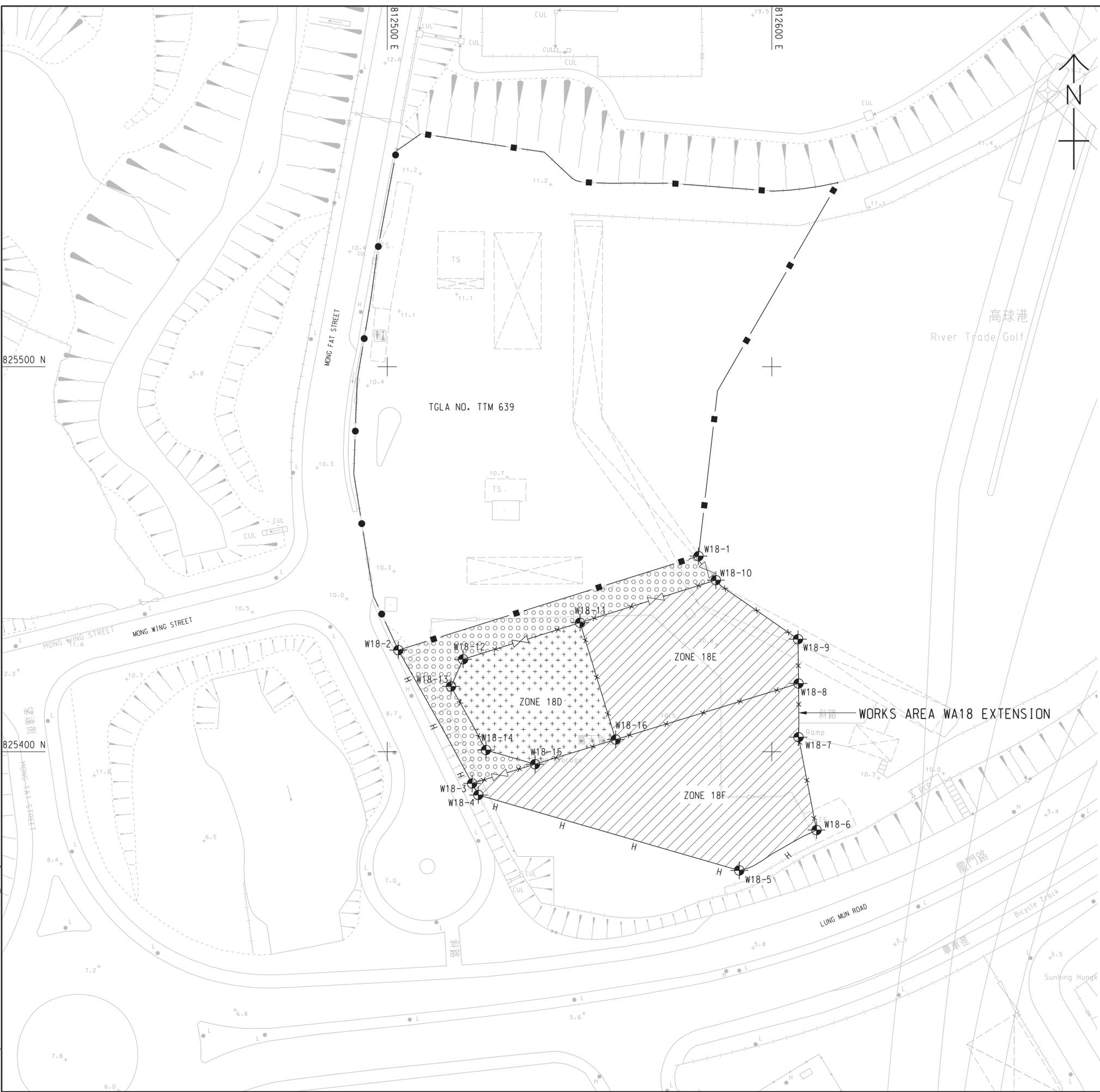
PROJECT NO.
 項目編號: 60240249
CONTRACT NO.
 合約編號: HY/2013/12

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

SHEET NUMBER
 圖紙編號: 60240249/C3/1052B

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Plot File by: LIXQ2 2014/03/4
 PATH: P:\Projects\60240249\DRAWING\CONTRACT\CS1000\C3_1062.dgn
 Project Management Initials: Designer: PL Checked: ALCF Approved: CWN ISO A1 594mm x 841mm



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

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
修訂

NO.	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

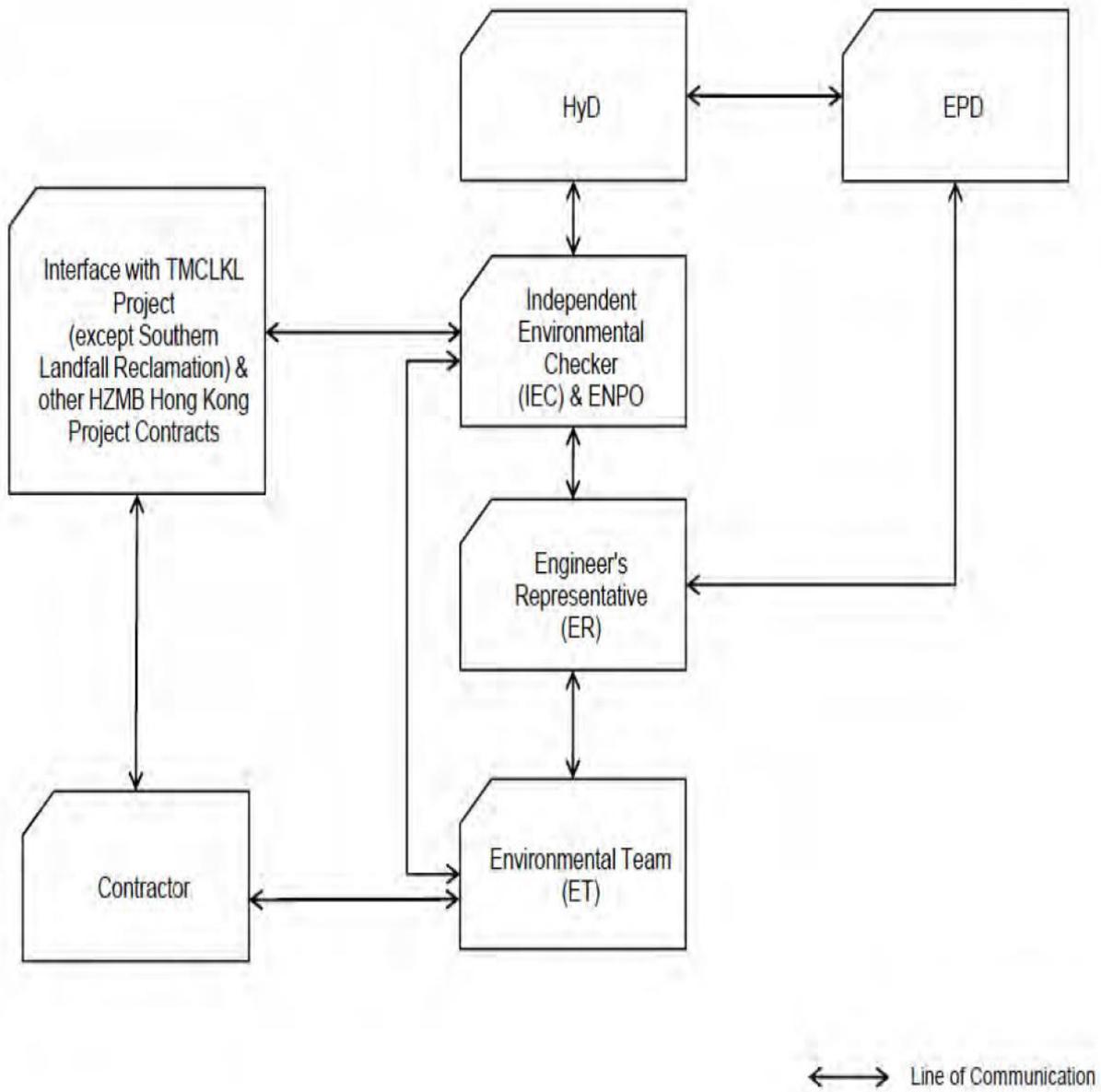
SHEET NUMBER
圖紙編號

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	2218 7289	2218 7399
Ramboll Environ	Environmental Project Office (ENPO)	Mr. YH Hui	3465 2850	3465 2899
Ramboll Environ	Independent Environmental Checker (IEC)	Dr. FC Tsang	3465 2851	3465 2899
CKJV	Deputy Project Manager	Mr. Raymond Suen	2253 8309	2253 8399
CKJV	Site Agent	Mr. Wilson Lau	2253 8300	2253 8399
CKJV	Environmental Officer	Mr. HY Tang	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

Construction Programme

Activity ID	Activity Name	2017				
		Feb	Mar	Apr	May	Jun
HY/2013/12 TMCLK Northern Connection Toll Plaza and Associated-Works Programme-Rev.4A Monthly						
Achievement of Stages/ Completion of Sections						
KD10170	KD7 - Sec 4 Completion All Works within Portion D incl EM&A Implementation					
Toll Plaza Decking TD1-Section 1						
Stage 1						
Method Statement Submission and Approval						
TD121360	Engineer's comments and approval					
Field Works						
Portal Construction						
Portal Beam 1st(H)						
TD121180	Portal beam 1st(Portal H -Pier 18 to Pier 19)					
Portal Beam 2nd(J)						
TD121190	Portal beam 2nd(Portal J -Pier 20 to Pier 21)					
Portal Beam 3rd(G)						
TD121200	Portal beam 3rd(Portal G -Pier 16 to Pier 17)					
Deck Construction						
Precast beam fabrication						
TD120800	Precast parapet and planter					
Precast beam installation						
TD12100	Precast beam installation between portal H and portal J (4nos)					
TD12110	Precast beam installation between portal G and portal H(4nos)					
TD12120	Precast beam installation between portal H and portal J(3nos)					
TD12130	Precast beam installation between portal J and portal K(4nos)					
In-situ Deck and Precast Beam						
TD121100	In-situ deck and precast beam between portal D and portal E					
TD121090	In-situ deck and precast beam between portal F and portal G					
TD121105	In-situ deck and precast beam between portal C and portal D					
TD121110	In-situ deck and precast beam between portal B and portal C					
TD121120	In-situ deck and precast beam between portal G and portal H					
TD121130	In-situ deck and precast beam between portal H and portal J					
TD121140	In-situ deck and precast beam between portal J and portal K					
TD121150	M.J installation					
Toll Booth Canopy						
Toll booth canopy and island						
TD121270	Toll booth island					
Toll Plaza Decking TD2-Section 1						
Field Works						

█ Remaining Level of Effort █ Critical Remaining Work
█ Actual Work ◆ Milestone
█ Remaining Work ▼ Summary

**CRBC - Kaden JV
Three-Month Rolling Programme**

Date	Revision	Checked	Approved
03-03-17			

Activity ID	Activity Name	2017	Feb	Mar	Apr	May	Jun
G.I and Piling Works							
DWP-Bored Piles							
TD220530	Working platform for pile cap L4						
TD220540	Bored piles for P12-13						
Deck Construction							
TD220190	Bearing,formwork, reinforcemnt& Concreting-North	Bearing,formwork, reinforcemnt& Concreting-North					
TD220200	Bearing,formwork, reinforcemnt& Concreting-South	Bearing,formwork, reinforcemnt& Concreting-South					
Miscellaneous Works							
TD220695	Cascade D construction	Cascade D construction					
Toll Plaza Footbridge-Section 1							
Stage 1							
Method Statement Submissions and Approval							
TFB1090	MSS for concrete slab and planter construction over steel truss	MSS for concrete slab and planter construction over steel truss					
Off-site Works							
TFB1100	Steel truss fabrication	Steel truss fabrication					
Field Works							
Pier Construction							
TFB1320	Construct pier P6	Construct pier P6					
TFB1310	Construct pier P4	Construct pier P4					
Steel Truss Installation							
TFB1330	Steel truss assembly and installation	Steel truss assembly and installation					
TFB1340	Steel truss connection	Steel truss connection					
Staircase and Lift Construction							
TFB1350	West staircase construction	West staircase construction					
TFB1370	East staircase construction	East staircase construction					
TFB1380	Lift construction B	Lift construction					
TFB1360	Lift construction A	Lift construction					
Concrete Decking , Planters and Finishing Works							
TFB1390	Concrete decking and planter construction	Concrete decking and planter construction					
Retaining Structure RW_B-Section 1							
Site Formation - Retaining Structure RW_B							
Stage 1							
Retaining Structure RW_B							
Structure(Base Slab, Wall, Colum, Top Slab)		Structure(Base Slab, Wall, Colum, Top Slab)					
Bay12-13		Bay12-13					
RWB10170	Bay12-13 and backfilling	Bay12-13 and backfilling					
Backfilling							

█ Remaining Level of Effort █ Critical Remaining Work
█ Actual Work ◆ Milestone
█ Remaining Work ▼ Summary

**CRBC - Kaden JV
Three-Month Rolling Programme**

Date	Revision	Checked	Approved
03-03-17			

Activity ID	Activity Name	2017	Feb	Mar	Apr	May	Jun
RWB10230	Backfilling						
RWB10260	Parapet and street furniture installation for TCSS and E&M installation						
Toll Collector Subway & Associated Works-Section 1							
Toll Collector Bridge (Portion I)-Section 1							
Stage 1							
Temporary Works Design (TWD) Submission and Approval							
TCS1240	TWD -Design of lifting system						
TCS1580	Engineer's comments and approval						
Field Works							
TCS1270	Finish the in-situ deck of Bridge TD1(G-H)						
Toll Collector Subway & Associate Works (Portion I)-Section 1							
Stage 1							
Method Statement Submissions and Approval							
TCS1630	Engineer's comments and approval						
Field Works - Toll Collector Subway and Staircase							
TCS1430	Construction of toll collector subway(from SB22-SB16)						
TCS1440	Construction of staircase						
Toll Collector Subway (Portion X)-Section 5							
Stage 3							
TCS1072	Construct Toll Collector Subway SB 1						
TCS1074	Backfill for SB 1						
TCS1130	Construct Toll Collector Subway SB 9-16						
TCS1090	Hand over Portion D						
TCS1140	Backfilling SB2-8						
TCS1150	Backfilling SB9-16						
TCS1160	Islands for Toll Booths SB 1-8						
TCS1170	Islands for Toll Booths SB 9-16						
Bridge G2							
Stage 2							
Temporary Works Design (TWD) Submission and Approval							
BG23620	Engineer's approval						
Field Works							
Foundation Works							
BG23340	Excavation for G2b						
Deck							
BG23050	Deck(G2d1-G2c1)						
BG23020	Deck(G2c2-G2b)&Construct Portal G2c						

Remaining Level of Effort Critical Remaining Work
 Actual Work Milestone
 Remaining Work Summary

**CRBC - Kaden JV
Three-Month Rolling Programme**

Date	Revision	Checked	Approved
03-03-17			

Activity ID	Activity Name	2017	Feb	Mar	Apr	May	Jun
BG23030	Deck(G2b-G2a)						Deck(G2b-G2a)
BG23060	Deck(G2c1-G2b)						
BG23070	Deck(G2b-G2a)						
Bridge G1							
Stage 2							
Design Submission and Approval							
BG112230	DDA for substructure(draft)						
BG112210	DDA for foundation submission						
BG112220	Engineer's approval						
BG112180	TWD -Form traveller design						
BG112300	Engineer's approval						
Field Works							
Deck Construction from Pier G1d to Pier G2a							
BG112120	Assemble of 1st formtraveller at G1d and testing						
BG112350	Balanced cantilever construction at G1d 1st segment						
BG112360	Assemble of 2nd formtraveller at G1d and testing						
BG112780	TTA application						
Bridge H1-Section 2							
Stage 2							
Design Submission and Approval							
BH12860	Engineer's approval						
Field Works							
Decking Construction From Abutment H1f to Pier H1d							
Balanced Canitilever Construction at Pier H1e							
BH12028	Balanced cantilever construction at H1e 2nd segment						
BH12030	2nd Pair						
BH12040	3rd Pair						
BH12050	4th Pair						
BH12060	5th Pair						
BH12070	6th Pair						
BH12080	7th Pair						
BH12090	8th Pair						
BH12110	9th Pair						
Insitu Deck at Abutment H1f							
BH12420	Construct End Span H1f						
Balanced Canitilever Construction at Pier H1d							
BH12130	Assemble of 1st formtraveller at H1d						

█ Remaining Level of Effort █ Critical Remaining Work
█ Actual Work ◆ Milestone
█ Remaining Work ▼ Summary

**CRBC - Kaden JV
Three-Month Rolling Programme**

Date	Revision	Checked	Approved
03-03-17			

Activity ID	Activity Name	2017	Feb	Mar	Apr	May	Jun
Culvert 1(TBM)-Stage 4		Culvert 1(TBM)-Stage 4					
Field Works		Field Works					
Bay15 to Bay16							
CUL13300	Excavation						
CUL13310	Pipe installation for Bay 15 and 16 and grouting						
FC2		FC2					
CUL13470	Construction of chamber FC2						
CUL13480	Backfilling and removal section of sheetpile	Backfilling and removal section of sheetpile					
BY-Pass Sewer between FC1 and FC2(1800 Pipe)		BY-Pass Sewer between FC1 and FC2(1800 Pipe)					
CUL13490	Sheetpile installation for FC2 to FC1						
CUL13500	Excavation and installation of 1800 pipe						
CUL13510	Backfilling	Backfilling					
Completion of KD3A and Remaining Works		Completion of KD3A and Remaining Works					
CUL13535	Backfilling	Backfilling					
Culvert 2 & Culvert 3 and Existing Box Culvert							
Method statement Submission		Method statement Submission					
CCE20140	Method statement for screeding the existing box culvert	Method statement for screeding the existing box culvert					
Culvert 2							
CCE20090	Bay 21	Bay 21					
CCE20120	Bay 20						
Culvert 3							
CCE20212	Drainage diversion	Drainage diversion					
CCE20215	MH8						
Existing Sewer Box Culvert							
MH3-MH6							
CCE20220	Base slab to be applied with screeding concrete						
Site Formation - Retaining Structure RW_A		Site Formation - Retaining					
Stage 3		Stage 3					
Retaining Wall A		Retaining Wall A:					
RWA20150	Construct Cascade D	Construct Cascade D					
RWA20160	Drainage Diversion of Existing Stream to Cascade D	Drainage Diversion of Existing Stream to Cascade D					
RWA20180	Backfilling Works	Backfilling Works					
RWA20240	Completion civil provision works for TCSS and E&M	Completion civil provision works for TCSS and E&M					
Retaining Structure RW_E		Retaining Structure RW_E					
Stage 2		Stage 2					
Design Submission and Approval		Design Submission and Approval					
RWE20000	DDA for foundation (draft)	DDA for foundation (draft)					

█ Remaining Level of Effort █ Critical Remaining Work
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**CRBC - Kaden JV
Three-Month Rolling Programme**

Date	Revision	Checked	Approved
03-03-17			

Activity ID	Activity Name	2017	Feb	Mar	Apr	May	Jun
RWE20010	Engineer's comments			Engineer's comments			
RWE20020	DDA for foundation submission				DDA for foundation submission		
RWE20040	DDA for substructure(draft)					DDA for substructure(draft)	
RWE20030	Engineer's approval					Engineer's approval	
Site Formation - Retaining Structure for Slope TP_F							Site Formation - Retaining Structure for Slope TP_F
Stage 3							Stage 3
Retaining Structure for Slope TP_F							Retaining Structure for Slope TP_F
RWF313071	Construct Retaining Wall-Wall construction Bay 20						
RWF31308	Backfilling						
RWF31480	U-Channel construction,Completion civil provision works for TCSS and E&M						U-Channel construction,Completion civil provision works for TCSS and E&M
Site Formation - Slope TP_A & Associated Works							Site Formation - Slope TP_A & Associated Works
Achievement of KD-3(Stage 3) for Slope A							Achievement of KD-3(Stage 3) for Slope A
TPA41800	Tunnel Lining Completion			◆ Tunnel Lining Completion			
TPA41830	Achievement of KD-3(Stage 3) for slope A				◆ Achievement of KD-3(Stage 3) for slope A		
TPA41810	Remaining civil works and draiange works(After tunnel civil works construction)					Remaining civil works and draiange works(After tunnel civil works construction)	
Site Formation - Slope TP_B & Associated Works							Site Formation - Slope TP_B & Associated Works
Achievement of KD-3(Stage 3) for Slope B							Achievement of KD-3(Stage 3) for Slope B
TPB41710	Remaining civil works and drainage works						Remaining civil works and drainage works
Site Formation - Slope TP_C & Associated Works							Site Formation - Slope TP_C & Associated Works
Achievement of KD-3(Stage 3) for Slope C							Achievement of KD-3(Stage 3) for Slope C
TPC51320	Achievement of KD-3(Stage 3) for slope C			◆ Achievement of KD-3(Stage 3) for slope C			
Achievement of KD-8 (Section 5) for Slope C							Achievement of KD-8 (Section 5) for Slope C
TPC51330	Remaining works inculde landscape works and establishment works					Remaining works inculde landscape works and establishment works	
Site Formation - Slope TP_D & Associated Works							Site Formation - Slope TP_D & Associated Works
Achievement of KD-7(Section 4) for Slope D							Achievement of KD-7(Section 4) for Slope D
TPD51755	Hand over of portion D			◆ Hand over of portion D			
Achievement of KD-3(Stage 3) for Slope D							Achievement of KD-3(Stage 3) for Slope D
TPD52350	Remaining civil works and drainage works					Remaining civil works and drainage works	
Site Formation - Slope TP_E & Associated Works							Site Formation - Slope TP_E & Associated Works
Stage 3							Stage 3
Slope Feature - Slope TP_E at Toll Control Building Area							Slope Feature - Slope TP_E at Toll Control Building Area
TPE61190	U-channel (150m) and Berm for slope E2b						
TPE61240	Excavation of Rock for slope E3b - stage 4						
TPE61380	U-channel (230m) and Berm for slope E1b and E1c					U-channel (230m) and Berm for slope E1b and E1c	
TPE61600	All remaining works include civil provision for TCSS and E&M					All remaining works include civil provision for TCSS and E&M	
TPE61700	Hand Over Portion D					Hand Over Portion D	
TPE65350	KD-7(Section 4)					◆ KD-7(Section 4)	

█ Remaining Level of Effort █ Critical Remaining Work
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**CRBC - Kaden JV
Three-Month Rolling Programme**

Date	Revision	Checked	Approved
03-03-17			

Activity ID	Activity Name	2017	Feb	Mar	Apr	May	Jun
Slope Feature - Slope TP_E Remaining Section and 5SE-D/C116		Slope Feature - Slope TP_E Remaining Section and 5SE-D/C116					
TPE62210	Excavation of Rock for slope E3c - stage 1						
TPE62410	Mapping & Dowelling			■ Mapping & Dowelling			
TPE62420	U-channel (220m) and Berm for slope E3a			■ U-channel (220m) and Berm for slope E3a			
TPE62600	Construct Cascade C			■ Construct Cascade C			
TPE62550	Remaining civil works			■ Remaining civil works			
TPE62700	Achievement of KD-3(Stage 3) for slope E			◆ Achievement of KD-3(Stage 3) for slope E			
Achievement of KD-8(Section 5) for Slope E		Achievement of KD-8(Section 5) for Slope E					
TPE65320	Remaining works include landscape works and establishment works						
Site Formation - Slope Upgrading Works		Site Formation - Slope Upgrading Works					
Stage 3 (Other Slope Features)		Stage 3 (Other Slope Features)					
Slope Feature - 5SE-D/C170		Slope Feature - 5SE-D/C170					
SFW10080	Excavation of Rock (30000m3) for 5SE-D/C170			■ Excavation of Rock (30000m3) for 5SE-D/C170			
SFW10105	Raking Drain Construction			■ Raking Drain Construction			
SFW10110	Drainage, U-channel (410m) and Handrailing			■ Drainage, U-channel (410m) and Handrailing			
SFW10850	Achievement of KD-3(Stage 3)					■ Achievement of KD-3(Stage 3)	
Slope Feature - 5SE-D/C165		Slope Feature - 5SE-D/C165					
SFW10780	Slope Cut and Modification Works (350m3)						
SFW10790	Soil Nail RowC (12nos) Level + 17.60 (Install and grouting)						
SFW10800	Soil Nail RowB (16nos) Level + 15.60 (Install and grouting)						
SFW10810	Soil Nail RowA (19nos) Level + 13.60 (Install and grouting)						
SFW10820	Drainage, U-channel (80m) and Handrailing			■ Drainage, U-channel (80m) and Handrailing			
SFW10830	Hydroseeding and Erosion Control Mat			■ Hydroseeding and Erosion Control Mat			
SFW10870	Achievement of KD-3(Stage 3)					■ Achievement of KD-3(Stage 3)	
Slope Feature - 5SE-D/C150		Slope Feature - 5SE-D/C150					
SFW10890	Achievement of KD-3(Stage 3)			◆ Achievement of KD-3(Stage 3)			
Slope Feature - 5SE-D/C152		Slope Feature - 5SE-D/C152					
SFW10220	Complete slope 5SE-D/C150						
SFW10240	Drainage, U-channel (90m) and Handrailing			■ Drainage, U-channel (90m) and Handrailing			
SFW10250	Hydroseeding and Erosion Control Mat			■ Hydroseeding and Erosion Control Mat			
SFW10910	Achievement of KD-3(Stage 3)					◆ Achievement of KD-3(Stage 3)	
Slope Feature - 5SE-D/C121		Slope Feature - 5SE-D/C121					
SFW10930	Achievement of KD-3(Stage 3)			◆ Achievement of KD-3(Stage 3)			
Slope Feature - 5SE-D/C122		Slope Feature - 5SE-D/C122					
SFW10950	Achievement of KD-3(Stage 3)			◆ Achievement of KD-3(Stage 3)			
Slope Feature - 5SE-D/C14		Slope Feature - 5SE-D/C14					
SFW10340	Complete TP_F Backfilling(Bay1-2)						◆ Complete TP_F Backfilling(Bay1-2)

■ Remaining Level of Effort ■ Critical Remaining Work
■ Actual Work ◆ Milestone
■ Remaining Work ▼ Summary

**CRBC - Kaden JV
Three-Month Rolling Programme**

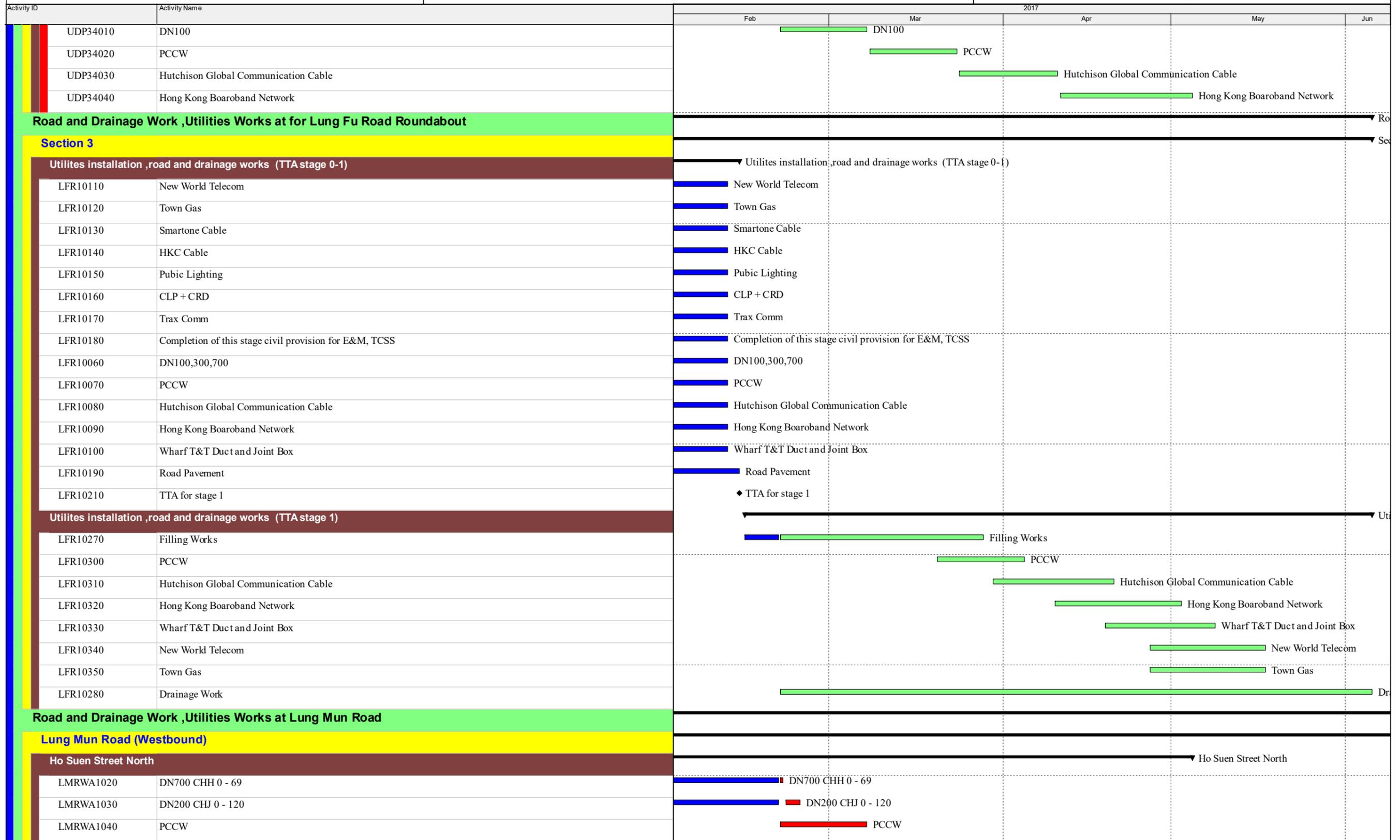
Date	Revision	Checked	Approved
03-03-17			

Activity ID	Activity Name	2017	Feb	Mar	Apr	May	Jun
AK10410	Possession of Portion X	◆ Possession of Portion X					
Slope Feature - 5SE-D/C149		▼ Slope Feature - 5SE-D/C149					
SFW10380	Complete slope 5SE-D/C152	◆ Complete slope 5SE-D/C152					
SFW10990	Achievement of KD-3(Stage 3)	◆ Achievement of KD-3(Stage 3)					
Slope Feature - 5SE-D/C115		▼ Slope Feature - 5SE-D/C115					
SFW10450	Drainage, U-channel (150m) and Handrailing						
SFW10420	Complete slope 5SE-D/C149						
SFW11010	Achievement of KD-3(Stage 3)	◆ Achievement of KD-3(Stage 3)					
Slope Feature - 5SE-D/C21		▼ Slope Feature - 5SE-D/C21					
SFW10550	Slope Modification	■ Slope Modification					
SFW10560	Rock Mapping and Stabilization	■ Rock Mapping and Stabilization					
SFW11070	Achievement of KD-3(Stage 3)	◆ Achievement of KD-3(Stage 3)					
SFW10570	Hydroseeding and Erosion Control Mat	■ Hydroseeding and Erosion Control Mat					
Slope Feature - 5SE-D/C171		▼ Slope Feature - 5SE-D/C171					
SFW10580	Complete slope 5SE-D/C21	◆ Complete slope 5SE-D/C21					
SFW11090	Achievement of KD-3(Stage 3)	◆ Achievement of KD-3(Stage 3)					
Slope Feature - 5SE-D/C16		▼ Slope Feature - 5SE-D/C16					
SFW10630	Slope Modification	■ Slope Modification					
SFW10640	Rock Mapping and Stabilization	■ Rock Mapping and Stabilization					
Slope Feature - 5SE-D/C17		▼ Slope Feature - 5SE-D/C17					
SFW10750	Slope Modification	■ Slope Modification					
SFW10760	Drainage, U-channel (180m) and Handrailing	■ Drainage, U-channel (180m) and Handrailing					
SFW10770	Hydroseeding and Erosion Control Mat	■ Hydroseeding and Erosion Control Mat					
SFW11170	Achievement of KD-3(Stage 3)	◆ Achievement of KD-3(Stage 3)					
Vehicular Underpass TN-01		▼ Vehicular Underpass TN-01					
Stage 3		▼ Stage 3					
Lining Works and Road Works		and Road Works					
Water Proofing and Lining Works		and Lining Works					
Type B							
Lining B1							
UDP4080	Completed the lining works						
Type C							
UDP4250	Formwork for east bulkhead wall	east bulkhead wall					
UDP4260	Concrete for east bulkhead wall	st bulkhead wall					
Road and Drainage Work, Utilities Works in Tunnel		Road and Drainage Work, Utilities Works in T					
Road and Drainage Work, Utilities Works in Tunnel		Road and Drainage Work, Utilities Works in T					
UDP34000	DN300	■ DN300					

■ Remaining Level of Effort ■ Critical Remaining Work
■ Actual Work ◆ Milestone
■ Remaining Work ▼ Summary

**CRBC - Kaden JV
Three-Month Rolling Programme**

Date	Revision	Checked	Approved
03-03-17			



█ Remaining Level of Effort █ Critical Remaining Work
█ Actual Work ◆ Milestone
█ Remaining Work ▶ Summary

CRBC - Kaden JV
Three-Month Rolling Programme

Date	Revision	Checked	Approved
03-03-17			

Activity ID	Activity Name	2017
		Feb Mar Apr May Jun
LMRWA1000	Drainage Work	
LMRWA1050	Hutchison Global Communication Cable	
LMRWA1060	Hong Kong Boaroband Network	
LMRWA1070	Wharf T&T Duct and Joint Box	
Ho Suen Street South		
LMRWA1200	DN300 CHE 0 - 116	
LMRWA1210	DN100 CHG 0 - 112	
LMRWA1170	Drainage Work	
Utilites installation ,road and drainage works for East Portal		
EPA1000	Rock Cutting	
EPA1020	DN300 CHA 0 - 175&DN100	
Utilites installation ,road and drainage works near portion D		
TOLLA1010	DN300	
TOLLA1020	DN100	
TOLLA1030	PCCW	
TOLLA1040	Hutchison Global Communication Cable	
TOLLA1050	Hong Kong Boaroband Network	
Sewage, Irrigation and Road& Drainage Works		
SAI10060	Sewage, irrigation and road&drainage works -G2-north side	
SAI10070	Sewage, irrigation and road&drainage works- G2-south side	
SAI10040	Sewage, irrigation and road&drainage works -G1&H1-north side	
Achievement of Key Dates		
AK10320	Achievement of KD-3(Stage 3) for slope C	
AK10365	Achievement of KD-7(Section 4) for slope E	
AK10280	Achievement of KD-3(Stage 3) for slope A	

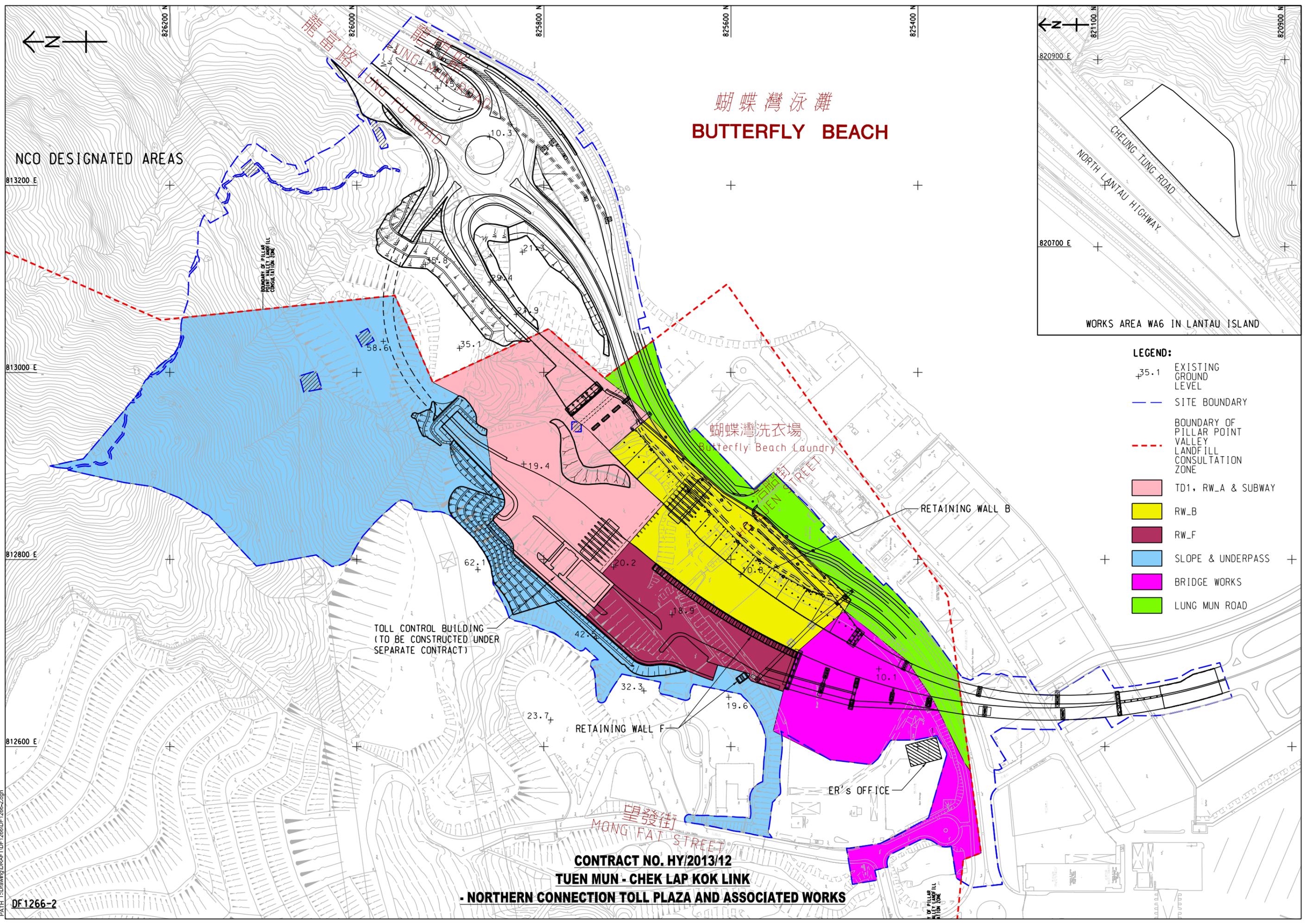
Remaining Level of Effort Critical Remaining Work
 Actual Work Milestone
 Remaining Work Summary

CRBC - Kaden JV
Three-Month Rolling Programme

Date	Revision	Checked	Approved
03-03-17			

Appendix E

Monitoring Locations / Sensitive Receivers for the Contract



蝴蝶灣泳灘
BUTTERFLY BEACH

NCO DESIGNATED AREAS

WORKS AREA WA6 IN LANTAU ISLAND

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

TOLL CONTROL BUILDING
 (TO BE CONSTRUCTED UNDER
 SEPARATE CONTRACT)

RETAINING WALL F

RETAINING WALL B

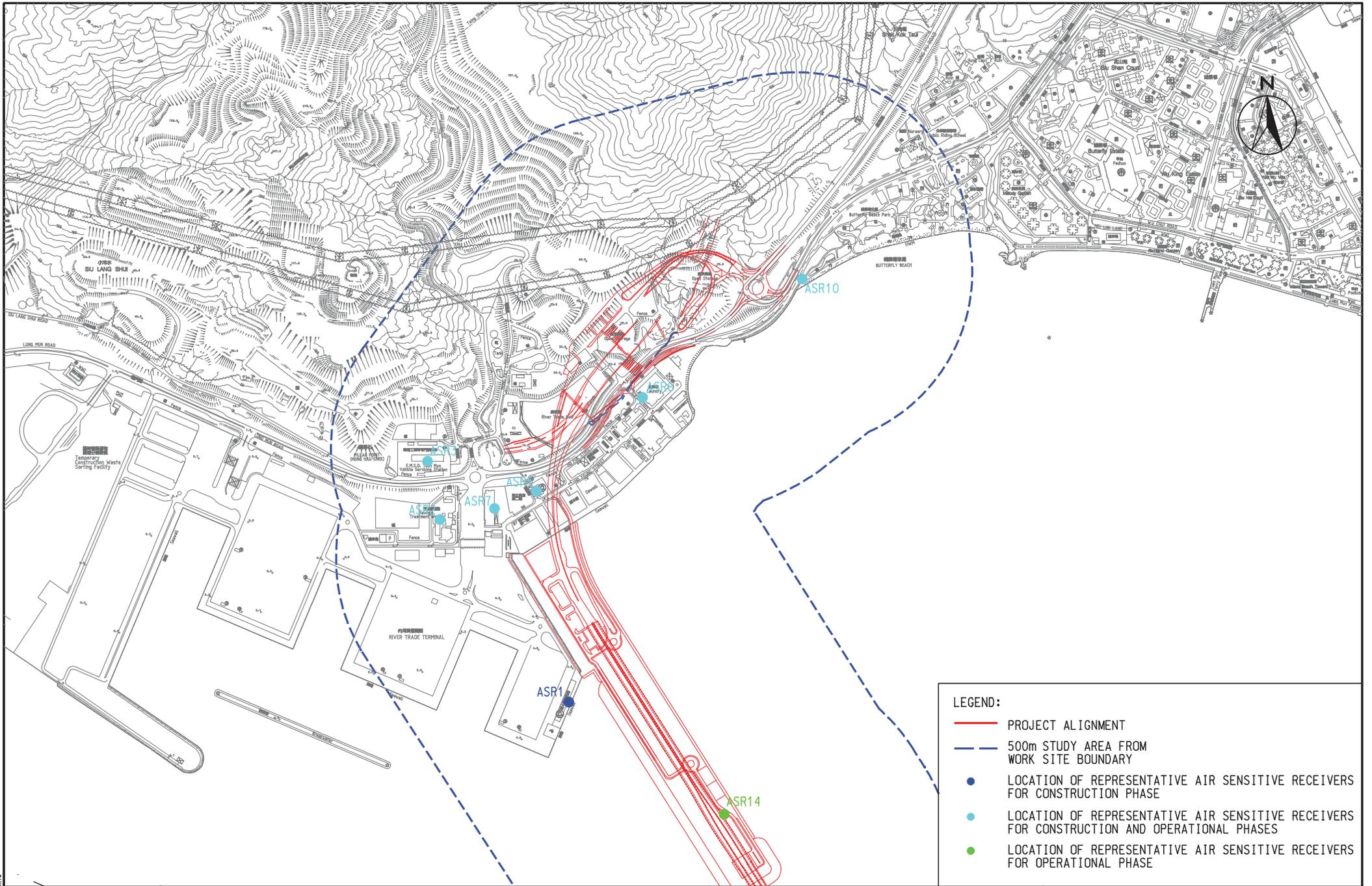
ER'S OFFICE

蝴蝶灣洗衣場
 Butterfly Beach Laundry

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

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DF1266-2

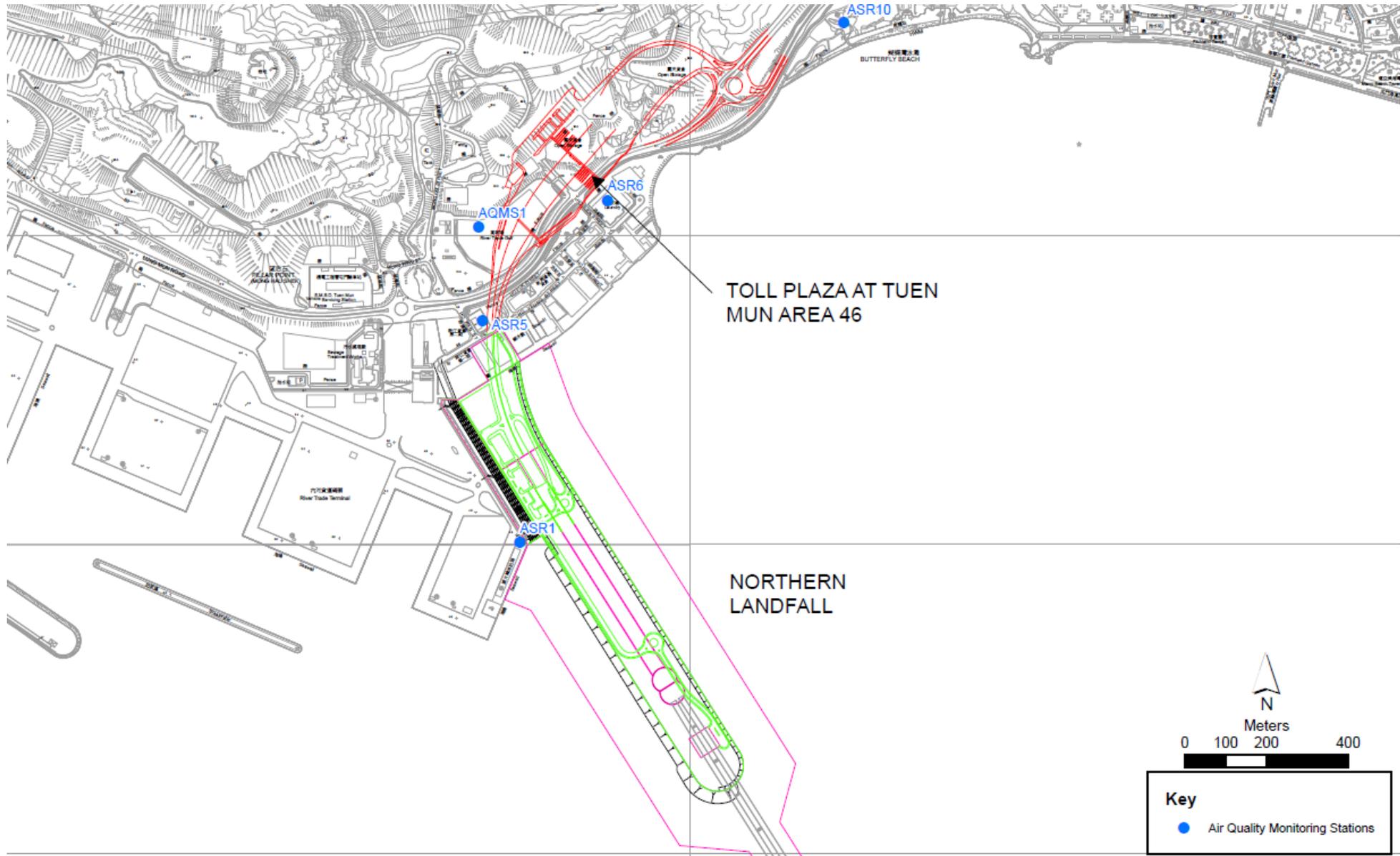


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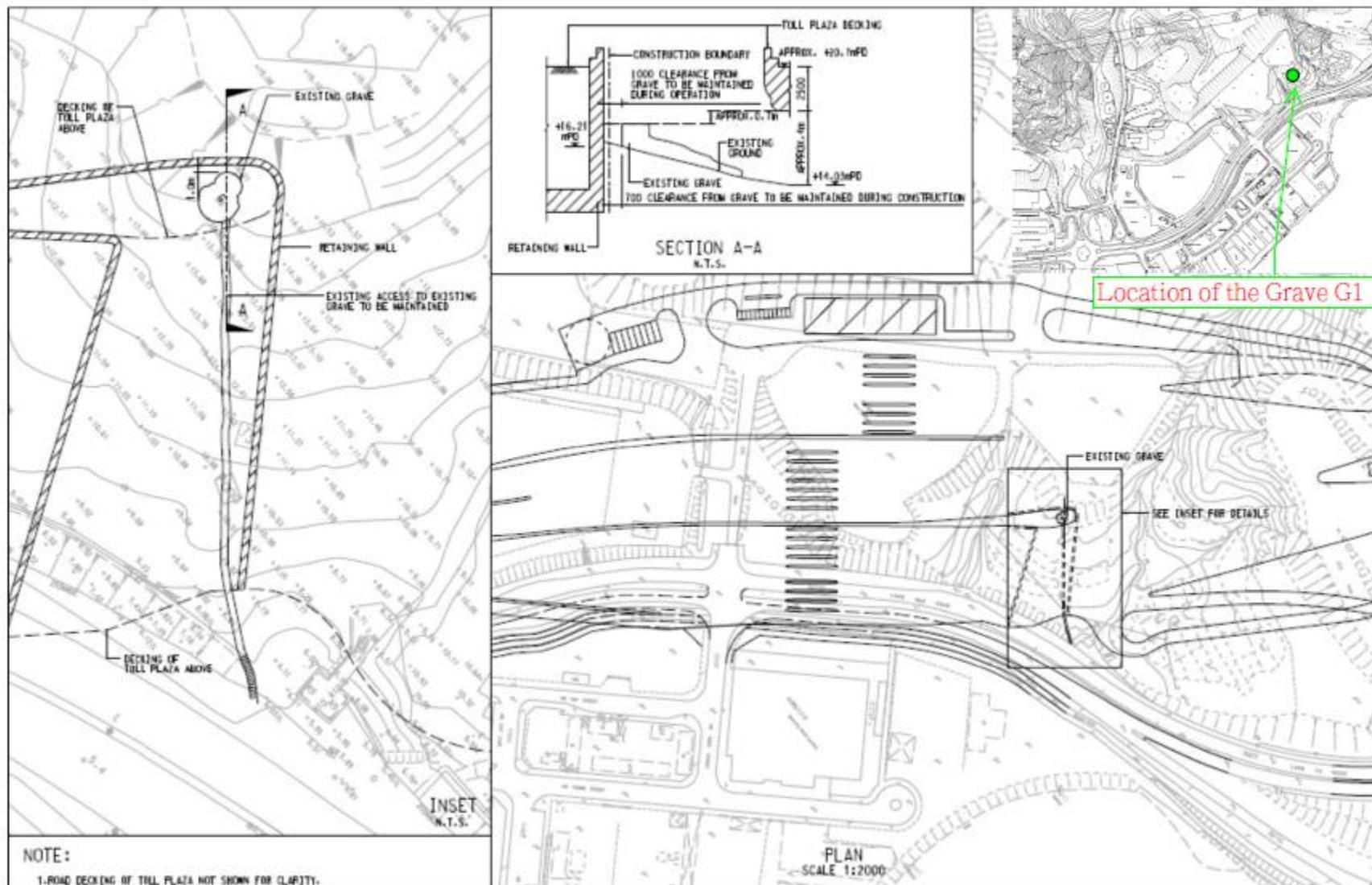
- PROJECT ALIGNMENT
- - - 500m STUDY AREA FROM WORK SITE BOUNDARY
- LOCATION OF REPRESENTATIVE AIR SENSITIVE RECEIVERS FOR CONSTRUCTION PHASE
- LOCATION OF REPRESENTATIVE AIR SENSITIVE RECEIVERS FOR CONSTRUCTION AND OPERATIONAL PHASES
- LOCATION OF REPRESENTATIVE AIR SENSITIVE RECEIVERS FOR OPERATIONAL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

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

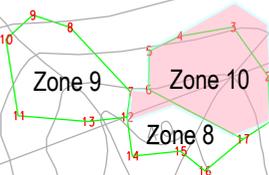
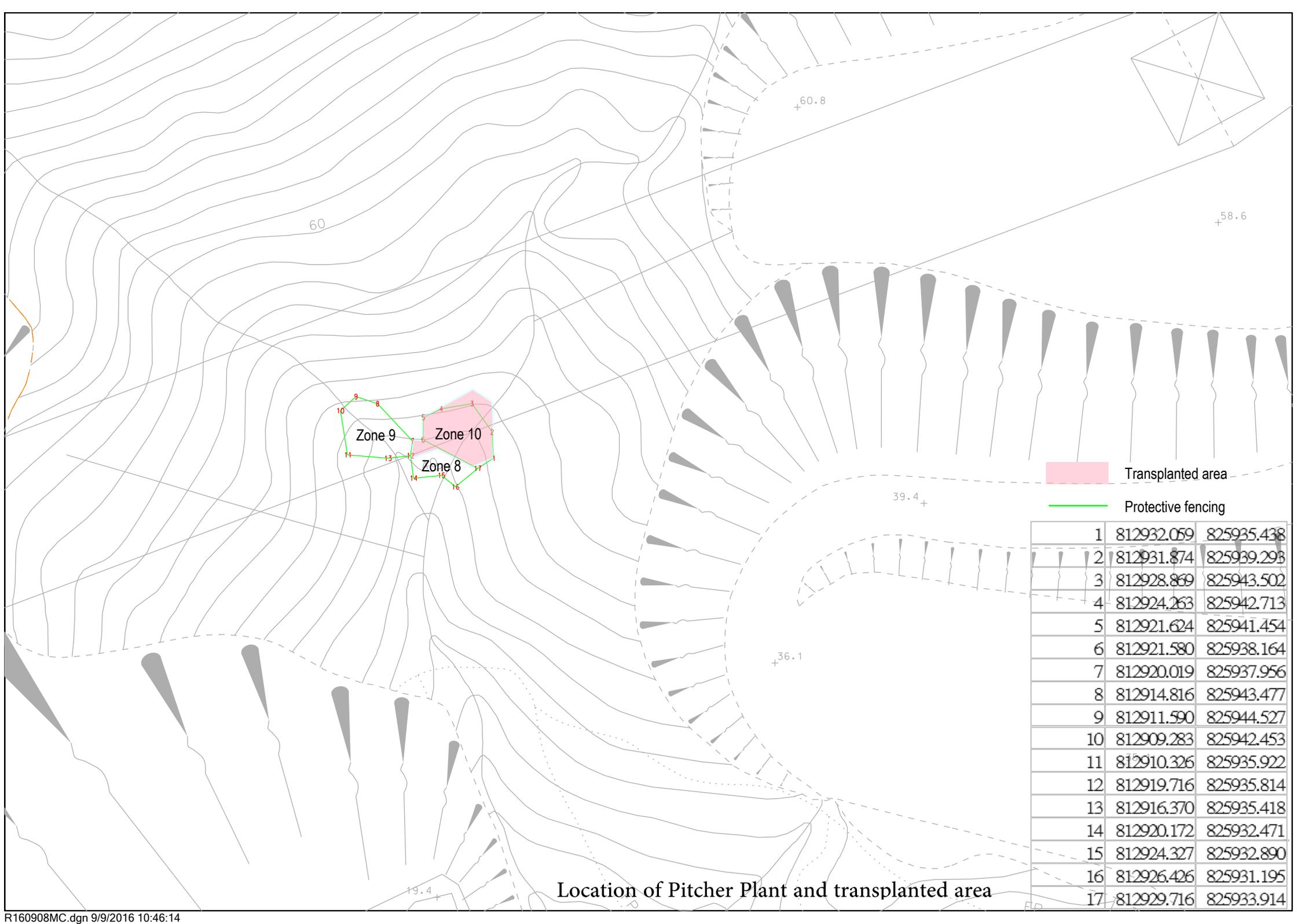
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Air Quality Monitoring Location



Location of the Grave G1



Transplanted area
 Protective fencing

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

Location of Pitcher Plant and transplanted area

Appendix F

Event and Action Plan

Event and Action Plan for Air Quality

EVENT	ACTION			
	ET ⁽¹⁾	IEC ⁽¹⁾	SOR ⁽¹⁾	Contractor(s)
Action Level				
Exceedance recorded	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

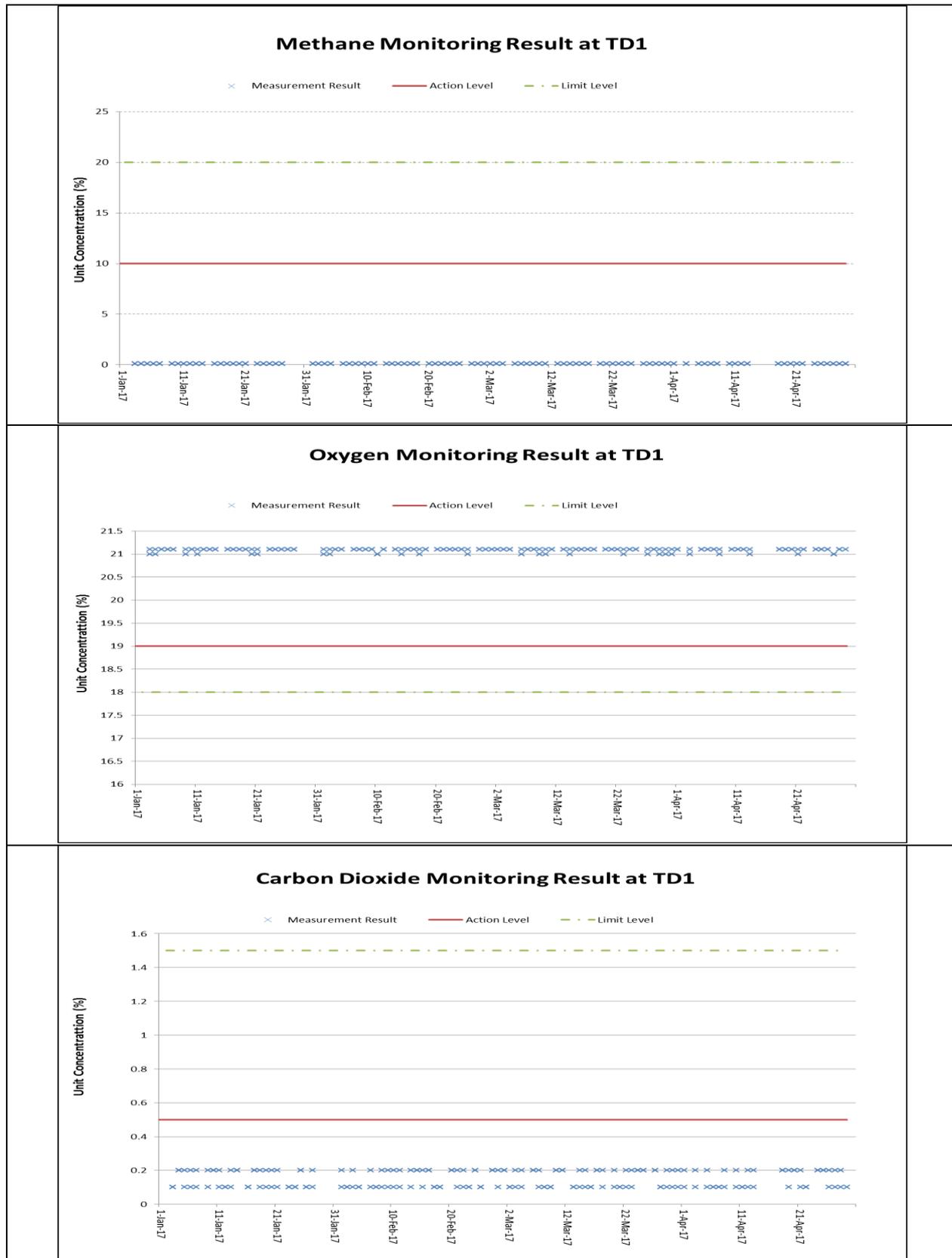
Note: ET – Environmental Specialist, IC(E) – Independent Checker (Environmental), ER – Engineer's Representative

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%

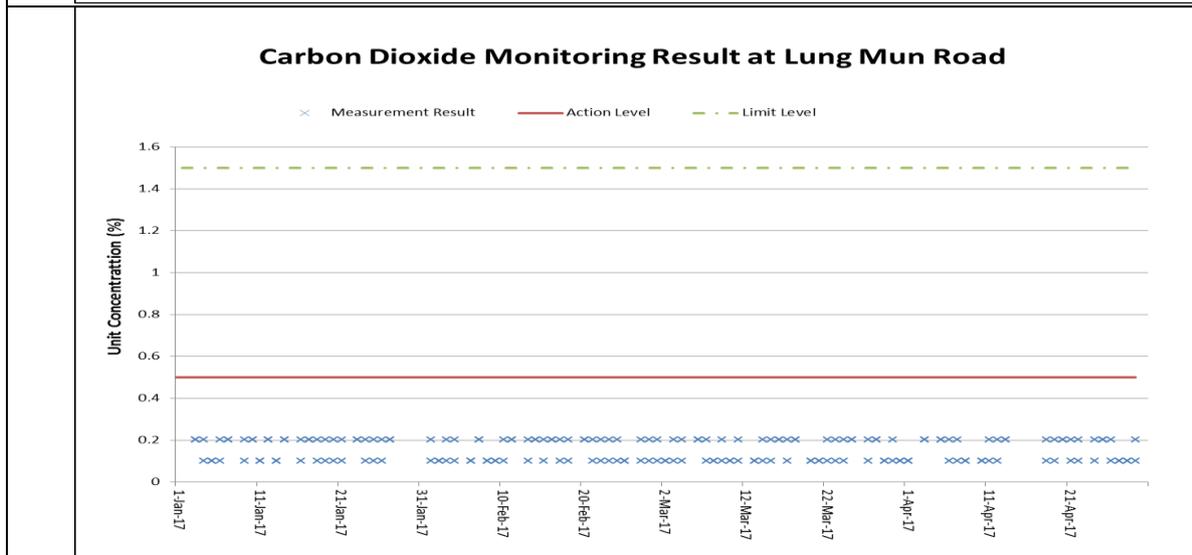
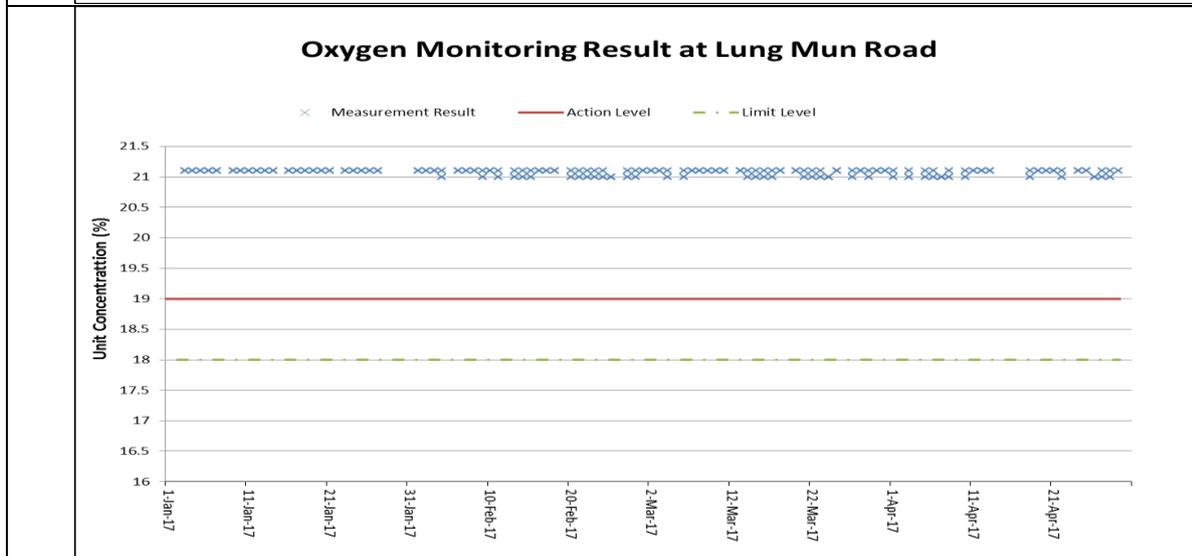
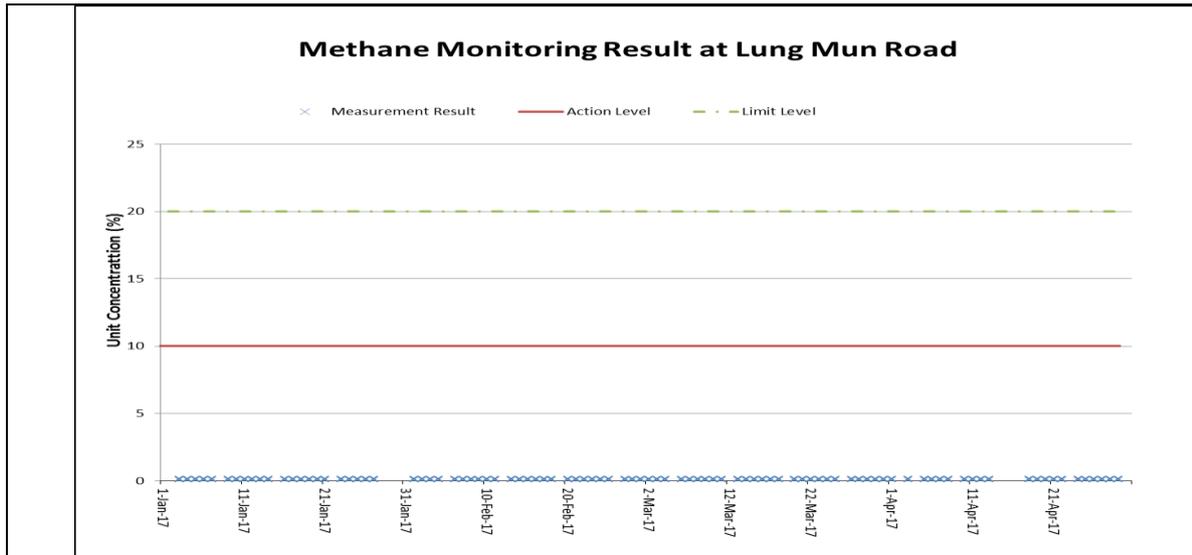
Appendix G

Landfill Gas Monitoring Graphical Plots



Annotation:

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



Annotation:

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

Appendix H

Waste Flow Table

Appendix A –Monthly Waste Flow Table

Monthly Summary Waste Flow Table for 2017 (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 (see note 4)	Paper / cardboard packaging (see note 4)	Plastics & Rubber (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	13.334	0.000	4.543	7.512	1.062	0.000	0.000	0.000	0.000	0.000	0.217
Feb	14.323	0.000	1.066	10.617	2.566	0.000	0.000	0.000	0.000	0.000	0.074
Mar	18.707	0.000	2.116	12.844	3.413	0.000	0.000	0.000	0.000	0.000	0.334
Apr	10.839	0.000	2.291	7.287	1.099	0.000	0.000	0.000	0.000	0.000	0.162
May											
June											
Sub-total	57.203	0.000	10.016	38.260	8.140	0.000	0.000	0.000	0.000	0.000	0.787
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total	57.203	0.000	10.016	38.260	8.140	0.000	0.000	0.000	0.000	0.000	0.787

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		✓

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**

4.8.1	3.8	During transportation by truck, materials shall not be loaded to a level higher than the side and tail boards, and shall be dampened or covered before transport.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	No earth, mud, debris, dust and the like shall be deposited on public roads. Wheel washing facility shall be usable prior to any earthworks excavation activity on the site.	construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	Areas of exposed soil shall be minimized to areas in which works have been completed shall be restored as soon as is practicable.	All exposed surfaces / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	All stockpiles of aggregate or spoil shall be enclosed or covered and water applied in dry or windy condition.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.11	Section 3	EM&A in the form of 1 hour and 24 hour dust monitoring and site audit	All representative existing ASRs / throughout construction period	Contractor	EM&A Manual		Y		✓

Cultural Heritage

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

Ecology

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

CONTRACT NO. HY/2013/12

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

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

Landfill Gas Hazard Assessment

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

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		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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		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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		transplanted straight to their final receptor site and not held in a temporary nursery. A detailed Tree Transplanting Specification shall be provided in the Contract Specification. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme (CM2)	construction	Contractor					
10.9	7.6	Hillside and roadside screen planting to proposed roads, associated structures and slope works (CM3)	All areas/detailed design/ during Construction/ post construction	Design Consultant/ Contractor	TMEIA	Y	Y		NA
10.9	7.6	Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material (in earth tone) (CM4)	All areas/detailed design/ during Construction/ post construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Screening of construction works by hoardings around works area in visually unobtrusive colours, to screen works (CM5)	All areas/detailed design/ during Construction	Design Consultant/ Contractor	TMEIA	Y	Y		< >
10.9	7.6	Control night-time lighting and glare by hooding all lights (CM6)	All areas/detailed design/ during Construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Ensure no run-off into water body adjacent to the Project Area (CM7)	All areas/detailed design/ during Construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (CM8)	All areas/detailed design/ during Construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Recycle/Reuse all felled trees and vegetation, e.g. mulching (CM9)	All areas/detailed design/ during Construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Compensatory tree planting shall be provided to the satisfaction of relevant Government departments. Required numbers and locations of compensatory trees shall be determined and agreed separately with Government during the Tree Felling Application process under ETWBTC 3/2006 (CM10)	All areas/detailed design/ during Construction	Design Consultant/ Contractor	TMEIA	Y	Y		NA
10.9	7.6	Re-vegetation of affected woodland/shrubland with	All areas/detailed design/ during Construction	Design	TMEIA	Y	Y	Y	N/A

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		native species (OM1)	during Construction/ post construction	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/ post construction	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/ post construction	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/ post construction	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/ post construction	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/ post construction	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