

JOB NO.: TCS00694/13



**AGREEMENT NO. CE 45/2008 (CE)
LIANTANG/HEUNG YUEN WAI
BOUNDARY CONTROL POINT AND ASSOCIATED
WORKS**

**18th QUARTERLY ENVIRONMENTAL MONITORING &
AUDIT SUMMARY REPORT –
(November 2017 to January 2018)**

PREPARED FOR

**CIVIL ENGINEERING AND DEVELOPMENT
DEPARTMENT (CEDD)**

Quality Index

Date	Reference No.	Prepared By	Certified By
26 April 2018	TCS00694/13/600/R1510v2	 Nicola Hon (Environmental Consultant)	 T.W. Tam (Environmental Team Leader)

Version	Date	Description
1	24 April 2018	First Submission
2	26 April 2018	Amended according to the IEC's comment on 25 April 2018

This report has been prepared by Action-United Environmental Services & Consulting with all reasonable skill, care and diligence within the terms of the Agreement with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.



Member of the Surbana Jurong Group

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global experience

Our ref: 7076192/L23002/AB/AW/MMC/rw

3 May 2018

AECOM
8/F, Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, N.T.

By Email & Post

Attention: Mr Simon LEUNG

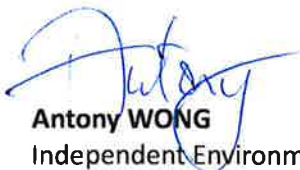
Dear Sirs

Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary Control Point and Associated Works
Independent Environmental Checker – Investigation
Quarterly EM&A Summary Report (No. 18) – November 2017 to January 2018

With reference to the Quarterly EM&A Report No. 18 for November 2017 to January 2018 (Version 2) certified by the ET Leader and received by us on 3 May 2018, please be noted that we have no adverse comments on the captioned submission. We herewith verify the captioned submission in accordance with Section 13.4 of the EM&A Manual.

Thank you for your attention and please do not hesitate to contact the undersigned on tel. 3995 8120 or by email to antony.wong@smec.com; or our Mr Arthur Chiu on tel. 3995 8144 or by email to arthur.chiu@smec.com.

Yours faithfully



Antony WONG
Independent Environmental Checker

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EXECUTIVE SUMMARY

ES.01. This is the 18th Quarterly EM&A Summary Report for the “Liantang/Heung Yuen Wai Boundary Control Point and Associated Works” under Environmental Permit No. EP-404/2011/D (hereinafter “the EP”), covering the period from 1 November 2017 to 31 January 2018 (hereinafter “Reporting Period”).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.02. In the Reporting Period, the construction works under Liantang/Heung Yuen Wai Boundary Control Point and Associated Works of the Project included Contract 2, Contract 3, Contract 6, Contract 7 and Contract SS C505. Environmental monitoring activities under the EM&A programme in the Reporting Period are summarized in the following table.

Environmental Aspect	Monitoring Parameters / Inspection	Reporting Period	
		Monitoring Locations / Contracts	Total Occasions
Air Quality	1-hour TSP	9	432
	24-hour TSP	9	144
Construction Noise	L _{eq(30min)} Daytime	10	130
Water Quality	Water in-situ measurement and/or sampling	WM1 & WM1-C,	40 scheduled and 0 extra of sampling day
		WM2A & WM2A-Cx	40 scheduled and 4 extra of sampling day
		WM2B & WM2B-C	(*) 40 Scheduled
		WM3 & WM3-C	40 scheduled and 2 extra of sampling day
		WM4, WM4-CA & WM4-CB	40 scheduled and 6 extra of sampling day
Ecology	Woodland compensation i) General Health condition of planted species ii) Survival of planted species	9 Quadrats	1
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	Contract 2	13
		Contract 3	13
		Contract 4	13
		Contract 6	13
		Contract 7	13
		Contract SS C505 (#)	14

Note: Extra monitoring day was due to measurement results exceedance

(#) IEC only joined inspection for Contract SS C505 once per month.

(*) During the whole reporting period, water sampling was unable to carry out at WM2B and WM2B-C due to shallow water (water depth under 150mm)

BREACHES OF ACTION/LIMIT LEVELS

ES.03. In the Reporting Period, no noise exceedance and valid noise complaint was registered for construction noise. For air quality, there were 6 Action Level exceedances of 24-hour TSP monitoring results recorded. For water quality monitoring, a total of 26 Action/ Limit Level exceedance were recorded. The summary of exceedance for the Reporting Period 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	--	--
	24-hour TSP	6	0	6	Not project related	NA

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--
Water Quality	DO	0	0	0	--	--
	Turbidity	0	13	13	<ul style="list-style-type: none"> 6 numbers of LL exceedances which recorded on 6, 11, 15 Dec 17 were related to the insufficient mitigation measures for Contract 3. Other 20 numbers of exceedances were not project related. 	The Contractor was reminded to implement water quality mitigation measures in accordance with ISEMM of the EM&A Manual requirements
	SS	1	12	13		

ES.04. Investigation Reports for all 24-hour TSP exceedances were completed by ET which concluded that the exceedances were not project related. According to the observation during site audit, the Contractor had properly implemented the dust mitigation measures such as provided water spraying on construction area and site haul road regularly. Moreover, water tanker and road sweeper were deployed the main road on regular basis to suppress fugitive dust and remover dirt and debris on road. It was considered that the exceedances were likely related to the dust impact from traffic.

ES.05. Investigation Reports for all water quality exceedances were completed by ET. The investigation result revealed that the LL exceedances on 6, 11, 15 December 2017 were related to the insufficient water quality mitigation measures for Contract 3 while the other exceedances was not project-related. As remedial action, the relevant Contractor had enhanced the water quality mitigation measures such as covering the exposed area by tarpaulin sheet to minimize muddy runoff and no project-related exceedance was recorded after the enhancement measures.

ENVIRONMENTAL COMPLAINT

ES.06. In this Reporting Period, four (4) documented environmental complaint was received regarding the air quality and noise issues under the EM&A Programme. Subsequent joint site inspection was carried out for complaint investigation and investigation reports were submitted by ET after reviewed by IEC. The IRs revealed that the Contractors have properly implemented the mitigation measures and no breaches of EM&A programme was seen. Further enhancement measures were included and implemented in response to the complaint.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.07. No environmental summons or successful prosecutions were recorded in the Reporting Period.

REPORTING CHANGES

ES.08. No reporting changes were made in the Reporting Period.

FUTURE KEY ISSUES

ES.09. During dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to villages. The Contractor should fully implement the construction dust mitigation measures as appropriately.

ES.10. Preventive measures for muddy water or other water pollutants from site surface flow to local stream such as Kong Yiu Channel, Ma Wat Channel, Ping Yuen River, Kwan Tei River or public area should be properly maintained. The Contractors should paid special attention on water

quality mitigation measures and fully implement according ISEMM of the EM&A Manual, in particular for working areas near Ma Wat Channel and Ping Yuen River.

- ES.11. In addition, all effluent discharge shall be ensure to fulfill Technical Memorandum of Effluent Discharged into Drainage and Sewerage Systems, inland and Coastal Waters criteria or discharge permits stipulation.
- ES.12. Construction noise would be a key environmental issue during construction work of the Project. Noise mitigation measures such as using quiet plants should be implemented in accordance with the EM&A requirement.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.1.1. Civil Engineering and Development Department is the Project Proponent and the Permit Holder of Agreement No. CE 45/2008 (CE) Liantang / Heung Yuen Wai Boundary Control Point and Associated Works, which is a Designated Project to be implemented under Environmental Permit number EP-404/2011/C granted on 12 March 2015 and the latest Environmental Permit number EP-404/2011/D granted on 20 January 2017.
- 1.1.2. The Project consists of two main components: Construction of a Boundary Control Point (hereinafter referred as “BCP”); and Construction of a connecting road alignment. Layout plan of the Project is shown in [Appendix A](#).
- 1.1.3. The proposed BCP is located at the boundary with Shenzhen near the existing Chuk Yuen Village, comprising a main passenger building with passenger and cargo processing facilities and the associated customs, transport and ancillary facilities. The connecting road alignment consists of six main sections:
- 1) Lin Ma Hang to Frontier Closed Area (FCA) Boundary – this section comprises at-grade and viaducts and includes the improvement works at Lin Ma Hang Road;
 - 2) Ping Yeung to Wo Keng Shan – this section stretches from the Frontier Closed Area Boundary to the tunnel portal at Cheung Shan and comprises at-grade and viaducts including an interchange at Ping Yeung;
 - 3) North Tunnel – this section comprises the tunnel segment at Cheung Shan and includes a ventilation building at the portals on either end of the tunnel;
 - 4) Sha Tau Kok Road – this section stretches from the tunnel portal at Wo Keng Shan to the tunnel portal south of Loi Tung and comprises at-grade and viaducts including an interchange at Sha Tau Kok and an administration building;
 - 5) South Tunnel – this section comprises a tunnel segment that stretches from Loi Tung to Fanling and includes a ventilation building at the portals on either end of the tunnel as well as a ventilation building in the middle of the tunnel near Lau Shui Heung;
 - 6) Fanling – this section comprises the at-grade, viaducts and interchange connection to the existing Fanling Highway.
- 1.1.4. 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.
- 1.1.5. This is the 18th Quarterly EM&A Summary Report presenting the monitoring results and inspection findings for the Reporting Period from **1 November 2017 to 31 January 2018**.

1.2 REPORT STRUCTURE

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

Section 1	Introduction
Section 2	Project Organization and Construction progress
Section 3	Summary of Impact monitoring Requirements
Section 4	Air Quality Monitoring
Section 5	Construction Noise Monitoring
Section 6	Water Quality Monitoring
Section 7	Ecology Monitoring
Section 8	Waste Management
Section 9	Site Inspection
Section 10	Non-compliance, Complaints, Notifications of Summons and Prosecutions
Section 11	Implementation Status of Mitigation Measures
Section 12	Conclusions and Recommendations

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 CONSTRUCTION CONTRACT PACKAGING

2.1.1 To facilitate the project management and implementation, the Project would be divided by the following contracts:

- Contract 2 (CV/2012/08)
- Contract 3 (CV/2012/09)
- Contract 4 (NE/2014/02)
- Contract 5 (CV/2013/03)
- Contract 6 (CV/2013/08)
- Contract 7 (NE/2014/03)
- ArchSD Contract No. SS C505

2.1.2 The details of each contracts is summarized below and the delineation of each contracts is shown in [Appendix A](#).

Contract 2 (CV/2012/08)

2.1.3 Contract 2 has awarded in December 2013 and construction work was commenced on 19 May 2014. Major Scope of Work of the Contract 2 is listed below:

- construction of an approximately 5.2km long dual two-lane connecting road (with about 0.4km of at-grade road and 4.8km of tunnel) connecting the Fanling Interchange with the proposed Sha Tau Kok Interchange;
- construction of a ventilation adit tunnel and the mid-ventilation building;
- construction of the north and south portal buildings of the Lung Shan Tunnel and their associated slope works;
- provision and installation of ventilation system, E&M works and building services works for Lung Shan tunnel and Cheung Shan tunnel and their portal buildings;
- construction of Tunnel Administration Building adjacent to Wo Keng Shan Road and the associated E&M and building services works; and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 3 (CV/2012/09)

2.1.4 Contract 3 was awarded in July 2013 and construction work was commenced on 5 November 2013. Major Scope of Work of the Contract 3 is listed below:

- construction of four link roads connecting the existing Fanling Highway and the south portal of the Lung Shan Tunnel;
- realignment of the existing Tai Wo Service Road West and Tai Wo Service Road East;
- widening of the existing Fanling Highway (HyD's entrustment works);
- demolishing existing Kiu Tau vehicular bridge and Kiu Tau footbridge and reconstruction of the existing Kiu Tau Footbridge (HyD's entrustment works); and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 4 (NE/2014/02)

2.1.5 Contract 4 was awarded in mid-April 2016 and construction work will be commenced on 2 May 2017. The scope of work of the Contract 4 includes:

- design, supply, delivery, installation, testing and commissioning of a traffic control and surveillance system for the connecting road linking up the Liantang / Heung Yuen Wai Boundary Control Point and the existing Fanling Highway.

Contract 5 (CV/2013/03)

- 2.1.6 Contract 5 has awarded in April 2013 and construction work was commenced in August 2013. Major Scope of Work of the Contract 5 is listed below:
- site formation of about 23 hectares of land for the development of the BCP;
 - construction of an approximately 1.6 km long perimeter road at the BCP including a 175m long depressed road;
 - associated diversion/modification works at existing local roads and junctions including Lin Ma Hang Road;
 - construction of pedestrian subway linking the BCP to Lin Ma Hang Road;
 - provision of resite area with supporting infrastructure for reprovisioning of the affected village houses; and
 - construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 6 (CV/2013/08)

- 2.1.7 Contract 6 was awarded in June 2015 and construction work was commenced on 23 October 2015. Major Scope of Work of the Contract 6 would be included below:
- construction of an approximately 4.6km long dual two-lane connecting road (with about 0.6km of at-grade road, 3.3km of viaduct and 0.7km of tunnel) connecting the BCP with the proposed Sha Tau Kok Road Interchange and the associated ventilation buildings;
 - associated diversion/modification works at access roads to the resite of Chuk Yuen Village;
 - provision of sewage collection, treatment and disposal facilities for the BCP and the resite of Chuk Yuen Village;
 - construction of a pedestrian subway linking the BCP to Lin Ma Hang Road;
 - provisioning of the affected facilities including Wo Keng Shan Road garden; and
 - construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 7 (NE/2014/03)

- 2.1.8 Contract 7 was awarded in December 2015 and the construction work was commenced 15 February 2016. Major Scope of Work of the Contract 7 would be included below:
- construction of the Hong Kong Special Administrative Region (HKSAR) portion of four vehicular bridge
 - construction of one pedestrian bridge crossing Shenzhen (SZ) River (cross boundary bridges)

ArchSD Contract No. SS C505

- 2.1.9 SS C505 has been awarded in July 2015 and construction work was commenced on 1 September 2015. Major Scope of Work of the SS C505 would be included below:
- passenger-related facilities including processing kiosks and examination facilities for private cars and coaches, passenger clearance building and halls, the interior fitting works for the pedestrian bridge crossing Shenzhen River, etc.;
 - cargo processing facilities including kiosks for clearance of goods vehicles, customs inspection platforms, X-ray building, etc.;
 - accommodation for the facilities inside of the Government departments providing services in connection with the BCP;
 - transport-related facilities inside the BCP including road networks, public transport interchange, transport drop-off and pick-up areas, vehicle holding areas and associated road furniture etc;
 - a public carpark; and
 - other ancillary facilities such as sewerage and drainage, building services provisions and electronic systems, associated environmental mitigation measure and landscape works.

2.2 PROJECT ORGANIZATION

2.2.1 The project organization is shown in [Appendix B](#). The responsibilities of respective parties are:

Civil Engineering and Development Department (CEDD)

2.2.2 CEDD is the Project Proponent and the Permit Holder of the EP of the development of the Project and will assume overall responsibility for the project. An Independent Environmental Checker (IEC) shall be employed by CEDD to audit the results of the EM&A works carried out by the ET.

Architectural Services Department (ArchSD)

2.2.3 ArchSD acts as the works agent for Development Bureau (DEVB), for Contract SS C505 Liantang/ Heung Yuen Wai Boundary Control Point (BCP) – BCP Buildings and Associated Facilities.

Environmental Protection Department (EPD)

2.2.4 EPD is the statutory enforcement body for environmental protection matters in Hong Kong.

Ronald Lu & Partners (Hong Kong) Ltd (The Architect)

2.2.5 Ronald Lu & Partners (Hong Kong) Ltd is appointed by ArchSD as an Architect for Contract SS C505 Liantang/ Heung Yuen Wai Boundary Control Point (BCP) – BCP Buildings and Associated Facilities. It responsible for overseeing the construction works of Contract SS C505 and for ensuring that the works are undertaken by the Contractor in accordance with the specification and contract requirements. The duties and responsibilities of the Architect with respect to EM&A are:

- Monitor the Contractors' compliance with contract specifications, including the implementation and operation of the environmental mitigation measures and their effectiveness
- Monitor Contractors' and ET's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual
- Facilitate ET's implementation of the EM&A programme
- Participate in joint site inspection by the ET and IEC
- Oversee the implementation of the agreed Event / Action Plan in the event of any exceedance
- Adhere to the procedures for carrying out complaint investigation
- Liaison with DSD, Engineer/Engineer's Representative, ET, IEC and the Contractor of the "Construction of the DSD's Regulation of Shenzhen River Stage 4 (RSR 4)" Project discussing regarding the cumulative impact issues.

Engineer or Engineers Representative (ER)

2.2.6 The ER is responsible for overseeing the construction works and for ensuring that the works are undertaken by the Contractor in accordance with the specification and contract requirements. The duties and responsibilities of the ER with respect to EM&A are:

- Monitor the Contractors' compliance with contract specifications, including the implementation and operation of the environmental mitigation measures and their effectiveness
- Monitor Contractors's, ET's and IEC's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual
- Facilitate ET's implementation of the EM&A programme
- Participate in joint site inspection by the ET and IEC
- Oversee the implementation of the agreed Event / Action Plan in the event of any exceedance
- Adhere to the procedures for carrying out complaint investigation
- Liaison with DSD, Engineer/Engineer's Representative, ET, IEC and the Contractor of the "Construction of the DSD's Regulation of Shenzhen River Stage 4 (RSR 4)" Project discussing regarding the cumulative impact issues.

The Contractor(s)

- 2.2.7 There will be one contractor for each individual works contract. The Contractor(s) should report to the ER. The duties and responsibilities of the Contractor are:
- Comply with the relevant contract conditions and specifications on environmental protection
 - Employ an Environmental Team (ET) to undertake monitoring, laboratory analysis and reporting of EM &A Facilitate ET's monitoring and site inspection activities
 - Participate in the site inspections by the ET and IEC, and undertake any corrective actions
 - Provide information / advice to the ET regarding works programme and activities which may contribute to the generation of adverse environmental impacts
 - Submit proposals on mitigation measures in case of exceedances of Action and Limit levels in accordance with the Event / Action Plans
 - Implement measures to reduce impact where Action and Limit levels are exceeded
 - Adhere to the procedures for carrying out complaint investigation

Environmental Team (ET)

- 2.2.8 One ET will be employed for this Project. The ET shall not be in any way an associated body of the Contractor(s), and shall be employed by the Project Proponent/Contractor to conduct the EM&A programme. The ET should be managed by the ET Leader. The ET Leader shall be a person who has at least 7 years' experience in EM&A and has relevant professional qualifications. Suitably qualified staff should be included in the ET, and resources for the implementation of the EM&A programme should be allocated in time under the Contract(s), to enable fulfillment of the Project's EM&A requirements as specified in the EM&A Manual during construction of the Project. The ET shall report to the Project Proponent and the duties shall include:
- Monitor and audit various environmental parameters as required in this EM&A Manual
 - Analyse the environmental monitoring and audit data, review the success of EM&A programme and the adequacy of mitigation measures implemented, confirm the validity of the EIA predictions and identify any adverse environmental impacts arising
 - Carry out regular site inspection to investigate and audit the Contractors' site practice, equipment/plant and work methodologies with respect to pollution control and environmental mitigation, and effect proactive action to pre-empt problems
 - Monitor compliance with conditions in the EP, environmental protection, pollution prevention and control regulations and contract specifications
 - Audit environmental conditions on site
 - Report on the environmental monitoring and audit results to EPD, the ER, the IEC and Contractor(s) or their delegated representatives
 - Recommend suitable mitigation measures to the Contractor in the case of exceedance of Action and Limit levels in accordance with the Event and Action Plans
 - Liaise with the IEC on all environmental performance matters and timely submit all relevant EM&A proforma for approval by IEC
 - Advise the Contractor(s) on environmental improvement, awareness, enhancement measures etc., on site
 - Adhere to the procedures for carrying out complaint investigation
 - Liaison with the client departments, Engineer/Engineer's Representative, ET, IEC and the Contractor(s) of the concurrent projects as listed under Section 2.3 below regarding the cumulative impact issues.

Independent Environmental Checker (IEC)

- 2.2.9 One IEC will be employed for this Project. The Independent Environmental Checker (IEC) should not be in any way an associated body of the Contractor(s) or the ET for the Project. The IEC should be employed by the Permit Holder (i.e., CEDD) prior to the commencement of the construction of the Project. The IEC should have at least 10 years' experience in EM&A and have relevant professional qualifications. The duty of IEC should be:

- Provide proactive advice to the ER and the Project Proponent on EM&A matters related to the project, independent from the management of construction works, but empowered to audit the environmental performance of construction
- Review and audit all aspects of the EM&A programme implemented by the ET
- Review and verify the monitoring data and all submissions in connection with the EP and EM&A Manual submitted by the ET
- Arrange and conduct regular, at least monthly site inspections of the works during construction phase, and ad hoc inspections if significant environmental problems are identified
- Check compliance with the agreed Event / Action Plan in the event of any exceedance
- Check compliance with the procedures for carrying out complaint investigation
- Check the effectiveness of corrective measures
- Feedback audit results to ET by signing off relevant EM&A proforma
- Check that the mitigation measures are effectively implemented
- Report the works conducted, the findings, recommendation and improvement of the site inspections, after reviewing ET's and Contractor's works, and advices to the ER and Project Proponent on a monthly basis
- Liaison with the client departments, Engineer/Engineer's Representative, ET, IEC and the Contractor(s) of the concurrent projects as listed under Section 2.3 below regarding the cumulative impact issues.

2.3 CONCURRENT PROJECTS

- 2.3.1 The concurrent construction works that may be carried out include, but not limited to, the following:
- (a) Regulation of Shenzhen River Stage IV;
 - (b) Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange – Contract No. HY/2012/06;
 - (c) Construction of BCP facilities in Shenzhen.

2.4 CONSTRUCTION PROGRESS

- 2.4.1 In the Reporting Period, the major construction activity conducted under the Project is located in Contracts 2, 3, 4, 6, 7 and SS C505 and they are summarized in below.

Contract 2 (CV/2012/08)

- 2.4.2 Construction work of Contract 2 was commenced on May 2014, the following activities were conducted in the Reporting Period.

Mid-Vent Portal	<ul style="list-style-type: none"> • Cavern internal structure and tunnel E&M activities • Stud tunnel post-excavation and earthworks • Structure connecting adit and ventilation building and backfilling • Ventilation building superstructure and internal structure • Ventilation building fitting out and E&M installation
North Portal	<ul style="list-style-type: none"> • Southbound tunnel waterproofing and lining • Southbound tunnel bench enlargement • Southbound tunnel internal structure, backfilling and cross passage • Tunnel Boring Machine (TBM) North drive excavation • Northbound tunnel bench excavation, water proofing and lining • North ventilation building structure • Construction of retaining wall • Mucking out from tunnels and tunnel E&M installation • D1500 drainage pipe jacking • Site formation and construction of slip road • Dismantling of mortar plant • Drainage cleansing works

South Portal	<ul style="list-style-type: none"> • Post-excavation tunnel activities and tunnel E&M installation • South ventilation building superstructure and internal structure • Tunnel invert, backfilling waterproofing, lining, internal structure and cross passage • Construction of retaining wall and backfilling activities • South ventilation building external wall finishing, fitting out and E&M installations
Admin Building	<ul style="list-style-type: none"> • Construction of fence wall, curtain wall, drainage and internal structure • Admin building fitting out, underground utilities and E&M installation

Contract 3 (CV/2012/09)

2.4.3 Contract commenced in November 2013, the following activities were conducted in the Reporting Period.

- Construction of profile barrier & Planter wall on Bridge deck
- Boundary wall for pumping station
- Cable detection and Trial Trenches
- Installation of Noise Barrier Steel post & panel
- Remaining works on New Kiu Tau Footbridge
- Mini-pile Installation
- Noise barrier construction
- Roadworks
- Viaduct Segment Erection
- Water Main Laying
- Parapet installation on bridge deck
- Construction of profile barrier & Planter wall on Bridge deck
- Drainage Work
- Stressing of External Tendon
- Construction of Retaining Wall behind Abutment
- Waterproofing works on Bridge deck
- Stitching works for longitudinal stitch of viaduct
- Installation of BFA lift
- Installation of Sign Gantry

Contract 4 (NE/2014/02)

2.4.4 The Contract was awarded in mid-April 2016 and the construction work was commenced on 2 May 2017. In this Reporting Period, construction activities conducted are listed below:

- System design and testing
- E&M installation at Admin Building
- E&M installation at Ventilation Building

Contract 5 (CV/2013/03)

2.4.5 As advised by the ER, the construction works under Contract 5 was substantially completed on 31 August 2016.

Contract 6 (CV/2013/08)

2.4.6 Contract 6 has awarded in June 2015 and construction work was commenced on 23 October 2015. In this Reporting Period, construction activities conducted are listed below:

- Bridge Segment Erection
- Bridge Installation Works
- Tunnel Works
- Sewage Treatment Plant Construction
- Tunnel Ventilation Building Construction

- Slip Road/ At-grade Road/ Periphery Road Construction

Contract 7 (NE/2014/03)

2.4.7 Contract 7 has awarded in December 2015 and construction work was commenced on 15 February 2015. In this Reporting Period, construction activities conducted are listed below:

- Column and deck construction at Bridges A and E
- Deck construction at Bridge B and D
- Falsework and formwork removal at Bridge B and D
- Installation of Façade at Bridge C
- Staircase construction at Bridge C
- Building Maintenance Unit (BMU) plinth construction at Bridge C
- R/F Slab and 3/F Slab construction at Bridge C

Contract SS C505

2.4.8 Contract SS C505 has awarded in July 2015 and construction work was commenced on 1 September 2015. In this Reporting Period, construction activities conducted are listed below:

- Building no. 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 13, 18, 41 and 43 construction
- Tower crane operation
- Bridge construction works including construction of bridge column, retaining wall, pile cap, pier, abutment, road and finishes works
- Underground drainage works, Road Works, CLP Cable laying and Landscaping
- Formwork and falsework for PTB's slab construction and Bridges Decks
- Construction PTB M/F, 1/F, 2/F and Roof flat slab
- Construction PTB non-structural wall, Late Cast Strip, Stairs and Lift Shaft
- Steel beam works for maintenance platform for PTB
- PTB backfilling works
- Integrated ABWF & MEP Works in PTB, Building no. 1, 2, 3, 4, 5, 6, 7, 10 and 18
- Elevated Walkway E1, E2, E3 and E4 construction
- Bridge deck construction for Bridges 1 - 5

2.5 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

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

- Project Layout Plans of Contracts 2, 3, 4, 5, 6, 7 and SS C505
- Landscape Plan
- Topsoil Management Plan
- Environmental Monitoring and Audit Programme
- Baseline Monitoring Report (TCS00690/13/600/R0030v3) for the Project
- Waste Management Plan of the Contracts 2, 3, 5, 6, 7 and SS C505
- Contamination Assessment Plan (CAP) and Contamination Assessment Report (CAR) for Po Kat Tsai, Loi Tung and the workshops in Fanling
- Vegetation Survey Report
- Woodland Compensation Plan
- Habitat Creation Management Plan
- Wetland Compensation Plan

2.5.2 Summary of the relevant permits, licenses, and/or notifications on environmental protection for the Project of each contracts are presented in **Table 2-1**.

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

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
Contract 2				
1	Air pollution Control (Construction Dust)	Ref No.: 368864	31 Dec 2013	Till Contract

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
	Regulation			ends
2	Chemical Waste Producer Registration	<i>North Portal</i> Waste Producers Number: No.5213-652-D2523-01	25 Mar 2014	Till Contract ends
		<i>Mid-Vent Portal</i> Waste Producers Number: No.5213-634-D2524-01	25 Mar 2014	Till Contract ends
		<i>South Portal</i> Waste Producers Number: No.5213-634-D2526-01	9 Apr 2014	Till Contract ends
3	Water Pollution Control Ordinance - Discharge License	No.WT00018374-2014	8 Oct 2014	30 Sep 2019
		No.: W5/1I389	28 Mar 2014	31 Mar 2019
		No. WT00023063-2015	18 Dec 2015	31 Mar 2019
		No.: W5/1I392	28 Mar 2014	31 Mar 2019
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7019105	8 Jan 2014	Till Contract ends
5	Construction Noise Permit	GW-RN0484-17	30-Jul-2017	20-Jan-2018
		GW-RN0515-17	10-Aug-2017	01-Feb-2018
		GW-RN0519-17	10-Aug-2017	01-Feb-2018
		GW-RN0601-17	27-Sep-2017	21-Mar-2018
		GW-RN0604-17	20-Sep-2017	16-Mar-2018
		GW-RN0605-17	27-Sep-2017	21-Mar-2018
		GW-RN0608-17	01-Oct-2017	31-Mar-2018
		GW-RN0673-17	28-Oct-2017	27-Apr-2018
		GW-RN0744-17	15-Nov-2017	09-May-2018
		GW-RN0747-17	15-Nov-2017	09-May-2018
		GW-RN0765-17	01-Dec-2017	31-May-2018
		GW-RN0788-17	06-Dec-2017	05-Jun-2018
GW-RN0839-17	25-Dec-2017	17-Jun-2018		
6	Specified Process License (Mortar Plant Operation)	L-3-251(1)	12-Apr-2016	11-Apr-2021
Contract 3				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 362101	17 Jul 2013	Till Contract ends
2	Chemical Waste Producer Registration	Waste Producers Number: No.:5113-634-C3817-01	7 Oct 2013	Till Contract ends
3	Water Pollution Control Ordinance - Discharge License	No.:WT00016832 – 2013	28 Aug 13	31 Aug 2018
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7017914	2 Aug 13	Till Contract ends
5	Construction Noise Permit	GW-RN0303-17	11 May 2017	10 Nov 2017
		GW-RN0342-17	28 May 2017	20 Nov 2017
		GW-RN0376-17	22 Jun 2017	21 Dec 2017
		GW-RN0417-17	27 Jun 2017	16 Dec 2017

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
		GW-RN0458-17	16 Jul 2017	18 Dec 2017
		GW-RN0477-17	28 Jul 2017	5 Jan 2018
		GW-RN0500-17	29 Aug 2017	24 Feb 2018
		GW-RN0501-17	25 Aug 2017	24 Feb 2018
		GW-RN0508-17	16 Aug 2017	15 Feb 2018
		GW-RN0510-17	16 Aug 2017	18 Nov 2017
		GW-RN0549-17	6 Sep 2017	5 Mar 2018
		GW-RN0564-17	1 Oct 2017	31 Mar 2018
		GW-RN0567-17	10 Sep 2017	21 Feb 2018
		GW-RN0571-17	30 Sep 2017	29 Mar 2018
		GW-RN0669-17	25 Oct 2017	7 Apr 2018
		GW-RN0697-17	21 Nov 2017	19 May 2018
		GW-RN0721-17	26 Nov 2017	20 May 2018
		GW-RN0782-17	8 Dec 2017	26 May 2018
		GW-RN0785-17	19 Dec 2017	16 Jun 2018
		GW-RN0786-17	19 Dec 2017	18 Jun 2018
		GW-RN0801-17	22 Dec 2017	21 Jun 2018
		GW-RN0863-17	17 Jan 2018	5 Jul 2018
Contract 5				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 359338	13 May 2013	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producers Number No.: 5213-642-S3735-01	8 Jun 2013	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: W5/1G44/1	8 Jun 13	30 Jun 2018
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7017351	29 Apr 13	Till the end of Contract
Contract 6				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 390614	29 Jun 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producers Number No.: 5213-652-C3969-01	31 Aug 2015	Till the end of Contract
3	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7022707	9 Jul 2015	Till the end of Contract
4	Water Pollution Control Ordinance - Discharge License	No.:WT00024574-2016	31 May 2016	31 May 2021
		No.:WT00024576-2016	31 May 2016	31 May 2021
		No.:WT00024742-2016	14 June 2016	30 June 2021
		No.:WT00024746-2016	14 June 2016	30 June 2021
5	Construction Noise Permit	GW-RW0578-17	11 Sep 2017	8 Dec 2017
		GW-RW0598-17	18 Sep 2017	17 Mar 2018

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
		GW-RW0684-17	30 Oct 2017	29 Apr 2018
		GW-RN0837-17	25 Dec 2017	28 Feb 2018
		GW-RW0668-17	16-Jan-2018	15-Jul-2018
Contract SS C505				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 390974	13 Jul 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producer No.: 5213-642-L1048-07	16 Sep 2015	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: WT00024865-2016	8 Jul 2016	30 Nov 2020
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7022831	23 Jul 2015	Till the end of Contract
5	Construction Noise Permit	GW-RN0355-17	30 May 2017	25 Nov 2017
		GW-RN0624-17	6 Oct 2017	5 Apr 2018
		GW-RN0720-17	26 Nov 2017	25 May 2018
Contract 7				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 397015	21 Dec 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producer No.: 5214-641-K3202-01	24 Mar 2016	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: WT00024422-2016	10 May 2016	31 May 2021
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7024129	21 Jan 2016	Till the end of Contract
5	Construction Noise Permit	GW-RN0321-17	10 May 2017	4 Nov 2017
		GW-RN0705-17	5 Nov 2017	4 May 2018
Contract 4				
1	Air pollution Control (Construction Dust) Regulation	Ref. No. 405353	22 July 2016	Till the end of Contract
2	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7024973	13 May 2016	Till the end of Contract

3 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

3.1 GENERAL

3.1.1 The Environmental Monitoring and Audit requirements are set out in the Approved EM&A manual. Environmental issues such as air quality, construction noise and water quality were identified as the key issues during the construction phase of the Project.

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

3.2 MONITORING PARAMETERS

3.2.1 The EM&A program of construction phase monitoring shall cover the following environmental issues:

- Air quality;
- Construction noise; and
- Water quality

3.2.2 A summary of the monitoring parameters is presented in *Table 3-1*.

Table 3-1 Summary of EM&A Requirements

Environmental Issue	Parameters
Air Quality	<ul style="list-style-type: none"> • 1-hour TSP by Real-Time Portable Dust Meter; and • 24-hour TSP by High Volume Air Sampler.
Noise	<ul style="list-style-type: none"> • $L_{eq(30min)}$ in normal working days (Monday to Saturday) 07:00-19:00 except public holiday; and • 3 sets of consecutive $L_{eq(5min)}$ on restricted hours i.e. 19:00 to 07:00 next day, and whole day of public holiday or Sunday • Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.
Water Quality	In-situ Measurements <ul style="list-style-type: none"> • Dissolved Oxygen Concentration (mg/L); • Dissolved Oxygen Saturation (%); • Turbidity (NTU); • pH unit; • Water depth (m); and • Temperature (°C).
	Laboratory Analysis <ul style="list-style-type: none"> • Suspended Solids (mg/L)

3.3 MONITORING LOCATIONS

3.3.1 The designated monitoring locations as recommended in the *EM&A Manual* are shown in *Appendix C*. As the access to some of the designated monitoring locations was questionable due to safety reason or denied by the landlords, alternative locations therefore have had proposed. The proposed alternative monitoring locations has updated in the revised EM&A Programme which verified by IEC and certified by ET Leader prior submitted to EPD on 10 July 2013. *Table 3-2*, *Table 3-3* and *Table 3-4* are respectively listed the air quality, construction noise and water quality monitoring locations for the Project and a map showing these monitoring stations is presented in *Appendix D*.

Table 3-2 Impact Monitoring Stations - Air Quality

Station ID	Description	Works Area	Related to the Work Contract
AM1b^	Open area at Tsung Yuen Ha Village	BCP	SS C505 Contract 7
AM2	Village House near Lin Ma Hang Road	LMH to Frontier Closed Area	Contract 6

Station ID	Description	Works Area	Related to the Work Contract
AM3	Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village.	LMH to Frontier Closed Area	Contract 6
AM4b [^]	House no. 10B1 Nga Yiu Ha Village	LMH to Frontier Closed Area	Contract 6
AM5a [^]	Ping Yeung Village House	Ping Yeung to Wo Keng Shan	Contract 6
AM6	Wo Keng Shan Village House	Ping Yeung to Wo Keng Shan	Contract 6
AM7b [@]	Loi Tung Village House	Sha Tau Kok Road	Contract 2 Contract 6
AM8	Po Kat Tsai Village No. 4	Po Kat Tsai	Contract 2
AM9b#	Nam Wa Po Village House No. 80	Fanling	Contract 3

Proposal for the change of air quality monitoring location from AM9a to AM9b was submitted to EPD on 4 Nov 2013 after verified by the IEC and it was approved by EPD (EPD's ref.: (15) in EP 2/N7/A/52 Pt.10 dated 8 Nov 2013).

* Proposal for the change of air quality monitoring location from AM1 to AM1a was submitted to EPD on 24 March 2014 after verified by the IEC. It was approved by EPD (EPD's ref.: (6) in EP 2/N7/A/52 Pt.12 dated 9 Jun 2014).

@ Proposal for the change of air quality monitoring location from AM7a to AM7b was submitted to EPD on 4 June 2014 after verified by the IEC. It was approved by EPD (EPD's ref.: (7) in EP 2/N7/A/52 Pt.12 dated 9 Jun 2014).

[^] Proposal for change of air quality monitoring locations was enclosed in the updated EM&A Programme which approval by EPD on 29 Mar 2016.

Table 3-3 Impact Monitoring Stations - Construction Noise

Station ID	Description	Works Area	Related to the Work Contract
NM1	Tsung Yuen Ha Village House No. 63	BCP	SS C505 Contract 7
NM2a#	Village House near Lin Ma Hang Road	Lin Ma Hang to Frontier Closed Area	Contract 6
NM3	Ping Yeung Village House (facade facing northeast)	Ping Yeung to Wo Keng Shan	Contract 6
NM4	Wo Keng Shan Village House	Ping Yeung to Wo Keng Shan	Contract 6
NM5	Village House, Loi Tung	Sha Tau Kok Road	Contract 2, Contract 6
NM6	Tai Tong Wu Village House 2	Sha Tau Kok Road	Contract 2, Contract 6
NM7	Po Kat Tsai Village	Po Kat Tsai	Contract 2
NM8	Village House, Tong Hang	Fanling	Contract 2 Contract 3
NM9	Village House, Kiu Tau Village	Fanling	Contract 3
NM10	Nam Wa Po Village House No. 80	Fanling	Contract 3

Proposal for the change of construction noise monitoring location from NM2 to NM2a was verified by the IEC on 6 May 2016 and was effective on 9 May 2016.

Table 3-4 Impact Monitoring Stations - Water Quality

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
WM1	Downstream	833 679	845 421	Alternative location located	SS C505

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
	of Kong Yiu Channel			at upstream 51m of the designated location	Contract 6
WM1-Control	Upstream of Kong Yiu Channel	834 185	845 917	NA	SS C505 Contract 6
WM2A	Downstream of River Ganges	834 204	844 471	Alternative location located at downstream 81m of the designated location	Contract 6
WM2A(a)*	Downstream of River Ganges	834 191	844 474	Alternative location located at upstream 70m of the designated location	Contract 6
WM2A-Controlx#	Upstream of River Ganges	835 377	844 188	Alternative location located at upstream 160m of the designated location	Contract 6
WM2B	Downstream of River Ganges	835 433	843 397	NA	Contract 6
WM2B-Control	Upstream of River Ganges	835 835	843 351	Alternative location located at downstream 31m of the designated location	Contract 6
WM3x#	Downstream of River Indus	836 206	842 270	Alternative location located at downstream 180m of the designated location	Contract 2 Contract 6
WM3-Control	Upstream of River Indus	836 763	842 400	Alternative location located at downstream 26m of the designated location	Contract 2# Contract 6
WM4	Downstream of Ma Wat Channel	833 850	838 338	Alternative location located at upstream 11m of the designated location	Contract 2 Contract 3
WM4-Control A	Kau Lung Hang Stream	834 028	837 695	Alternative location located at downstream 28m of the designated location	Contract 2 Contract 3
WM4-Control B	Upstream of Ma Wat Channel	833760	837395	Alternative location located at upstream 15m of the designated location	Contract 2 Contract 3

Note: EPD has approved the revised EM&A Programme (Rev.7) which proposed that (1) if the measured water depth of the monitoring station is lower than 150 mm, alternative location based on the criteria were selected to perform water monitoring; and (2) If no suitable alternative location could be found within 15m far from the original location, the sampling at that location will be cancelled since sampling at too far from the designated location could not make a representative sample in accordance with the updated EM&A Programme (Rev. 07) (Section 4.1.4) (EPD ref.: () in EP2/N7/A/52 Ax(1) Pt.20 dated 7 April 2017)

(*) Proposal for the change of water monitoring location from WM2A to WM2A(a) was verified by the IEC and it was approved by EPD. (EPD's ref. (10) in EP 2/N7/A/52 Pt.19)

(#) Proposal for the change of water quality monitoring location (EM3x and WM2A-Cx) was included in the EM&A Programme Rev .05 which approved by EPD on 29 March 2016 (EPD ref.: (3) in EP2/N7/A/52 Ax(1) Pt.19)

3.4 MONITORING FREQUENCY AND PERIOD

3.4.1 The requirements of impact monitoring are stipulated in Sections 2.1.6, 3.1.5 and 4.1.6 of the approved EM&A Manual and presented as follows.

Air Quality Monitoring

- 3.4.2 Frequency of impact air quality monitoring is as follows:
- 1-hour TSP 3 times every six days during course of works
 - 24-hour TSP Once every 6 days during course of works.

Noise Monitoring

- 3.4.3 One set of $L_{eq(30min)}$ as 6 consecutive $L_{eq(5min)}$ between 0700-1900 hours on normal weekdays and once every week during course of works. If construction work necessary to carry out at other time periods, i.e. restricted time period (19:00 to 07:00 the next morning and whole day on public holidays) (hereinafter referred as “the restricted hours”), 3 consecutive $L_{eq(5min)}$ measurement will depended CNP requirements to undertake. Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.

Water Quality Monitoring

- 3.4.4 The water quality monitoring frequency shall be 3 days per week during course of works. The interval between two sets of monitoring shall not be less than 36 hours.

3.5 MONITORING EQUIPMENT

Air Quality Monitoring

- 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*. If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve.
- 3.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.
- 3.5.3 All equipment to be used for air quality monitoring is listed in *Table 3-5*.

Table 3-5 Air Quality Monitoring Equipment

Equipment	Model
<i>24-Hour TSP</i>	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Model TE-5025A
<i>1-Hour TSP</i>	
Portable Dust Meter	Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter

Wind Data Monitoring Equipment

- 3.5.4 According to the approved 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:
- 1) The wind sensors should be installed 10 m above ground so that they are clear of obstructions or turbulence caused by buildings.
 - 2) The wind data should be captured by a data logger. The data shall be downloaded for analysis at least once a month.
 - 3) The wind data monitoring equipment should be re-calibrated at least once every six months.
 - 4) Wind direction should be divided into 16 sectors of 22.5 degrees each.
- 3.5.5 ET has liaised with the landlords of the successful granted HVS installation premises. However, the owners rejected to provide premises for wind data monitoring equipment installation.
- 3.5.6 Under this situation, the ET proposed alternative methods to obtain representative wind data.

Meteorological information as extracted from “the Hong Kong Observatory Ta Kwu Ling Station” is alternative method to obtain representative wind data. For Ta Kwu Ling Station, it is located nearby the Project site. Moreover, this station is located at 15m above mean sea level while its anemometer is located at 13m above the existing ground which in compliance with the general setting up requirement. Furthermore, this station also can be to provide the humidity, rainfall, and air pressure and temperature etc. meteorological information. In Hong Kong of a lot development projects, weather information extracted from Hong Kong Observatory is common alternative method if weather station installation not allowed.

Noise Monitoring

- 3.5.7 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m s⁻¹.
- 3.5.8 Noise monitoring equipment to be used for monitoring is listed in **Table 3-6**.

Table 3-6 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	B&K Type 2238 or Rion NL-31 or Rion NL-52
Calibrator	B&K Type 4231 or Rion NC-74 or Quest QC-20
Portable Wind Speed Indicator	Testo Anemometer

- 3.5.9 Sound level meters listed above comply with the *International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1)* specifications, as recommended in TM issued under the NCO. The acoustic calibrator and sound level meter to be used in the impact monitoring will be calibrated yearly.

Water Quality Monitoring

- 3.5.10 DO and water temperature should be measured in-situ by a DO/temperature meter. The instrument should be portable and weatherproof using a DC power source. It should have a membrane electrode with automatic temperature compensation complete with a cable. The equipment should be capable of measuring:
- DO level in the range of 0-20 mg/l and 0-200% saturation; and
 - temperature of between 0 and 45 degree Celsius.
- 3.5.11 A portable pH meter capable of measuring a range between 0.0 and 14.0 should be provided to measure pH under the specified conditions accordingly to the APHA Standard Methods.
- 3.5.12 The instrument should be portable and weatherproof using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0-1000 NTU.
- 3.5.13 A portable, battery-operated echo sounder or tape measure will be used for the determination of water depth at each designated monitoring station as appropriate.
- 3.5.14 A water sampler e.g. Kahlsico Water Sampler, which is a transparent PVC cylinder with capacity not less than 2 litres, will be used for water sampling if water depth over than 0.5m. For sampling from very shallow water depths e.g. <0.5 m, water sample collection will be directly from water surface below 100mm use sampling plastic bottle to avoid inclusion of bottom sediment or humus. Moreover, Teflon/stainless steel bailer or self-made sampling buckets maybe used for water sampling. The equipment used for sampling will be depended the sampling location and depth situations.
- 3.5.15 Water samples for laboratory measurement of SS will be collected in high density polythene bottles, packed in ice (cooled to 4 °C without being frozen), and delivered to the laboratory in the

same day as the samples were collected.

- 3.5.16 Analysis of suspended solids should be carried out in a HOKLAS or other accredited laboratory. Water samples of about 1L should be collected at the monitoring stations for carrying out the laboratory suspended solids determination. The SS determination work should start within 24 hours after collection of the water samples. The SS analyses should follow the *APHA Standard Methods 2540D* with Limit of Reporting of 2 mg/L.
- 3.5.17 Water quality monitoring equipment used in the impact monitoring is listed in *Table 3-7*. Suspended solids (SS) analysis is carried out by a local HOKLAS-accredited laboratory, namely *ALS Technichem (HK) Pty Ltd*.

Table 3-7 Water Quality Monitoring Equipment

Equipment	Model
Water Depth Detector	Eagle Sonar or tape measures
Water Sampler	A 2-litre transparent PVC cylinder with latex cups at both ends or teflon/stainless steel bailer or self-made sampling bucket
Thermometer & DO meter	YSI PRO20 Handheld Dissolved Oxygen Instrument / YSI 550A Multifunctional Meter
pH meter	AZ8685 pH pen-style meter
Turbidimeter	Hach 2100Q
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-liter plastic cool box with Ice pad

3.6 MONITORING METHODOLOGY

1-hour TSP Monitoring

- 3.6.1 The 1-hour TSP monitor was a brand named "Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter" which is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90° light scattering. The 1-hour TSP monitor consists of the following:
- A pump to draw sample aerosol through the optic chamber where TSP is measured;
 - A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
 - A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.
- 3.6.2 The 1-hour TSP meter is used within the valid period as follow manufacturer's Operation and Service Manual.

24-hour TSP Monitoring

- 3.6.3 The equipment used for 24-hour TSP measurement is Tisch Environmental, Inc. Model TE-5170 TSP high volume air sampling system, which complied with *EPA Code of Federal Regulation, Appendix B to Part 50*. The High Volume Air Sampler (HVS) consists of the following:
- An anodized aluminum shelter;
 - A 8"x10" stainless steel filter holder;
 - A blower motor assembly;
 - A continuous flow/pressure recorder;
 - A motor speed-voltage control/elapsed time indicator;
 - A 7-day mechanical timer, and
 - A power supply of 220v/50 Hz
- 3.6.4 The HVS is operated and calibrated on a regular basis in accordance with the manufacturer's

instruction using Tisch Calibration Kit Model TE-5025A. Calibration would carry out in two month interval.

- 3.6.5 24-hour TSP is collected by the ET on filters of HVS and quantified by a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (ALS), upon receipt of the samples. The ET keep all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% RH (Relative Humidity) and 25°C, for six months prior to disposal.

Noise Monitoring

- 3.6.6 Noise measurements were taken in terms of the A-weighted equivalent sound pressure level (L_{eq}) measured in decibels dB(A). Supplementary statistical results (L_{10} and L_{90}) were also obtained for reference.
- 3.6.7 During the monitoring, all noise measurements were performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq(30min)}$ in six consecutive $L_{eq(5min)}$ measurements were used as the monitoring parameter for the time period between 0700-1900 hours on weekdays; and also $L_{eq(15min)}$ in three consecutive $L_{eq(5min)}$ measurements is used as monitoring parameter for other time periods (e.g. during restricted hours), if necessary.
- 3.6.8 Prior of noise measurement, the accuracy of the sound level meter is checked using an acoustic calibrator generating a known sound pressure level at a known frequency. The checking was performed before and after the noise measurement.

Water Quality

- 3.6.9 Water quality monitoring is conducted at the designated locations. The sampling produce with the in-situ monitoring are presented as below:

Sampling Procedure

- 3.6.10 A Digital Global Positioning System (GPS) is used to identify the designated monitoring stations prior to water sampling. A portable, battery-operated echo sounder is used for the determination of water depth at each station. At each station, water sample would be collected from 0.1m below water surface or the water surface to prevent the river bed sediment for stirring.
- 3.6.11 The sample container will be rinsed with a portion of the water sample. The water sample then will be transferred to the high-density polythene bottles as provided by the laboratory, labeled with a unique sample number and sealed with a screw cap.
- 3.6.12 Before sampling, general information such as the date and time of sampling, weather condition as well as the personnel responsible for the monitoring would be recorded on the field data sheet.
- 3.6.13 A 'Willow' 33-liter plastic cool box packed with ice will be used to preserve the water samples prior to arrival at the laboratory for chemical determination. The water temperature of the cool box is maintained at a temperature as close to 4°C as possible without being frozen. Samples collected are delivered to the laboratory upon collection.

In-situ Measurement

- 3.6.14 Instrument including YSI PRO20 Handheld Dissolved Oxygen Instrument or YSI 550A Multifunctional Meter is used for water in-situ measures, which automates the measurements and data logging of temperature, dissolved oxygen and dissolved oxygen saturation. Before each round of monitoring, the dissolved oxygen probe would be calibrated by the wet bulb method.
- 3.6.15 A portable AZ8685 pH pen-style meter is used for in-situ pH measurement. The pH meter is capable of measuring pH in the range of 0 – 14 and readable to 0.1.

- 3.6.16 A portable Hach 2100Q Turbidimeter is used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU. StablCal[®] Standards of known NTU are used for calibration of the instrument before and after measurement.
- 3.6.17 All in-situ measurement equipment are calibrated by HOKLAS accredited laboratory of three month interval.

Laboratory Analysis

- 3.6.18 All water samples are analyzed with Suspended Solids (SS) as specified in the *EM&A Manual* by a local HOKLAS-accredited testing laboratory (ALS Technichem (HK) Pty Ltd HOKLAS registration no. 66). SS analysis is determined by the laboratory upon receipt of the water samples using *APHA Standard Methods 2540D* (namely ALS Method EA-025 as accredited HOKLAS Scheme) started within 48 hours of water sample receipt.

3.7 EQUIPMENT CALIBRATION

- 3.7.1 Calibration of the HVS is performed upon installation and thereafter at bimonthly intervals in accordance with the manufacturer’s instruction using the certified standard calibrator (TISCH Model TE-5025A). Moreover, the Calibration Kit would be calibrated annually. The calibration data are properly documented and the records are maintained by ET for future reference.
- 3.7.2 The 1-hour TSP meter was calibrated by the supplier prior to purchase. Zero response of the equipment would be checked before and after each monitoring event. Annually calibration with the High Volume Sampler (HVS) in same condition would be undertaken by the Laboratory.
- 3.7.3 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis.
- 3.7.4 All water quality monitoring equipment is calibrated by HOKLAS accredited laboratory of three month intervals.
- 3.7.5 The calibration certificates of all monitoring equipment used for the impact monitoring program in the Reporting Period and the HOKLAS accredited certificate of laboratory are presented in the relevant monthly EM&A reports.

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

- 3.8.1 The baseline results form the basis for determining the environmental acceptance criteria for the impact monitoring. According to the approved Environmental Monitoring and Audit Manual, the air quality, construction noise and water quality criteria were set up, namely Action and Limit levels are listed in *Tables 3-8, 3-9 and 3-10*.

Table 3-8 Action and Limit Levels for Air Quality Monitoring

Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)		Limit Level ($\mu\text{g}/\text{m}^3$)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AM1b	265	143	500	260
AM2	268	149		
AM3	269	145		
AM4b	267	148		
AM5a	268	143		
AM6	269	148		
AM7b	275	156		
AM8	269	144		
AM9b	271	151		

Table 3-9 Action and Limit Levels for Construction Noise

Monitoring Location	Action Level	Limit Level in dB(A)
	Time Period: 0700-1900 hours on normal weekdays	
NM1, NM2a, NM3, NM4, NM5, NM6, NM7, NM8, NM9, NM10	When one or more documented complaints are received	75 dB(A) ^{Note 1 & Note 2}

Note 1: Acceptable Noise Levels for school should be reduced to 70 dB(A) and 65 dB(A) during examination period

Note 2: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the NCA have to be followed.

Table 3-10 Action and Limit Levels for Water Quality

Parameter	Performance criteria	Monitoring Location				
		WM1	WM2A(a)	WM2B	WM3x	WM4
DO (mg/L)	Action Level	(*)4.23	(**)4.00	(*)4.74	(**)4.00	(*)4.14
	Limit Level	(#)4.19	(**)4.00	(#)4.60	(**)4.00	(#)4.08
Turbidity (NTU)	Action Level	51.3	24.9	11.4	13.4	35.2
	Limit Level	AND 120% of upstream control station of the same day				
SS (mg/L)	Action Level	54.5	14.6	11.8	12.6	39.4
	Limit Level	AND 120% of upstream control station of the same day				
		64.9	17.3	12.4	12.9	45.5
		AND 130% of upstream control station of the same day				

Remarks:

(*) The Proposed **Action Level** of Dissolved Oxygen is adopted to be used 5%-ile of baseline data

(**) The Proposed **Action & Limit Level** of Dissolved Oxygen is used 4mg/L

(#) The Proposed **Limit Level** of Dissolved Oxygen is adopted to be used 1%-ile of baseline data

3.8.2 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 E](#).

3.9 DATA MANAGEMENT AND DATA QA/QC CONTROL

3.9.1 All monitoring data will be handled by the ET's in-house data recording and management system. The monitoring data recorded in the equipment will be downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data will input into a computerized database properly maintained by the ET. The laboratory results will be input directly into the computerized database and checked by personnel other than those who input the data.

3.9.2 For monitoring parameters that require laboratory analysis, the local laboratory shall follow the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.

4 AIR QUALITY MONITORING

4.1 GENERAL

4.1.1 In the Reporting Period, construction works under the project have been commenced in Contracts 2, 3, 4, 6, 7 and Contract SS C505 and air quality monitoring was performed at all designated locations.

4.2 SUMMARY OF MONITORING RESULTS

4.2.1 Summary of air quality monitoring results during the Reporting Period are tabulated in **Table 4-1**. The relevant graphical plots throughout the Reporting Period are presented in **Appendix F**.

Table 4-1 Summary of Air Quality Monitoring Results

Monitoring Location	1-hour TSP ($\mu\text{g}/\text{m}^3$)			24-hour TSP ($\mu\text{g}/\text{m}^3$)		
	Max	Min	Mean	Max	Min	Mean
AM1b	114	22	68	142	24	94
Record Date	15-Dec-17	8-Jan-18	48 events	8-Dec-17 20-Dec-17	6-Jan-18	16 events
AM2	148	25	78	237	42	127
Record Date	15-Dec-17	8-Jan-18	48 events	8-Dec-17	6-Jan-18	16 events
AM3	136	25	77	211	21	110
Record Date	15-Dec-17	8-Jan-18	48 events	8-Dec-17	6-Jan-18	16 events
AM4b	97	26	67	142	23	76
Record Date	2-Nov-17	20-Nov-17	48 events	2-Jan-18	31-Jan-18	16 events
AM5a	91	30	67	242	12	78
Record Date	1-Dec-17 13-Dec-17	20-Nov-17	48 events	4-Nov-17	8-Jan-18	16 events
AM6	99	33	69	194	22	100
Record Date	10-Jan-18	20-Nov-17	48 events	4-Nov-17	8-Jan-18	16 events
AM7b	116	33	77	153	23	116
Record Date	10-Jan-18	14-Nov-17 20-Nov-17	48 events	2-Jan-18	8-Jan-18	16 events
AM8	97	40	67	116	19	59
Record Date	13-Dec-17	14-Nov-17	48 events	2-Jan-18	8-Jan-18	16 events
AM9b	107	30	62	144	29	78
Record Date	25-Jan-18	22-Nov-17	48 events	14-Dec-17	18-Jan-18	16 events

Remark: Bold and italic indicate Action Level exceedance.

4.2.2 Breaches of air quality A/L levels and statistical analysis of compliance for the air quality monitoring results are summarized in **Table 4-2**.

Table 4-2 Summaries of Breaches of Air Quality A/L Levels

Location	Exceedance	1-hour TSP	24-hour TSP	Total
AM1	Action Level	0	0	0
	Limit Level	0	0	0
AM2	Action Level	0	2	2
	Limit Level	0	0	0
AM3	Action Level	0	2	2
	Limit Level	0	0	0
AM4a	Action Level	0	0	0
	Limit Level	0	0	0
AM5a	Action Level	0	1	1
	Limit Level	0	0	0
AM6	Action Level	0	1	1
	Limit Level	0	0	0

Location	Exceedance	1-hour TSP	24- hour TSP	Total
AM7b	Action Level	0	0	0
	Limit Level	0	0	0
AM8	Action Level	0	0	0
	Limit Level	0	0	0
AM9b	Action Level	0	0	0
	Limit Level	0	0	0

4.2.3 In the Reporting Period, all the 1-hour TSP monitoring results were below the Action/Limit Levels. For 24-hour TSP, there were 6 Action Level exceedances recorded, specifically at AM2 on 3 Nov 2017 and 8 Dec 2017, at AM3 on 4 Nov 2017 and 8 Dec 2017 and at AM5a and AM6 on 4 Nov 2017. Notification of Exceedance (NOE) was issued to relevant parties upon confirmation of the result and Investigation Reports for the exceedances have conducted by ET accordingly. According to the observation during site audit, the Contractor had properly implemented the dust mitigation measures such as provided water spraying on construction area and site haul road regularly. Moreover, water tanker and road sweeper were deployed the main road on regular basis to suppress fugitive dust and remover dirt and debris on road.

4.2.4 The summary of weather conditions during the Reporting Period is presented in [Appendix G](#).

5 CONSTRUCTION NOISE MONITORING

5.1 GENERAL

5.1.1 In the Reporting Period, construction works under the project have been commenced in Contracts 2, 3, 4, 6, 7 and Contract SS C505 and noise monitoring was performed at all designated locations.

5.2 SUMMARY OF MONITORING RESULTS

5.2.1 The sound level meter was set in 1m from the exterior of the building façade including noise monitoring locations NM1, NM2, NM3, NM4, NM5, NM6, NM7, NM8 and NM9. No façade correction (+3 dB(A)) is added according to acoustical principles and EPD guidelines. However, free-field status is performed at NM2a and NM10 and façade correction (+3 dB(A)) has added according to the requirement.

5.2.2 Summary of noise monitoring results during the Reporting Period are tabulated in *Table 5-1*. The relevant graphical plots throughout the Reporting Period are presented in *Appendix F*.

Table 5-1 Summary of Construction Noise Monitoring Results

Monitoring Location	Leq, 30min (dB(A))	
	Max	Min
NM1	62	46
Record Date	21-Dec-17	25-Jan-18
NM2a ^(*)	75	64
Record Date	15-Dec-17	10-Nov-17
NM3	66	58
Record Date	1-Dec-17	20-Nov-17 10-Jan-18
NM4	68	63
Record Date	10-Jan-18	2-Nov-17 1 & 19-Dec-17 22-Jan-18
NM5	66	51
Record Date	2-Nov-17	20-Nov-17 16-Jan-18
NM6	65	58
Record Date	2-Nov-17	4-Jan-18 16 & 22-Jan-18
NM7	64	56
Record Date	1-Dec-17	19-Dec-17
NM8	65	56
Record Date	27-Dec-17	31-Jan-18
NM9	70	59
Record Date	8-Jan-18	25-Jan-18
NM10 ^(*)	69	61
Record Date	10-Nov-17	25-Jan-18

^(*) façade correction (+3 dB(A)) is added according to acoustical principles and EPD guidelines

5.2.3 Breaches of construction noise A/L levels and statistical analysis of compliance for construction noise monitoring results are summarized in *Table 5-2*.

Table 5-2 Summaries of Breaches of Construction Noise A/L Levels

Station	Limit Level	Action Level	Received Date
NM1	0	0	N/A
NM2a	0		
NM3	0		
NM4	0		
NM5	0		
NM6	0		
NM7	0		
NM8	0		
NM9	0		
NM10	0		

5.2.4 In this Reporting Period, the noise level measured at all designated monitoring locations were below 75dB(A). No Action level and Limit Level exceedance was triggered and no corrective action was required.

6 WATER QUALITY MONITORING

6.1 GENERAL

6.1.1 In the Reporting Period, construction works under the project has been commenced in Contracts 2, 3, 4, 6, 7 and Contract SS C505 and water quality monitoring was performed at all designated locations.

6.2 SUMMARY OF MONITORING RESULTS

6.2.1 Summary of monitoring results during the Reporting Period are tabulated in *Tables 6-1 and 6-4*. The relevant graphical plots throughout the Reporting Period are presented in *Appendix F*.

6.2.2 In accordance with “*Event and Action Plan*”, the water quality monitoring frequency shall be increased to daily when exceedance recorded at the exceeded monitoring location. In the Reporting Period, 40 days of scheduled water monitoring were conducted. Moreover, 4, 2 and 6 days of extra water sampling were conducted for WM2A(a) WM3 and WM4 and all its control station.

Table 6-1 Summary of the Water Quality Monitoring Results – Contracts SS C505 and 6

Statistics	DO (mg/L)		Turbidity (NTU)		SS (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
Min	5.5	4.2	3.7	5.8	< 2.0	< 2.0
Max	15.1	15.2	74.8	66.0	64.0	54.0
Average	8.9	8.4	20.3	19.6	14.7	13.5

Table 6-2 Summary of the Water Quality Monitoring Results – Contracts 2 & 3

Statistics	DO (mg/L)			Turbidity (NTU)			SS (mg/L)		
	WM4	WM4 - CA	WM4 - CB	WM4	WM4 - CA	WM4 - CB	WM4	WM4 - CA	WM4 - CB
Min	4.3	4.5	3.7	4.1	1.3	1.3	4.0	< 2.0	3.0
Max	10.8	49.9	10.6	132.5	11.0	25.9	161.0	11.0	25.5
Average	7.7	9.9	6.8	22.6	4.6	9.5	25.1	3.0	9.5

Table 6-3 Summary of the Water Quality Monitoring Results – Contract 6

Statistics	DO (mg/L)				Turbidity (NTU)				SS (mg/L)			
	WM2A(a)	WM2A-C	WM2B	WM2B-C	WM2A(a)	WM2A-C	WM2B	WM2B-C	WM2A(a)	WM2A-C	WM2B	WM2B-C
Min	5.8	5.8	*	*	7.4	4.1	*	*	3.0	< 2.0	*	*
Max	14.1	13.6	*	*	516.5	777.0	*	*	268.5	408.0	*	*
Average	8.5	8.8	*	*	38.9	36.9	*	*	21.0	19.9	*	*

Remark: (*) Since 10 Apr 2017, water sampling was unable to carry out at WM2B and WM2B-C due to shallow water (water depth under 150mm)

Table 6-4 Summary of the Water Quality Monitoring Results – Contracts 2 & 6

Statistics	DO (mg/L)		Turbidity (NTU)		SS (mg/L)	
	WM3	WM3-Control	WM3	WM3-Control	WM3	WM3-Control
Min	4.2	4.1	2.5	1.0	< 2.0	< 2.0
Max	13.0	50.2	152.5	40.7	669.5	62.5
Average	8.5	10.8	11.8	7.7	22.5	12.4

6.2.3 Breaches of water quality A/L levels and statistical analysis of compliance for the water quality

monitoring results are summarized in *Tables 6-5*.

Table 6-5 Summaries of Breaches of the Existing Water Quality A/L Levels

Reporting Period	No. of sampling day	Location	DO (mg/L)		Turbidity (NTU)		SS (mg/L)	
			Action	Limit	Action	Limit	Action	Limit
Nov-17	13	WM1	0	0	0	0	0	0
	13	WM2A(a)	0	0	0	0	0	0
	0	WM2B	0	0	0	0	0	0
	13	WM3x	0	0	0	0	0	0
	13	WM4	0	0	0	0	0	0
Dec-17	13	WM1	0	0	0	0	0	0
	13	WM2A(a)	0	0	0	0	0	0
	0	WM2B	0	0	0	0	0	0
	13	WM3x	0	0	0	0	0	0
	19	WM4	0	0	0	5	0	5
Jan-18	14	WM1	0	0	0	0	0	0
	18	WM2A(a)	0	0	0	6	1	5
	0	WM2B	0	0	0	0	0	0
	16	WM3x	0	0	0	2	0	2
	14	WM4	0	0	0	0	0	0
Total	40	WM1	0	0	0	0	0	0
	44	WM2A(a)	0	0	0	6	1	5
	0	WM2B	0	0	0	0	0	0
	42	WM3x	0	0	0	2	0	2
	46	WM4	0	0	0	5	0	5
Sum			0	0	0	13	1	12

6.2.4 In the Reporting Period, a total of 26 Action Level (AL)/ Limit Level (LL) exceedances, namely 13 LL exceedance of turbidity and 13 AL/LL exceedances of Suspended Solids were recorded. NOEs were issued to relevant parties upon confirmation of the results.

6.2.5 Investigation reports for the exceedance were conducted by the ET and the investigation results revealed that all exceedances were not related to the works under the project. The detailed investigation reports are summarized in *Table 6-6* and presented in the relevant monthly EM&A reports.

Table 6-6 Summary of Water Quality Exceedance in the Reporting Period

Date of Exceedance	Location	Exceeded Parameter	Cause of Water Quality Exceedance In Brief
6 11 and 15 Dec 2017	WM4	NTU & SS	As advised by the Contractor of C3 (Chun Wo), starting from early December 2017, demolition of existing Retaining Wall and construction of new Retaining Wall has been carrying out at Location BC02 which next the stream to Ma Wat River and the duration of works would be 3 to 4 months. As water quality mitigation measure, the original stream was blocked and water diversion was setup to divert the existing stream water to downstream area to prevent it from deteriorating by the construction works. In our investigation, deficiency on the water diversion

			<p>was observed during the site inspection in early December 2017 and the exceedances on 6, 11 and 15 December 2017 were related to the works at Location BC02 with insufficient mitigation measures. Chun Wo should continuously improve the mitigation measures to muddy surface from construction site entering the diverted flow specifically during rain. ET will closely monitor the related mitigation measures in the subsequent site inspection</p>
21 Dec 2017	WM4	NTU & SS	<p>During water quality monitoring on 21 December 2017, inflow of turbid water to Ma Wat River was observed and the source of unknown turbid water was out of the site boundary.</p> <p>In our investigation, no adverse water quality impact was observed during the site inspection and the exceedance on 21 December 2017 were likely related to the unknown inflow of muddy water to Ma Wat River. Nevertheless, ET will closely monitor the water quality mitigation measures in the subsequent site inspection. As advised by Chun Wo on 2 January 2018, the exposed surface of the flow division was covered with tarpaulin sheet as protective measures to minimize muddy runoff.</p>
29 Dec 2017	WM4	NTU & SS	<p>In our investigation, no adverse water quality impact was observed during the site inspection. Moreover, there were no rainfall record on 29 December 2017 and muddy runoff from the site area was unlikely to occur. It was considered that the exceedances were unlikely caused by the works under Contracts 2 and 3. Nevertheless, the Contractor of Contract 3 was advised to continuously improve the mitigation measures to muddy surface from construction site entering the diverted flow specifically during rain and potential muddy runoff generated by watering during dusty work.</p>
8, 9, 10, 11, 12 and 13 Jan 2018	WM2A(a)	NTU & SS	<p>According to the weather information from the Observatory, successive heavy rainstorm was recorded during 7 to 9 January 2018. The water quality throughout the river course was highly affected by the stirred up sediment and muddy runoff from the surrounding environment even outside the construction site. The muddy water was trapped at the Nylon Dam at intermediate of the construction site.</p> <p>In our investigation, the Contractor had implemented water quality mitigation measures such as providing temporary bund and tarpaulin sheet align the river course, there were no adverse water quality impact observed during the site inspection. Since the existing river water was found turbid even without adverse water impact of the site and muddy water was also observed at upstream during the exceedance days, it is considered that the exceedances were related to the impact of rainstorm.</p>

8 Jan 2018	WM3x	NTU & SS	According to weather record from the Observatory, there was heavy rainstorm on 8 January 2018 and the water quality in the river course was deteriorated by rain and stirred up sediment. Moreover, storm water from road surface of Sha Tau Kok Road entering WM3x was noted during rainy day. It was concluded that the exceedances were caused by the rain.
27 Jan 2018	WM3x	NTU & SS	Inspection was carried out at upstream of WM3x, a vehicle was found parked on the access road in Ng Tung River, suspecting for channel maintenance by other party and turbid water was observed since there. The Contractor of Contracts 2 and 6 explained that the vehicle was not belonging to them as they have no permit to access the channel area. Moreover, it was observed that the water quality from North Portal Site and Admin Building Site under Contract 2 and South Portal under Contact 6 were clear and no deteriorated water quality was noted from both Sites. It is considered that the exceedances were related to other source of turbid water and not caused by the works under Contract 2.

7 ECOLOGY MONITORING

7.1 GENERAL

- 7.1.1 Ecology monitoring for woodland compensation shall be conducted at bi-monthly interval for the first year and the monitoring frequency would be reduced to quarterly from the second year.
- 7.1.2 The Quarterly Ecological Monitoring Report (Sep - Nov 2017) was submitted to EPD in December 2017 as standalone as supplementary of the EM&A Report.

8 WASTE MANAGEMENT

8.1 GENERAL WASTE MANAGEMENT

8.1.1 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

8.2 RECORDS OF WASTE QUANTITIES

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

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse

8.2.2 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 8-1* and *8-2* and the Waste Flow Table is presented in *Appendix H*.

Table 8-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Contract No	Quantity			Disposal Location	
		Nov 2017	Dec 2017	Jan 2018		Total
C&D Materials (Inert) (in '000m ³)	2	75.214	72.9824	86.64	276.2604	-
	3	3.051	2.4	3.089		-
	4	0	0	0		-
	6	4.523	4.721	4.152		-
	7	2.036	1.382	0.015		-
	SS C505	3.248	7.509	5.298		-
Reused in this Project (Inert) (in '000m ³)	2	0	0	0	1.958	-
	3	0.21	0.18	0.06		-
	4	0	0	0		-
	6	0	0.238	0.629		-
	7	0	0	0		-
	SS C505	0.16	0.321	0.16		-
Reused in other Projects (Inert) (in '000m ³)	2	0.1339	0.1278	5.29	7.5157	C6/ NENT# & other projects approved by the ER
	3	0	0	0		-
	4	0	0	0		-
	6	0	0.017	1.947		C5 & other projects approved by the ER
	7	0	0	0		-
	SS C505	0	0	0		-
Disposal as Public Fill (Inert) (in '000m ³)	2	75.0801	72.8546	81.35	264.3087	Tuen Mun 38 TKO 137
	3	1.841	1.997	2.725		
	4	0	0	0		
	6	4.523	4.466	1.576		
	7	2.036	1.382	0.015		
	SS C505	3.068	6.903	4.492		

Remark:

(#)The C&D materials were delivered to NENT for reuse by laying cover of the landfilling area.

Table 8-2 Summary of Quantities of C&D Wastes

Type of Waste	Contract No	Quantity			Total	Disposal Location
		Nov 2017	Dec 2017	Jan 2018		
Recycled Metal ('000kg) #	2	0.0113	0.0284	45	1154.9897	By licensed collector
	3	0	0	0		
	4	0	0	0		
	6	0	0	0		
	7	29.7	49.8	14.5		
	SS C505	446.27	193.81	375.87		
Recycled Paper / Cardboard Packing ('000kg) #	2	0.34	0.325	0.31	5.065	By licensed collector
	3	0	0	0		
	4	0	0	0		
	6	0.82	0	0.24		
	7	0.1	0.1	0.5		
	SS C505	1.81	0.3	0.22		
Recycled Plastic ('000kg) #	2	2.18	3.238	2.8	8.322	By licensed collector
	3	0	0	0		
	4	0	0	0		
	6	0	0	0		
	7	0.001	0.001	0.001		
	SS C505	0.069	0	0.032		
Chemical Wastes ('000kg) *	2	1.332	1.156	4.576	7.064+ *0.033m ³	By licensed collector
	3	0	0.033*	0		
	4	0	0	0		
	6	0	0	0		
	7	0	0	0		
	SS C505	0	0	0		
General Refuses ('000m ³)	2	0.7348	0.8125	0.6575	10.4178	NENT
	3	0.15	0.125	0.15		
	4	0	0	0		
	6	0.418	0.618	0.892		
	7	0.03	0.05	0.15		
	SS C505	1.931	1.781	1.918		

Remark:

(#) Unit of recycled metal, recycled paper/ cardboard packing and recycled plastic for Contractor 3 was in ('000m³).

(*) Unit of chemical waste for Contractor 3 was in m³.

- 8.2.3 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.

9 SITE INSPECTIONS

9.1 REQUIREMENTS

9.1.1 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.

Contract 2

9.1.2 During the Reporting Period, **13** events of the joint site inspections were undertaken at Contract 2 to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in **Table 9-1** and the details of site inspection can be found in relevant EM&A monthly report.

Table 9-1 Summary of Reminders/Observations of Site Inspection – Contract 2

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
November 2017	3, 10, 17 and 24 November 2017	5	Completed
December 2017	1, 8, 15, 22 and 29 December 2017	4	Completed
January 2018	5, 12, 19 and 25 January 2018	9	Completed

9.1.3 In the Reporting Period, no non-compliance was recorded; however, **18** 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.

Contract 3

9.1.4 During the Reporting Period, **13** events of the joint site inspections were undertaken at Contract 3 to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in **Table 9-2** and the details of site inspection can be found in relevant EM&A monthly report.

Table 9-2 Summary of Reminders/Observations of Site Inspection – Contract 3

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
November 2017	2, 9, 15, 23 and 30 November 2017	6	Completed
December 2017	7, 14, 20 and 28 December 2017	8	Completed
January 2018	4, 11, 17 and 25 January 2018	3	Completed

9.1.5 In the Reporting Period, no non-compliance was recorded; however, **17** 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.

Contract 4

9.1.6 During the Reporting Period, **13** events of the joint site inspections were undertaken at Contract 4 to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in **Table 9-3** and the details of site inspection can be found in relevant EM&A monthly report.

Table 9-3 Summary of Reminders/Observations of Site Inspection – Contract 4

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
------------------	-------------------------	------------------------------	------------------

November 2017	3, 10, 17 and 20 November 2017	0	Completed
December 2017	1, 8, 15, 18 and 29 December 2017	0	Completed
January 2018	5, 12, 15 and 26 January 2018	0	Completed

9.1.7 In the Reporting Period, no non-compliance was recorded; however, no observations/ reminders was recorded during the site inspections. The environmental performance of the Project was therefore considered satisfactory.

Contract 6

9.1.8 During the Reporting Period, **13** events of the joint site inspections were undertaken at Contract 6 to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in **Table 9-3** and the details of site inspection can be found in relevant EM&A monthly report.

Table 9-3 Summary of Reminders/Observations of Site Inspection – Contract 6

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
November 2017	2, 9, 16, 23 and 30 November 2017	5	Completed
December 2017	7, 14, 21 and 27 December 2017	1	Completed
January 2018	4, 11, 18 and 26 January 2018	3	Completed

9.1.9 In the Reporting Period, no non-compliance was recorded; however, **9** 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.

Contract SS C505

9.1.10 During the Reporting Period, **14** events of the joint site inspections were undertaken at Contract SS C505 to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in **Table 9-4** and the details of site inspection can be found in relevant EM&A monthly report.

Table 9-4 Summary of Reminders/Observations of Site Inspection – Contract SS C505

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
November 2017	1, 8, 15, 22 and 29 November 2017	3	Completed
December 2017	6, 13, 20 and 27 December 2017	4	Completed
January 2018	3, 10, 17, 24 and 31 January 2018	6	Completed

9.1.11 In the Reporting Period, no non-compliance was recorded; however, **13** 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.

Contract 7

9.1.12 During the Reporting Period, **13** events of the joint site inspections were undertaken at Contract SS C505 to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in **Table 9-5** and the details of site inspection can be found in relevant EM&A monthly report.

Table 9-5 Summary of Reminders/Observations of Site Inspection – Contract 7

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
November 2017	3, 10, 17 and 21 November 2017	4	Completed
December 2017	1, 8, 15, 19 and 29 December 2017	4	Completed
January 2018	5, 12, 16 and 26 January 2018	1	Completed

9.1.13 In the Reporting Period, no non-compliance was recorded; however, 9 observations/ reminder 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.

Other Contracts

9.1.14 Since the construction work of Contract 5 has substantially completed, no site inspection was performed.

10 NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS AND PROSECUTIONS

10.1 STATUS OF NON-COMPLIANCE ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

10.1.1 In the Reporting Period, no summons and prosecution under the EM&A Programme was lodged for all Contracts. However, four (4) documented environmental complaints were received by under the EM&A Programme and the details are summary below. The status of the investigation report and finding and listed below.

Date of complaint	Complaint Detail	Investigation Status
7 and 21 November 2017	A public complaint was received by 1823 on 7 November 2017 regarding the dust pollution causing by construction site near in Tai Tong Wu and construction vehicles. On 21 November 2017, the complainant further complained about the day time air pollution and questioned about the monitoring schedule of the monitoring programme executed for the project.	Inspection was carried out at related Contract 2 and Contract 6 accordingly. The IR revealed that the Contractors have properly implemented dust mitigation measures and no adverse dust impact caused by the construction site was observed. It was considered that the complaint was related to traffic dust from public road which frequent use by dump truck and heavy vehicle in dry season. The Investigation Report has been conducted by ET and no further comment from IEC.
27 December 2017	A public complaint was received by 1823 regarding the dust pollution in Kau Kung Hang. The complainant stated that uncovered stockpiles was observed in the construction site which causing fugitive dust problem health hazard throughout Kau Kung Hang and further Hong Lok Yuen.	Inspection was carried out at related Contract 3 accordingly. The IR revealed that the Contractor has implemented dust mitigation measures to suppression the dust impact arising from the construction site. In view of recent dry season and response to the complaint, the relevant Contractor was advised to enhance the dust mitigation measures which had been implemented promptly after the complaint.
28 December 2017	A public complaint was received by CEDD regarding noise nuisance causing by operation of excavator at 11:02pm which affecting the rest time. The complainant requested the relevant department to follow up and resolve the problem. However, there was lack of information about complaint location as it did not mention in the complainant's e-mail and no photo was provided.	Draft Investigation Report was issued by ET. Based on the information provided by CCKJV, there should not be any operation of excavator between 23:00 and 07:00 of next day. The works carried out at during restricted hours did not breach the CNP requirement. Nevertheless, CCKJV was reminded not to violate CNP conditions.
24 January 2018	A complaint was raised by EPD regarding observations of some spoils was dropped into the sea during the offloading operation at Cheung Sha Wan Pier.	Investigation was carried out at Cheung Sha Wan Pier on 9 Feb. The IR revealed that the operation of the jetty is managed by Tapbo Civil Engineering Company Limit as a transfer station for unloading excavated materials from various sources and it was not a newly

		constructed barging point for the Project use. The unloaded materials of Contract 2 will be subsequently delivered to the designated disposal ground, TM38 or TKO137. Dust mitigation measures and preventive measures to avoid spoil from dropping into the sea were provided during spoils offloading. It is considered that no breaches of EP's conditions and improper disposal were involved.
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10.1.2 The statistical summary table of environmental complaint, summons and prosecution are presented in Tables 10-1, 10-2 and 10-3.

Table 10-1 Statistical Summary of Environmental Complaints

Contract No	Reporting Period	Environmental Complaint Statistics			
		Frequency	Cumulative since commencement of project	Complaint Nature	Project related complaint
2	Nov 2017	1	33	<ul style="list-style-type: none"> • (18) Water Quality • (8) Dust • (5) Noise • (1) dust & noise • Waste management 	(6) water quality (2) dust (1) noise
	Dec 2017	0			
	Jan 2018	1			
3	Nov 2017	0	6	<ul style="list-style-type: none"> • (2) Dust • (3) Water quality • (1) Noise 	0
	Dec 2017	1			
	Jan 2018	0			
4	Nov 2017	0	0	NA	NA
	Dec 2017	0			
	Jan 2018	0			
6	Nov 2017	1	36	<ul style="list-style-type: none"> • (23) Water Quality • (8) Dust • (3) Noise • (1) Nuisance • (1) Noise and dust 	(7) water quality (3) dust (1) Nuisance (1) Water quality and dust
	Dec 2017	1			
	Jan 2018	0			
7	Nov 2017	0	2	<ul style="list-style-type: none"> • (1) Noise • (1) Water quality and dust 	(1) Water quality and dust
	Dec 2017	0			
	Jan 2018	0			
SS C505	Nov 2017	0	3	<ul style="list-style-type: none"> • (1) Dust • (1) Noise • (1) Water quality and dust 	(1) Water quality and dust
	Dec 2017	0			
	Jan 2018	0			

Table 10-2 Statistical Summary of Environmental Summons

Contract No	Reporting Period	Environmental Summons Statistics		
		Frequency	Cumulative since commencement of project	Complaint Nature
2	Nov 2017	0	1	contravening the Water Pollution Control (General) Regulations
	Dec 2017	0		
	Jan 2018	0		
3	Nov 2017	0	0	NA
	Dec 2017	0		
	Jan 2018	0		
4	Nov 2017	0	0	NA

Contract No	Reporting Period	Environmental Summons Statistics		
		Frequency	Cumulative since commencement of project	Complaint Nature
	Dec 2017	0		
	Jan 2018	0		
6	Nov 2017	0	0	NA
	Dec 2017	0		
	Jan 2018	0		
7	Nov 2017	0	0	NA
	Dec 2017	0		
	Jan 2018	0		
SS C505	Nov 2017	0	0	NA
	Dec 2017	0		
	Jan 2018	0		

Table 10-3 Statistical Summary of Environmental Prosecution

Contract No	Reporting Period	Environmental Prosecution Statistics		
		Frequency	Cumulative since commencement of project	Complaint Nature
2	Nov 2017	0	1	contravening the Water Pollution Control (General) Regulations
	Dec 2017	0		
	Jan 2018	0		
3	Nov 2017	0	0	NA
	Dec 2017	0		
	Jan 2018	0		
4	Nov 2017	0	0	NA
	Dec 2017	0		
	Jan 2018	0		
6	Nov 2017	0	0	NA
	Dec 2017	0		
	Jan 2018	0		
7	Nov 2017	0	0	NA
	Dec 2017	0		
	Jan 2018	0		
SS C505	Nov 2017	0	0	NA
	Dec 2017	0		
	Jan 2018	0		

10.1.3 Since the construction works at the Contract 5 was substantially completed, no environmental complaint, summons and prosecution under the EM&A Programme are registered.

11 IMPLEMENTATION STATUS OF MITIGATION MEASURES

11.1 GENERAL REQUIREMENTS

11.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the approved EM&A Manual covered the issues of dust, noise, water and waste and they are summarized presented in *Appendix I*.

11.1.2 All contracts under the Project shall be implementing the required environmental mitigation measures according to the approved EM&A Manual as subject to the site condition. Environmental mitigation measures generally implemented by Contracts 2, 3, 5, 6 and SS C505 in this Reporting Period are summarized in *Table 11-1*.

Table 11-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	<ul style="list-style-type: none"> Wastewater to be treated by the filtration systems i.e. sedimentation tank or AquaSed before to discharge.
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 breaking works A cleaning truck was regularly performed on the public road to prevent fugitive dust emission
Noise	<ul style="list-style-type: none"> Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. Keep good maintenance of plants Place noisy plants away from residence or school Provide noise barriers or hoarding to enclose the noisy plants or works 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.

12 CONCLUSIONS AND RECOMMENDATIONS

12.1 CONCLUSIONS

- 12.1.1 This is the 18th Quarterly EM&A Summary Report presenting the monitoring results and inspection findings for the Reporting Period from **1 November 2017 to 31 January 2018**.
- 12.1.2 For air quality monitoring, no 1-hour TSP monitoring results triggered the Action or Limit Levels. For 24-hour TSP, there were 6 Action Level exceedances recorded and Notification of Exceedances (NOEs) was issued to relevant parties upon confirmation of the result. Investigation Report for the exceedances have conducted by ET and the investigation findings revealed that the Contractors have implemented dust mitigation measures properly and the exceedances were not related to works under the Project.
- 12.1.3 In the Reporting Period, no construction noise exceedances were recorded and no complaints (which triggered the Action Level exceedances) were received which triggered the Action Level exceedances.
- 12.1.4 For water quality monitoring, a total of 26 Action/ Limit Level, namely 13 LL exceedance of turbidity and 13 AL/LL exceedances of Suspended Solids were recorded for the Project. The investigation result revealed that the LL exceedances on 6, 11, 15 December 2017 were related to the insufficient water quality mitigation measures for Contract 3 while the other exceedances was not project-related. As remedial action, the relevant Contractor had enhanced the water quality mitigation measures such as covering the exposed area by tarpaulin sheet to minimize muddy runoff and no project-related exceedance was recorded after the enhancement measures.
- 12.1.5 Ecology monitoring for woodland compensation was conducted for period of Sep to Nov 2017 and the Monitoring Report for Woodland Compensation was submitted to EPD in December 2017 as a stand-alone report as supplementary for the EM&A Report.
- 12.1.6 In this Reporting Period, four (4) documented environmental complaint was received regarding the air quality and noise issues under the EM&A Programme. Subsequent joint site inspection was carried out for complaint investigation and investigation reports were submitted by ET after reviewed by IEC. The IRs revealed that the Contractors have properly the mitigation measures and no breaches of EM&A programme was seen. Further enhancement measures were included and implemented in response to the complaint.
- 12.1.7 No environmental summons or successful prosecutions were recorded in the Reporting Period.
- 12.1.8 During the Reporting Period, weekly joint site inspection by the RE, IEC, ET with the relevant Main-contractor were carried out for Contracts 2, 3, 4, 6 and 7 in accordance with the EM&A Manual stipulation. For Contract SS C505, weekly joint site inspection was carried out by the RE, IEC, ET and main-contractor whereas IEC performed monthly site inspection. No non-compliance observed during the site inspection.

12.2 RECOMMENDATIONS

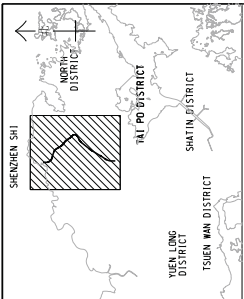
- 12.2.1 During dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to villages. The Contractor should fully implement the construction dust mitigation measures as appropriately.
- 12.2.2 Preventive measures for muddy water or other water pollutants from site surface flow to local stream such as Kong Yiu Channel, Ma Wat Channel, Ping Yuen River, Kwan Tei River or public area should be properly maintained. The Contractors should paid special attention on water quality mitigation measures and fully implement according ISEMM of the EM&A Manual, in particular for working areas near Ma Wat Channel and Ping Yuen River.
- 12.2.3 In addition, all effluent discharge shall be ensure to fulfill Technical Memorandum of Effluent

Discharged into Drainage and Sewerage Systems, inland and Coastal Waters criteria or discharge permits stipulation.

- 12.2.4 Construction noise would be a key environmental issue during construction work of the Project. Noise mitigation measures such as using quiet plants should be implemented in accordance with the EM&A requirement.
- 12.2.5 Furthermore, daily cleaning and weekly tidiness shall be properly performed and maintained. In addition, mosquito control should be kept to prevent mosquito breeding on site.

Appendix A

Layout plan of the Project

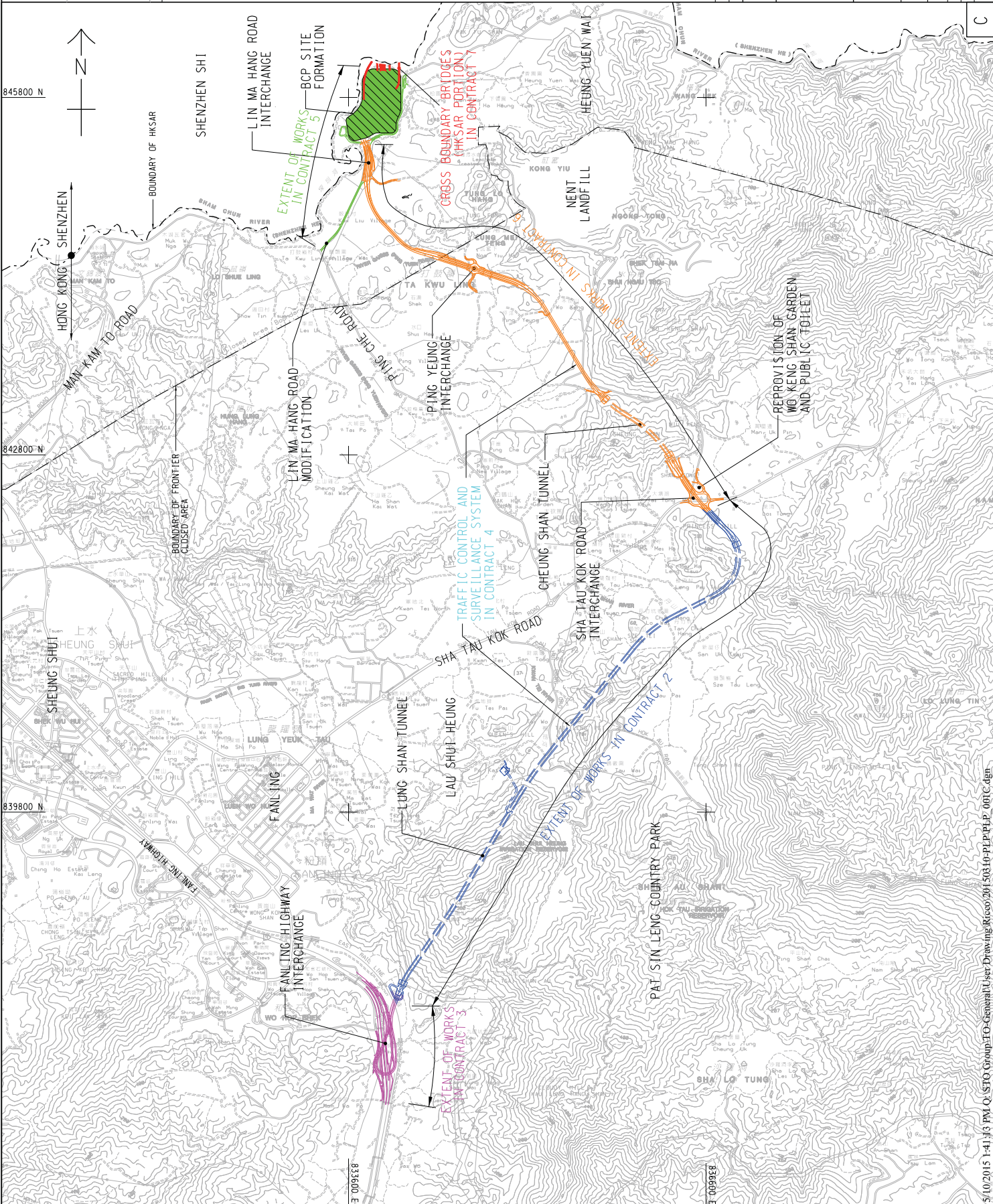


LOCATION PLAN
SCALE 1 : 3000

LEGEND:

--- UNDERGROUND WORKS

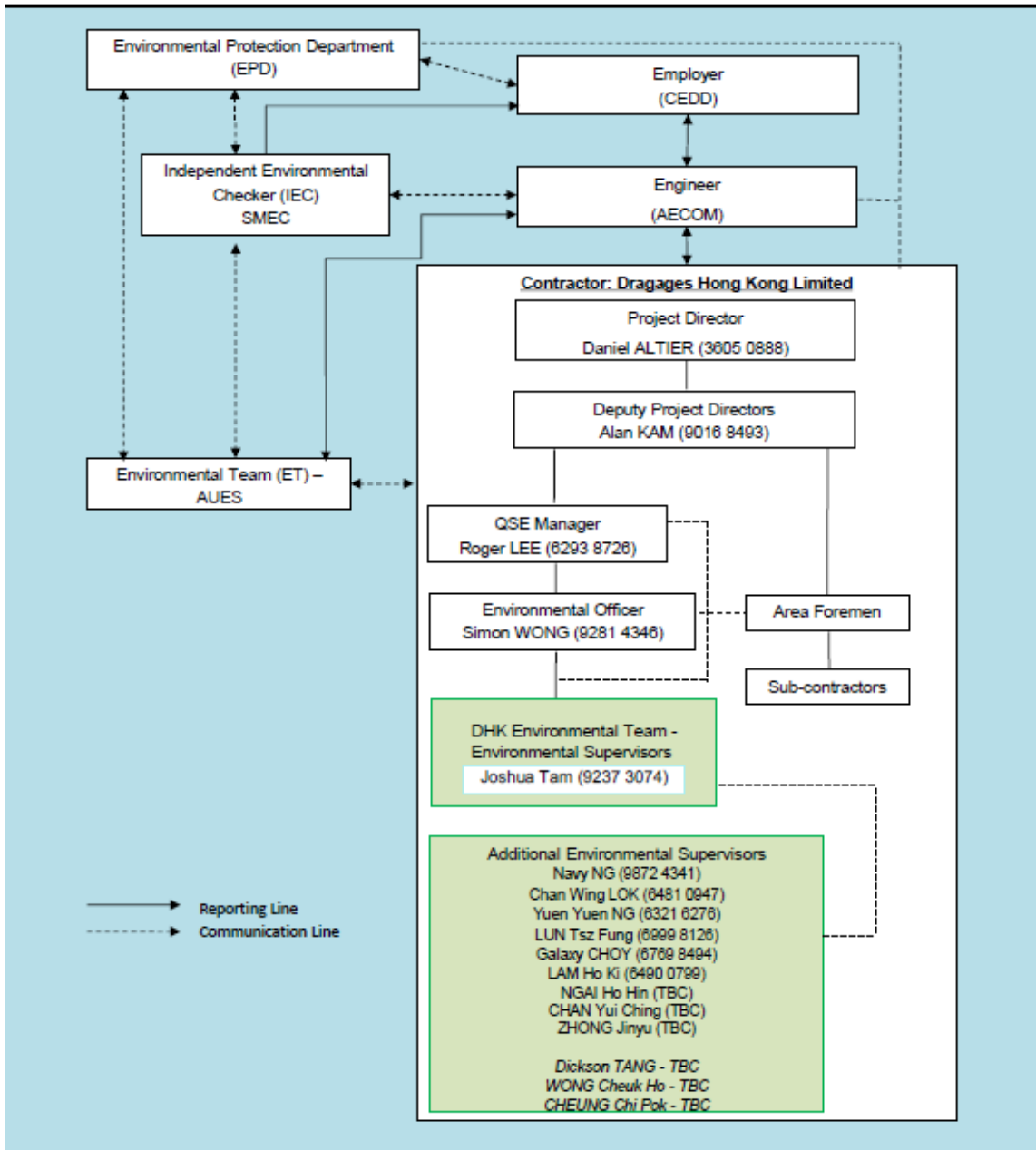
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DATE	2/1/2015
SCALE	1:3000
PROJECT NAME	PROJECT LAYOUT PLAN
DESIGNER	CECC 土木工程發展署 Civil Engineering and Development Department
CLIENT	LIANJIAN/HEUNG YUEN WAI BOUNDARY CROSS-BRIDGE (HKSAR PORTION) (SITE FORMATION AND INFRASTRUCTURE) DESIGN AND CONSTRUCTION
PROJECT NO.	60212563/PLP/001
DATE	2/1/2015
SCALE	1:3000
PROJECT NAME	PROJECT LAYOUT PLAN
DESIGNER	CECC 土木工程發展署 Civil Engineering and Development Department
CLIENT	LIANJIAN/HEUNG YUEN WAI BOUNDARY CROSS-BRIDGE (HKSAR PORTION) (SITE FORMATION AND INFRASTRUCTURE) DESIGN AND CONSTRUCTION
PROJECT NO.	60212563/PLP/001
DATE	2/1/2015
SCALE	1:3000
PROJECT NAME	PROJECT LAYOUT PLAN
DESIGNER	CECC 土木工程發展署 Civil Engineering and Development Department
CLIENT	LIANJIAN/HEUNG YUEN WAI BOUNDARY CROSS-BRIDGE (HKSAR PORTION) (SITE FORMATION AND INFRASTRUCTURE) DESIGN AND CONSTRUCTION



Appendix B

Environmental Management Organization Chart

Environmental Management Organization for Contract 2 - (CV/2012/08)



Environmental Management Organization for Contract 2 - (CV/2012/08)

Contact Details of Key Personnel for Contract 2 - CV/2012/08

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Edwin Ching	2171 3300	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
DHK	Project Director	Daniel Altier	3605 0888	2171 3299
DHK	Deputy Project Manager	Alan Kam	9016 8493	2171 3299
DHK	QSE Manager	Roger Lee	6293 8726	2171 3299
DHK	Environmental Officer	Simon Wong	2171 3017	2171 3299
DHK	Environmental Supervisor	Joshua Tam	9237 3074	2171 3299
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

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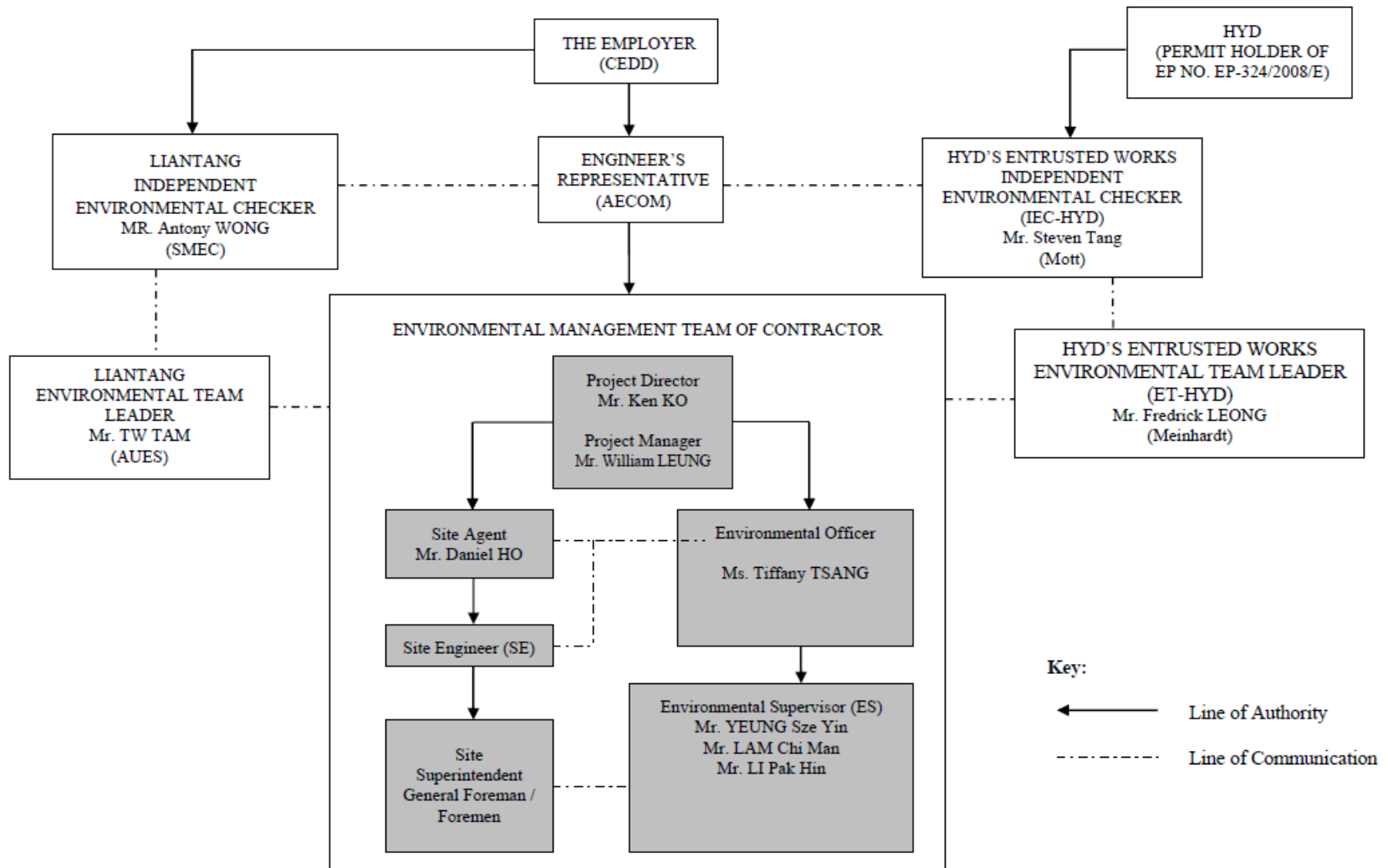
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

DHK (Main Contractor) – Dragages Hong Kong Ltd.

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization for Contract 3 - (CV/2012/09)

Contact Details of Key Personnel for Contract 3 - CV/2012/09

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Alan Lee	2171 3300	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
Chun Wo	Project Director	Ken Ko	3758 8735	2638 7077
Chun Wo	Project Manager	William Leung	2638 6136	2638 7077
Chun Wo	Site Agent	Daniel Ho	2638 6144	2638 7077
Chun Wo	Environmental Officer	Tiffany Tsang	2638 6115	2638 7077
Chun Wo	Environmental supervisor	Li Pak Hin	2638 6125	2638 7077
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

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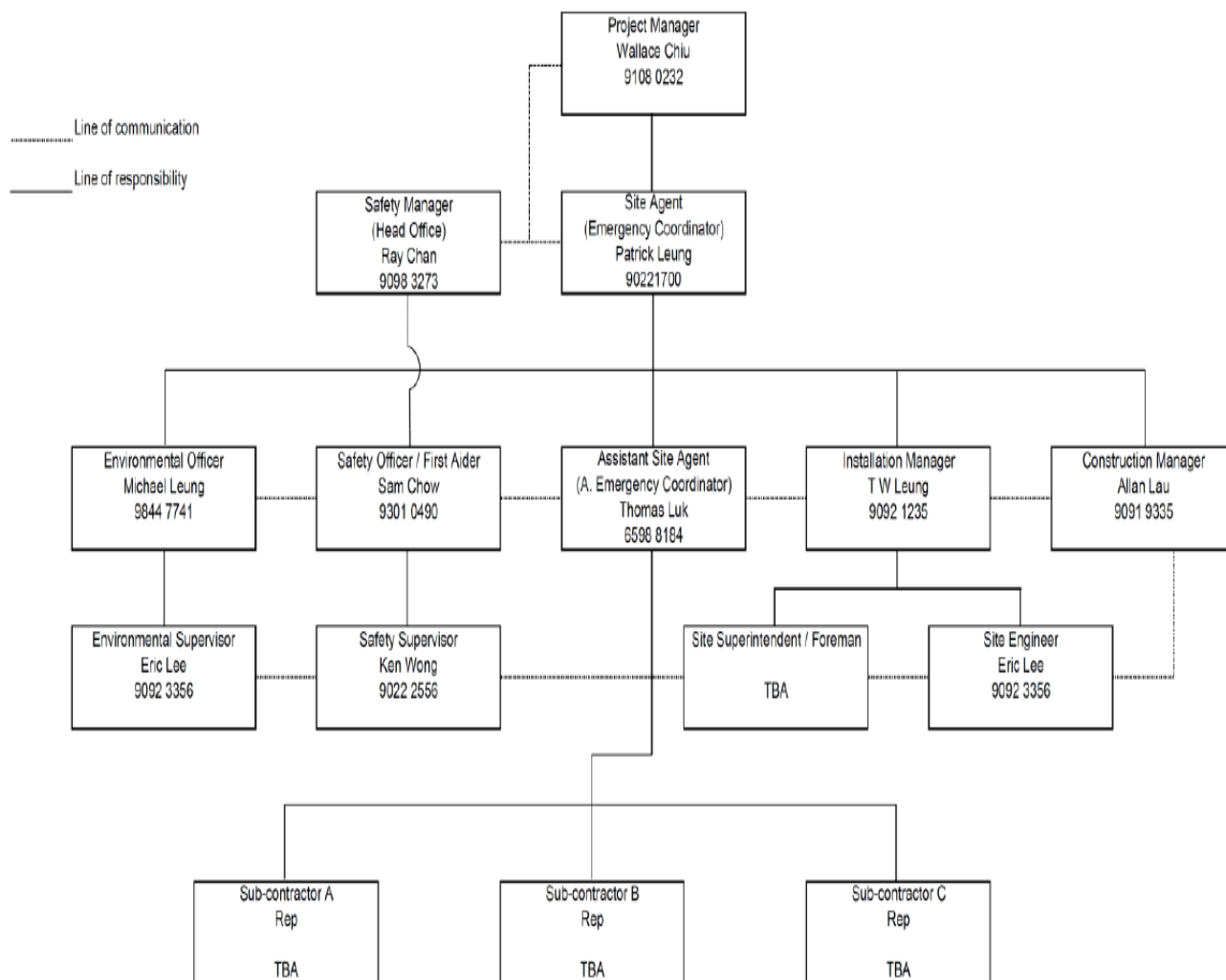
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

Chun Wo (Main Contractor) – Chun Wo Construction Ltd.

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization for Contract 4 - NE/2014/02

Environmental Management Organization for Contract 4 - NE/2014/02

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Alan Lee	2171 3300	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
Siemens	Project Manager	Wallace Chiu	9108 0232	--
Siemens	Site Agent	Patrick Leung	9022 1700	--
Siemens	Environmental Officer	Michael Leung	9844 7741	--
Siemens	Environmental Supervisors	Eric Lee	9092 3356	--
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

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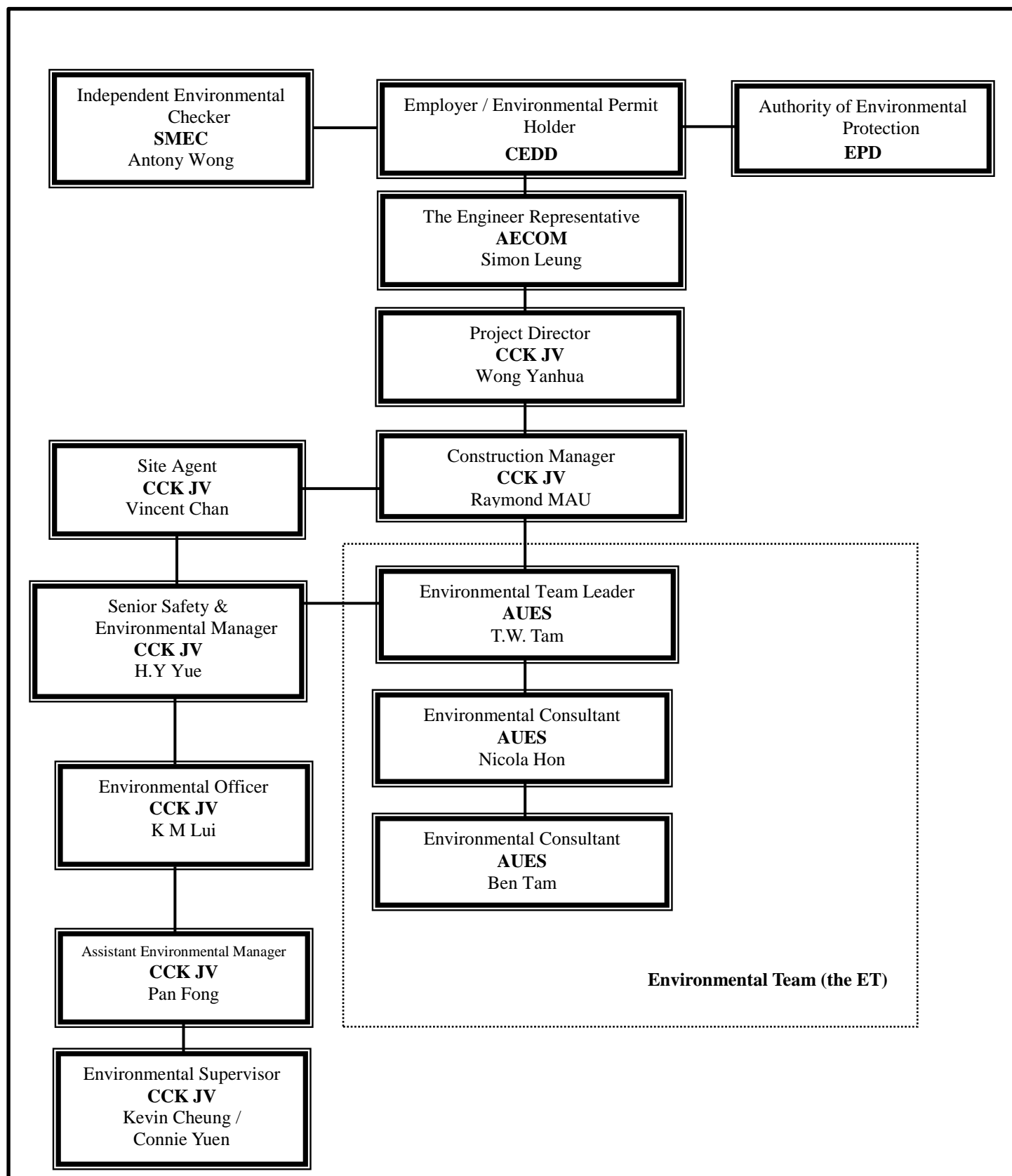
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

Siemens (Main Contractor) – Siemens Ltd.

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization – CV/2013/08

Contact Details of Key Personnel for Contract 6 - CV/2013/08

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
AECOM	Engineer's Representative	Simon Leung	2674 2273	2674 7732
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
CCK JV	Project Director	Wang Yanhua	6190 4212	--
CCK JV	Construction Manager	Raymond Mau Sai-Wai	9011 5340	--
CCK JV	Site Agent	Vincent Chan	9655 9404	--
CCK JV	Senior Safety & Environmental Manager	H.Y. Yue	9185 8186	--
CCK JV	Environmental Officer	K M Lui	51138223	--
CCK JV	Assistant Environmental Officer	Pan Fong	9436 9432	--
CCK JV	Environmental Supervisor	Kevin Cheung/ Connie Yuen	6316 6931 6117 1344	--
AUES	Environmental Team Leader	TW Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079

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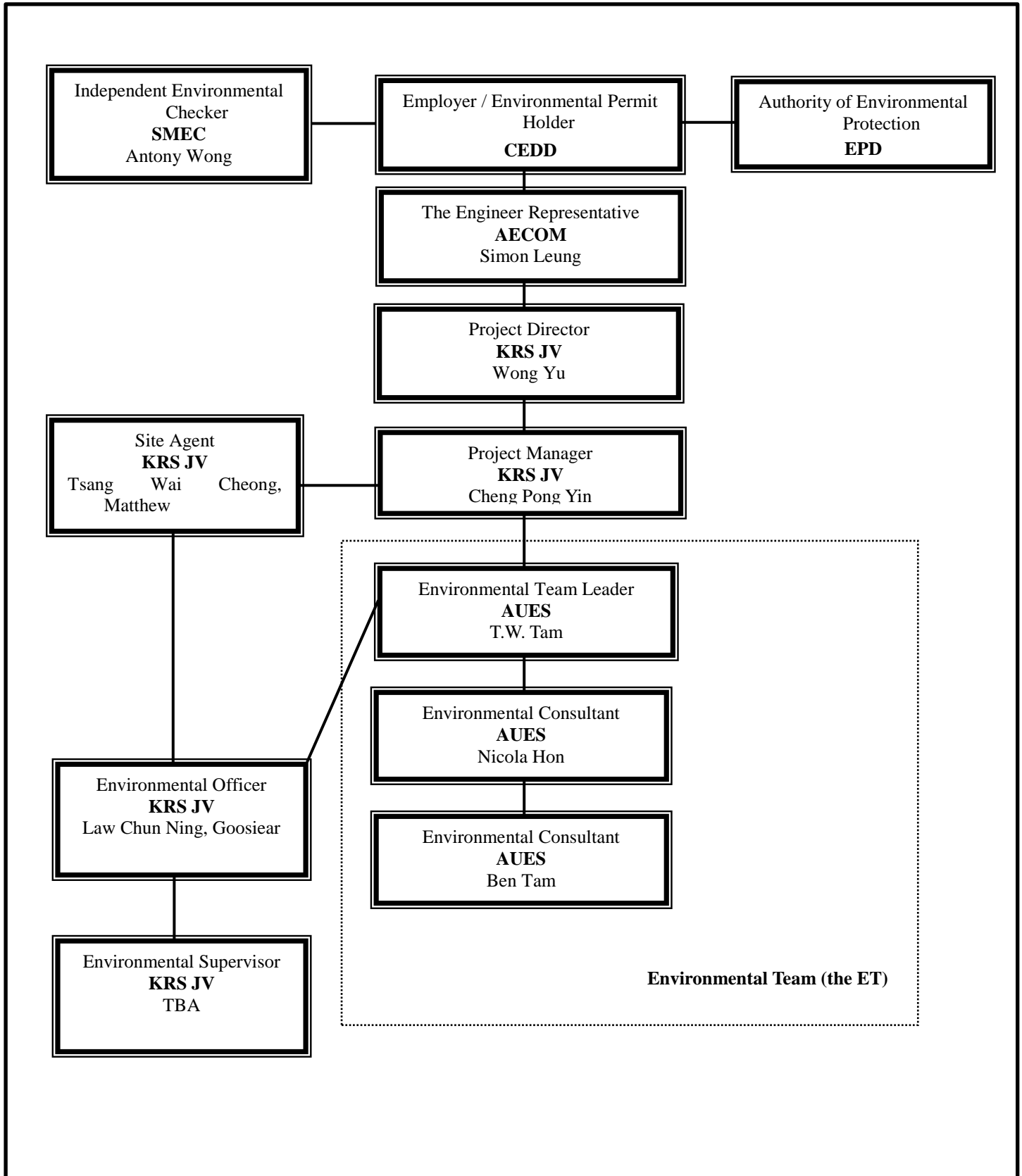
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

CCK JV (Main Contractor) – CRBE-CEC-Kaden Joint Venture

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization –NE/2014/03

Contact Details of Key Personnel for Contract 7 – NE/2014/03

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
AECOM	Engineer's Representative	Simon Leung	2674 2273	2674 7732
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
KRSJV	Project Director	Wong Yu	2682 6691	2682 2783
KRSJV	Project Manager	Cheng Pong Yin	9023 4821	2682 2783
KRSJV	Site Agent	Tsang Wai Cheong, Matthew	9705 7536	2682 2783
KRSJV	Environmental Officer	Law Chun Ning, Goosiear	9625 2381	2682 2783
KRSJV	Environmental Supervisor	TBA	6592 3084	2682 2783
AUES	Environmental Team Leader	TW Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079

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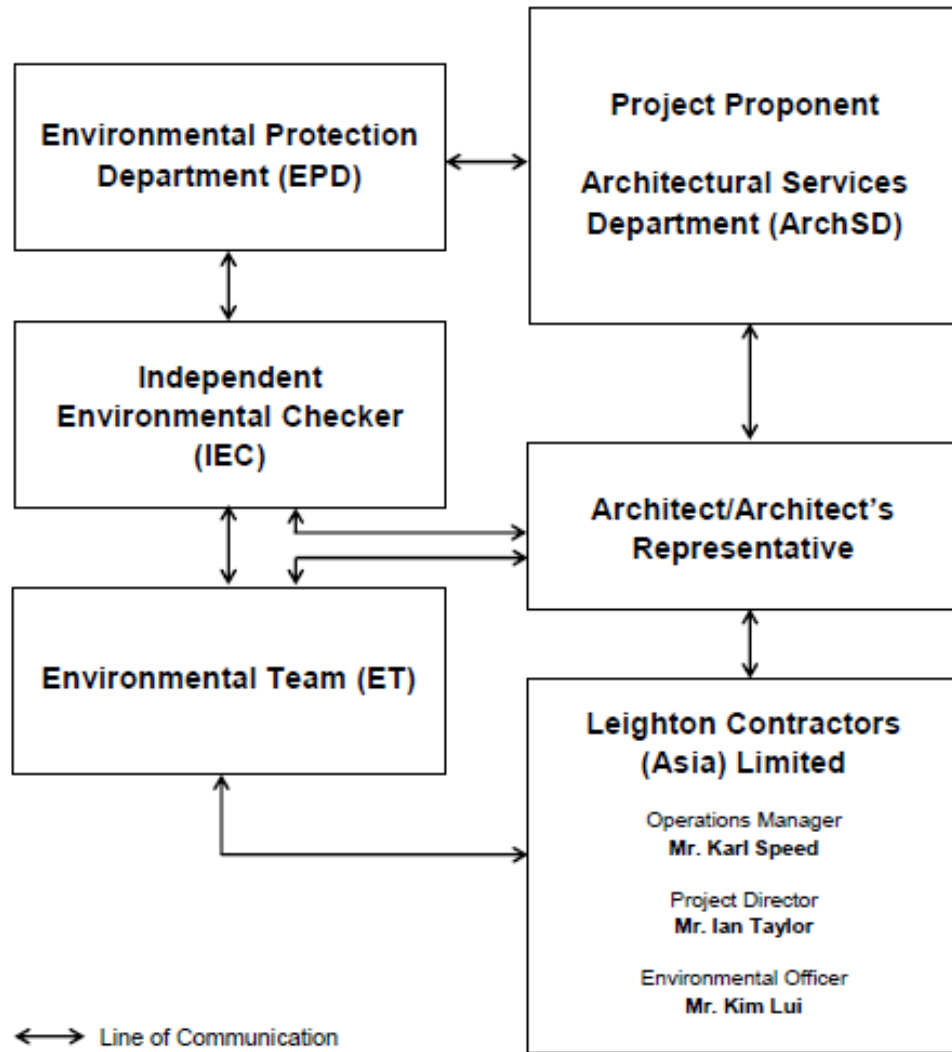
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

KRS JV (Main Contractor) –Kwan On-Richwell-SCG Joint Venture

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organigram

Environmental Management Organization for Contract SS C505

Contact Details of Key Personnel for Contract SS C505

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
ArchSD	Works agent for the Development Bureau (DEVB)	Mr. William Cheng	2867 3904	2804 6805
Ronald Lu & Partners	Architect/ Architect's Representative	Mr. Justin Cheung	3189 9272	2834 5442
SMEC	Independent Environmental Checker	Mr. Antony Wong	3995 8120	3995 8101
Leighton	Operation Manager	Mr. Antony Zervaas	2823 1433	2529 8784
Leighton	Project Director	Mr. Steven Wong	2858 1519	2858 1899
Leighton	Site Agent	Mr. Ray Ho	2858 1519	2858 1899
Leighton	Environmental Officer	Mr. Kim Lui	3973 1003	-
Leighton	Assistant Environmental Officer	Ms. Penny Yiu	3973 0818	-
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Mr. Ben Tam	2959 6059	2959 6079

Legend:

ArchSD (Project Proponent) – Architectural Services Department

Ronald Lu & Partners (Architect/ Architect's Representative) – Ronald Lu & Partners (Hong Kong) Ltd

Leighton (Main Contractor) – Leighton Contractors (Asia) Limited

SMEC (IEC) – SMEC Asia Limited

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

Appendix C

Designated Monitoring Locations as Recommended in the Approved EM&A Manual

LEGEND:

- BOUNDARY OF HSAR
- - - WORKS AREA (ABOVE GROUND)
- - - WORKS AREA (TUNNEL)
- X AIR MONITORING STATIONS

PI	REV.	NO.	DATE	DESCRIPTION	BY	CHKD	APP'D



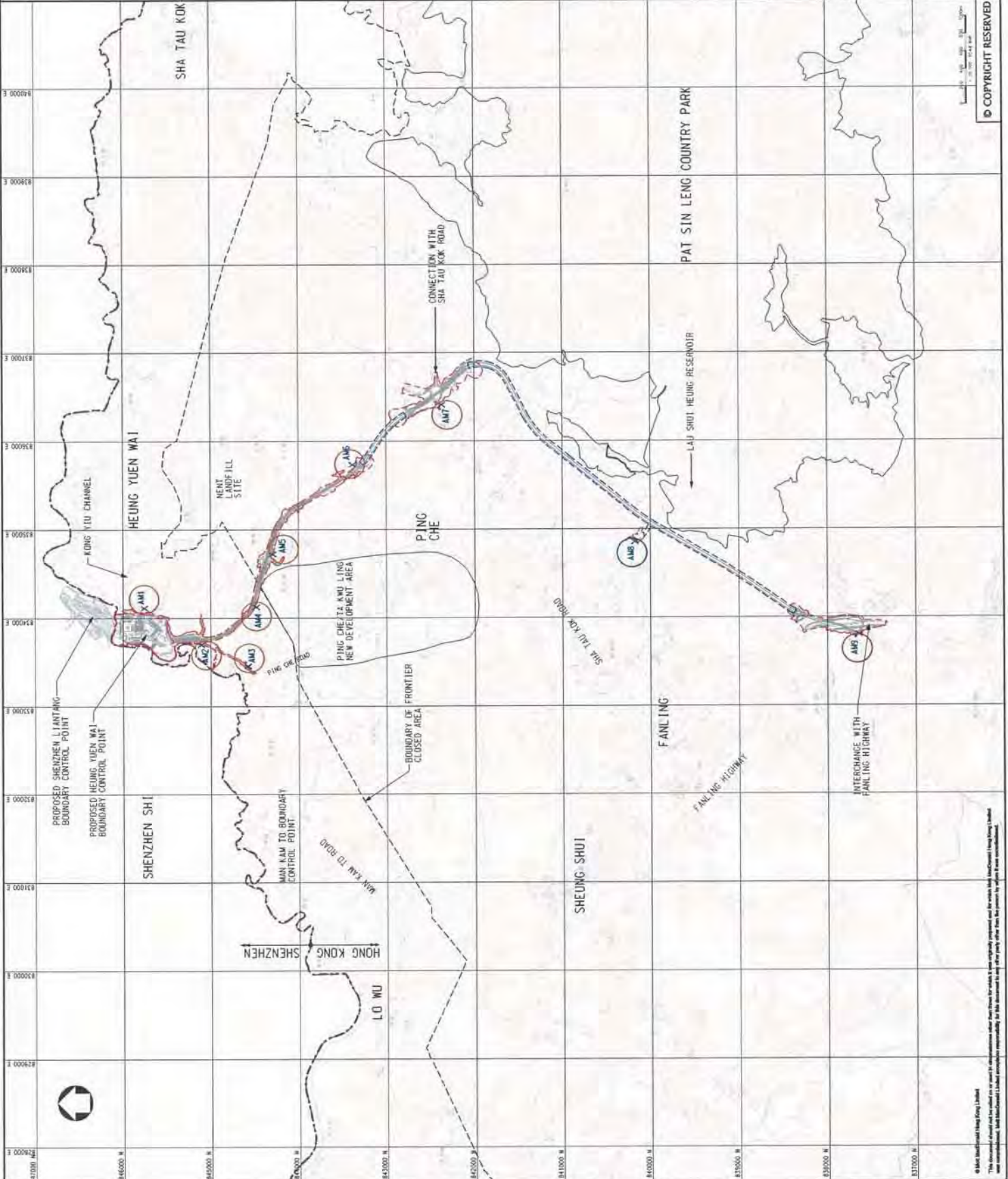
CIVIL ENGINEERING
AND DEVELOPMENT
DEPARTMENT

AGREEMENT NO. CE-45/2008(CE)
LIANTANG/HEUNG YUEN WAI BOUNDARY
CONTROL POINT AND ASSOCIATED WORKS

PROPOSED LOCATION OF CONSTRUCTION
AIR QUALITY MONITORING STATIONS

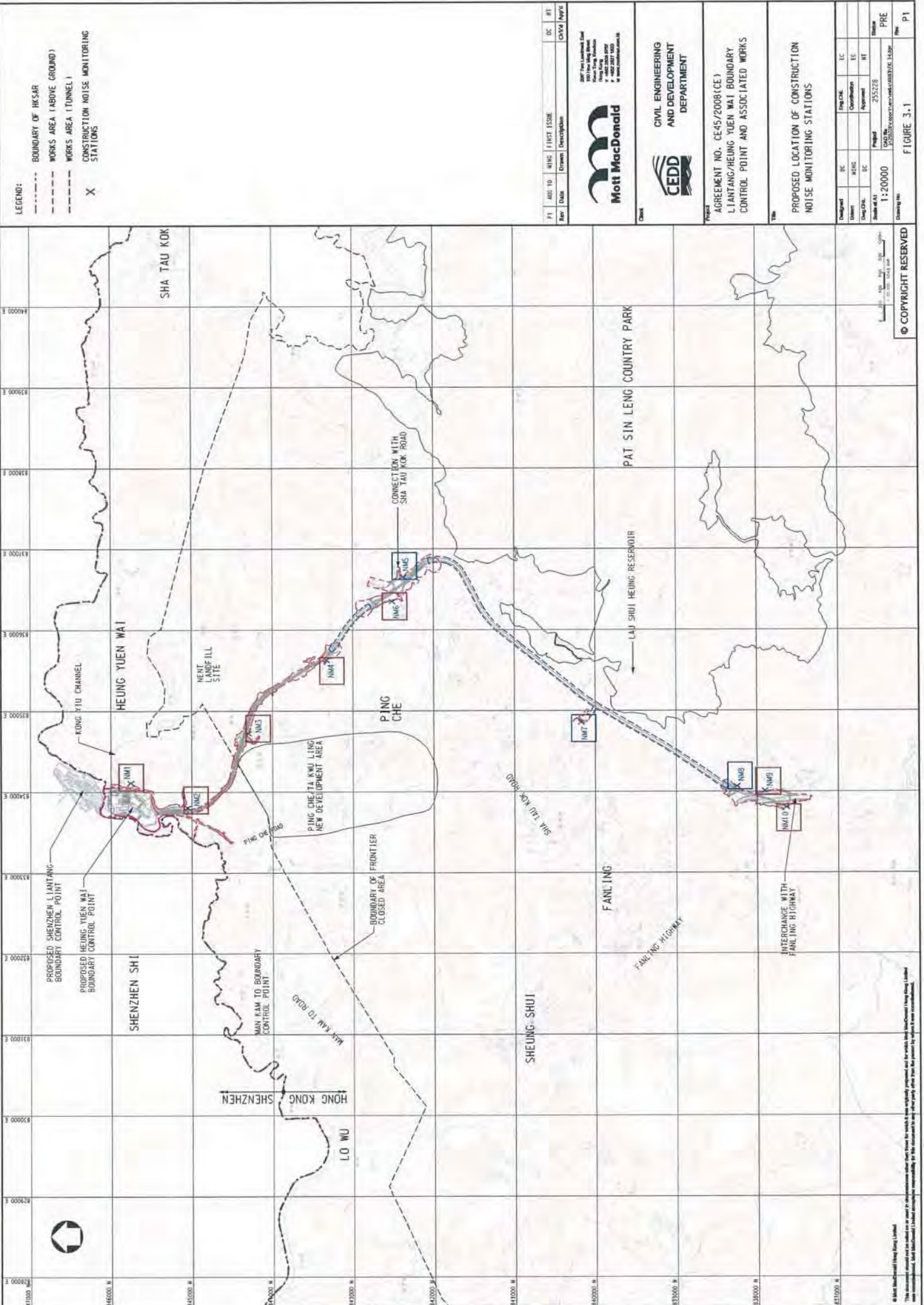
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Drawn						
Checked						
Scale	1:20000					
Project No.	253228					
Drawn by						
Checked by						
Scale						
Project						
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FIGURE 2.1



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- LEGEND:
- BOUNDARY OF HKSR
 - - - WORKS AREA (ABOVE GROUND)
 - - - WORKS AREA (TUNNEL)
 - X CONSTRUCTION NOISE MONITORING STATIONS

PI	ADD TO	NING	FIRST ISSUE	DC	RE
Rev	Date	Drawn	Description	Checked	Appr'd



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Civil Engineering
AND DEVELOPMENT
DEPARTMENT

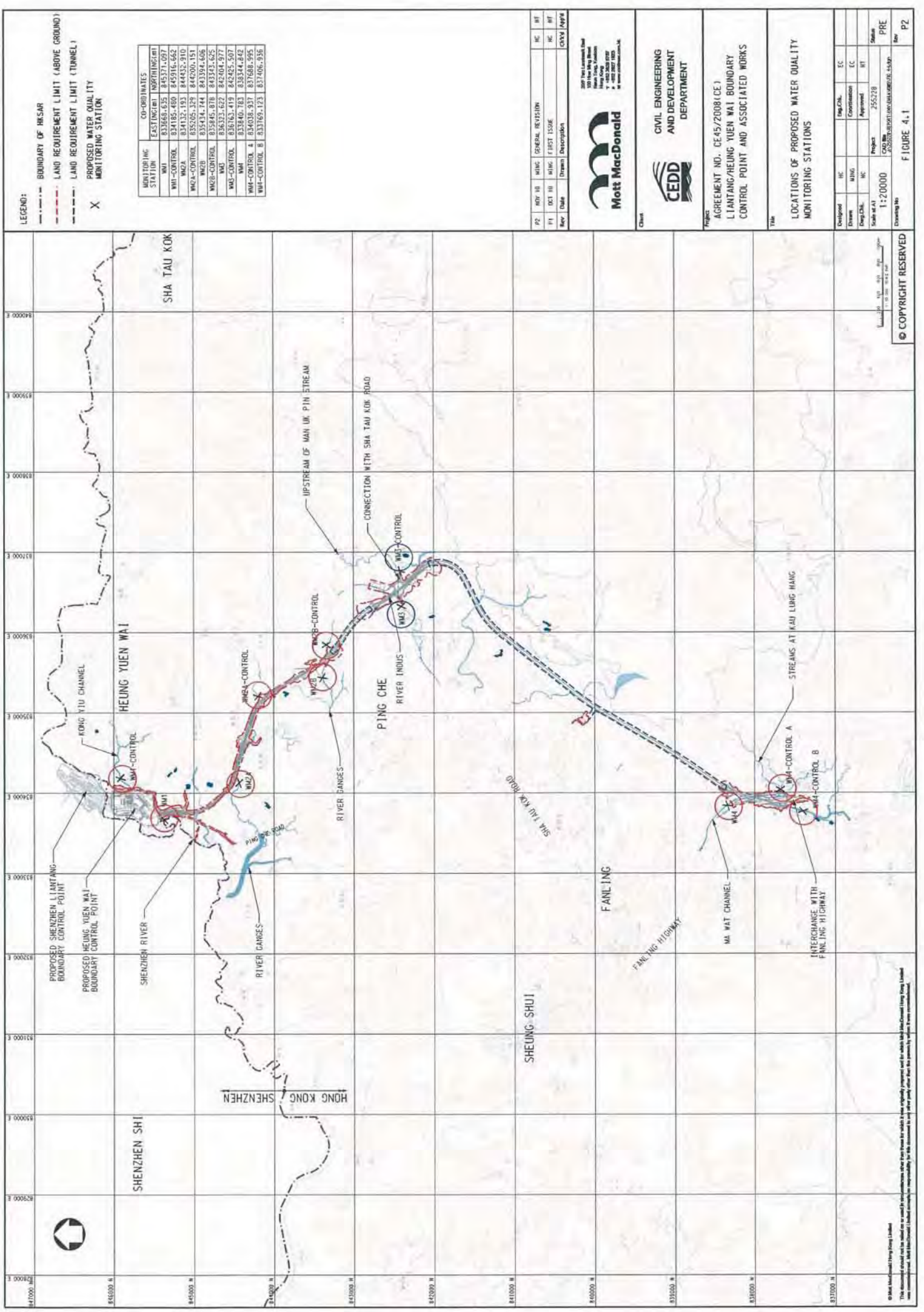
Project
AGREEMENT NO. CE-45/2008(CE)
LIANTANG/HEUNG YUEN WAI BOUNDARY
CONTROL POINT AND ASSOCIATED WORKS

Proposed
LOCATION OF CONSTRUCTION
NOISE MONITORING STATIONS

Designated	IC	Pre-CHK	EC
Station	N/ING	Description	EC
Dist. CHK.	DC	Approval	BT
Scale at A1	Project 255228		
Scale at A2	CAD File: 255228/CONSTRUCTION/NOISE/03/06/16.dwg		
Drawing No.	PRE		
	Rev P1		

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LEGEND:

- BOUNDARY OF HK SAR
- LAND REQUIREMENT LIMIT (ABOVE GROUND)
- LAND REQUIREMENT LIMIT (TUNNEL)
- PROPOSED WATER QUALITY MONITORING STATION
- X

MONITORING STATION	CO-ORDINATES	
	EASTING (M)	NORTHING (M)
WMA	837668.635	845171.097
WMA-COMB-CONTROL	834185.460	845916.662
WMA-A	834132.193	844832.910
WMA-COMB-CONTROL	835205.329	844200.151
WMA-B	835334.744	843384.606
WMA-COMB-CONTROL	835845.878	843323.625
WMA-C	836323.622	842404.977
WMA-COMB-CONTROL	836163.419	842425.507
WMA	833940.763	838344.842
WMA-COMB-CONTROL A	834038.937	837688.995
WMA-COMB-CONTROL B	833769.123	837406.936

REV	NOY	NO	DATE	DESCRIPTION	BY	CHK
P2	REV 10	MISC	GENERAL REVISION		HC	HT
P1	REV 10	MISC	FIRST ISSUE		HC	HT
Rev	Date	Drawn	Description		CHKD	Apprd



CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

AGREEMENT NO. CE-45/2008(CE)
LIANTANG/HUANG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

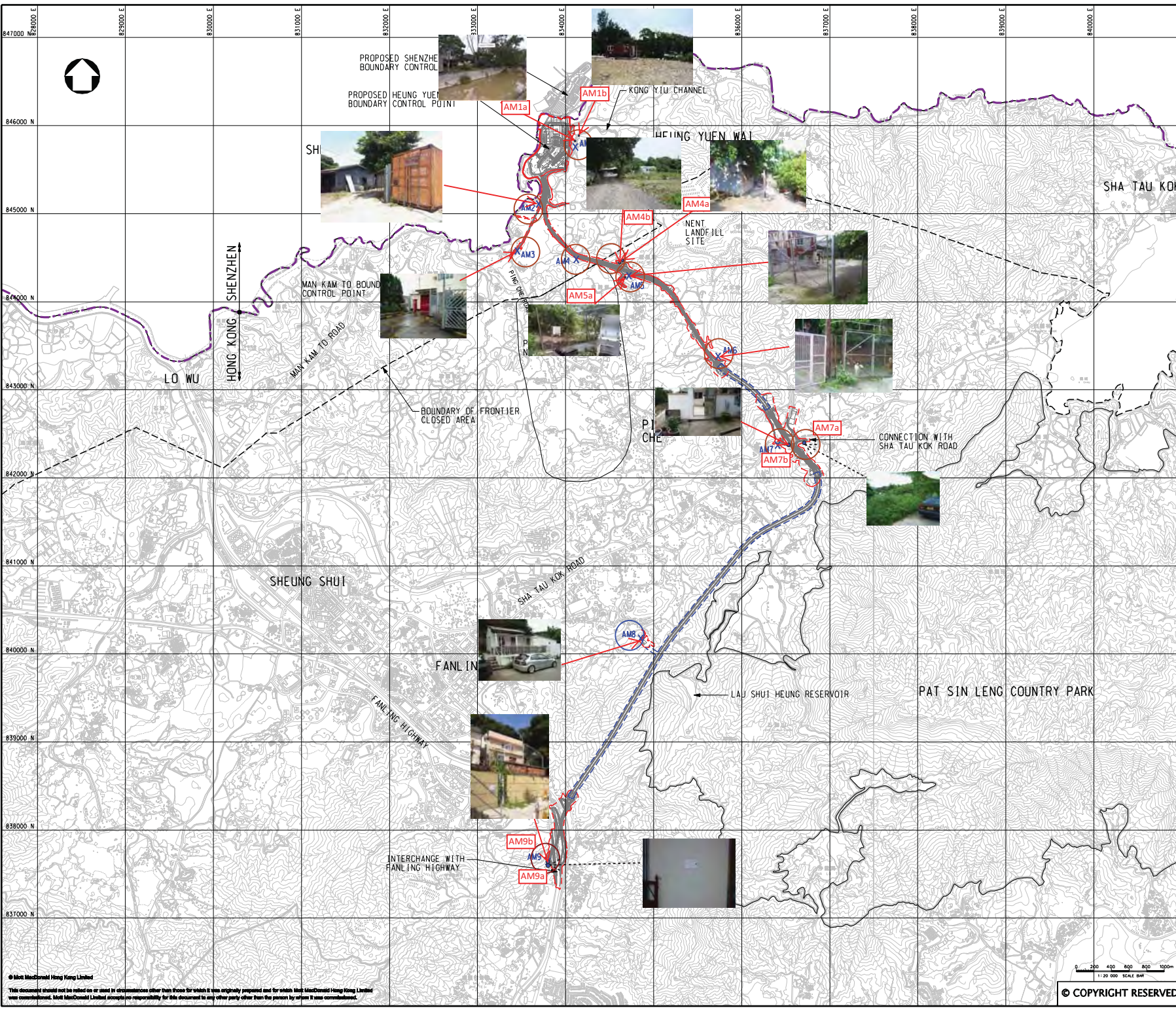
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Drawn			
Eng. Chk.			
Scale at A1			
Scale at A2			
Project	255278		
CDU No.	255278/01/01/04/08/05/16/97		
Drawing No.	FIGURE 4.1		
Rev	P2		

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Appendix D

Monitoring Locations for Impact Monitoring




- LEGEND:**
- BOUNDARY OF HKSAR
 - WORKS AREA (ABOVE GROUND)
 - WORKS AREA (TUNNEL)
 - X Air Monitoring Stations in the EM&A Manual
 - Proposed Air Monitoring Stations

P1	AUG 10	MING	FIRST ISSUE	DC	HT
Rev	Date	Drawn	Description	Chk'd	App'd



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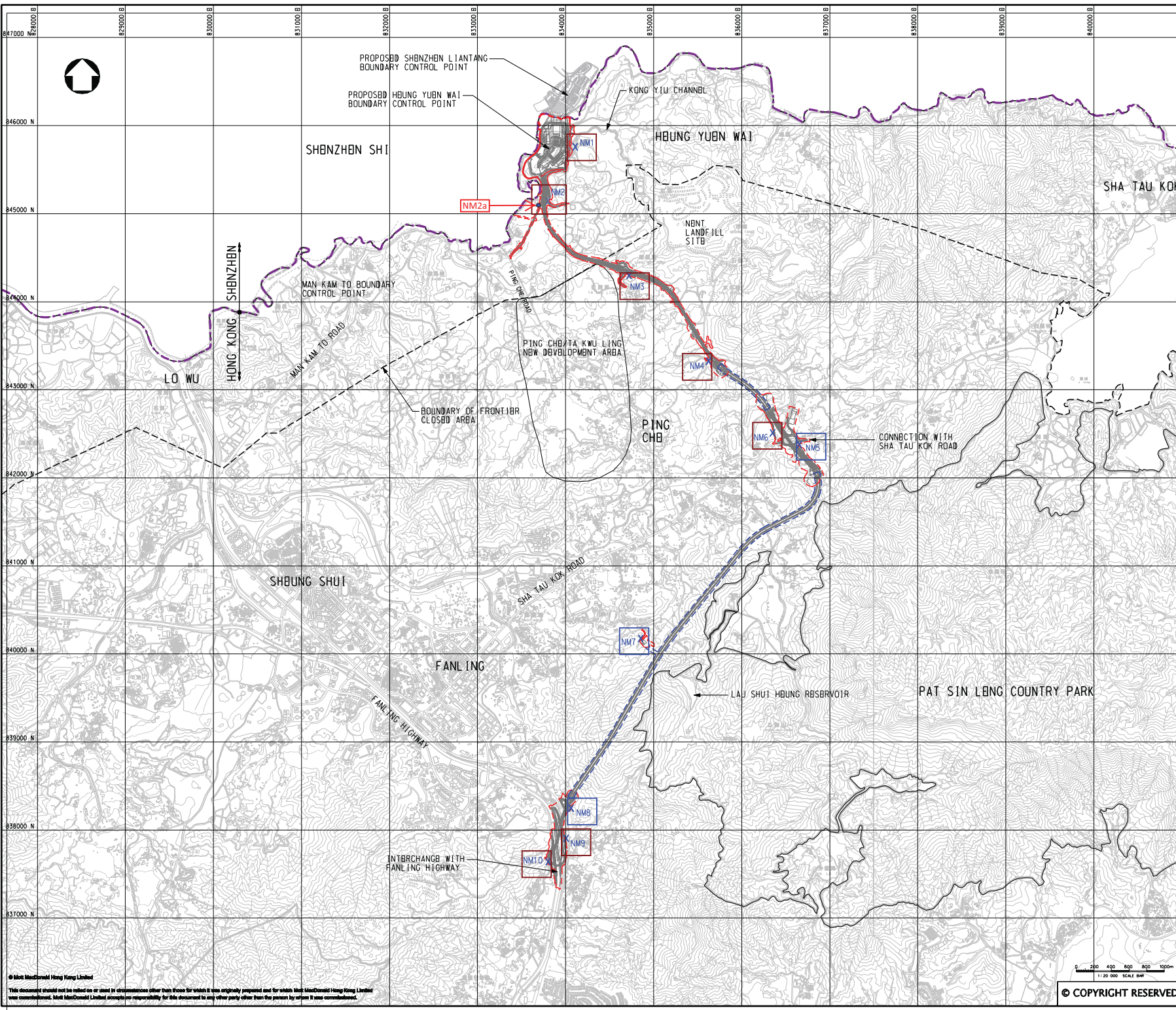
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project
 AGREEMENT NO. CE45/2008(CE)
 LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title
 PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

Designed	DC	Eng.Chk.	EC	
Drawn	MING	Coordination	EC	
Draw.Chk.	DC	Approved	HT	
Scale at A1	1:20000	Project	255228	Status
		CAD file	255228\report\env\em&a\00831\FE_21.dgn	PRE
Drawing No				Rev
				P1

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- LEGEND:**
- BOUNDARY OF HKSAR
 - WORKS AREA (ABOVE GROUND)
 - WORKS AREA (TUNNBL)
 - X CONSTRUCTION NOISE MONITORING STATIONS
 - Proposed Noise Monitoring Stations

P1	AUG 10	MING	FIRST ISSUE	DC	HT
Rev	Date	Drawn	Description	CHK'd	App'd



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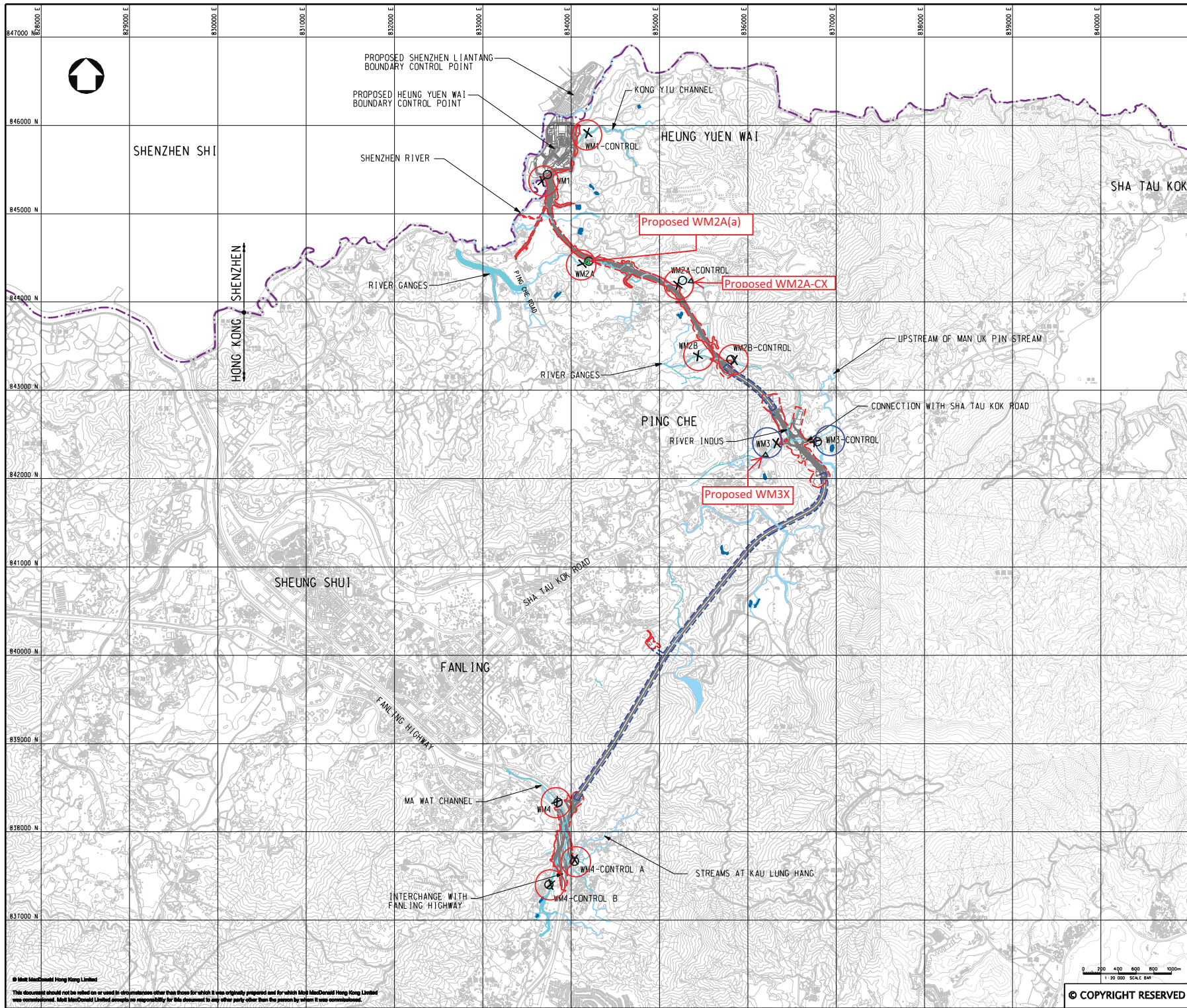
Project
 AGREEMENT NO. CB45/2008(CB)
 LIANTANG/HUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title
 PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	DC	Eng.Chk.	BC	
Drawn	MING	Coordination	BC	
Dep.Chk.	DC	Approved	HT	
Scale of A1	1:20000	Project	255228	Status
		CAD file	3\255228\report\env\env\ca\00831\FE_31.dgn	PRB
Drawing No				Rev
				P1

Scale at A1
 1:20000
 Scale bar: 0 200 400 600 800 1000m
 1:20 000 SCALE BAR
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- LEGEND:**
- BOUNDARY OF HKSAR
 - LAND REQUIREMENT LIMIT (ABOVE GROUND)
 - LAND REQUIREMENT LIMIT (TUNNEL)
 - X** Water Quality Monitoring Location Recommended in EM&A Manual
 - O** Alternative Water Quality Monitoring Location for EM&A Programme
 - △** New Proposed Water Quality Monitoring Location in November 2015
 - ▲** New Proposed Water Quality Monitoring Location in May 2016

Station ID	Location recommended in EM&A Manual		Location found during site visit	
	Easting	Northing	Easting	Northing
WM1	83456.833	84577.072	83457.1	84542.1
WM1-Control	83418.480	84591.647	83418.5	84517.1
WM2A	83412.319	84432.910	83420.4	84517.3
WM2A-Control	83505.329	84400.151	83527.0	84474.5
WM2B	83514.744	84339.606	83543.5	84339.7
WM2B-Control	83565.878	84343.625	83535.1	84355.1
WM3	83623.622	84265.377	83632.4	84240.7
WM3-Control	83675.410	84243.507	83675.1	84240.0
WM4	83540.781	83834.842	83550.1	83838.1
WM4-Control A	84018.937	83764.995	84028.1	83765.1
WM4-Control B	83769.123	83740.916	83760.1	83739.1

New Proposed Water Quality Monitoring Location in November 2015

Location ID	Easting	Northing
WM2A-C (Original)	0835270	0844243
WM2A-Cx (Proposed)	0835377	0844188
WM3 (Original)	0836324	0842407
WM3x (Proposed)	0836206	0842270

New Proposed Water Quality Monitoring Location in May 2016

Location ID	Easting	Northing
WM2A (Original)	834204	844471
WM2A(a) (Proposed)	834191	844474

Rev	Date	Drawn	Description	CHK'd	App'd
P2	NOV 10	MING	GENERAL REVISION	HC	HT
P1	OCT 10	MING	FIRST ISSUE	HC	HT



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AGREEMENT NO. CE45/2008 (CE)
LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title

LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

Designed	HC	Eng. Chk.	EC
Drawn	MING	Coordination	EC
Dwg. Chk.	HC	Approved	HT

Scale at A1: 1:20000 Project: 255228 Status: PRE

Drawing No: **Appendix C** Rev: P2

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Appendix E

Event and Action Plan

Event and Action Plan for Air Quality

Event	ET	IEC	ER	Action Contractor
Action Level				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit Level				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented;	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not
	and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	the ER accordingly; 5. Monitor the implementation of remedial measures.	5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Event and Action Plan for Construction Noise

Event		ET	IEC	ER	Action Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify ER, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Advise the ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC and ER; 2. Implement noise mitigation proposals. 	
Limit Level	<ol style="list-style-type: none"> 1. Inform IEC, ER, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and ER on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated. 	

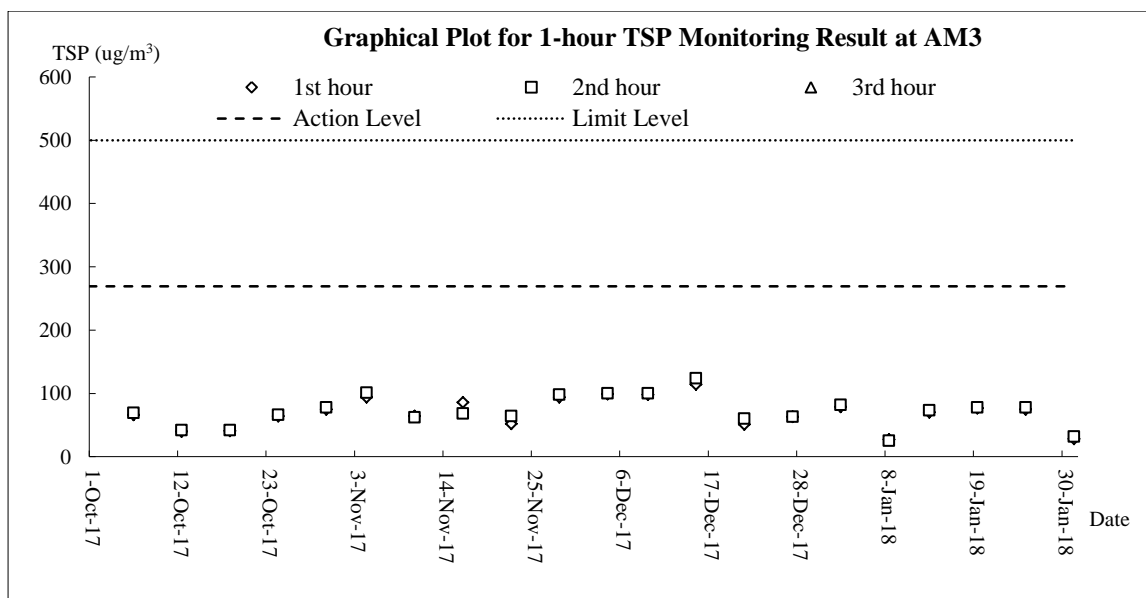
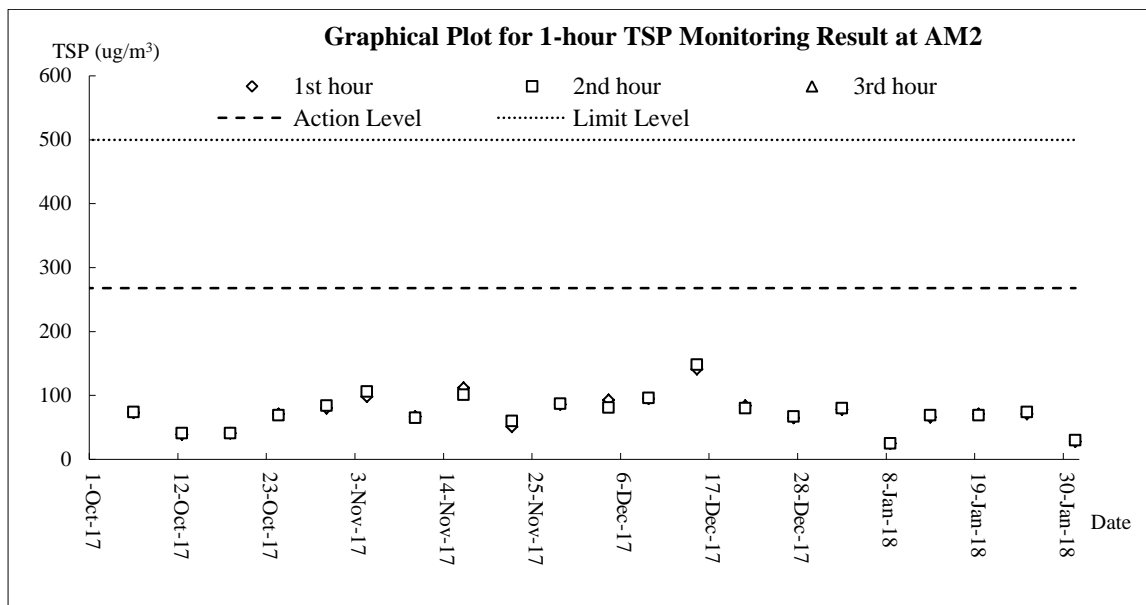
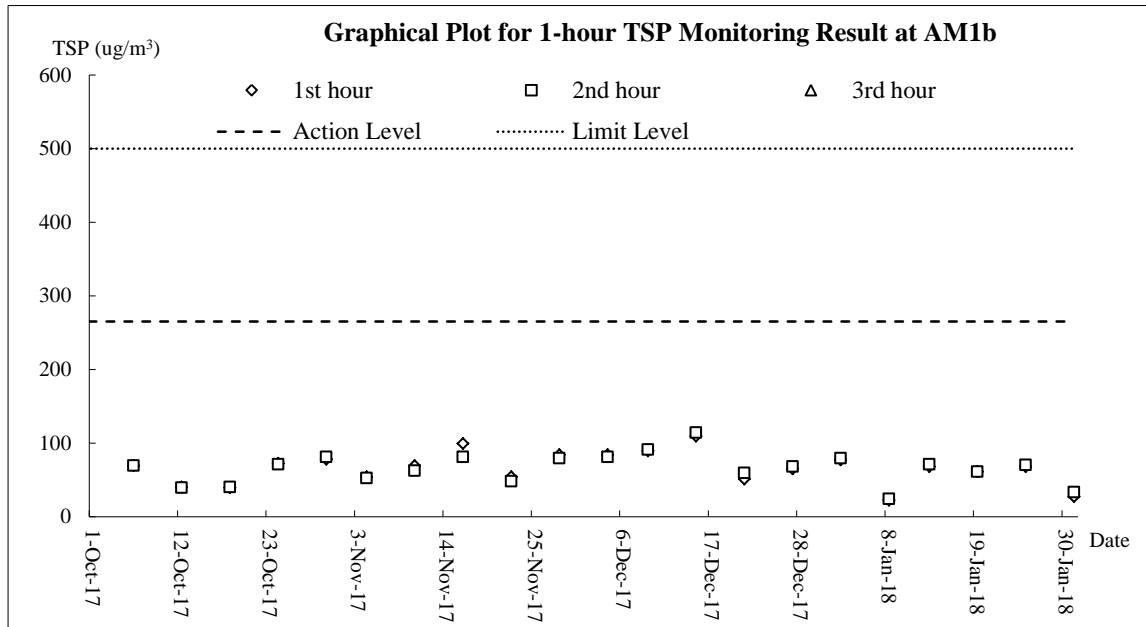
Event and Action Plan for Water Quality

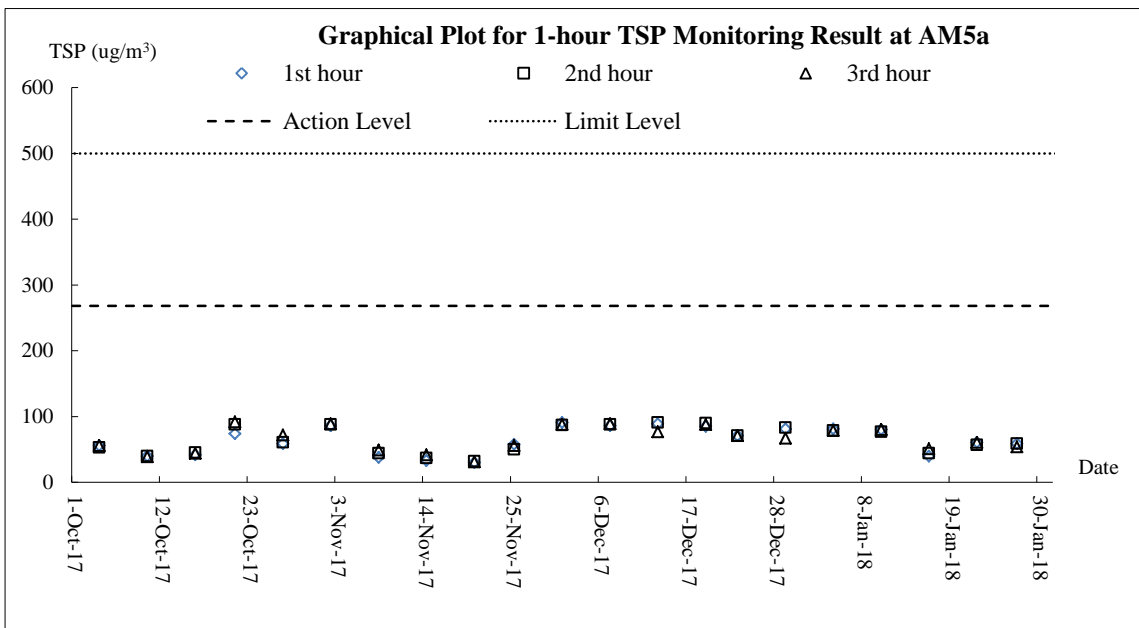
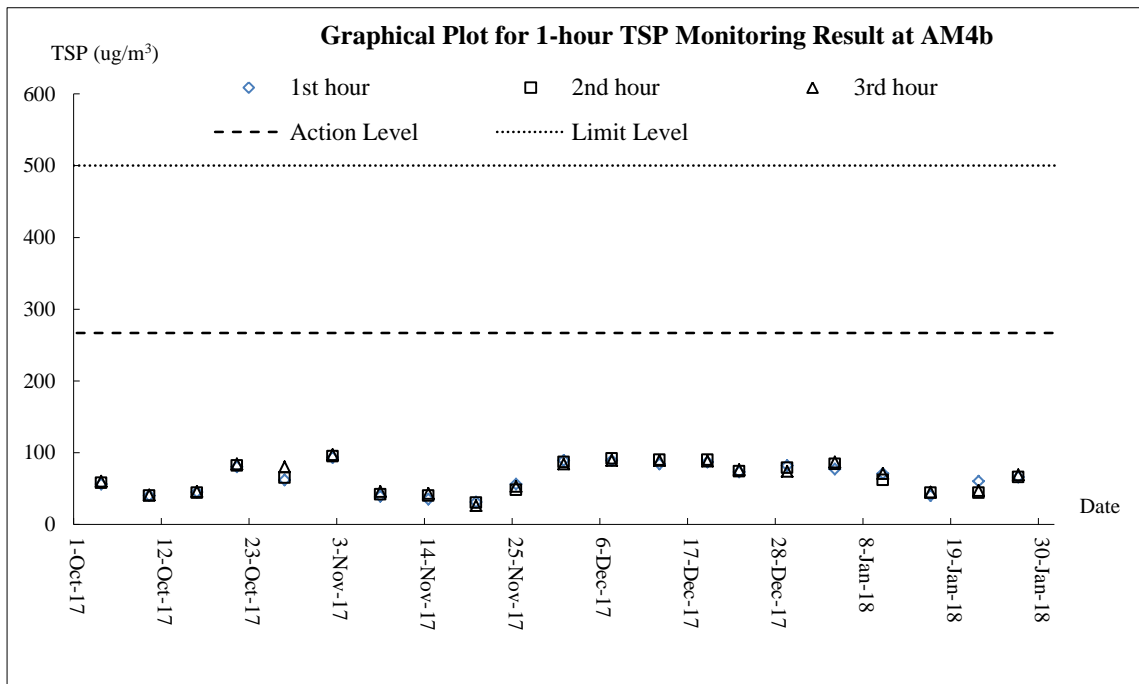
EVENT	ET	IEC	ER	ACTION CONTRACTOR
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> Repeat in-situ measurement to confirm findings; Identify reasons for non-compliance and sources of impact; Inform IEC and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC and Contractor; Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> Discuss with IEC on the proposed mitigation measures; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IEC and propose mitigation measures to IEC and ER; Implement the agreed mitigation measures.
Action Level being exceeded by more than two consecutive sampling days	<ol style="list-style-type: none"> Repeat in-situ measurement to confirm findings; Identify reasons for non-compliance and sources of impact; Inform IEC and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC and Contractor; Ensure mitigation measures are implemented; Prepare to increase the monitoring frequency to daily; Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> Discuss with IEC on the proposed mitigation measures; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; Implement the agreed mitigation measures.
Limit Level being exceeded by one sampling day	<ol style="list-style-type: none"> Repeat in-situ measurement to confirm findings; Identify reasons for non-compliance and sources of impact; Inform IEC, Contractor and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit Level. 	<ol style="list-style-type: none"> Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; Implement the agreed mitigation measures.
Limit level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> Repeat in-situ measurement to confirm findings; Identify reasons for non-compliance and sources of impact; Inform IEC, Contractor and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days. 	<ol style="list-style-type: none"> Discuss with ET and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Assess the effectiveness of the implemented mitigation measures; Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit Level. 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; Implement the agreed mitigation measures; As directed by the ER, to slow down or to stop all or part of the construction activities.

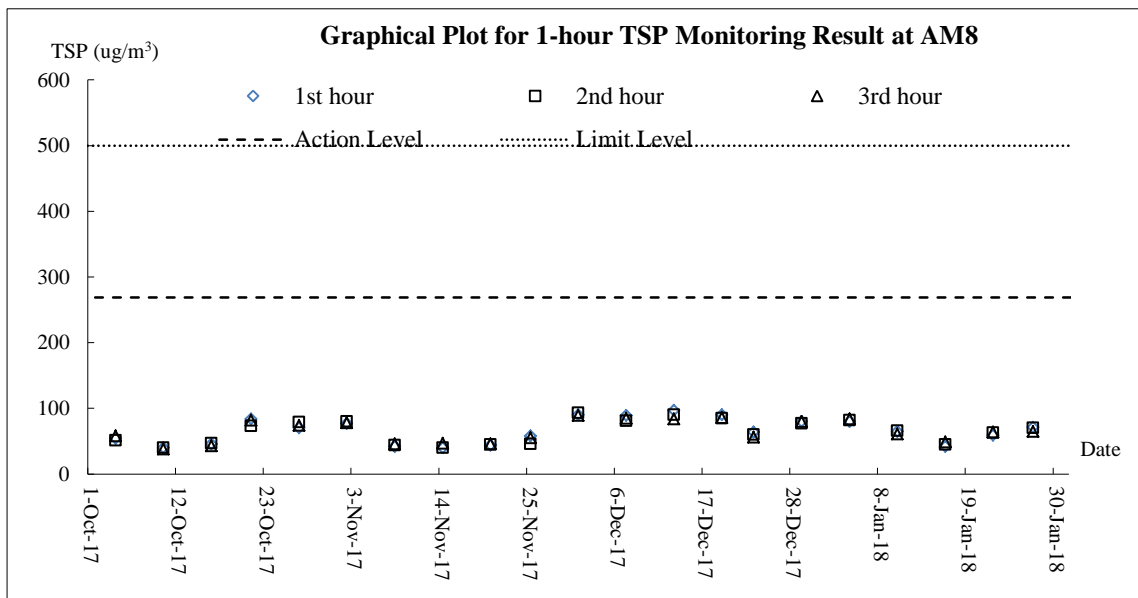
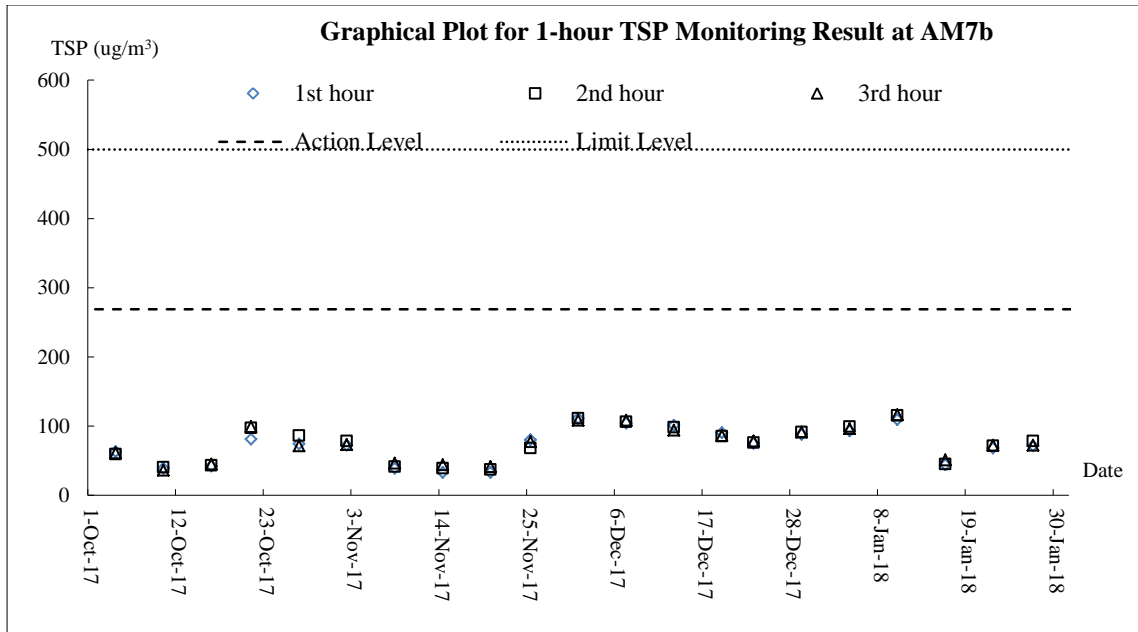
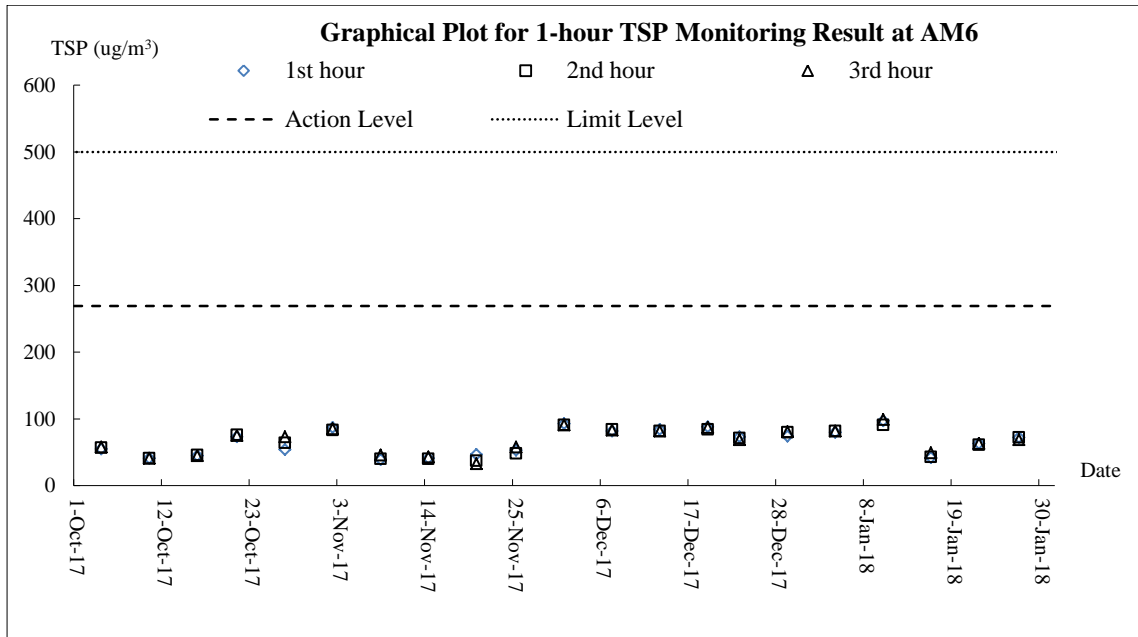
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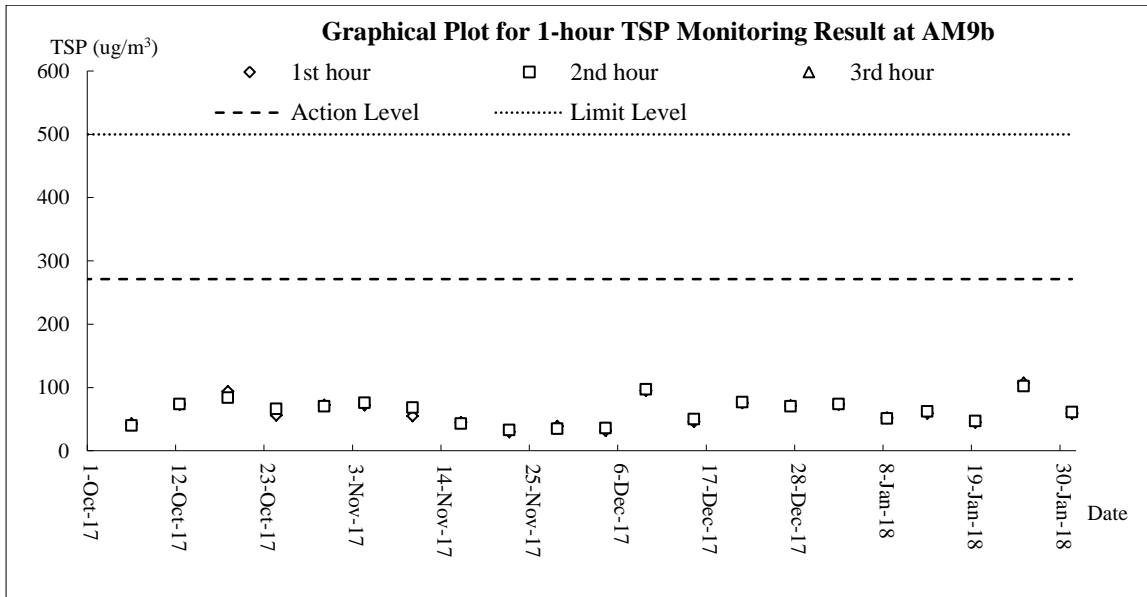
Graphical Plots for Monitoring Result

Air Quality – 1-hour TSP

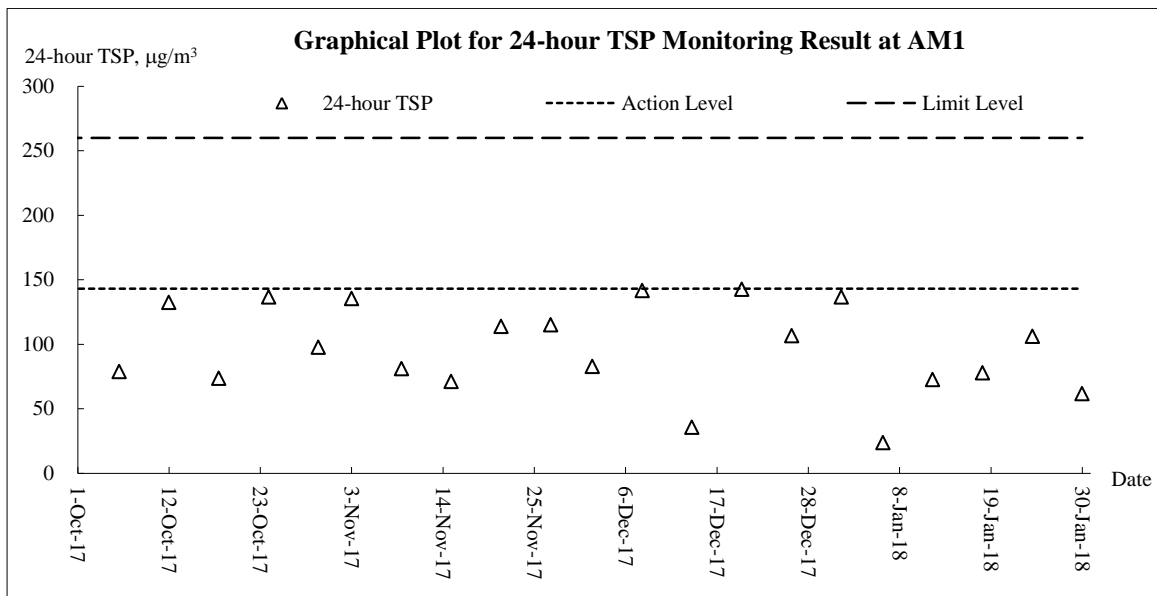


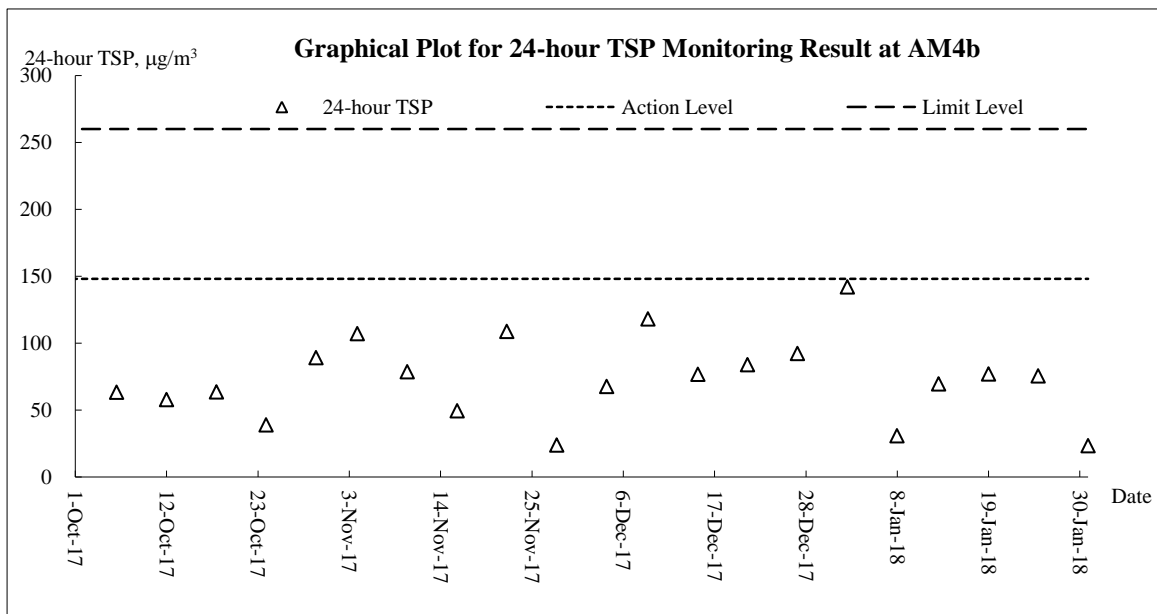
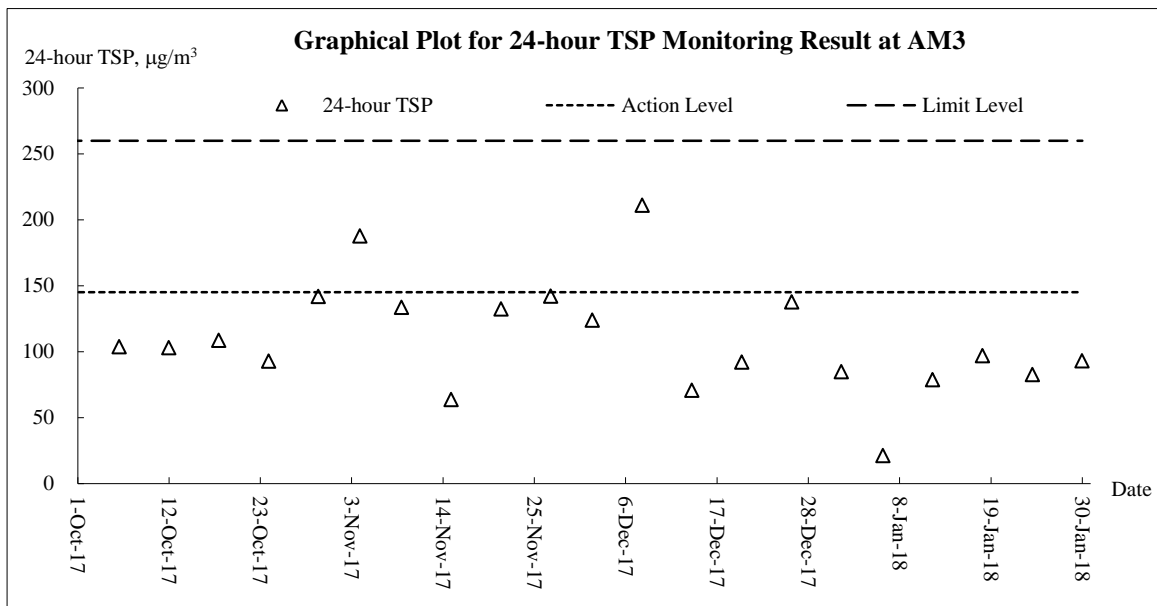
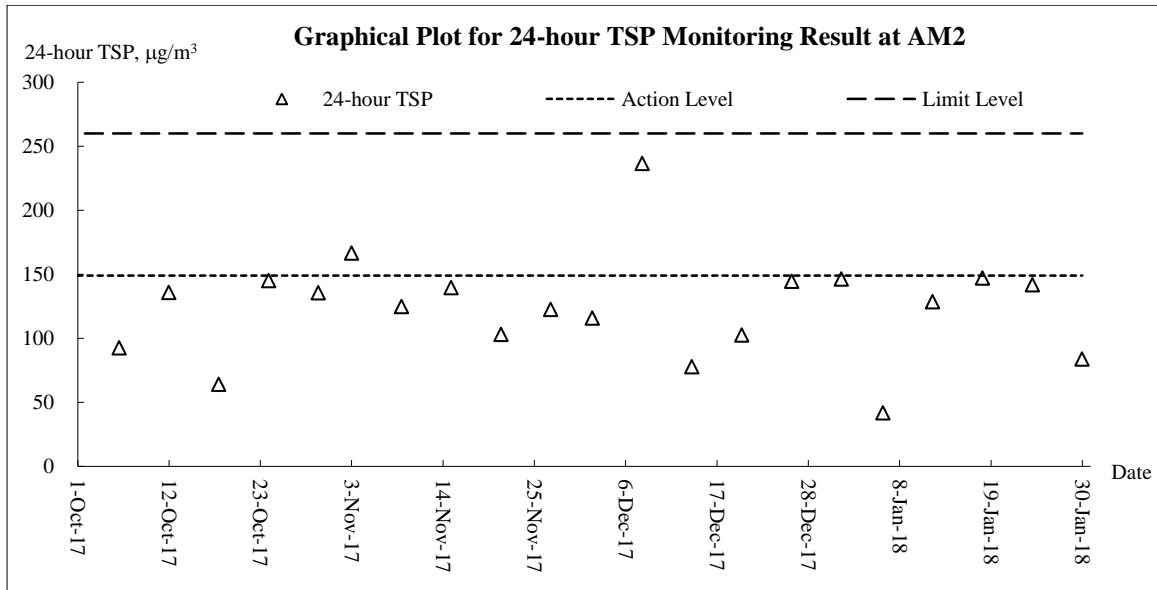


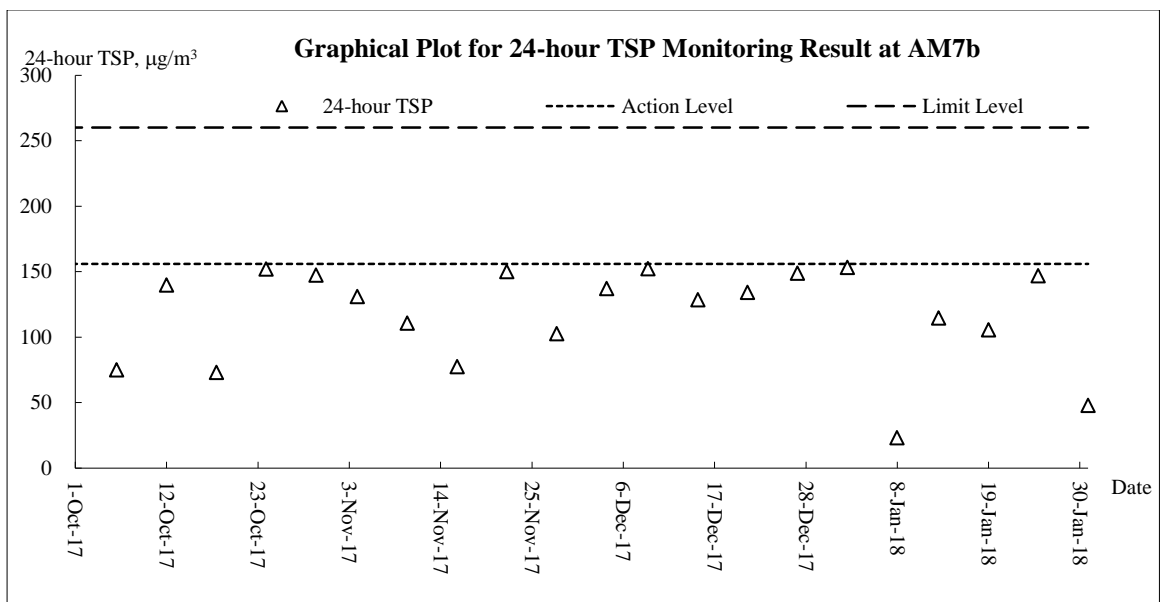
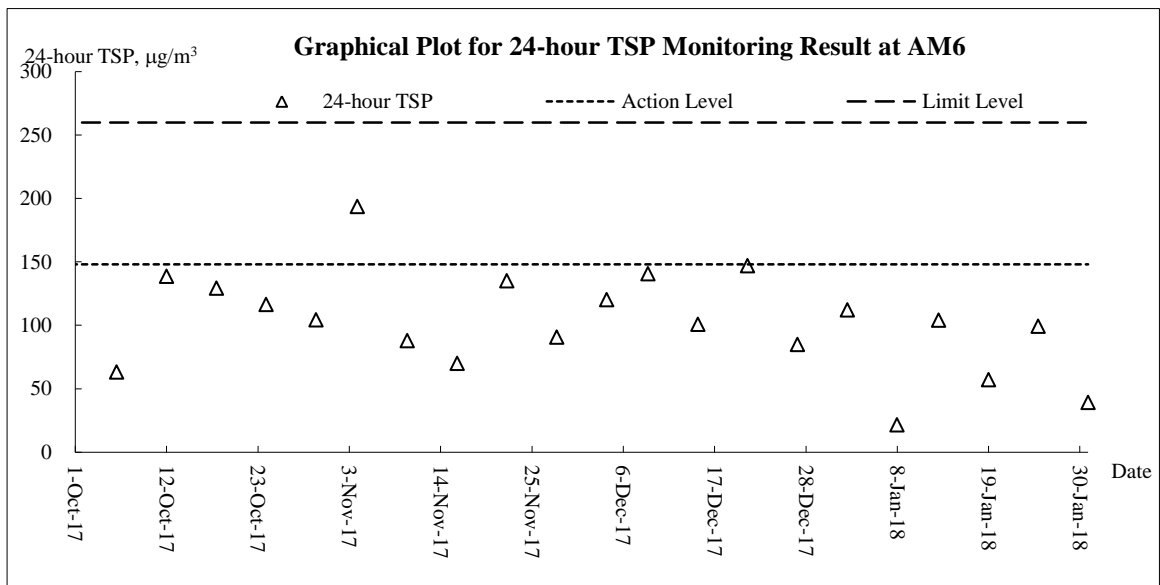
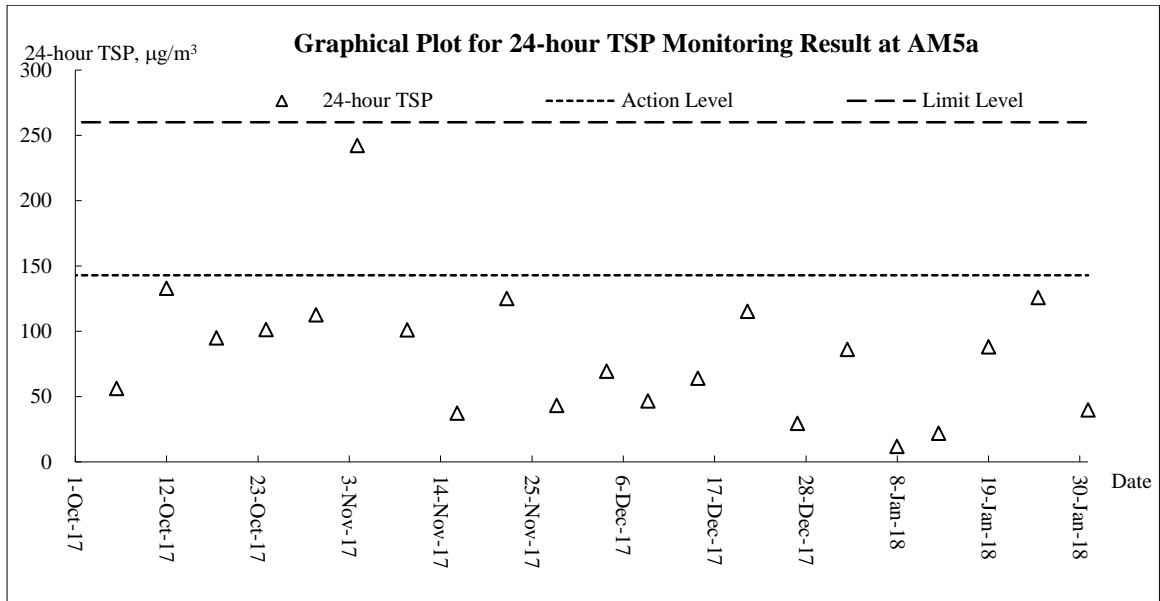


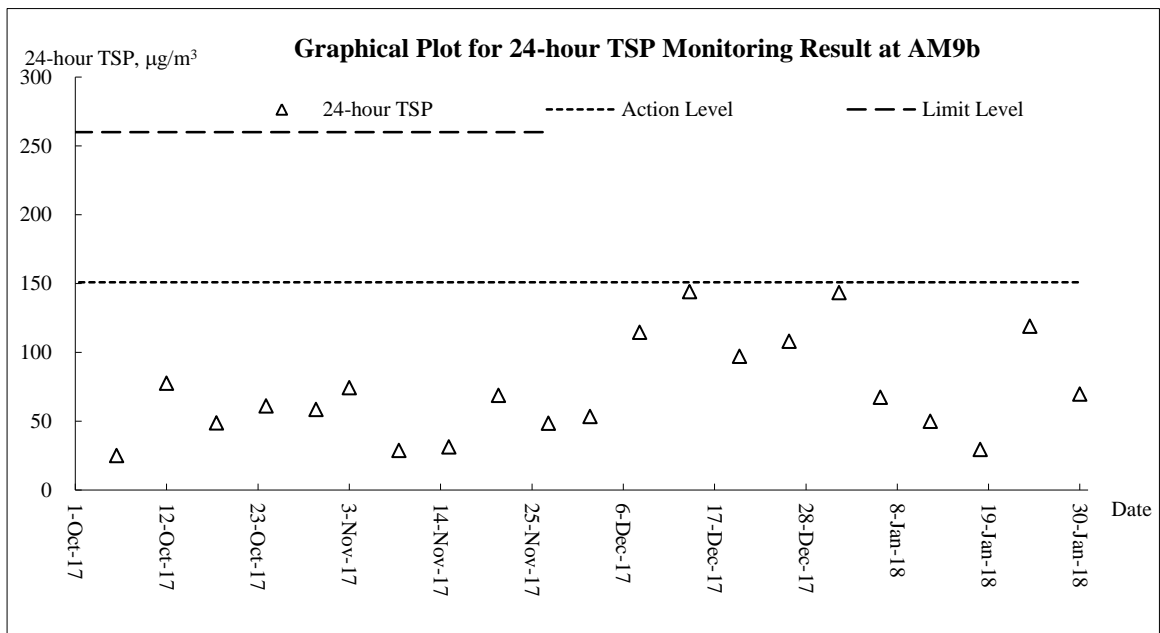
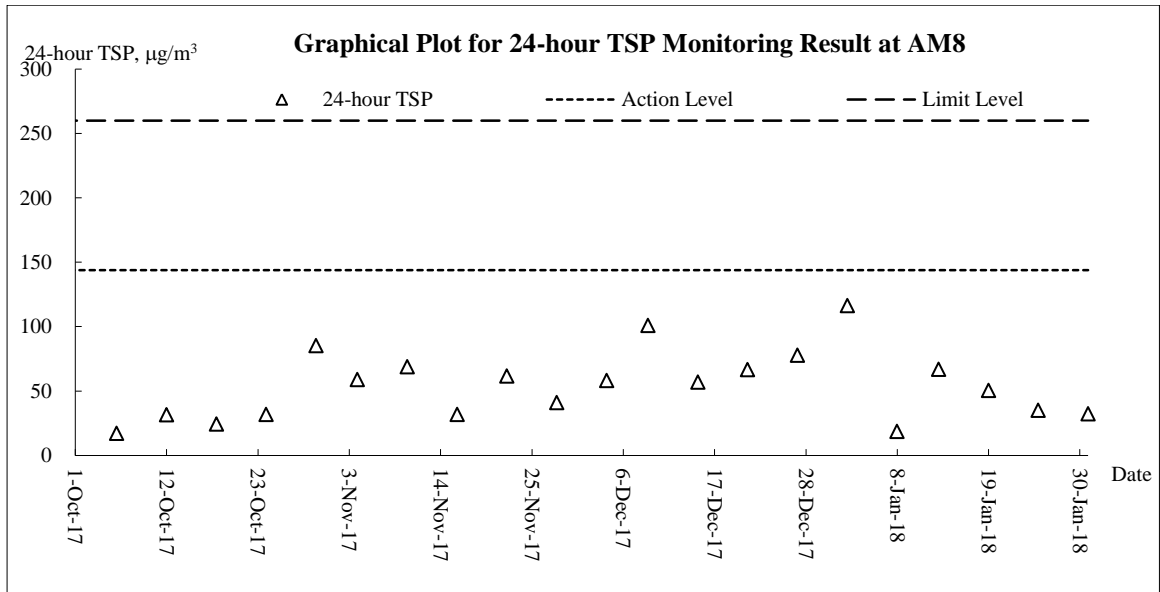


Air Quality – 24-hour TSP

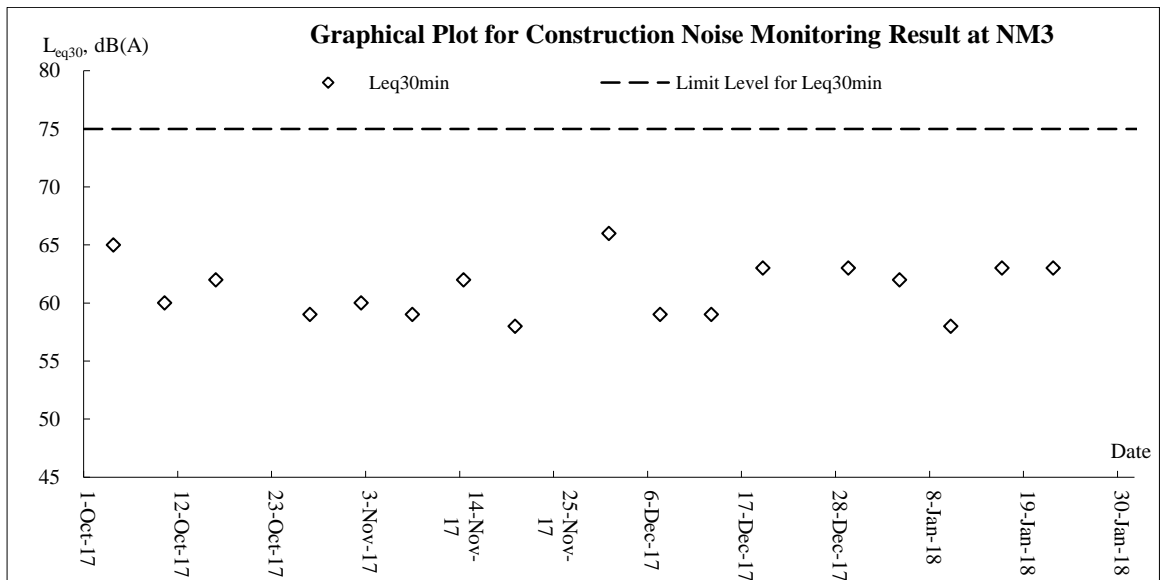
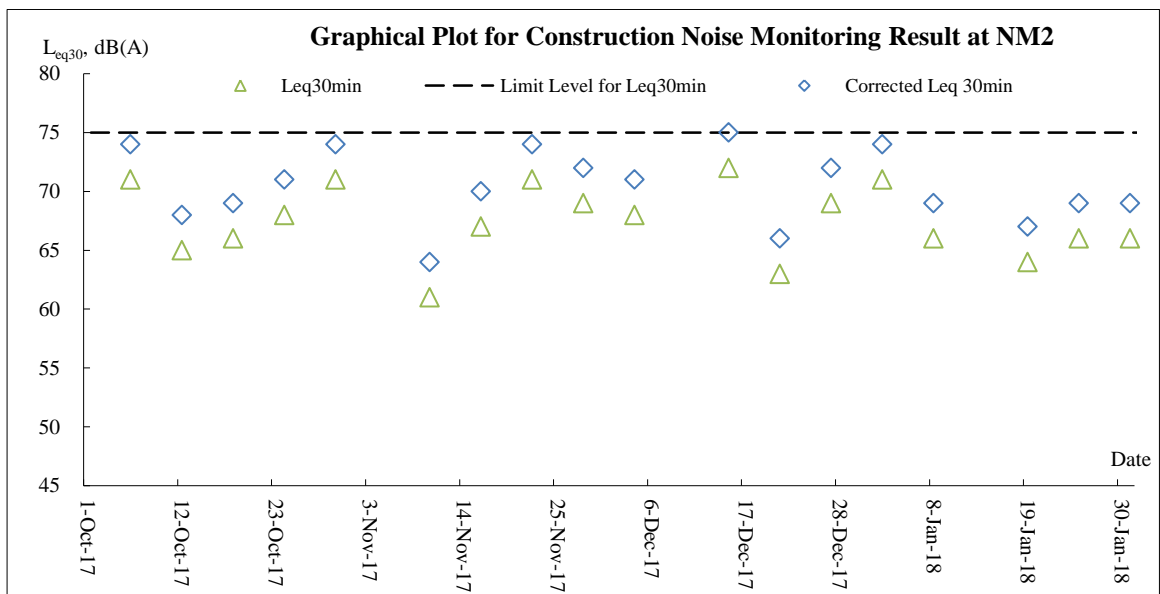
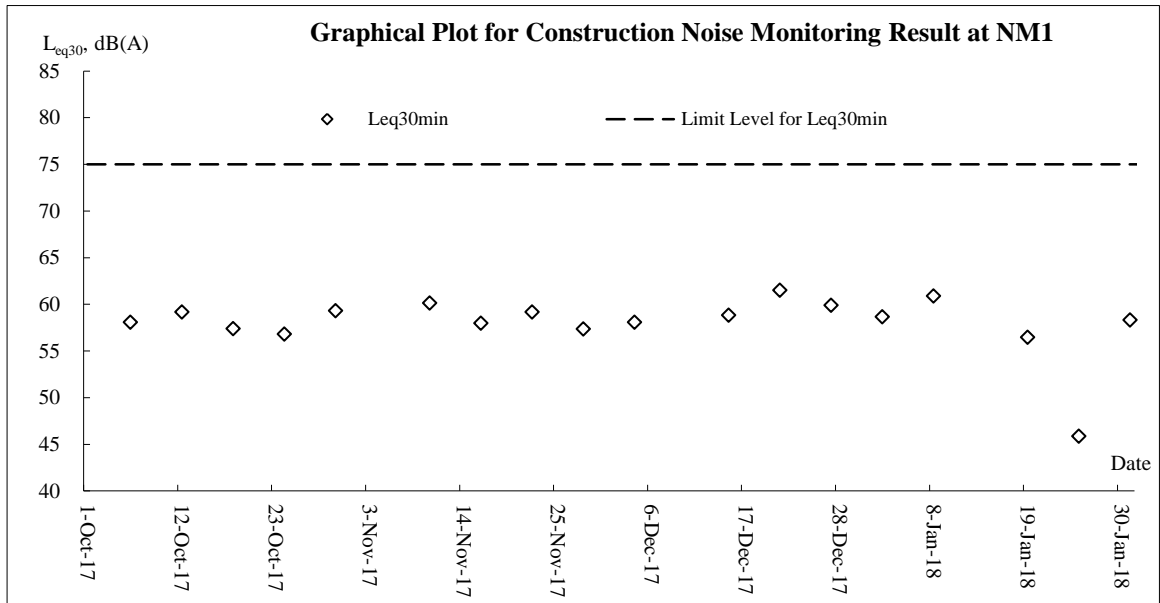


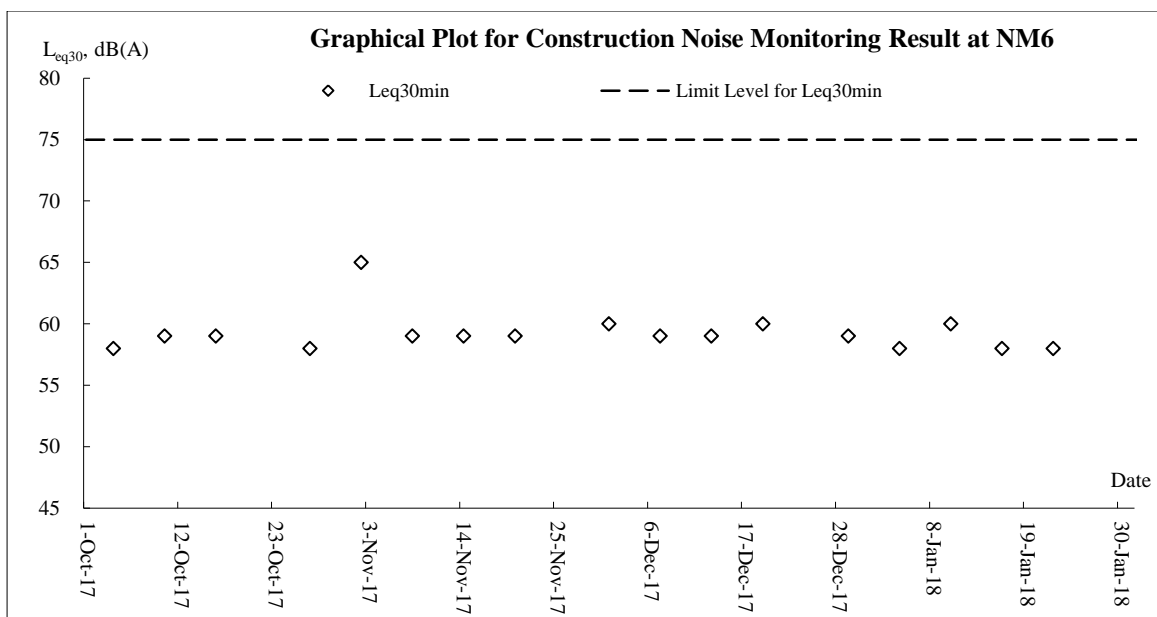
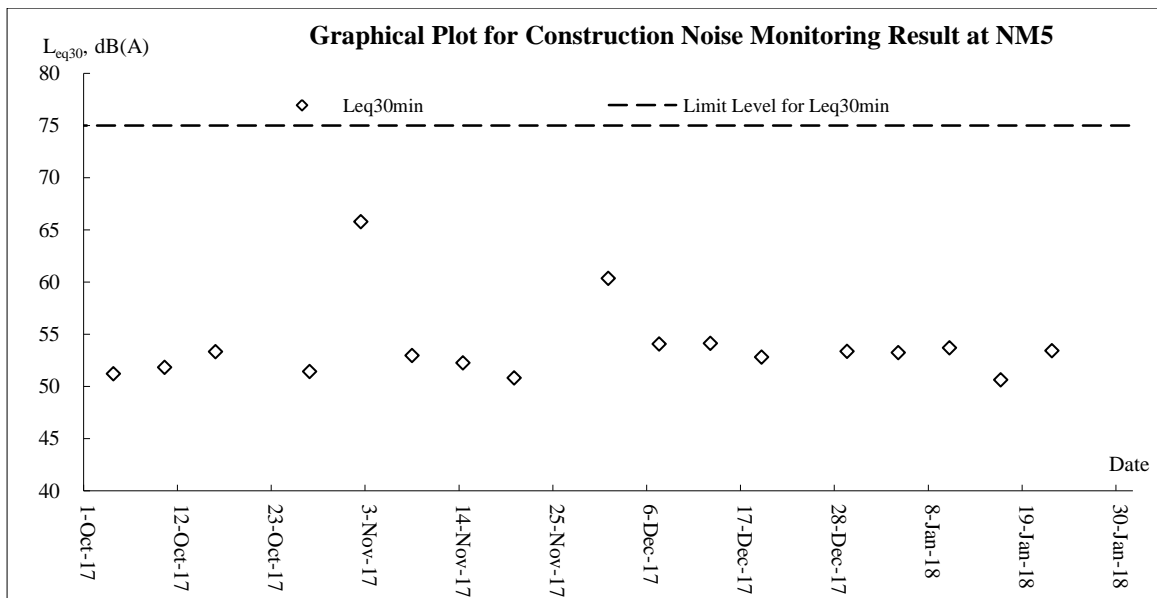
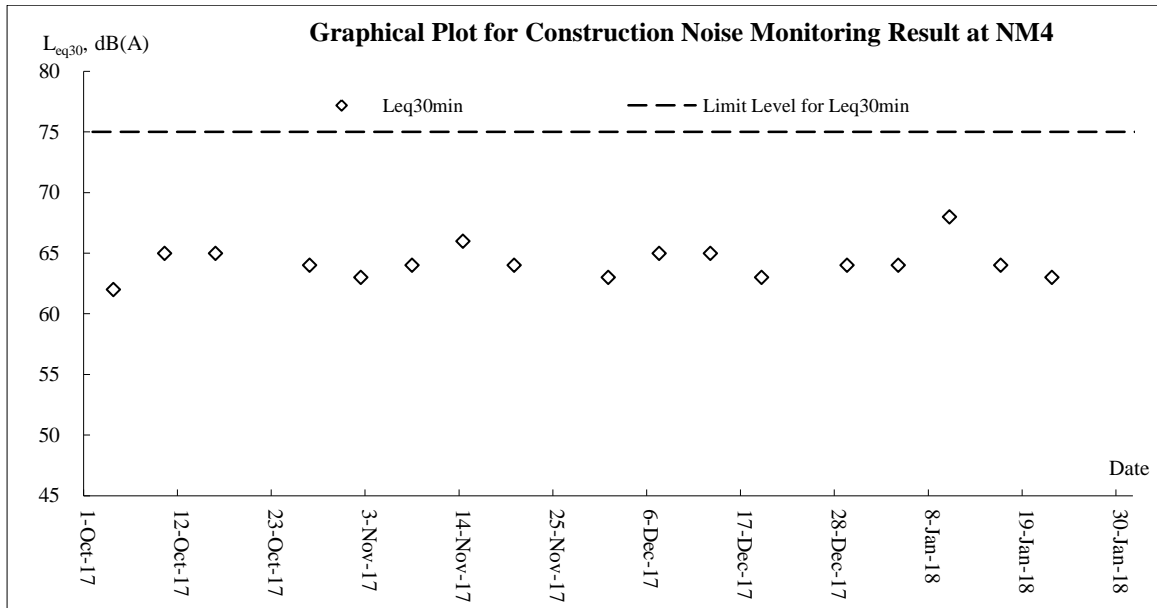


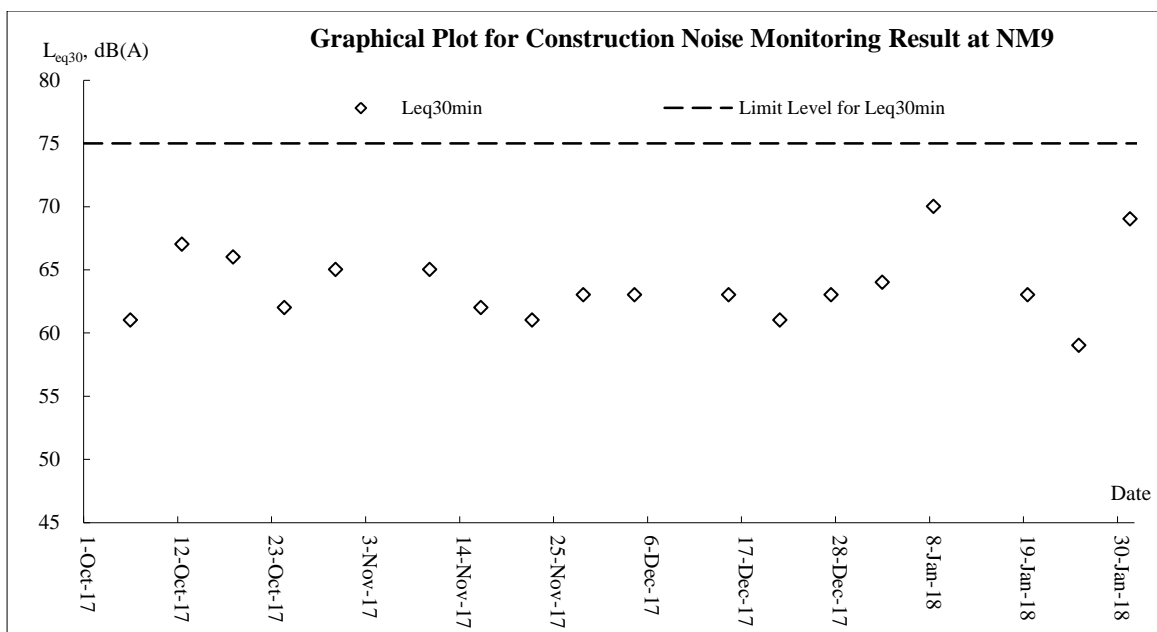
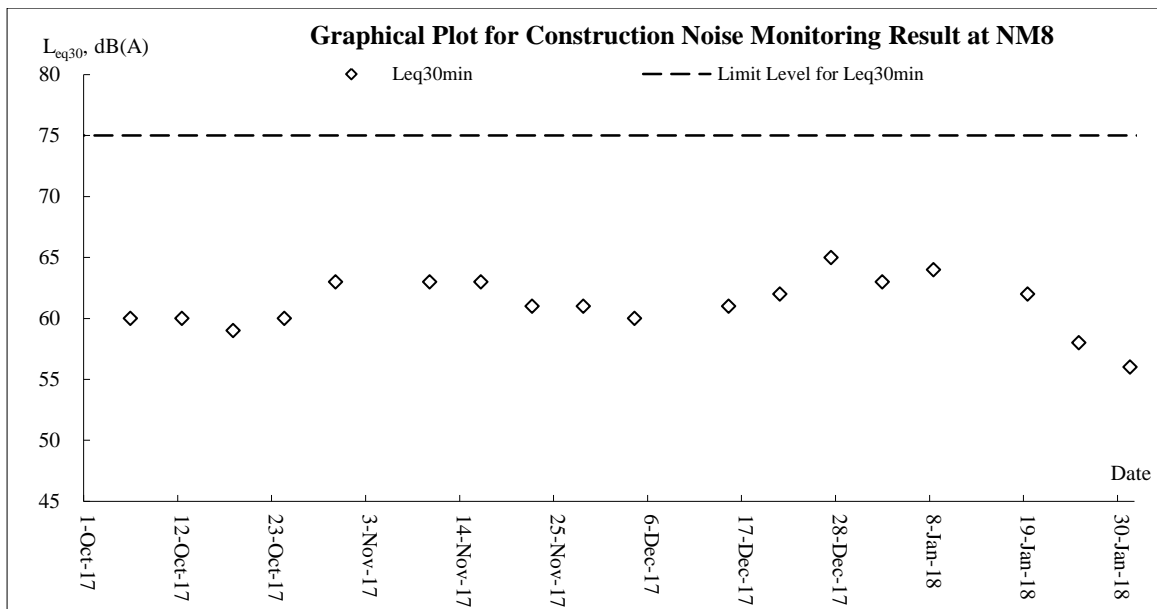
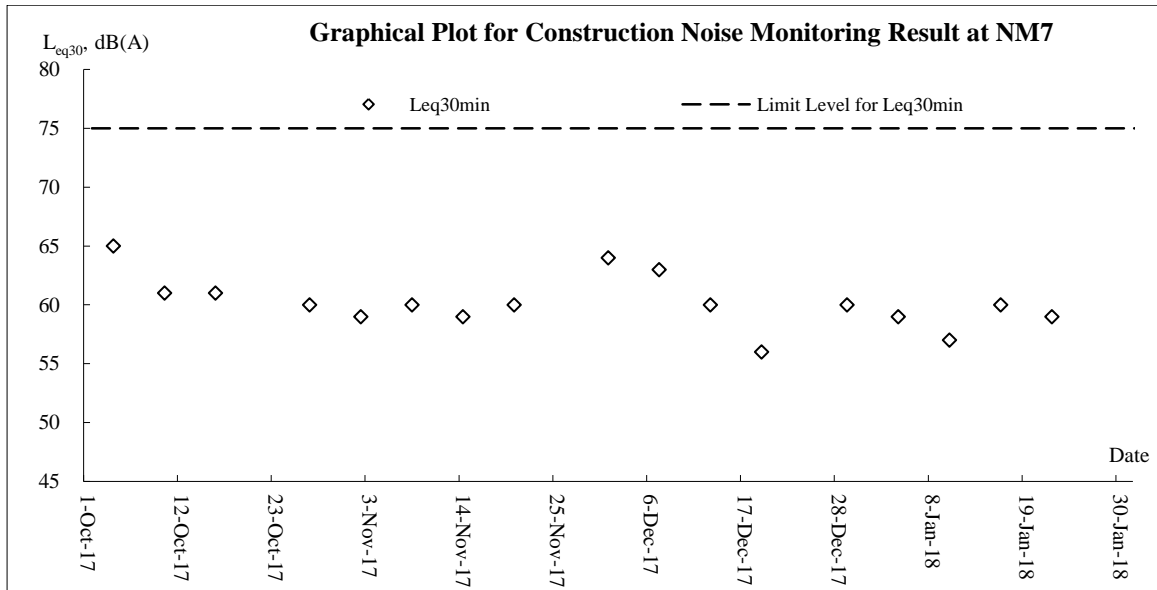


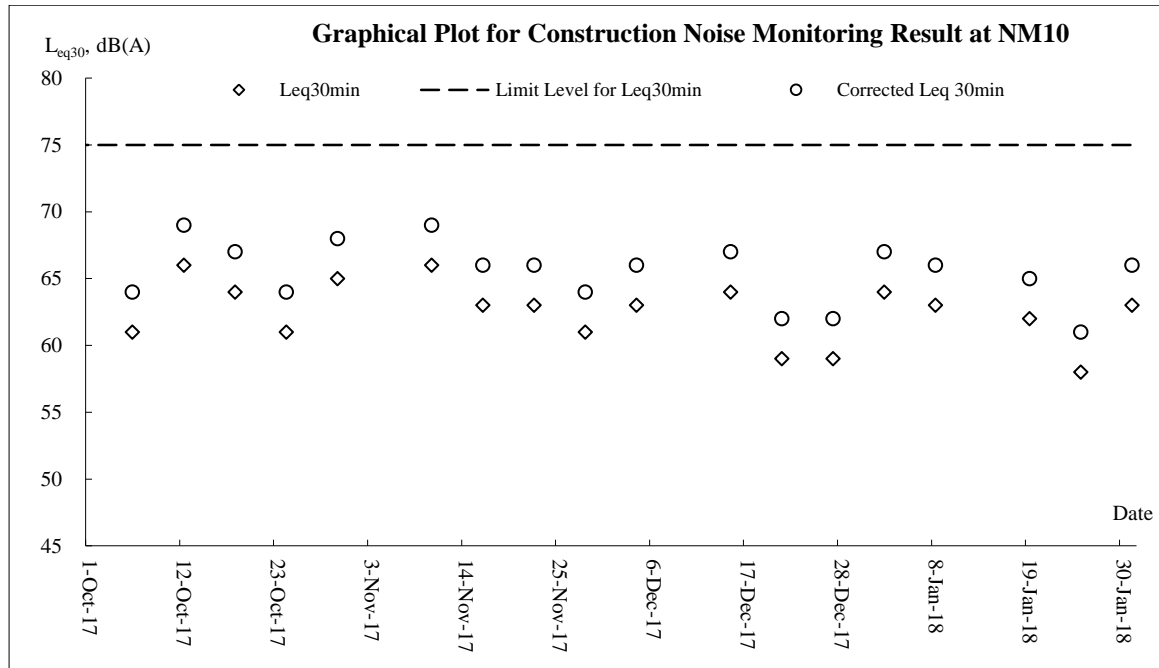


Noise

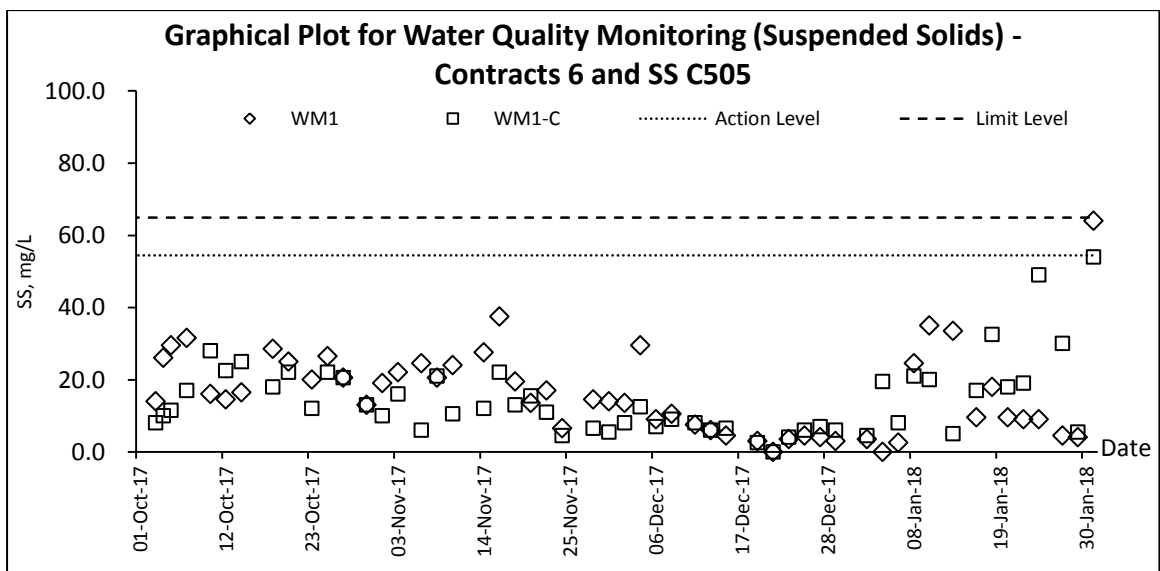
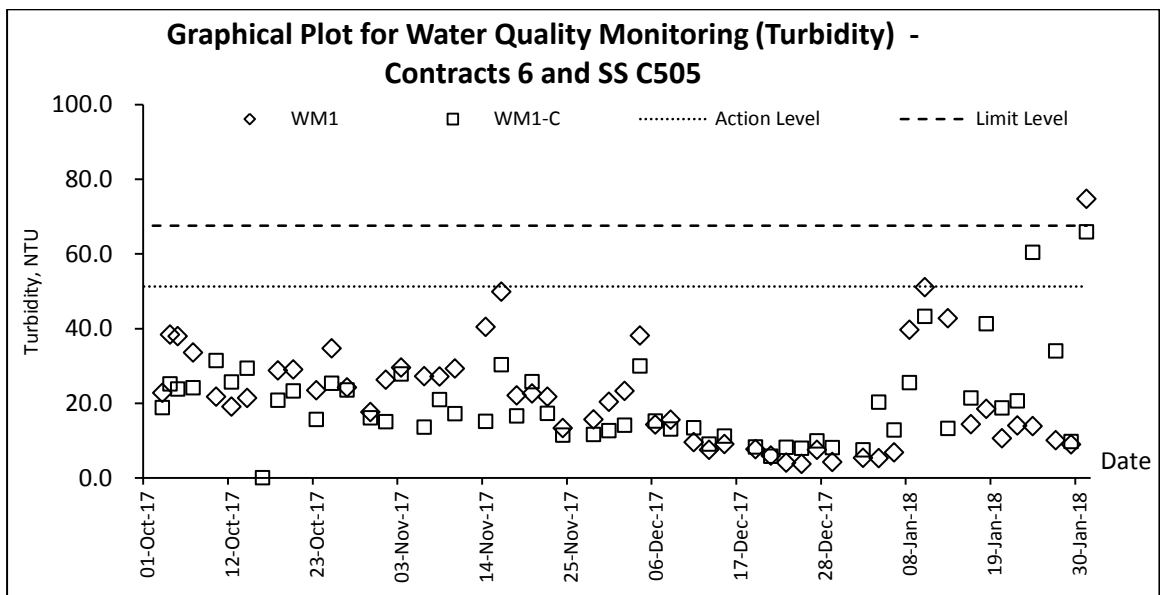
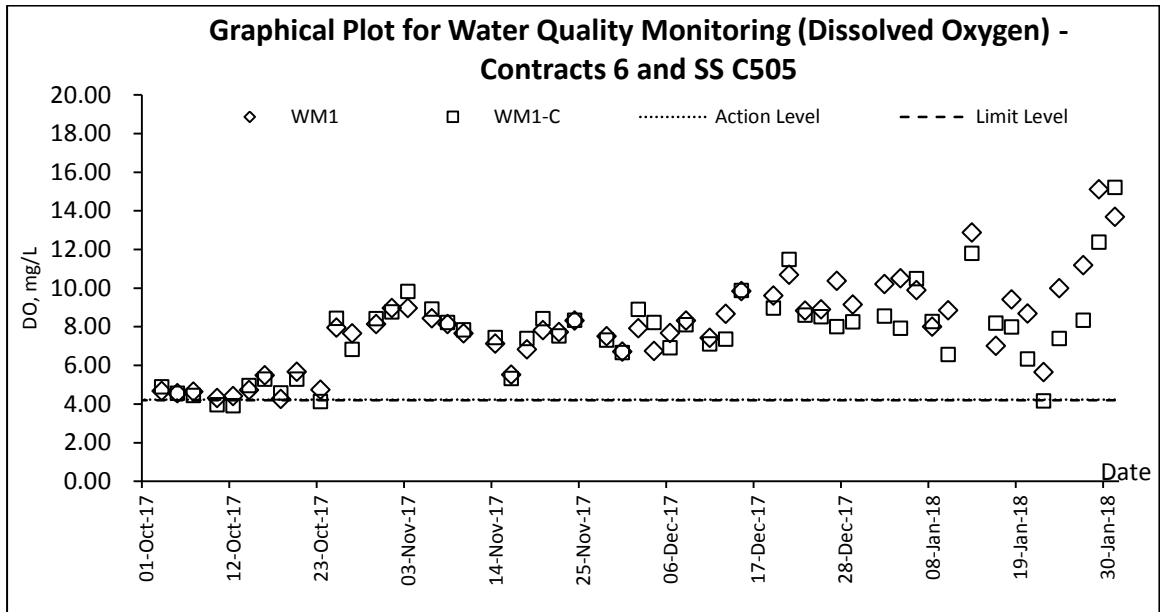


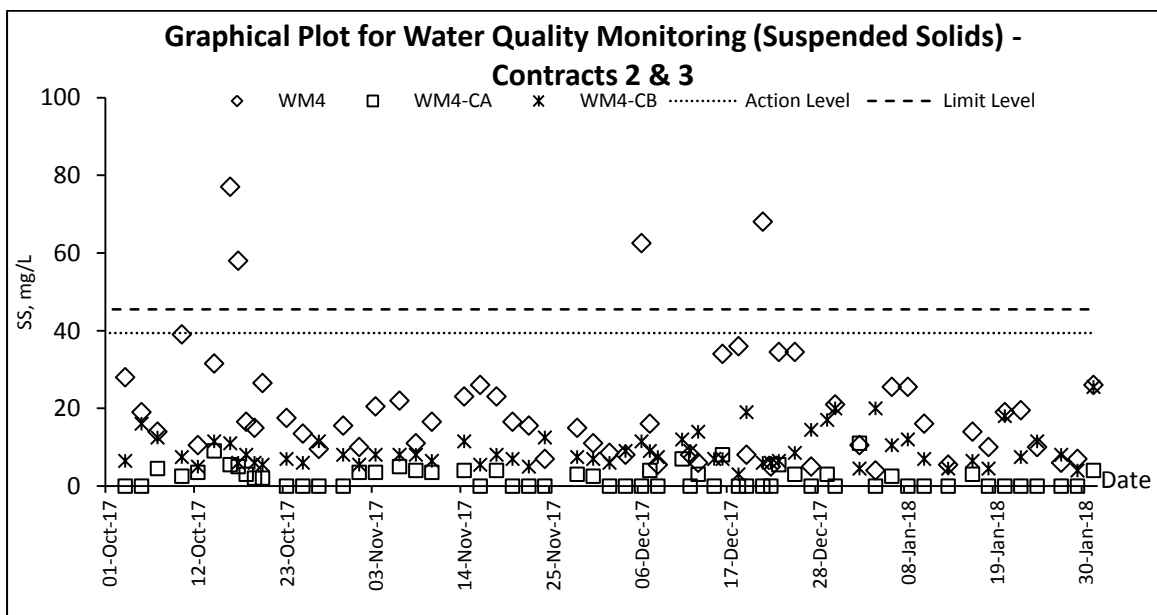
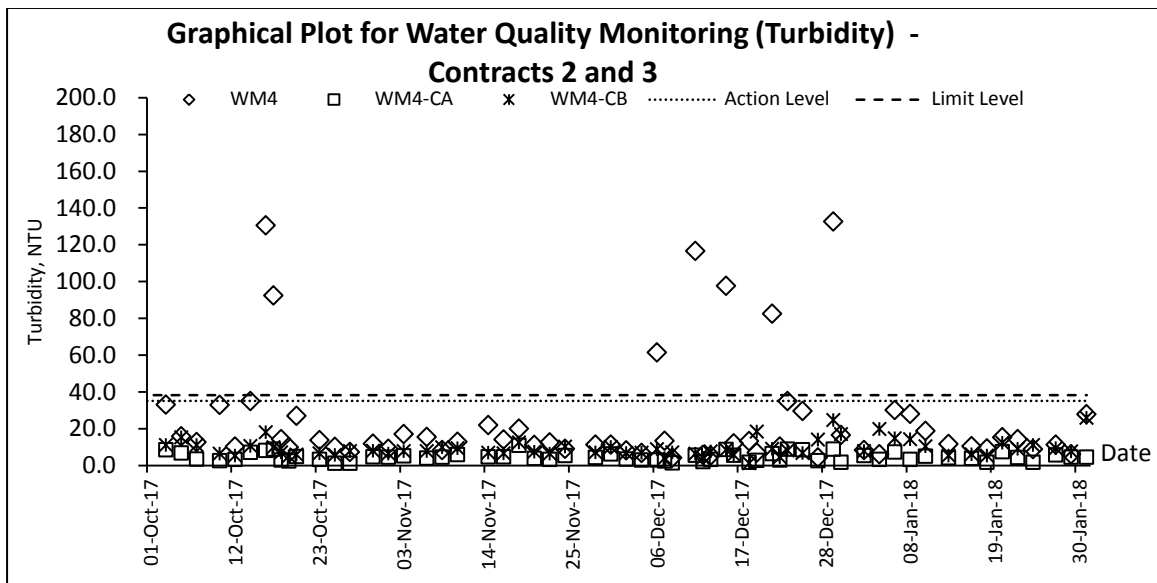
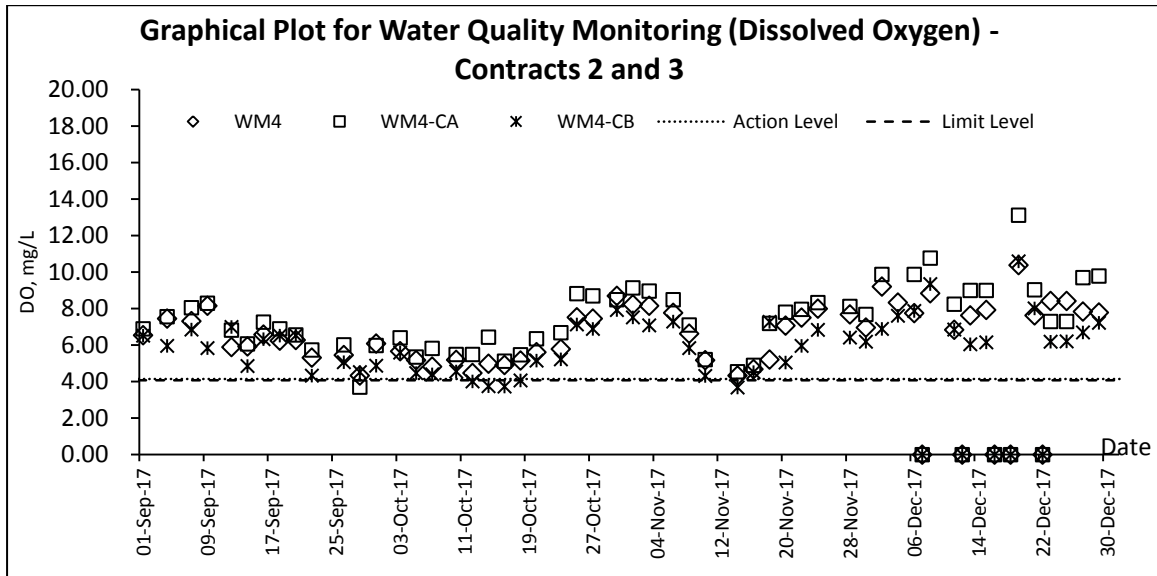


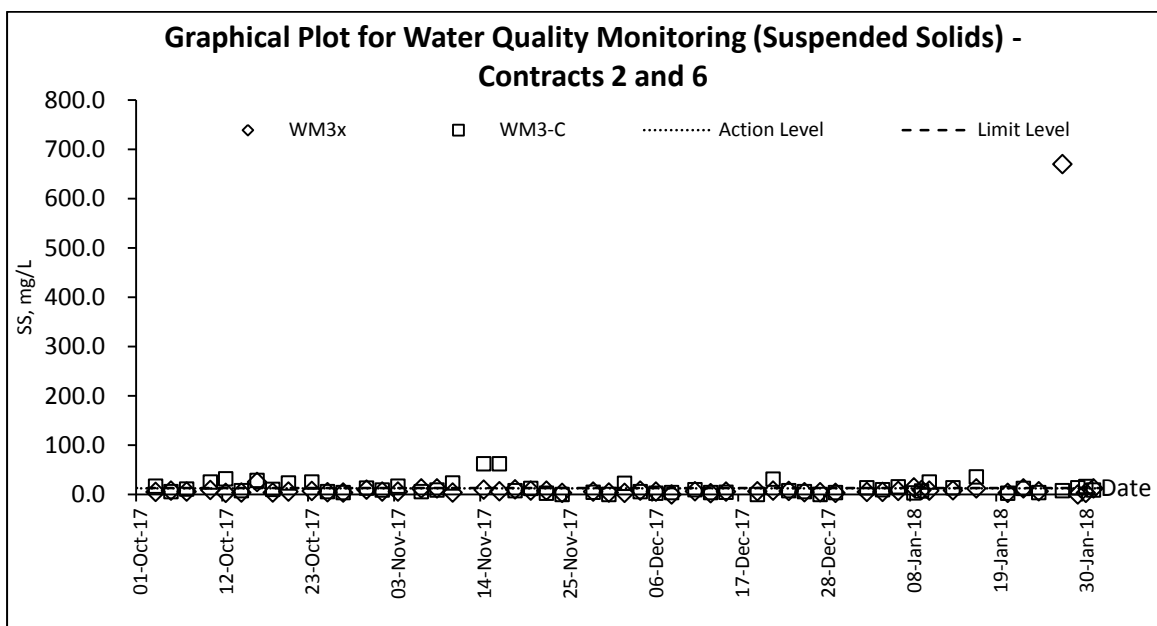
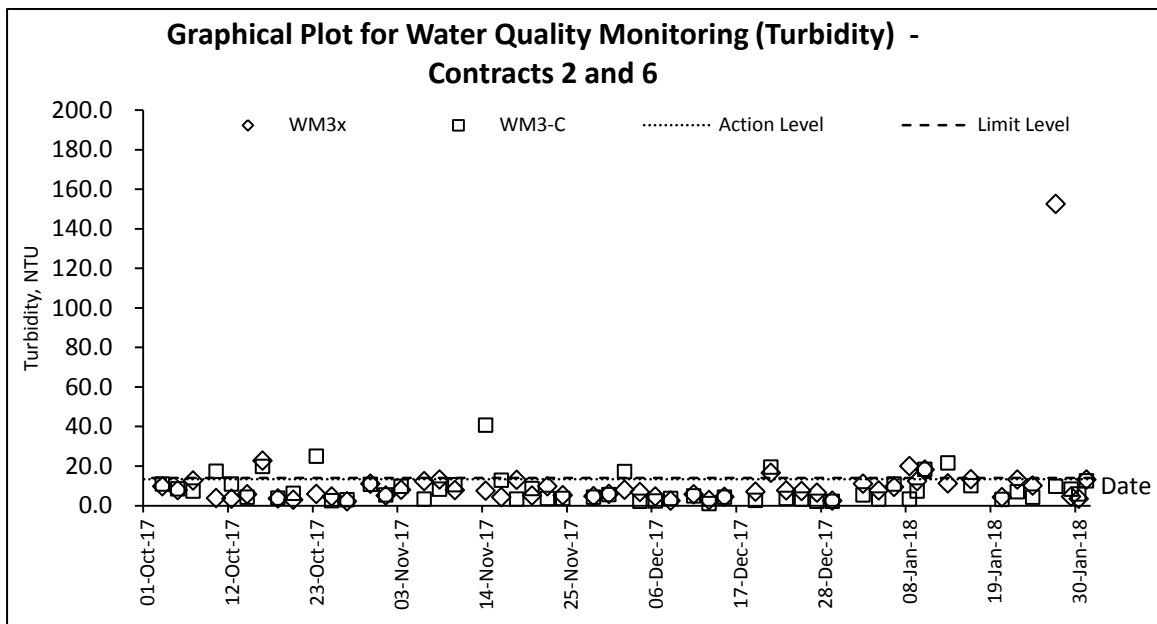
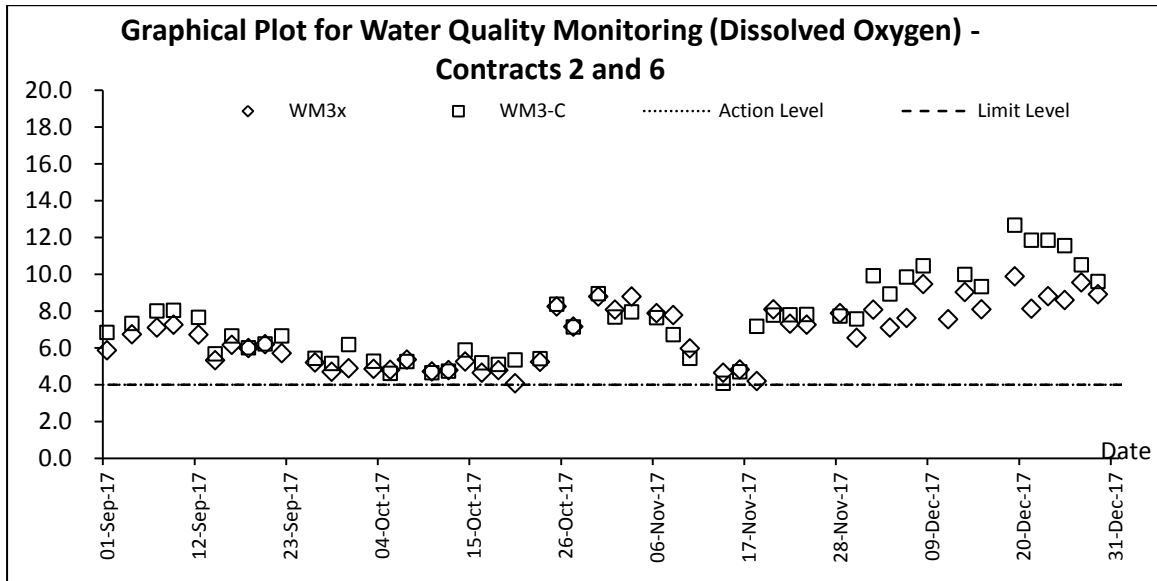


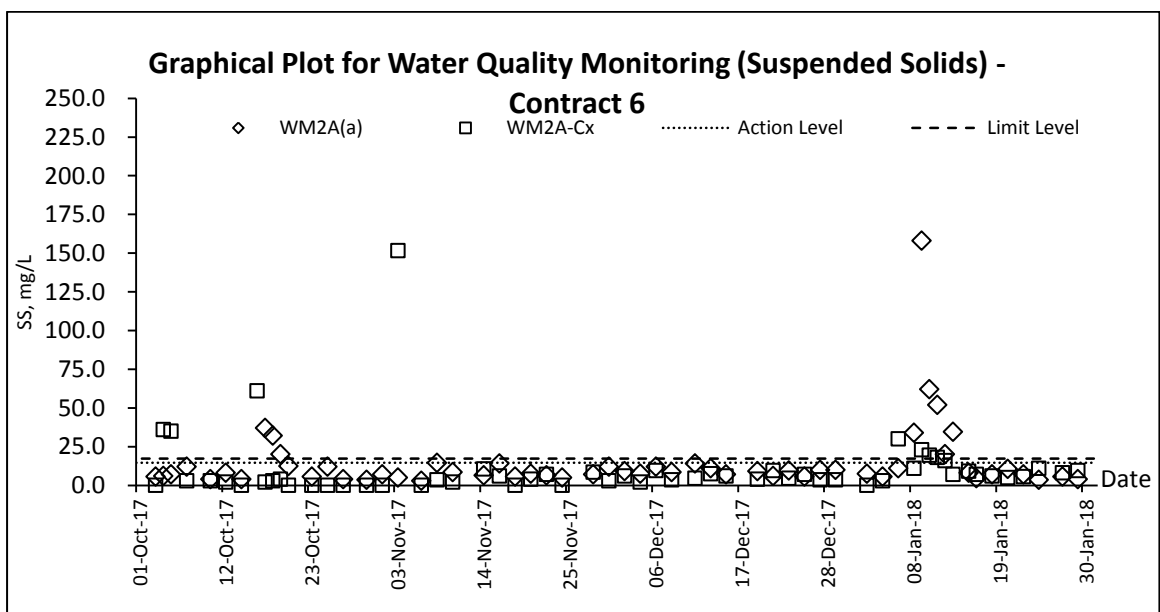
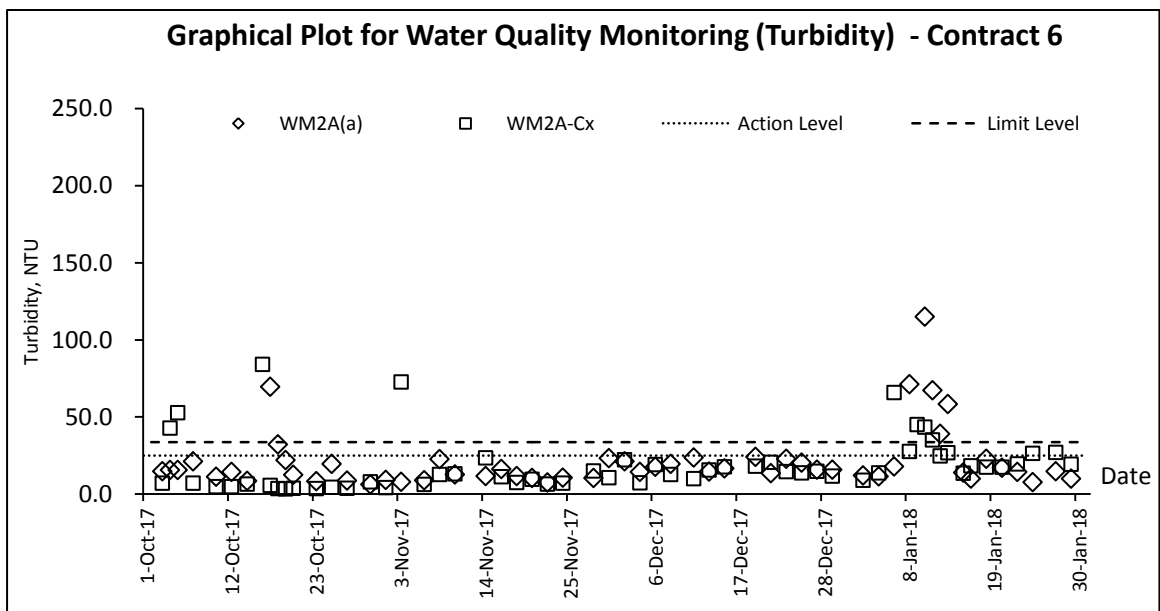
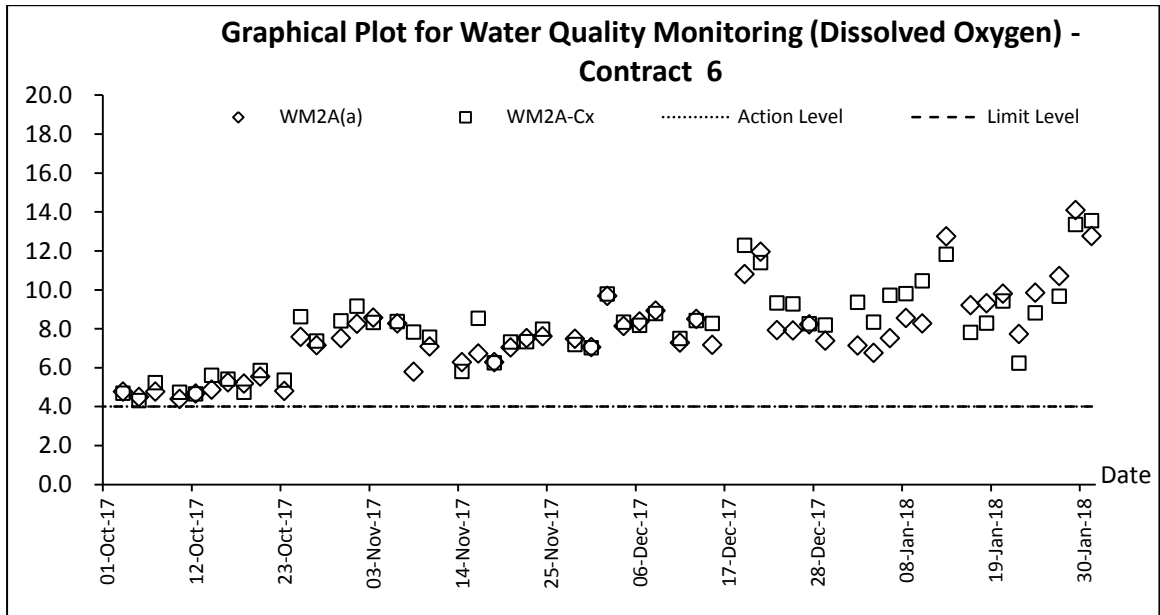


Water Quality









Appendix G

Weather information

Weather Condition Extracted from HKO

The weather of November 2017

The weather in Hong Kong was gloomier and more humid than usual in November 2017. The duration of bright sunshine in the month was only 114.3 hours, about 37 percent below the normal figure of 180.1 hours and the third lowest for November on record. The monthly mean temperature was 22.2 degrees, 0.4 degree above the normal figure of 21.8 degrees. Despite the rather cloudy and more humid conditions for most part of the month, the monthly rainfall was only 31.2 millimetres, about 17 percent below the normal of 37.6 millimetres. The accumulated rainfall this year up to November was 2572.1 millimetres, a surplus of about 8 percent above the normal of 2371.7 millimetres for the same period.

The weather of December 2017

In contrast to November, the weather in Hong Kong was sunny and bright in December 2017 and, apart from three days on 13, 17 and 23 December, the territory enjoyed more than two hours of sunshine each day during the month. The monthly total sunshine duration amounted to 209.6 hours, 37.4 hours and 22 percent above the December normal of 172.2 hours. The monthly mean temperature was 17.8 degrees, 0.1 degree below the December normal of 17.9 degrees. Only traces of rainfall were recorded in the month, with most of them occurring during a surge of strong easterly monsoon on 12 – 14 December. The only rain-free December was way back in 1909, and December 2017 was one of ten Decembers with traces of rainfall since records began in 1884. Nevertheless, the total rainfall of 2572.1 millimetres accumulated in 2017 still exceeded the annual normal of 2398.5 millimetres by about 7 percent.

The weather of January 2018

Despite some mild interludes, January 2018 was dominated by the northeast monsoon with two episodes of cold weather during the first half and towards the end of the month. Overall, the month was slightly cooler than usual with a mean temperature of 16.1 degrees, 0.2 degree below the normal figure of 16.3 degrees. It also had more rain than usual with 62.2 millimetres of rainfall recorded in the month, more than double the normal figure of 24.7 millimetres.

Remark: The meteorological data during the Reporting Period is presented in the relevant monthly EM&A report.

Appendix H

Waste Flow Table

APPENDIX G: MONTHLY SUMMARY WASTE FLOW TABLE

FOR: 2017

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill*	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse#
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 ton)	(in '000 kg)	(in '000 g)	(in '000 kg)	(in '000m ³)
Jan	72.9008	0.0000	2.0045	31.5900	39.3063	9.1064	0.1440	0.3600	1.9179	1.7600	0.3210
Feb	85.5921	0.0000	1.4413	29.9165	54.2343	8.4347	0.0769	0.3000	2.1663	4.3480	0.3365
Mar	36.8512	0.0000	0.5903	33.0669	3.1940	7.7980	0.3892	0.4000	1.3527	4.0720	0.4167
Apr	41.5647	0.0000	1.2335	33.1649	7.1663	7.9084	0.4200	0.3200	2.0268	13.0254	0.3862
May	38.2029	0.0000	0.4115	33.2084	4.5830	8.3119	0.4765	0.3700	2.7135	3.5440	0.3907
June	38.6829	0.0000	0.9191	13.5900	24.1738	8.0061	0.0917	0.3300	2.0648	4.8760	0.3265
Sub-total	313.7946	0.0000	6.6002	174.5367	132.6577	49.5655	1.5983	2.0800	12.2420	31.6254	2.1776
July	85.5801	0.0000	1.2343	2.8380	81.5079	8.2250	0.0802	0.3200	2.0394	1.5080	0.5330
Aug	73.2350	0.0000	0.3805	0.8032	72.0514	8.4800	0.0311	0.3500	2.4100	2.8400	0.5071
Sep	69.9895	0.0000	0.0705	1.4936	68.4254	7.1930	0.0423	0.3400	2.1170	1.1560	0.5672
Oct	77.6273	0.0000	0.0000	0.0000	77.6273	0.2297	0.0280	0.3200	2.2253	8.9592	0.6288
Nov	75.2140	0.0000	0.0000	0.1339	75.0801	0.2448	0.0113	0.3400	2.1800	1.3320	0.7348
Dec	72.9824	0.0000	0.0000	0.1278	72.8546	0.2571	0.0284	0.3250	3.2380	1.1560	0.8125
Sub-total	454.6283	0.0000	1.6853	5.2686	365.4592	24.3725	0.1929	1.6100	10.9717	15.7952	2.9709
Total	768.4229	0.0000	8.2855	179.8053	498.1169	73.9380	1.7912	3.6900	23.2137	47.4206	5.1485

Notes:

- (1) The performance targets are given in PS 1.100(14)(a)
- (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
- (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
- (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials.
- (5) Assumption: 1m³ of inert material weight 2.2 tonne 1m³ of non-inert material weight 1.6 tonne 1m³ of chemical waste weight 0.88 tonne

Forecast of Total Quantities of C&D Materials to be Generated from the Project											
Forecast Made at the End of the Project	Total Quantity Generated	Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemicals Waste	Others, e.g. general refuse
									(see Note 3)		
Month-Year	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000m3)
Dec-14	425.4406	0.0000	2.7362	376.3945	46.3099	5.6245	3.2100	0.4390	0.0070	10.8800	2.2609
Dec-15	570.9459	0.0000	20.8159	543.2162	6.9138	4.5492	14.1300	3.9220	11.9700	16.1920	1.1696
Dec-16	905.8375	0.0000	7.7367	427.7834	470.3174	24.8350	259.2290	3.8500	18.7262	34.2936	1.9720
Dec-17	686.2076	0.0000	8.2855	179.8053	498.1169	73.9380	1.7912	3.6900	23.2137	47.4206	5.1485
Dec-18											
Total:	2,588.43	0.00	39.57	1,527.20	1,021.66	108.95	278.36	11.90	53.92	108.79	10.55

Name of Department : CEDD

Contract No./ Work Order No. :

CV/2012/08

Appendix I - Monthly Summary Waste Flow Table for 2018

(All quantities shall be rounded off to 3 decimal places)

Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (Recycled) (in '000kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (in '000 m3) (in '000m3)
January	86.6400	0.0000	0.0000	5.2900	81.3500	1.6570	45.0000	0.3100	2.8000	4.5760	0.6575
February	0.0000										
March	0.0000										
April	0.0000										
May	0.0000										
June	0.0000										
Half-year total	86.6400	0.0000	0.0000	5.2900	81.3500	1.6570	45.0000	0.3100	2.8000	4.5760	0.6575
July	0.0000										
August	0.0000										
September	0.0000										
October	0.0000										
November	0.0000										
December	0.0000										
Yearly Total	86.6400	0.0000	0.0000	5.2900	81.3500	1.6570	45.0000	0.3100	2.8000	4.5760	0.0000

(All quantities shall be rounded off to 3 decimal places)

Year	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (Recycled) (in kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (in '000 m3) (in '000m3)
2013	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	220.6270	0.0000	0.0000	0.0000	0.0000
2014	425.4406	0.0000	2.7362	376.3945	46.3099	5.6245	3.2100	0.4390	0.0070	10.8800	2.2609
2015	570.9459	0.0000	20.8159	543.2162	6.9138	4.5492	37.6310	3.9220	11.9700	16.1920	1.1696
2016	905.0989	0.0000	7.4372	427.7834	469.8783	24.8350	430.5200	3.8500	18.7262	34.2936	1.9720
2017	741.9482	0.0000	8.0385	175.6792	558.2305	78.3865	1681.8000	4.0700	30.5175	48.7906	5.9610
2018	81.3500	0.0000	0.0000	5.2900	81.3500	1.6570	45.0000	0.3100	2.8000	4.5760	0.6575
Total	2724.7836	0.0000	39.0278	1528.3634	1162.6825	115.0522	2418.7880	12.5910	64.0207	114.7322	12.0210

Remark:

1) Density of C&D material to be 2.2 metric ton/m3
2) Density of General Refuse to be 1.6 metric ton/m3

3) Density of Spent Oil to be 0.88 metric ton/m3

Monthly Summary Waste Flow Table for 2017 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in m ³)	(in '000m ³)
Jan	1.150	0.204	0.150	0.000	0.796	1.150	0.000	0.000	0.001	0.000	0.170
Feb	1.160	0.308	0.192	0.000	0.660	0.926	0.000	0.000	0.001	0.000	0.140
Mar	2.287	0.565	0.060	0.000	1.662	1.055	0.000	0.000	0.000	0.000	0.115
Apr	1.004	0.064	0.036	0.000	0.903	0.463	0.000	0.000	0.004	0.000	0.075
May	0.497	0.005	0.120	0.000	0.372	0.050	0.767	0.000	0.000	0.000	0.105
Jun	1.249	0.150	0.150	0.000	0.948	0.008	0.000	0.000	0.000	0.000	0.135
Sub-total	7.347	1.297	0.708	0.000	5.342	3.651	0.767	0.000	0.006	0.000	0.740
Jul	1.917	0.180	0.120	0.000	1.617	0.542	0.000	0.000	0.000	0.000	0.065
Aug	1.297	0.118	0.120	0.000	1.059	0.099	0.000	0.000	0.000	0.000	0.130
Sep	2.448	0.437	0.090	0.000	1.921	0.291	0.000	0.000	0.000	0.000	0.115
Oct	2.156	0.544	0.240	0.000	1.372	0.939	0.000	0.000	0.000	0.000	0.090
Nov	3.051	1.000	0.210	0.000	1.841	0.368	0.000	0.000	0.000	0.000	0.150
Dec	2.400	0.223	0.180	0.000	1.997	0.377	0.000	0.000	0.000	0.033	0.125
Total	20.616	3.799	1.668	0.000	15.149	6.267	0.767	0.000	0.006	0.033	1.415

- Note:**
1. Assume the density of soil fill is 2 ton/m³.
 2. Assume the density of rock and broken concrete is 2.5 ton/m³.
 3. Assume each truck of C&D wastes is 5m³.
 4. The inert C&D materials except slurry and bentonite are disposed at Tuen Mun 38.
 5. The slurry and bentonite are disposed at Tseung Kwun O 137.
 6. The non-inert C&D wastes are disposed at NENT.
 7. Assume the density of metal is 7,850 kg/m³.
 8. Assume the density of plastic is 941 kg/m³.
 9. Assume the density of paper is 800 kg/m³.

Forecast of Total Quantities of C&D Materials to be Generated from the Contract										
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Diposal as Public Fill	Imported Fill	Metals	Paper/card board packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)
52.5	5.2	12.3	0.0	35.0	41.8	5.0	1.0	1.0	0.5	44.8

Notes:

- (1) The performance targets are given in PS Clause 6(14).
- (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
- (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
- (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works if equal to or exceed 50,000 m³.

SUMMARY TABLE FOR WORK PROCESSES OR ACTIVITIES REQUIRING TIMBER FOR TEMPORARY WORKS

Contract No.: CV/2012/09

Contract Title: Liantang /Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works - Contract 3

Item No.	Description of Works Process or Activity [see note (a) below]	Justifications for Using Timber in Temporary Construction Works	Est. Quantities of Timber Used (m³)	Actual Quantities Used (m³)	Remarks
1	Formwork for concreting the Stem wall bay4 of noise barrier NB66	Easy handling by manpower	4.67	4.33	
		Total Estimated Quantity of Timber Used	4.67		

- Notes:
- (a) The Contractor shall list out all the work items requiring timber for use in temporary construction works. Several minor work items may be grouped into one for ease of updating.
 - (b) The summary table shall be submitted to the Engineer's Representative monthly together with the Waste Flow Table for review and monitoring in accordance with the PS Clause 25.24(11)..

Monthly Summary Waste Flow Table for 2018 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in m ³)	(in '000m ³)
Jan	3.089	0.304	0.060	0.000	2.725	0.923	0.000	0.000	0.000	0.000	0.150
Feb											
Mar											
Apr											
May											
Jun											
Sub-total	3.089	0.304	0.060	0.000	2.725	0.923	0.000	0.000	0.000	0.000	0.150
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	3.089	0.304	0.060	0.000	2.725	0.923	0.000	0.000	0.000	0.000	0.150

- Note:**
1. Assume the density of soil fill is 2 ton/m³.
 2. Assume the density of rock and broken concrete is 2.5 ton/m³.
 3. Assume each truck of C&D wastes is 5m³.
 4. The inert C&D materials except slurry and bentonite are disposed at Tuen Mun 38.
 5. The slurry and bentonite are disposed at Tseung Kwun O 137.
 6. The non-inert C&D wastes are disposed at NENT.
 7. Assume the density of metal is 7,850 kg/m³.
 8. Assume the density of plastic is 941 kg/m³.
 9. Assume the density of paper is 800 kg/m³.

Forecast of Total Quantities of C&D Materials to be Generated from the Contract										
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Diposal as Public Fill	Imported Fill	Metals	Paper/card board packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)
52.5	5.2	12.3	0.0	35.0	41.8	5.0	1.0	1.0	0.5	44.8

Notes:

- (1) The performance targets are given in PS Clause 6(14).
- (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
- (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
- (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works if equal to or exceed 50,000 m³.

SUMMARY TABLE FOR WORK PROCESSES OR ACTIVITIES REQUIRING TIMBER FOR TEMPORARY WORKS

Contract No.: CV/2012/09

Contract Title: Liantang /Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works - Contract 3

Item No.	Description of Works Process or Activity [see note (a) below]	Justifications for Using Timber in Temporary Construction Works	Est. Quantities of Timber Used (m³)	Actual Quantities Used (m³)	Remarks
1	Formwork for concreting the Stem wall bay4 of noise barrier NB67	Easy handling by manpower	4.58	4.37	
		Total Estimated Quantity of Timber Used	4.58		

- Notes:
- (a) The Contractor shall list out all the work items requiring timber for use in temporary construction works. Several minor work items may be grouped into one for ease of updating.
 - (b) The summary table shall be submitted to the Engineer's Representative monthly together with the Waste Flow Table for review and monitoring in accordance with the PS Clause 25.24(11)..

Name of Department: CEDD

Contract No.: NE/2014/02

Monthly Summary Waste Flow Table for 2017

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jan-17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Feb-17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mar-17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Apr-17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
May-17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jun-17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jul-17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aug-17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sep-17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Oct-17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nov-17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dec-17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Forecast of Total Quantities of C&D Materials to be Generated from the Contract*										
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
0.500	0.000	0.000	0.000	0.500	0.000	0.500	0.200	0.000	0.000	0.200

Notes :

- (1) The performance targets are given in PS Clause 1.84(14).
- (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Sites.
- (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging materials.
- (4) Estimate 6m³ capacity per dump truck

Name of Department: CEDD

Contract No.: NE/2014/02

Monthly Summary Waste Flow Table for 2018

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jan-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Feb-18											
Mar-18											
Apr-18											
May-18											
Jun-18											
Jul-18											
Aug-18											
Sep-18											
Oct-18											
Nov-18											
Dec-18											
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Forecast of Total Quantities of C&D Materials to be Generated from the Contract*										
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
0.500	0.000	0.000	0.000	0.500	0.000	0.500	0.200	0.000	0.000	0.200

Notes :

- (1) The performance targets are given in PS Clause 1.84(14).
- (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Sites.
- (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging materials.
- (4) Estimate 6m³ capacity per dump truck

Monthly Summary Waste Flow Table for 2017 (year)

Name of Person completing the record: K.M. Lui (EO)

Project : Liangtang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 6

Contract No.: CV/2013/08

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m ³)
Jan	40.128	0	19.297	6.067	14.764	0	0	0.171	0	0	0.065
Feb	48.065	0	16.328	7.123	24.614	0	0	0.294	0	0	0.107
Mar	49.230	0	5.661	15.029	28.540	0	0	0.494	0	0	0.217
Apr	52.348	0	10.824	31.732	9.792	0	0	0.331	0	0.290	0.162
May	47.339	0	24.850	12.383	10.106	0	0	0	0	0	0.228
Jun	1.108	0	0	0	1.108	0	0	0.285	0	0	0.258
Sub-total	238.218	0	76.960	72.334	88.92418	0	0	1.575	0	0.29	1.037
Jul	0.934	0	0	0	0.934	0	0	0.360	0	0	0.288
Aug	1.656	0	0.432	0	1.224	0	0	0.291	0	0	0.510
Sep	4.210	0	1.386	0	2.824	0	0	0.339	0	0	0.513
Oct	0.970	0	0.520	0	0.450	0	0	0.221	0	0	0.515
Nov	4.523	0	0	0	4.523	0	0	0.820	0	0	0.418
Dec	4.721	0	0.238	0.017	4.466	0	0	0	0	0	0.618
Total	998.394	0	163.227	270.643	564.52455	53.939	0	6.379	0.007	34.045	8.751

- 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.

Monthly Summary Waste Flow Table for 2018 (year)

Name of Person completing the record: K.M. Lui (EO)

Project : Liangtang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 6

Contract No.: CV/2013/08

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m ³)
Jan	4.152	0	0.629	1.947	1.576	0	0	0.240	0	0	0.892
Feb											
Mar											
Apr											
May											
Jun											
Sub-total	4.152	0.000	0.629	1.947	1.576	0.000	0.000	0.240	0.000	0.000	0.892
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	1002.546	0.000	163.856	272.590	566.101	53.939	0.000	6.619	0.007	34.045	9.643

- 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.

MONTHLY SUMMARY WASTE FLOW TABLEName of Department: CEDD Contract Title: Liantang/ Heung Yuen Wai Boundary Control Point
Site Formation and Infrastructure Works – Contract 7Contract No.: NE/2014/03 **Monthly Summary Waste Flow Table for 2017 (year)**

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of Non-Inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/cardboard packaging	Plastic (see Note 3)	Chemical Waste	Others, e.g. 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	0	0	0	0	0	0	0.1	0.05	0.001	0	0.01
Feb	0	0	0	0	0	0	0.5	0.04	0.001	0	0.015
Mar	0.822	0	0	0	0.822	0	2.2	0.04	0.001	0	0.025
Apr	1.473	0	0	0	1.473	0	3.1	0.04	0.001	0	0.02
May	1.129	0	0	0	1.129	0	4.5	0.04	0.001	0	0.03
June	0.317	0	0	0	0.317	0	4	0.04	0.001	0	0.04
Sub-total	3.741	0	0	0	3.741	0	14.4	0.25	0.006	0	0.14
July	0.931	0	0	0	0.931	0	2	0.04	0.001	0	0.025
Aug	0	0	0	0	0	0	2.5	0.04	0.001	0	0.01
Sept	0.068	0	0	0	0.068	0	2	0.04	0.001	0	0.01
Oct	0.381	0	0	0	0.381	0	11.7	0.04	0.001	0	0.008
Nov	2.036	0	0	0	2.036	0	29.7	0.1	0.001	0	0.03
Dec	1.382	0	0	0	1.382	0	49.8	0.1	0.001	0	0.05
Total	8.53928	0	0	0	8.53928	0	112.1	0.61	0.012	0	0.273

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

MONTHLY SUMMARY WASTE FLOW TABLEName of Department: CEDD Contract Title: Liantang/ Heung Yuen Wai Boundary Control Point
Site Formation and Infrastructure Works – Contract 7Contract No.: NE/2014/03 **Monthly Summary Waste Flow Table for 2018 (year)**

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of Non-Inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/cardboard packaging	Plastic (see Note 3)	Chemical Waste	Others, e.g. 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	0.015	0	0	0	0.015	0	14.5	0.5	0.001	0	0.15
Feb											
Mar											
Apr											
May											
June											
Sub-total	0.015	0	0	0	0.015	0	14.5	0.5	0.001	0	0.15
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total	0.015	0	0	0	0.015	0	14.5	0.5	0.001	0	0.150

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

Contract No. / Works Order No.: - SSC505**Monthly Summary Waste Flow Table for 2017** [year] [to be submitted not later than the 15th day of each month following reporting month]

(All quantities shall be rounded off to 3 decimal places.)

Month	Actual Quantities of Inert Construction Waste Generated Monthly				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Broken Concrete (see Note 4)	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)
Jan	3.160	0.000	2.003	0.000	1.157
Feb	1.374	0.000	0.249	0.000	1.125
Mar	0.548	0.000	0.054	0.000	0.494
Apr	4.136	0.013	1.139	0.000	2.984
May	4.201	0.000	1.191	0.000	3.010
Jun	9.813	0.000	1.317	0.000	8.496
Sub-total	23.230	0.013	5.953	0.000	17.264
Jul	9.101	0.000	1.223	0.000	7.878
Aug	6.341	0.000	2.532	0.000	3.809
Sep	5.142	0.000	4.992	0.000	0.150
Oct	2.610	0.000	0.250	0.000	2.360
Nov	3.248	0.020	0.160	0.000	3.068
Dec	7.509	0.285	0.321	0.000	6.903
Total	57.180	0.317	15.431	0.000	41.431

Month	Actual Quantities of Non-inert Construction Waste Generated Monthly												
	Timber		Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Other Recyclable Materials (see Page 3)		General Refuse disposed of at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000m ³)
	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated
Jan	0.000	0.000	458.150	458.150	0.560	0.560	0.058	0.058	0.000	0.000	0.024	0.024	0.481
Feb	0.000	0.000	177.180	177.180	0.370	0.370	0.036	0.036	0.000	0.000	0.008	0.008	0.280
Mar	0.000	0.000	97.370	97.370	3.380	3.380	1.573	1.573	0.000	0.000	0.036	0.036	0.423
Apr	0.000	0.000	148.110	148.110	0.300	0.300	1.223	1.223	0.000	0.000	29.795	29.795	0.358
May	0.000	0.000	405.500	405.500	0.44	0.440	0.040	0.040	0.000	0.000	0.006	0.006	0.644
Jun	0.000	0.000	338.580	338.580	0.710	0.710	0.036	0.036	0.000	0.000	0.002	0.002	0.878
Sub-total	0.000	0.000	1624.890	1624.890	5.760	5.760	2.966	2.966	0.000	0.000	29.871	29.871	3.064
Jul	0.000	0.000	296.540	296.540	0.650	0.650	1.040	1.040	0.000	0.000	0.002	0.002	1.651
Aug	0.000	0.000	239.720	239.720	0.700	0.700	0.000	0.000	0.000	0.000	0.000	0.000	1.554
Sep	0.000	0.000	68.060	68.060	0.570	0.570	1.037	1.037	0.000	0.000	0.001	0.001	1.606
Oct	0.000	0.000	53.130	53.130	0.000	0.000	3.000	3.000	0.000	0.000	0.000	0.000	1.651
Nov	0.000	0.000	446.270	446.270	1.810	1.810	0.069	0.069	0.000	0.000	0.005	0.005	1.931
Dec	0.000	0.000	193.810	193.810	0.300	0.300	0.000	0.000	0.000	0.000	0.000	0.000	1.781
Total	0.000	0.000	2922.420	2922.420	9.790	9.790	8.112	8.112	0.000	0.000	29.879	29.879	13.238

Description of mode and details of recycling if any for the month e.g. XX kg of used timber was sent to YY site for transformation into fertilizers					
300 kg of papers were sent to Wai San for recycling.	193.81 tons of scrap metals were sent to Chung Yue Steel Group Co. Ltd. and Win Link Trading Ltd. for recycling.	15.32 tons and 554.55 tons of broken concrete were sent to K. Wah and TRA for recycling respectively.			

- Notes:
- (1) The performance targets are given in the Particular Specification on Environmental Management Plan.
 - (2) The waste flow table shall also include construction waste that are specified in the Contract to be imported for use at the site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) Broken concrete for recycling into aggregates.
 - (5) If necessary, use the conversion factor: 1 full load of dumping truck being equivalent to 6.5 m³ by volume.

Contract No. / Works Order No.: - SSC505**Monthly Summary Waste Flow Table for 2018** [year] [to be submitted not later than the 15th day of each month following reporting month]

(All quantities shall be rounded off to 3 decimal places.)

Month	Actual Quantities of Inert Construction Waste Generated Monthly				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Broken Concrete (see Note 4)	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)
Jan	5.298	0.646	0.160	0.000	4.492
Feb					
Mar					
Apr					
May					
Jun					
Sub-total	5.298	0.646	0.160	0.000	4.492
Jul					
Aug					
Sep					
Oct					
Nov					
Dec					
Total	5.298	0.646	0.160	0.000	4.492

Month	Actual Quantities of Non-inert Construction Waste Generated Monthly												
	Timber		Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Other Recyclable Materials (see Page 3)		General Refuse disposed of at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000m ³)
	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated
Jan	0.000	0.000	375.870	375.870	0.220	0.220	0.032	0.032	0.000	0.000	0.000	0.000	1.918
Feb													
Mar													
Apr													
May													
Jun													
Sub-total	0.000	0.000	375.870	375.870	0.220	0.220	0.032	0.032	0.000	0.000	0.000	0.000	1.918
Jul													
Aug													
Sep													
Oct													
Nov													
Dec													
Total	0.000	0.000	375.870	375.870	0.220	0.220	0.032	0.032	0.000	0.000	0.000	0.000	1.918

Description of mode and details of recycling if any for the month e.g. XX kg of used timber was sent to YY site for transformation into fertilizers					
220 kg of papers were sent to Chung Fat for recycling.	32 kg of plastic bottles were sent to Action Health for recycling.	375.87 tons of scrap metals were sent to Sam Kee Metal Co. Ltd. and Win Link Trading Ltd. for recycling.	1,291.62 tons of broken concrete were sent TRA for recycling.		

- Notes:
- (1) The performance targets are given in the Particular Specification on Environmental Management Plan.
 - (2) The waste flow table shall also include construction waste that are specified in the Contract to be imported for use at the site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) Broken concrete for recycling into aggregates.
 - (5) If necessary, use the conversion factor: 1 full load of dumping truck being equivalent to 6.5 m³ by volume.

Appendix I

Implementation Schedule for Environmental Mitigation Measures

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
Air Quality Impact (Construction)							
3.6.1.1	2.1	<p>General Dust Control Measures</p> <p>The following dust suppression measures should be implemented:</p> <ul style="list-style-type: none"> ■ Frequent water spraying for active construction areas (4 times per day for active areas in Po Kak Tsai and 8 times per day for all other active areas), including areas with heavy construction and slope cutting activities ■ 80% of stockpile areas should be covered by impervious sheets ■ Speed of trucks within the site should be controlled to about 10 km/hr ■ All haul roads within the site should be paved to avoid dust emission due to vehicular movement 	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation
3.6.1.2	2.1	<p>Best Practice for Dust Control</p> <p>The relevant best practices for dust control as stipulated in the Air Pollution Control (Construction Dust) Regulation should be adopted to further reduce the construction dust impacts of the Project. These best practices include:</p> <p><i>Good site management</i></p> <ul style="list-style-type: none"> ■ The Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. ■ Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimize the release of visible dust emission. ■ Any piles of materials accumulated on or around the work areas should be cleaned up regularly. ■ Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimizing generation of fugitive dust emissions. ■ The material should be handled properly to prevent fugitive dust emission before cleaning. <p><i>Disturbed Parts of the Roads</i></p> <ul style="list-style-type: none"> ■ Each and every main temporary access should be paved with 	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		<p>concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or</p> <ul style="list-style-type: none"> Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. <p><i>Exposed Earth</i></p> <ul style="list-style-type: none"> Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seeding with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies. <p><i>Loading, Unloading or Transfer of Dusty Materials</i></p> <ul style="list-style-type: none"> All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. <p><i>Debris Handling</i></p> <ul style="list-style-type: none"> Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides. Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. <p><i>Transport of Dusty Materials</i></p> <ul style="list-style-type: none"> Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards. <p><i>Wheel washing</i></p> <ul style="list-style-type: none"> Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. <p><i>Use of vehicles</i></p> <ul style="list-style-type: none"> Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle. 					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		<p><i>Site hoarding</i></p> <ul style="list-style-type: none"> Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit. <p><i>Blasting</i></p> <ul style="list-style-type: none"> The areas within 30m from the blasting area should be wetted with water prior to blasting. 					
<u>Air Quality Impact (Operation)</u>							
3.5.2.2	2.2	<p>The following odour containment and control measures will be provided for the proposed sewage treatment work at the BCP site:</p> <ul style="list-style-type: none"> The treatment work will be totally enclosed. Negative pressure ventilation will be provided within the enclosure to avoid any fugitive odorous emission from the treatment work. Further odour containment will be achieved by covering or confining the sewage channels, sewage tanks, and equipment with potential odour emission. Proper mixing will be provided at the equalization and sludge holding tanks to prevent sewage septicity. Chemical or biological deodorisation facilities with a minimum odour removal efficiency of 90% will be provided to treat potential odorous emissions from the treatment plant including sewage channels / tanks, filter press and screening facilities so as to minimize any potential odour impact to the nearby ASRs. 	To minimize potential odour impact from operation of the proposed sewage treatment work at BCP	DSD	BCP	Operation Phase	EIA recommendation
<u>Noise Impact (Construction)</u>							
4.4.1.4	3.1	<p>Adoption of Quieter PME</p> <p>Use of the recommended quieter PME such as those given in the BS5228: Part 1:2009 and presented in Table 4.14, which can be found in Hong Kong.</p>	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and Noise Control Ordinance (NCO)

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.4.1.4	3.1	<p>Use of Movable Noise Barrier</p> <p>The use of movable barrier for certain PME can further alleviate the construction noise impacts. In general, a 5 dB(A) reduction for movable PME and 10 dB(A) for stationary PME can be achieved depending on the actual design of the movable noise barrier. The Contractor shall be responsible for design of the movable noise barrier with due consideration given to the size of the PME and the requirement for intercepting the line of sight between the NSRs and PME. Barrier material with surface mass in excess of 7 kg/m² is recommended to achieve the predicted screening effect.</p>	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
4.4.1.4	3.1	<p>Use of Noise Enclosure/ Acoustic Shed</p> <p>The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the GW-TM.</p>	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
4.4.1.4	3.1	<p>Use of Noise Insulating Fabric</p> <p>Noise insulating fabric can be adopted for certain PME (e.g. drill rig, pilling auger etc). The insulating fabric should be lapped such that there are no openings or gaps on the joints. Technical data from manufacturers state that by using the Fabric, a noise reduction of over 10 dB(A) can be achieved on noise level.</p>	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.4.1.4	3.1	<p>Good Site Practice</p> <p>The good site practices listed below should be followed during each phase of construction:</p> <ul style="list-style-type: none"> • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction programme; • Mobile plant, if any, should be sited as far from NSRs as possible; • Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities. 	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
Noise Impact (Operation)							
<u>Road Traffic Noise</u>							
Table 4.42 and Figure 4.20.1 to 4.20.4	3.2	Erection of noise barrier/ enclosure along the viaduct section.	To minimize the road traffic noise along the connecting road of BCP	Contractor	Loi Tung and Fanling Highway Interchange	Before Operation	EIAO and NCO
<u>Fixed Plant Noise</u>							
Table 4.46	3.2	Specification of the maximum allowable sound power levels of the proposed fixed plants during daytime and night-time.	To minimize the fixed plant noise impact	Managing Authority of the buildings / Contractor	BCP, Administration Building and all ventilation buildings	Before Operation	EIA recommendation, EIAO and NCO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.5.2.4	3.2	<p>The following noise reduction measures shall be considered as far as practicable during operation:</p> <ul style="list-style-type: none"> Choose quieter plant such as those which have been effectively silenced; Include noise levels specification when ordering new plant (including chillier and E/M equipment); Locate fixed plant/louver away from any NSRs as far as practicable; Locate fixed plant in walled plant rooms or in specially designed enclosures; Locate noisy machines in a basement or a completely separate building; Install direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosure where necessary; and Develop and implement a regularly scheduled plant maintenance programme so that equipment is properly operated and serviced in order to maintain a controlled level of noise. 	To minimize the fixed plant noise impact	Managing Authority of the buildings / Contractor	BCP, Administration Building and all ventilation buildings	Before Operation	EIAO and NCO
Water Quality Impact (Construction)							
5.6.1.1	4.1	<p>Construction site runoff and drainage</p> <p>The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts:</p> <ul style="list-style-type: none"> At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the Contractor prior to the commencement of construction. The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. 	To control site runoff and drainage; prevent high sediment loading from reaching the nearby watercourses	Contractor	Construction Works Sites	Construction Phase	Practice Note for Professional Persons on Construction Site Drainage (ProPECC Note PN 1/94)

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		<p>Temporary ditches should be provided to facilitate the runoff discharge into stormwater drainage system through a sediment/silt trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates, if practical.</p> <ul style="list-style-type: none"> ▪ Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the Contractor prior to the commencement of construction. ▪ All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. ▪ Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities. ▪ If surface excavation works cannot be avoided during the wet season (April to September), temporarily exposed slope/soil surfaces should be covered by tarpaulin or other means, as far as practicable, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Interception channels should be provided (e.g. along the crest/edge of the excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC Note PN 1/94. ▪ The overall slope of the site should be kept to a minimum to reduce 					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		<p>the erosive potential of surface water flows.</p> <ul style="list-style-type: none"> ▪ All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. ▪ Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. ▪ Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers. ▪ Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes. ▪ Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries. 					
5.6.1.1	4.1	<p>Good site practices for works within water gathering grounds</p> <p>The following conditions should be complied, if there is any works to be carried out within the water gathering grounds:</p>	To minimize water quality impacts to the water gathering grounds	Contractor	Construction Works Sites within the water gathering	Construction Phase	ProPECC Note PN 1/94

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		<ul style="list-style-type: none"> ▪ Adequate measures should be implemented to ensure no pollution or siltation occurs to the catchwaters and catchments. ▪ No earth, building materials, oil or fuel, soil, toxic materials or any materials that may possibly cause contamination to water gathering grounds are allowed to be stockpiled on site. ▪ All surplus spoil should be removed from water gathering grounds as soon as possible. ▪ Temporary drains with silt traps should be constructed at the site boundary before the commencement of any earthworks. ▪ Regular cleaning of silt traps should be carried out to ensure proper operation at all time. ▪ All excavated or filled surfaces which have the risk of erosion should always be protected form erosion. ▪ Facilities for washing the wheels of vehicles before leaving the site should be provided. ▪ Any construction plant which causes pollution to catchwaters or catchments due to the leakage of oil or fuel should be removed off site immediately. ▪ No maintenance activities which may generate chemical wastes should be undertaken in the water gathering grounds. Vehicle maintenance should be confined to designated paved areas only and any spillages should be cleared up immediately using absorbents and waste oils should be collected in designated tanks prior to disposal off site. All storm water run-off from these areas should be discharged via oil/petrol separators and sand/silt removal traps. ▪ Any soil contaminated with fuel leaked from plant should be removed off site and the voids arising from removal of contaminated soil should be replaced by suitable material approved by the Director of Water Supplies. ▪ Provision of temporary toilet facilities and use of chemicals or insecticide of any kind are subject to the approval of the Director of Water Supplies. ▪ Drainage plans should be submitted for approval by the Director of 			grounds		

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		<p>Water Supplies.</p> <ul style="list-style-type: none"> ▪ An unimpeded access through the waterworks access road should always be maintained. ▪ Earthworks near catchwaters or streamcourses should only be carried out in dry season between October and March, ▪ Advance notice must be given before the commencement of works on site quoting WSD's approval letter reference. 					
5.6.1.2	4.1	<p>Good site practices of general construction activities</p> <p>Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby stormwater drain. Stockpiles of cement and other construction materials should be kept covered when not being used.</p> <p>Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby stormwater drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.</p>	To minimize water quality impacts	Contractor	All construction works sites	Construction phase	EIA Recommendation
5.6.1.3	4.1	<p>Sewage effluent from construction workforce</p> <p>Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.</p>	To minimize water quality impacts	Contractor	All construction works sites with on-site sanitary facilities	Construction phase	EIA Recommendation and Water Pollution Control Ordinance (WPCO)
5.6.1.4	4.1	<p>Hydrogeological Impact</p> <p>Grout injection works would be conducted before blasting, for sealing a limited area around the tunnel with a grout of a suitable strength for controlling the potential groundwater inflows. The pre-injection grouting method would be supplemented by post-injection grouting where necessary to further enhance the groundwater inflow control. On-site treatment for the groundwater ingress pumped out would be required to remove any contamination by grouting materials before discharge off-site.</p>	To minimize water quality impacts	Contractor	Construction works sites of the drill and blast tunnel	Construction phase	EIA Recommendation and WPCO
<u>Water Quality Impact (Operation)</u>							
No mitigation measure is required.							

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
<u>Sewage and Sewerage Treatment Impact (Construction)</u>							
6.7	5	The sewage generated by the on-site workforce should be collected in chemical toilets and disposed of off-site by a licensed waste collector.	To minimize water quality impacts	Contractor	All construction works sites with on-site sanitary facilities	Construction phase	EIA recommendation and WPCO
<u>Sewage and Sewerage Treatment Impact (Operation)</u>							
6.6.3	5	Sewage generated by the BCP and Chuk Yuen Village Resite will be collected and treated by the proposed on-site sewage treatment facility using Membrane Bioreactor treatment with a portion of the treated wastewater reused for irrigation and flushing within the BCP.	To minimize water quality impacts	DSD	BCP	Operation phase	EIA recommendation and WPCO
6.5.3	5	Sewage generated from the Administration Building will be discharged to the existing local sewerage system.	To minimize water quality impacts	DSD	Administration Building	Operation phase	EIA recommendation and WPCO
<u>Waste Management Implication (Construction)</u>							
7.6.1.1	6	<p>Good Site Practices</p> <p>Adverse impacts related to waste management such as potential hazard, air, odour, noise, wastewater discharge and public transport as mentioned in section 3.4.7.2 (ii)(c) of the Study Brief are not expected to arise, provided that good site practices are strictly followed. Recommendations for good site practices during the construction activities include:</p> <ul style="list-style-type: none"> ▪ Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site ▪ Training of site personnel in proper waste management and chemical handling procedures ▪ Provision of sufficient waste disposal points and regular collection of waste ▪ Dust suppression measures as required under the Air Pollution Control (Construction Dust) Regulation should be followed as far as practicable. Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by covering trucks or in enclosed containers ▪ General refuse shall be removed away immediately for disposal. As 	To minimize adverse environmental impact	Contractor	Construction works sites (general)	Construction Phase	EIA recommendation; Waste Disposal Ordinance; Waste Disposal (Chemical Wastes) (General) Regulation; and ETWB TC(W) No. 19/2005, Environmental Management on Construction Site

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		<p>such odour is not anticipated to be an issue to distant sensitive receivers</p> <ul style="list-style-type: none"> ▪ Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction from public road ▪ Covers and water spraying system should be provided for the stockpiled C&D material to prevent dust impact or being washed away ▪ Designate different locations for storage of C&D material to enhance reuse ▪ Well planned programme for transportation of C&D material to lessen the off-site traffic impact. Well planned delivery programme for offsite disposal and imported filling material such that adverse noise impact from transporting of C&D material is not anticipated ▪ Site practices outlined in ProPECC PN 1/94 “Construction Site Drainage” should be adopted as far as practicable, such as cleaning and maintenance of drainage systems regularly ▪ Provision of cover for the stockpile material, sand bag or earth bund as barrier to prevent material from washing away and entering the drains 					
7.6.1.2	6	<p>Waste Reduction Measures</p> <p>Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> ▪ Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal ▪ Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force ▪ Proper storage and site practices to minimise the potential for damage or contamination of construction materials ▪ Plan and stock construction materials carefully to minimise amount 	To reduce the quantity of wastes	Contractor	Construction works sites (General)	Construction Phase	EIA recommendation and Waste Disposal Ordinance

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		<p>of waste generated and avoid unnecessary generation of waste</p> <ul style="list-style-type: none"> In addition to the above measures, specific mitigation measures are recommended below for the identified waste arising to minimise environmental impacts during handling, transportation and disposal of these wastes. 					
7.6.1.3	6	<p>C&D Materials</p> <p>In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the excavated materials should be reused on-site as backfilling material as far as practicable. The surplus rock and other inert C&D material would be disposed of at the Government's Public Fill Reception Facilities (PFRFs) at Tuen Mun Area 38 for beneficial use by other projects in the HKSAR as the last resort. C&D waste generated from general site clearance and tree felling works would require disposal to the designated landfill site. Other mitigation requirements are listed below:</p> <ul style="list-style-type: none"> A Waste Management Plan should be prepared and implemented in accordance with ETWB TC(W) No. 19/2005 Environmental Management on Construction Site; and In order to monitor the disposal of C&D material and solid wastes at public filling facilities and landfills, and to control fly-tipping, a trip-ticket system (e.g. ETWB TCW No. 31/2004) should be included. 	To minimize impacts resulting from C&D material	Contractor	Construction Works Sites (General)	Construction Phase	EIA recommendation; Waste Disposal Ordinance; and ETWB TCW No. 31/2004
7.6.1.4	6	<p>General refuse</p> <p>General refuse should be stored in enclosed bins or compaction units separated from other C&D material. A reputable waste collector is to be employed by the Contractor to remove general refuse from the site separately. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' litter.</p>	To minimize impacts resulting from collection and transportation of general refuse for off-site disposal	Contractor	Construction works sites (General)	Construction phase	Waste Disposal Ordinance and Public Health and Municipal Services Ordinance - Public Cleansing and Prevention of Nuisances Regulation
7.6.1.5	6	<p>Chemical waste</p> <p>If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i>. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical</p>	To minimize impacts resulting from collection and transportation of chemical waste for off-site disposal	Contractor	Construction works sites (General)	Construction phase	Waste Disposal (Chemical Waste) (General) Regulation and Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes