

JOB NO.: TCS00694/13



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

**11th QUARTERLY ENVIRONMENTAL MONITORING &
AUDIT SUMMARY REPORT –
(February 2016 to April 2016)**

PREPARED FOR

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

Quality Index

Date	Reference No.	Prepared By	Certified By
29 August 2016	TCS00694/13/600/R0324v2	 Nicola Hon (Environmental Consultant)	 T.W. Tam (Environmental Team Leader)

Version	Date	Description
1	26 July 2016	First Submission
2	29 August 2016	Amended according to the IEC's comments on 2 August 2016

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.



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29 August 2016

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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. 11) – Feb 2016 to Apr 2016**

With reference to the Quarterly EM&A Report No. 11 for Feb 2016 to Apr 2016 (Version 2) certified by the ET Leader and received by us on 29 August 2016, 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 Man Kit CHEUNG on tel. 3995 8132 or by email to man.cheung@smec.com.

Yours faithfully
for and on behalf of
SMEC Asia Limited



Antony WONG

Independent Environmental Checker

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EXECUTIVE SUMMARY

ES.01. This is the 11th Quarterly EM&A Summary Report for the “Liantang/Heung Yuen Wai Boundary Control Point and Associated Works” under Environmental Permit No. EP-404/2011/C (hereinafter “the EP”), covering the period from 1 February 2016 to 30 April 2016 (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 currently included Contract 2, Contract 3, Contract 5, Contract 6 and Contract SS C505. In addition, construction work for Contract 7 has been commenced on 15 February 2016. 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	456
	24-hour TSP	9	150
Construction Noise	$L_{eq(30min)}$ Daytime	10	150
Water Quality	Water measurement in-situ and/or sampling	WM1 & WM1-C,	37 scheduled and 7 extra of sampling days
		WM2A & WM2A-C	37 scheduled and 4 extra of sampling days
		WM2B & WM2B-C	37 scheduled and 18 extra of sampling days
		WM3 & WM3-C	37 scheduled and 6 extra of sampling days
		WM4, WM4-CA & WM4-CB	37 scheduled and 2 extra of sampling days
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	Contract 2	13
		Contract 3	12
		Contract 5	13
		Contract 6	13
		Contract 7	11
		Contract SS C505	13

Note: Extra monitoring day was due to measurement results exceedance

BREACHES OF ACTION/LIMIT LEVELS

ES.03. In the Reporting Period, no air quality exceedance was registered for the Project. For construction noise, one (1) noise complaint was received by 1823 for Contract 3 on 18 February 2016 which triggered the Action Level (AL). Moreover, total ninety-two (92) of Action/ Limit Level exceedance were recorded for water quality monitoring which included turbidity and Suspended Solids. The summary of breach of environmental performance is shown below.

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	$L_{eq(30min)}$ Daytime	1	0	1	The noise complaint was not project related.	N/A

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Water Quality	DO	0	0	0	--	--
	Turbidity	0	48	48	Total 16 exceedance is the Project related but 32 exceedance were not due to the Project construction activities	The relevant Contractors including C2 and C6 shall implemented water quality
	SS	1	43	44	Total 12 exceedance is the Project related but 32 exceedance were not due to the Project construction activities	mitigation measures in accordance with ISEMM of the EM&A Manual requirements

ENVIRONMENTAL COMPLAINT

ES.04. In this Reporting Period, nine (9) documented environmental complaints were received and lodged. Follow up actions have been undertaken by the Contractor to resolve the deficiencies. The investigation reports conducted by the ET were all completed and submitted to all relevant parties. In brief, all complaints were unlikely due to the project. However, the Contractor was reminded to fully implement the recommended mitigation measures as per the EM&A Manual.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

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

REPORTING CHANGES

ES.06. EPD has approved the revised EM&A Programme on 29th March 2016. If the measured water depth of the monitoring station is lower than 150 mm, alternative location based on the criteria will be selected to perform water monitoring in accordance with the updated EM&A Programme (Rev. 05) (Section 4.1.4)

FUTURE KEY ISSUES

ES.07. In upcoming wet season, 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 or public area would be the key issue. The Contractors should pay special attention on water quality mitigation measures and fully implement according to ISEMM of the EM&A Manual, in particular for working areas near Ma Wat Channel and Ping Yuen River. Moreover, all effluent discharge shall ensure to fulfill Technical Memorandum of Effluent Discharged into Drainage and Sewerage Systems, inland and Coastal Waters criteria or discharge permits stipulation.

ES.08. 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.

ES.09. Since most of construction sites under the Project are located adjacent to villages, the Contractors should fully implement air quality mitigation measures to reduce construction dust emission.

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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.
- 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 11th Quarterly EM&A Summary Report for the “*Liantang/Heung Yuen Wai Boundary Control Point and Associated Works*” under Environmental Permit No. EP-404/2011/C, covering the period from **1 February 2016 to 30 April 2016**.

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	Waste Management
Section 8	Non-compliance, Complaints, Notifications of Summons and Prosecutions
Section 9	Implementation Status of Mitigation Measures
Section 10	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 has awarded in mid-April 2016. However, the major construction work still is not yet commenced. 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 is 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', 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:

- Regulation of Shenzhen River Stage IV;
- Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange – Contract No. HY/2012/06;
- 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, 5, 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 19 May 2014, the following activities were conducted in the Reporting Period.

Mid-Vent Portal	<ul style="list-style-type: none"> • Tube excavation (NB + SB) • Adit invert slab • Building works foundation • Installation of blast curtain • Ventilation building superstructure
North Portal	<ul style="list-style-type: none"> • Slope stabilization and retaining wall • Northbound top heading excavation and tunnel enlargement • Tunnel Boring Machine excavation
South Portal	<ul style="list-style-type: none"> • Southbound and Northbound Drill and Blast excavation • Building works foundation and substructure
Admin Building	<ul style="list-style-type: none"> • Building works foundation

Contract 3 (CV/2012/09)

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

- Cable detection and trial trenches
- Decking construction for Bridge E

- E&M work for new valve control & Telemetry House
- Filling works at Tong Hang East
- FRP Lining on existing water main
- Storm drain laying
- Noise barrier construction
- Pier / pier table construction
- Pile cap works
- Portal beam construction
- Pre-drilling
- Retaining Wall construction
- Road works at Fanling Highway
- Sewer works
- Tree felling works
- Utilities duct laying
- Viaduct segment erection
- Slope works
- Waterworks
- Pre-drilling works for noise barrier

Contract 4 (NE/2014/02)

- 2.4.4 The Contract was awarded in mid-April 2016 and the major construction work has not yet commenced.

Contract 5 (CV/2013/03)

- 2.4.5 Contract commenced in August 2013, the following activities were conducted in the Reporting Period.

- Construction of rising main (VO61) at existing Lin Ma Hang (LMH) Road
- Drainage works of Depressed Road at BCP3
- Additional works (Access Works) for Village House at RS4
- Drainage works at existing LMH Road
- Brick laying at footpath of proposed LMH road
- Preparation works for planting at proposed LMH road
- Installation of Underground Utility (UU) at proposed and existing LMH road
- Irrigation at proposed LMH Road
- Water works at existing LMH Road
- Bituminous laying at L15 road existing & proposed LMH road
- Planting at proposed and existing LMH road

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:

- Site Clearance
- Slope Works
- Site Accesses Construction
- Ground Investigation (GI) Works
- Soil nail
- Bored piling
- Pile cap construction
- H-piling
- Road surfacing

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:
- Erection of Engineer’s Site Office
 - Ground Investigation Works for Bridge A-E
 - Piling Works for Bridge B-D

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:
- General Site Setup
 - Building no. 5 and 9 construction
 - Assembly of Crawler Crane / Drilling Rig / Pre-boring Rig
 - H-pile works
 - Tower crane construction
 - Erection of Welfare Shelter
 - Underground drainage works
 - Column works
 - Weighbridge works
 - Prototype “A” Construction works
 - Project Signboard works
 - Mock Up Curtain Wall works
 - Pile Cap construction
 - Bored Pile works
 - Bored Pile works and pre-drill works
 - Bridge construction works

2.5 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

- 2.5.1 In according to the EP, the required documents have submitted to EPD for retention which listed in below:
- Project Layout Plans of Contracts 2, 3, 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 and SS C505
 - Contamination Assessment Plan (CAP) for Po Kat Tsai, Loi Tung and the workshops in Fanling
 - 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) Regulation	Ref No.: 368864	31 Dec 2013	Till Contract ends
2	Chemical Waste	<i>North Portal</i> Waste Producers Number:	25 Mar 2014	Till Contract

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
	Producer Registration	No.5213-652-D2523-01 <i>Mid-Vent Portal</i> Waste Producers Number: No.5213-634-D2524-01 <i>South Portal</i> Waste Producers Number: No.5213-634-D2526-01	25 Mar 2014 9 Apr 2014	ends Till Contract ends Till Contract ends
3	Water Pollution Control Ordinance - Discharge License	No.WT00018374-2014	3 Mar 2014	28 Feb 2019
		No.: W5/1I389	28 Mar 2014	31 Mar 2019
		No.: W5/1I390	19 June 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-RN0738-15	18 Nov 2015	8 May 2016
		GW-RN0760-15	26 Nov 2015	27 Feb 2016
		GW-RN0761-15	28 Nov 2015	27 Feb 2016
		GW-RN0795-15	7 Dec 2015	6 Jun 2016
		GW-RN0838-15	24-Dec-2015	23-Feb-2016
		GW-RN0875-15	24-Dec-2015	23-Feb-2016
		GW-RN0893-15	01-Jan-2016	27-Jun-2016
		GW-RN0057-16	28-Feb-2016	27-May-2016
		GW-RN0059-16	24-Feb-2016	23-Apr-2016
		GW-RN0067-16	28-Feb-2016	27-May-2016
		GW-RN0068-16	23-Feb-2016	22-Apr-2016
		GW-RN0071-16	02-Feb-16	31-Jul-2016
		GW-RN0077-16	07-Feb-2016	06-Aug-2016
		GW-RN0167-16	18-Mar-2016	17-May-2016
		GW-RN0199-16	24-Mar-2016	17-Sep-2016
		GW-RN0323-16	30-Apr-2016	29-Jun-2016
		GW-RN0321-16	30-Apr-2016	29-Jun-2016
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 -	No.:WT00016832 – 2013	28 Aug 13	31 Aug 2018

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
	Discharge License			
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-RN0495-15	12 Aug 2015	11 Feb 2016
		GW-RN0497-15	14 Aug 2015	13 Feb 2016
		GW-RN0525-15	29 Aug 2015	13 Feb 2016
		GW-RN0542-15	1 Sep 2015	25 Feb 2016
		GW-RN0608-15	28 Sep 2015	29 Feb 2016
		GW-RN0633-15	15 Oct 2015	29 Feb 2016
		GW-RN0655-15	1 Dec 2015	29 Feb 2016
		GW-RN0677-15	26 Oct 2015	29 Feb 2016
		GW-RN0699-15	10 Nov 2015	27 Feb 2016
		GW-RN0695-15	29 Nov 2015	28 Feb 2016
		GW-RN0712-15	16 Nov 2015	29 Feb 2016
		GW-RN0736-15	24 Nov 2015	29 Feb 2016
		GW-RN0765-15	1 Dec 2015	27 Feb 2016
		GW-RN0812-15	20 Dec 2015	29 Feb 2016
		GW-RN0837-15	23 Dec 2015	29 Feb 2016
		GW-RN0892-15	9 Jan 2016	8 July 2016
		GW-RN0894-15	5 Jan 2016	27 Feb 2016
		GW-RN0001-16	8 Jan 2016	27 Feb 2016
		GW-RN0049-16	26 Jan 2016	29 Feb 2016
		GW-RN0056-16	2 Feb 2016	18 Mar 2016
		GW-RN0060-16	1 Feb 2016	30 Jun 2016
		GW-RN0064-16	16 Feb 2016	13 Aug 2016
		GW-RN0086-16	16 Feb 2016	7 May 2016
		GW-RN0094-16	6 Mar 2016	22 May 2016
		GW-RN0096-16	6 Mar 2016	12 Jun 2016
		GW-RN0097-16	1 Mar 2016	17 Jun 2016
		GW-RN0098-16	1 Mar 2016	4 Sep 2016
		GW-RN0111-16	1 Mar 2016	30 Apr 2016
		GW-RN0113-16	25 Feb 2016	24 Aug 2016
		GW-RN0115-16	1 Mar 2016	7 May 2016
		GW-RN0139-16	2 Mar 2016	24 Aug 2016
		GW-RN0140-16	2 Mar 2016	24 Aug 2016
GW-RN0157-16	8 Mar 2016	7 Jun 2016		
GW-RN0158-16	8 Mar 2016	31 Aug 2016		
GW-RN0164-16	16 Mar 2016	31 Mar 2016		
GW-RN0168-16	15 Mar 2016	14 Sep 2016		
GW-RN0169-16	15 Mar 2016	14 Jun 2016		

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
		GW-RN0170-16	11 Mar 2016	10 Sep 2016
		GW-RN0172-16	29 Mar 2016	8 Apr 2016
		GW-RN0218-16	6 April 2016	30 Sep 2016
		GW-RN0233-16	11 April 2016	10 Oct 2016
		GW-RN0244-16	16 April 2016	13 May 2016
		GW-RN0297-16	4 May 2016	30 June 2016
		GW-RN0303-16	30 April 2016	29 July 2016
		GW-RN0111-16	1 March 2016	30 Apr 2016
		GW-RN0169-16	15 Mar 2016	Cancelled on 28 Apr 2016
		GW-RN0309-16	30 April 2016	29 Oct 2016
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	Application is under consideration by EPD		
5	Construction Noise Permit	GW-RN0681-15	26 Oct 2015	25 Apr 2016
6	Construction Noise Permit	GW-RN0683-15	26 Oct 2015	25 Apr 2016
Contract SS C505				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 390974	13 Jul 2015	Till the end of Contract
2	Chemical Waste	Waste Producer No.:	16 Sep 2015	Till the end of

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
	Producer Registration	5213-642-L1048-07		Contract
3	Water Pollution Control Ordinance - Discharge License	Licence No.: WT00022774-2015	17 Nov 2015	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	PP-RN0027-15	5 Oct 2015	2 Apr 2016
		PP-RN0007-16	10 Mar 2016	9 May 2016
		GW-RN0197-16	23 Jan 2016	22 May 216
		GW-RN0209-16	23 Jan 2016	22 May 216
		PP-RN0002-16	23 Jan 2016	22 Mar 2016
		PP-RN0013-16	14 April 2016	22 May 2016
		GW-RN0023-16	23 Jan 2016	22 Mar 2016
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

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 5 Contract 7

Station ID	Description	Works Area	Related to the Work Contract
AM2	Village House near Lin Ma Hang Road	LMH to Frontier Closed Area	Contract 5, Contract 6
AM3	Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village.	LMH to Frontier Closed Area	Contract 5, 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 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	ArchSD SS C505 Contract 5
NM2	Village House near Lin Ma Hang Road	Lin Ma Hang to Frontier Closed Area	Contract 5, 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

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 of Kong Yiu Channel	833 679	845 421	Alternative location located at upstream 51m of the designated location	ArchSD SS C505 Contract 5
WM1-	Upstream of	834 185	845 917	NA	ArchSD SS

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
Control	Kong Yiu Channel				C505 Contract 5
WM2A	Downstream of River Ganges	834 204	844 471	Alternative location located at downstream 81m 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

EPD has approved the revised EM&A Programme on 29th March 2016. If the measured water depth of the monitoring station is lower than 150 mm, alternative location (WM3x and WM2A-Controlx) based on the criteria were selected to perform water monitoring in accordance with the updated EM&A Programme (Rev.05) (Section 4.1.4)

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
24-Hour TSP	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Model TE-5025A
1-Hour TSP	
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-14 or Rion NL-31 or Rion NL-52
Calibrator	B&K Type 4231
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 Professional Plus / YSI 6820/650MDS / YSI PRO20 Handheld Dissolved Oxygen Instrument / YSI 550A Multifunctional Meter
pH meter	AZ8685 pH pen-style meter / YSI Professional Plus / YSI 6820/650MDS
Turbidimeter	Hach 2100Q / Turbidimeter YSI Professional DSS
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 4⁰C as possible without being frozen. Samples collected are delivered to the laboratory upon collection.

In-situ Measurement

- 3.6.14 Instrument including YSI Professional Plus or YSI 6820/650MDS or 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 or YSI Professional Plus or YSI 6820/650MDS 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 or Turbidimeter YSI Professional DSS 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, NM2, 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	WM2B	WM3	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
		AND 120% of upstream control station of the same day				
	Limit Level	67.6	33.8	12.3	14.0	38.4
SS (mg/L)	Action Level	54.5	14.6	11.8	12.6	39.4
		AND 120% of upstream control station of the same day				
	Limit Level	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, 5, 6 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
AM1a/ AM1b	207	22	90	105	17	49
Record Date	1-Mar-16	12-Mar-16	48 events	5-Mar-16	17-Mar-16	17 events
AM2	220	27	97	138	21	74
Record Date	1-Mar-16	12-Mar-16	48 events	2-Apr-16	2-Feb-16	17 events
AM3	236	38	94	140	28	79
Record Date	1-Mar-16	24-Mar-16	48 events	5-Feb-16	17-Mar-16	17 events
AM4a	137	14	71	131	27	63
Record Date	23-Feb-16	10-Mar-16	54 events	22-Feb-16	24-Mar-16	16 event
AM5a	126	7	69	82	26	53
Record Date	23-Feb-16	10-Mar-16	54 events	27-Feb-16	22-Apr-16	16 event
AM6	115	9	65	127	29	86
Record Date	23-Feb-16	10-Mar-16	54 events	30-Mar-16	24-Mar-16	16 event
AM7b	169	20	78	130	22	62
Record Date	29-Feb-16	1-Feb-16	51 events	30-Mar-16	10-Mar-16	17 events
AM8	165	19	76	70	19	36
Record Date	12-Feb-16	1-Feb-16	51 events	30-Mar-16	16-Mar-16 24-Mar-16	17 events
AM9b	181	29	89	116	19	49
Record Date	16-Apr-16	11-Apr-16	48 events	30-Apr-16	26-Apr-16	17 events

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	0	0
	Limit Level	0	0	0
AM3	Action Level	0	0	0
	Limit Level	0	0	0
AM4a	Action Level	0	0	0
	Limit Level	0	0	0
AM5a	Action Level	0	0	0
	Limit Level	0	0	0
AM6	Action Level	0	0	0
	Limit Level	0	0	0
AM7b	Action Level	0	0	0
	Limit Level	0	0	0
AM8	Action Level	0	0	0

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

4.2.3 In the Reporting Period, no exceedances were recorded for 1-hour and 24-hour TSP. No corrective measures were therefore required.

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, 5, 6 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 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	69	52
Record Date	3-Feb-16	12-Feb-16
NM2	71	53
Record Date	24-Feb-16	12-Feb-16
NM3	63	53
Record Date	16-Mar-16 & 26-Apr-16	12-Feb-16
NM4	68	57
Record Date	29-Feb-16	16-Mar-16
NM5	63	51
Record Date	20-Apr-16	12-Feb-16 & 17-Mar-16
NM6	63	51
Record Date	26-Apr-16 & 6-Feb-16	14-Apr-16
NM7	65	59
Record Date	23-Feb-16 & 11-Mar-16	17-Mar-16 & 23-Mar-16
NM8	65	52
Record Date	11-Apr-16	5-Feb-16
NM9	67	55
Record Date	11-Apr-16	5-Feb-16
NM10 ^(*)	73	52
Record Date	22-Apr-16	6-Feb-16

^(*) 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	1	18 Feb 2016
NM2	0		
NM3	0		
NM4	0		

Station	Limit Level	Action Level	Received Date
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). However, one (1) noise complaint was received by 1823 for Contract 3 on 18 February 2016 which triggered the Action Level (AL). Investigation report for the complaint was conducted by ET and the result revealed that the complaint was not related to the works under Contract 3.

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, 5, 6 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, 37 days of scheduled water monitoring were conducted. Moreover, 7, 4, 18, 6 and 2 days of extra water sampling were conducted for WM1, WM2A, WM2B, WM3 and WM4 and all its control station.

Table 6-1 Summary of the Water Quality Monitoring Results – Contract 5

Statistics	DO (mg/L)		Turbidity (NTU)		SS (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
Min	4.9	6.7	15.1	5.0	6.5	2.0
Max	12.3	16.1	578.0	607.5	530.0	495.0
Average	8.5	9.1	76.4	52.4	80.6	43.8

Table 6-2 Summary of the Water Quality Monitoring Results – Contract 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	4.8	4.9	4.1	7.2	3.4	3.1	5.5	2.0	8.0
Max	14.6	14.9	13.7	149.5	208.0	49.1	138.0	100.0	51.0
Average	8.3	9.0	7.3	24.9	23.4	19.0	23.4	17.0	21.5

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

Statistics	DO (mg/L)				Turbidity (NTU)				SS (mg/L)			
	WM2A	WM2A-C	WM2B	WM2B-C	WM2A	WM2A-C	WM2B	WM2B-C	WM2A	WM2A-C	WM2B	WM2B-C
Min	6.3	5.7	6.3	6.0	4.8	3.8	2.9	2.1	2.0	2.0	2.0	2.0
Max	14.5	15.2	13.4	12.4	198.5	48.9	999.0	49.8	164.5	27.5	1355.0	37.0
Average	9.1	8.9	9.2	8.2	25.6	12.2	83.4	6.4	22.0	7.1	97.2	7.3

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

Statistics	DO (mg/L)		Turbidity (NTU)		SS (mg/L)	
	WM3	WM3-Control	WM3	WM3-Control	WM3	WM3-Control
Min	5.2	4.7	4.2	2.6	4.0	2.5
Max	11.8	12.8	121.5	488.0	109.0	4485.0
Average	8.5	8.5	22.2	37.6	23.0	175.2

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
Feb-16	12	WM1	0	0	0	0	0	0
	12	WM2A	0	0	0	0	0	0
	16	WM2B	0	0	0	5	0	4
	12	WM3	0	0	0	0	0	0
	13	WM4	0	0	0	1	0	1
Mar-16	15	WM1	0	0	0	3	0	2
	13	WM2A	0	0	0	1	0	1
	21	WM2B	0	0	0	15	1	11
	13	WM3	0	0	0	3	0	3
	13	WM4	0	0	0	1	0	1
Apr-16	17	WM1	0	0	0	5	0	5
	16	WM2A	0	0	0	3	0	6
	18	WM2B	0	0	0	7	0	8
	18	WM3	0	0	0	4	0	1
	13	WM4	0	0	0	0	0	0
Total	44	WM1	0	0	0	8	0	7
	41	WM2A	0	0	0	4	0	7
	55	WM2B	0	0	0	27	1	23
	43	WM3	0	0	0	7	0	4
	39	WM4	0	0	0	2	0	2
Sum			0	0	0	48	1	43

6.2.4 In the Reporting Period, a total of ninety-two (92) Action/ Limit Level exceedances namely 48 exceedances of turbidity and 44 exceedances of SS 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 are summarized in *Table 6-6*. The detailed investigation reports have been presented in the relevant monthly EM&A reports.

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

Exceedance Day	Location	Exceeded Parameter	Cause of Water Quality Exceedance
1-Feb-16	WM2B	NTU & SS	Soil erosion and generation of run-off from the excavation area at North Portal was happened on 1 and 2 February 2016 during rainstorm. The exceedances were related to Contract 6. The Contractor had enhanced the mitigation measures such as covering the open slope as far as practicable to minimize muddy runoff and construction of sump pit to collect the site runoff. The construction of 2 new sump pits under the slopes and covering of open slopes were completed on 5 February 2016.
2-Feb-16	WM2B	NTU & SS	
23-Feb-16	WM2B	NTU	The exceedances were due to the shallow water and the disturbance of sediment at river bed and unlikely related to the works under Contract 6.
25-Feb-16	WM2B	NTU & SS	The exceedances were related to the external turbid water emerged from the outlet pipe and unlikely due to the works under Contract 6.

26-Feb-16	WM4	NTU & SS	The Contractor of Contract 3 was conducted the removal work of the supporting of Bridge E on 26 February 2016. The removal of broken concrete by an excavator stirred up the river bed. The exceedances were related to Contract 3. The Contractor explained that in order to reinstate the river, this process is unavoidable. Since the river is fairly shallow in the dry season and working in the river inevitably disturbed the river bed, very few could be done to get rid of the impact. As to minimize the impact, the Contractor was managed to remove broken concrete in 3 days (25 to 27 February 2016). The construction activities carried out by Contract 2 was away from the river course and no discharge was made on 26 February 2016, it is considered that the exceedances were not related to Contract 2.
29-Feb-16	WM2B	NTU & SS	The exceedances were due to the shallow water and the disturbance of sediment at river bed and unlikely related to the works under Contract 6.
2 & 3 Mar 2016	WM2B (C6)	NTU & SS	A pipe carrying wastewater from bored piling to the nearest AquaSed was burst on 2 March 2016 and the untreated wastewater were getting into the open channel accidentally. CCKJV has immediate halted the bored piling work until the damaged pipe was replaced. The exceedances were related to the pipe burst accident and unlikely related to the works under Contract 6.
4 Mar 2016	WM2B (C6)	NTU	The exceedances were due to the shallow water and the disturbance of sediment at river bed and unlikely related to the works under Contract 6.
5 Mar 2016	WM2B (C6)	NTU	Channel clearing was carried out on 5, 8, 9 and 10 March 2016 to remove the silt cumulated at the channel bed. The exceedances were due to insufficient mitigation measures during channel clearing. CCKJV should ensure the turbid water at the adjacent open channel was entirely blocked by the sand bag barrier or other means to prevent it flowing further downstream before carry out the channel cleaning.
8, 9 & 10 Mar 2016	WM2B (C6)	NTU & SS	
4, 9 & 10 Mar 2016	WM1 (C5, C6 and SS C505)	NTU & SS	<ul style="list-style-type: none"> • C5 - There were no wastewater generation activities carried out on 4, 9 & 10 Mar 2016 and no discharge made into the river course. The exceedances were unlikely due to the Contract 5. • C6 - Turbid water was observed at upstream of the site area of Contract 6, the exceedances were unlikely due to the Contract 6. • SS C505 - The discharge point connecting public drainage under SS C505 would not flow to WM1 and its upstream, the exceedances were unlikely due to the SS C505.
11 Mar 2016	WM2A (C6)	NTU & SS	The condition of the water quality besides of Ping Yuen River of Bridge D under C6 on 1 Mar 2016 was normal and no turbid water was observed. There were no trails of turbid water discharge from the construction site, it is considered that exceedances were unlikely due to Contract 6.
11 Mar 2016	WM2B (C6)	NTU & SS	The water recirculation pump was detached from the water pipe accidentally and causing overflow of turbid water through the bar screen to downstream. The Contractor immediately fixed the detached recirculation pump and water pipe and the function of the recirculation pump was back to normal in the afternoon. It is concluded that the exceedances were a single incident.
14, 15 & 16 Mar 2016	WM2B (C6)	NTU & SS	The exceedances were due to the shallow water and the disturbance of sediment at river bed and unlikely related to the works under Contract 6.
21, 22, 23 & 24 Mar 2016	WM2B (C6)	NTU & SS	The effluent quality of C6 was visually acceptable. However, it was observed that muddy runoff from the public road surface into the existing channel due to rain. It is considered

			that the exceedances were related to cumulated silt at the river bed and muddy runoff from the public road surface and unlikely related to the works under Contract 6.
21 Mar 2016	WM4 (C2 & C3)	NTU & SS	<ul style="list-style-type: none"> C2 & C3 - muddy water flowed from other upstream location which was not under monitored by the Contract was observed on 21 Mar 2016. It is considered that the exceedances were due to the stir up of sediment during rain and external muddy water from upstream and not related to the works under Contracts 2 & 3.
29, 30 & 31 Mar 2016	WM3 (C2 & C6)	NTU & SS	<ul style="list-style-type: none"> C2 & C6 - discharge of turbid water and accumulated silt was observed from an unknown outfall which located at between the works area of C6 and WM3. It is considered that the turbid water detected at WM3 was related to the turbid discharge from the unknown outfall and unlikely due to the works under Contracts 2 and 6.
5 th , 6 th , 7 th , 8 th and 11 th April 2016	WM1 (C5, C6 and SS C505)	NTU & SS	Accumulation of rubbish were observed at the screening steel bar of box culvert near WM1 on 4 April 2016 after heavy rainstorm. Water flow near WM1 was therefore retarded and turbid water would be cumulated at WM1. Considered that the exceedances were unlikely related or due to the works of Contracts 5, 6 and SS C505.
11 th , 13 th , 14 th , 18 th , 19 th and 22 nd April 2016	WM2A (C6)	NTU and/or SS	<ul style="list-style-type: none"> Since too much silt accumulated inside the sedimentation tank, the quality of effluent was not desirable and some turbid effluent was discharged into Ping Yuen River on 11th April 2016. The exceedance should relate to Contract 6 since turbid effluent flowed into Ping Yuen River from working area. A total rainfall 76.4 mm was recorded on 13 April 2016 and 23.7 mm on 18 April 2016. Due to the heavy rainfall, the soil slope at the river side was eroded and ran into the Ping Yuen River and muddy water was observed after passing the suspected soil erosion point. Hence, exceedances as recorded on <u>13th, 14th, 18th, 19th and 22nd April 2016</u> are unlikely related the C6 construction activities.
7 th , 11 th , 14 th , 20 th , 22 nd , 23 rd , 25 th and 26 th April 2016	WM2B (C6)	NTU and/or SS	<ul style="list-style-type: none"> Water monitoring on 7 April 2016 at WM2B, daily effluent self-monitoring was recorded visually clear. However, the silt cumulated at the channel bed or the screen gate was stirred-up by the flow of discharge from the AquaSed. Then the mixture of silt and treated water was overflow to the downstream. So the exceedance was not due to C6 construction activities. On 11th and 20th April 2016, around 20mm shallow water deep encountered during water sampling. Moreover, the water flowing in the channel and the water samples collected at WM2B was observed visually clear. Consider that the water sample could not avoid inclusion of the loose sediment and debris and concluded the exceedance not due to C6 construction activities. According to the site record from the monitoring team on 14 April 2016, very shallow water was measured at WM2B and the water depth was around 0.02m and water sampling during rainfall and it was observed that the water flowing in the open channel was slightly turbid due to stir up of sediment and cumulated silt at the river bed during rain. So, the exceedance was not due to C6 construction activities. According to the site photos taken on 22, 23, 25 and 26 April 2016 by the ET, it was observed that the water samples collected at WM2B were turbid while water samples collected at WM2B-C were clear. As extracted from the Hong Kong Observatory, heavy rainfall was recorded 22nd and 25th April 2016. Hence, runoff was generated from the excavating areas during the rainfall and

			the turbid water was flowed into river channel. Thus, it is considered that the exceedances recorded on 22, 23, 25 and 26 April 2016 were related to runoff from the excavation work of site access construction.
2 nd , 20 th , 21 st and 22 nd April 2016	WM3 (C2 and C6)	NTU and/or SS	<ul style="list-style-type: none"> • The exceedance recorded on 2 April 2016 caused by turbid water discharge from the unknown outfall. Hence, the exceedance triggered unlikely due to the works under Contracts 2 and 6. • For investigation, the Contractor of C2 said that no discharge was made from the construction admin building. However, site inspection by RE, ET, IEC and the Contractor of C6 on 21 April 2016, the AquaSed (SH-8) which located upstream of W3, was found to have turbid treated effluent. As reported by the Contractor of C6, the AquaSed(SH-8) was running out of flocculent thus effectiveness of the water treatment was reduced. Hence, the exceedance triggered likely due to the works of Contract 6 for effluent discharge.

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

7 WASTE MANAGEMENT

7.1 GENERAL WASTE MANAGEMENT

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

7.2 RECORDS OF WASTE QUANTITIES

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

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

7.2.2 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 7-1* and *7-2* and the Waste Flow Table is presented in *Appendix H*.

Table 7-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Contract No	Quantity			Total	Disposal Location
		Feb 2016	Mar 2016	Apr 2016		
C&D Materials (Inert) (in '000m ³)	2	55.6715	34.1616	86.9048	333.83 84	-
	3	1.225	1.084	0.472		-
	5	0	0	0		-
	6	74.418	43.765	33.767		-
	7	0.16	0.135	0.313		-
	SS C505	0.858	0.793	0.1105		-
Reused in this Project (Inert) (in '000m ³)	2	1.0145	0.31	0.7045	19.223	-
	3	0.02	0	0.018		-
	5	0	0	0		-
	6	8.785	6.438	1.933		-
	7	0	0	0		-
	SS C505	0	0	0		-
Reused in other Projects (Inert) (in '000m ³)	2	38.3484	29.3514	32.8811	158.22 39	C6 / NENT# & other project approved by the ER
	3	0	0	0		-
	5	0	0	0		-
	6	39.85	12.034	5.759		C5 and other project approved by the ET
	7	0	0	0		-
	SS C505	0	0	0		-
Disposal as Public Fill (Inert) (in '000m ³)	2	16.3085	4.5003	53.3191	156.34 44	Tuen Mun 38
	3	1.205	1.084	0.408		
	5	0	0	0		
	6	25.783	25.292	26.075		
	7	0.16	0.135	0.313		
	SS C505	0.858	0.793	0.1105		

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

Table 7-2 Summary of Quantities of C&D Wastes

Type of Waste	Contract No	Quantity			Total	Disposal Location
		Feb 2016	Mar 2106	Apr 2016		
Recycled Metal ('000kg) #	2	0	0	0.002	1518.3444	By licensed collector
	3	0	0	0		
	5	0	0	0		
	6	0	0	0		
	7	0	0	0		
	SS C505	0.0004	52.752	1465.59		
Recycled Paper / Cardboard Packing ('000kg) #	2	0	0	0.4	0.8706	By licensed collector
	3	0	0	0		
	5	0	0	0		
	6	0.097	0	0.221		
	7	0	0	0		
	SS C505	0.0186	0.044	0.09		
Recycled Plastic ('000kg) #	2	0	0	0	0.008	By licensed collector
	3	0	0.001	0		
	5	0	0	0		
	6	0	0.007	0		
	7	0	0	0		
	SS C505	0	0	0		
Chemical Wastes ('000kg) #	2	0.88	11.7920	0.704	13.376	By licensed collector
	3	0	0	0		
	5	0	0	0		
	6	0	0	0		
	7	0	0	0		
	SS C505	0	0	0		
General Refuses ('000m ³)	2	0.1089	0.0682	0.1306	1.5937	NENT
	3	0.11	0.09	0.135		
	5	0.045	0.055	0.03		
	6	0.339	0.042	0.07		
	7	0	0.005	0.005		
	SS C505	0.21	0.059	0.091		

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

- 7.2.3 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.

8 SITE INSPECTIONS

8.1 REQUIREMENTS

8.1.1 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

8.1.2 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 8-1** and the details of site inspection can be found in relevant EM&A monthly report.

Table 8-1 Summary of Reminders/Observations of Site Inspection – Contract 2

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
February 2016	5, 12, 19, 26 February 2016	4	Completed
March 2016	4, 11, 18 and 24 March 2016	2	Completed
April 2016	1, 8, 15, 22, 29 April 2016	2	Completed

8.1.3 In the Reporting Period, no non-compliance was recorded; however, **8** 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

8.1.4 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 8-2** and the details of site inspection can be found in relevant EM&A monthly report.

Table 8-2 Summary of Reminders/Observations of Site Inspection – Contract 3

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
February 2016	1, 11, 17, 22 and 29 February 2016	10	Completed
March 2016	7, 16, 21 and 30 March 2016	2	Completed
April 2016	6, 11, 20 and 25 April 2016	4	Completed

8.1.5 In the Reporting Period, no non-compliance was recorded; however, **16** 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 5

8.1.6 During the Reporting Period, **13** events of the joint site inspections were undertaken at Contract 5 to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in **Table 8-3** and the details of site inspection can be found in relevant EM&A monthly report.

Table 8-3 Summary of Reminders/Observations of Site Inspection – Contract 5

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
February 2016	2, 11, 16 and 23 February 2016	2	Completed
March 2016	1, 8, 15, 22 and 29 March 2016	1	Completed
April 2016	5, 12, 19, 26 April 2016	1	Completed

8.1.7 In the Reporting Period, no non-compliance was recorded; however, **4** 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 6

8.1.8 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 8-4** and the details of site inspection can be found in relevant EM&A monthly report.

Table 8-4 Summary of Reminders/Observations of Site Inspection – Contract 6

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
February 2016	4, 12, 18 and 25 February 2016	11	Completed
March 2016	3, 10, 17, 24 and 31 March 2016	14	Completed
April 2016	7, 14, 21, 28 April 2016	9	Completed

8.1.9 In the Reporting Period, no non-compliance was recorded; however, **34** 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

8.1.10 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 8-5** and the details of site inspection can be found in relevant EM&A monthly report.

Table 8-5 Summary of Reminders/Observations of Site Inspection – Contract SS C505

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
February 2016	3, 11, 17 and 24 February 2016	4	Completed
March 2016	2, 9, 16, 23 and 30 March 2016	8	Completed
April 2016	6, 13, 20, 27 April 2016	3	Completed

8.1.11 In the Reporting Period, no non-compliance was recorded; however, **15** 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

8.1.12 Although construction activities under **Contract 7** have not yet commenced, site preparation work was conducted. In the Reporting Period, **11** events of the joint site inspections were undertaken at Contract 7 to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in **Table 8-6** and the details of site inspection can be found in relevant EM&A monthly report.

Table 8-6 Summary of Reminders/Observations of Site Inspection – Contract 7

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
February 2016	16 and 23 February 2016	2	Completed
March 2016	1, 8, 15, 22 and 29 March 2016	1	Completed
April 2016	5, 12, 19, 26 April 2016	1	Completed

8.1.13 In the Reporting Period, no non-compliance was recorded; however, **4** 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

8.1.14 Since the construction works at the Contract 4 are not yet commenced, no site inspection is performed for these Contracts.

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

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

9.1.1 In the Reporting Period, no non-compliance, no summons and prosecution under the EM&A Programme was recorded and lodged for the Project. However, a total nine (9) documented environmental complaints which including one (1) complaint related Contract 3, one (1) complaint related Contract 2, six (6) complaints related Contract 6, and; moreover one (1) complaints as related Contract 2 and Contract 6. The summary of complaint received in the Reporting Period is listed below.

- 18 February 2016 - a complaint was received via 1823 regarding construction noise generated from the construction of flyover near Yuen Leng Village of Kau Lung Hang. In our investigation, it was observed that the complaint location is situated outside the site boundary of Contract 3. Moreover, there are several concurrent projects undertaking by other contractors, including the construction of flyover and road works which were not within the scope of Contract 3. It was concluded that the complaint was not related to the works under Contract 3. (Contract 3)
- 22 February 2016 - EPD notified CCKJV that a complaint was received with respect to the turbid river water observed in Ng Tung River near Contract 6's site office. In our investigation, it was observed that the AquaSed (SH-06) which adjacent to the wheel washing machine at Bridge A was not functioning properly due to excessive cleaning of dump trucks. Further enhancement of the wheel washing arrangement of Bridge A, such as deploy of new washing bay, additional sedimentation tanks and WetSep and sump pit modification, were implemented and the remedial works carried out by Contract 6 was acceptable and the ET will keep closely monitored the site performance. (Contract 6)
- 23 February 2016 - a complaint was received by CEDD regarding the soil/ debris brought by the dump trucks from the construction site running along Sha Tau Kok Road. In our investigation, no oil/debris was brought out by any trucks of LT/HYW was observed during site inspection and wheel washing facilities were implemented properly at all site exits. Moreover, there are many other dump trucks out of the project running along the Sha Tau Kok Road, particularly the Site Exit at Sha Tau Kok Road maintained by CCKJV, it was concluded that the complaint was unlikely to the Project. (Contract 6)
- 8 March 2016 - a complaint was received from 1823 regarding the generation of fugitive dust when heavy dump truck from construction site of Contract 2 (DHK) travelling on Sha Tau Kok Road. In our investigation, it is noted that water bowser for road cleaning has been providing on Sha Tau Kok Road and the route is between Wo Keng Shan Road (Admin Bldg Site) to Ping Che Roundabout which covered the complaint location. Moreover, apart from the project, there were many other heavy vehicles using the Sha Tau Kok Road and it was concluded that the dust problem on Sha Tau Kok Road was not likely due to the Contract. (Contract 2)
- 20 April 2016 - CEDD received a complaint from the Sha Tau Kok District Rural Committee expressing their concerns with respect to discharge of suspected untreated muddy water from the construction sites at Wo Keng Shan Road and Sha Tau Kok Road into the existing river channel. Inspection was carried out at construction sites at Wo Keng Shan Road and Sha Tau Kok Road to confirm that the Contractors have implemented proper mitigation measures and no muddy water was observed and being discharged from the site. It was concluded that the complaints were unlikely related to the Contracts. (Contracts 2 and 6)
- 22 April 2016 - CEDD received a complaint regarding to the direct discharge of wastewater into the manhole. In our investigation, a sedimentation tank was placed next to the manhole but it was idled and would only be used as a spare tank for emergency. As advised by CCKJV, all wastewater from that site area was stored in temporary pit and diverted to treat in wastewater treatment facilities including sedimentation tank and AquaSed and there is no

discharge of wastewater into the drainage hole. The sedimentation tank was found removed from site on 26 April 2016. It was concluded that the complaint was not related to the contract. (Contract 6)

- 22 April 2016 - CEDD received a complaint from Sha Tau Kok District Rural Committee expressing their concerns with respect to pumping water from the exiting river channel near Ping Yuen Road for construction purpose without prior notice to villager and discharging suspected untreated muddy water into the river channel. As advised by CCKJV, water was extracted from the river channel for dust mitigation control measures. Inspection was carried out at upstream of the river and turbid water was observed but the source was unknown. It is considered that the quality of water in Ping Yuen River is not only affected by the construction activities but also the external factor such as rainfall and possible domestic discharge from the villager. It was concluded that the complaint was unlikely due to the Contract. (Contract 6)
- 21 April 2016 - a complaint was received from 1823 and passed to CEDD and EPD. There are two concerns. Firstly, it is suspected that dump trucks were not washed in wheel washing facilities before leaving the site and the site had not carried out water spraying which lead to dust nuisance to the nearby farmlands. Secondly, it is suspected that the Contractor discharged wastewater directly into the storm drain and Ng Tung River, affecting the residents and farmers of Tai Tong Wu. In our investigation, the Contractor had carried out dust suppression measures such as water spraying to minimize construction dust impact. Based on the observations from the site inspections and monitoring data, it is considered that the complaint regarding to dust is not evidenced. For the second concern, it was observed that the Contractor (C6) has provided AquaSed for wastewater treatment. Runoff from wheel washing was diverted to the temporary pit and then to the AquaSed. The treated effluent is used for wheel washing or diverted to the drainage outlet for discharge. Also, all storm drains were blocked. No discharge of wastewater or runoff into the storm drains and directly into Ng Tung River could be observed. Based on the observations from site inspection and the result of monitoring data, the complaint regarding to the direct discharge of wastewater in storm drains and Ng Tung River was not evidenced. (Contract 6)
- 28 April 2016 - a complaint was received from 1823 regarding to suspected muddy water discharged from the construction site, affecting the growth of crops and condition of soil in farmland at junction of Wo Keng Shan Road and Ng Chow Road. In our investigation, the construction activities in the above locations were mainly bored piling work and the construction activity unlikely generates any chemicals that contaminate the soil and adversely affect the growth of crops. Moreover, the Contractor has provided mitigation measures such as site hoardings, concrete blocks, sandbags and temporary drainage to prevent any runoff/discharge from the site. It was concluded that the complaint was unlikely related to the Contract. (Contract 6)

9.1.2 Upon receipt of the complaint, follow up action has been undertaken by both Contractor promptly to resolve the complaints and deficiencies. During the complaint investigation work, the Contractor was co-operated with the ET in providing all the necessary information and assistance for completion of the investigation. The investigation reports conducted by the ET were submitted to relevant parties.

9.1.3 The statistical summary table of environmental complaint, summons and prosecution are presented in **Tables 9-1, 9-2 and 9-3**.

Table 9-1 Statistical Summary of Environmental Complaints

Contract No	Reporting Period	Environmental Complaint Statistics		
		Frequency	Cumulative since commencement of project	Complaint Nature
2	Feb 2016	0	15	<ul style="list-style-type: none"> • (7) Water Quality • (6) Construction Dust • (2) Noise
	Mar 2016	1		
	Apr 2016	1		
3	Feb 2016	1	4	<ul style="list-style-type: none"> • (1) Construction Dust • (2) Water quality • (1) Noise
	Mar 2016	0		
	Apr 2016	0		
5	Feb 2016	0	2	<ul style="list-style-type: none"> • (2) Construction Dust
	Mar 2016	0		
	Apr 2016	0		
6	Feb 2016	2	13	<ul style="list-style-type: none"> • (11) Water Quality • (2) construction Dust
	Mar 2016	0		
	Apr 2016	5		
7	Feb 2016	0	0	N/A
	Mar 2016	0		
	Apr 2016	0		
SS C505	Feb 2016	0	0	N/A
	Mar 2016	0		
	Apr 2016	0		

Table 9-2 Statistical Summary of Environmental Summons

Contract No	Reporting Period	Environmental Summons Statistics				
		Frequency	Cumulative since commencement of project	Complaint Nature		
				Water	Air	Noise
2	Feb 2016	0	0	0	0	0
	Mar 2016	0		0	0	0
	Apr 2016	0		0	0	0
3	Feb 2016	0	0	0	0	0
	Mar 2016	0		0	0	0
	Apr 2016	0		0	0	0
5	Feb 2016	0	0	0	0	0
	Mar 2016	0		0	0	0
	Apr 2016	0		0	0	0
6	Feb 2016	0	0	0	0	0
	Mar 2016	0		0	0	0
	Apr 2016	0		0	0	0
7	Feb 2016	0	0	0	0	0
	Mar 2016	0		0	0	0
	Apr 2016	0		0	0	0
SS C505	Feb 2016	0	0	0	0	0
	Mar 2016	0		0	0	0
	Apr 2016	0		0	0	0

Table 9-3 Statistical Summary of Environmental Prosecution

Contract No	Reporting Period	Environmental Prosecution Statistics				
		Frequency	Cumulative since commencement of project	Complaint Nature		
				Water	Air	Noise
2	Feb 2016	0	0	0	0	0
	Mar 2016	0		0	0	0
	Apr 2016	0		0	0	0
3	Feb 2016	0	0	0	0	0
	Mar 2016	0		0	0	0
	Apr 2016	0		0	0	0
5	Feb 2016	0	0	0	0	0
	Mar 2016	0		0	0	0
	Apr 2016	0		0	0	0
6	Feb 2016	0	0	0	0	0
	Mar 2016	0		0	0	0
	Apr 2016	0		0	0	0
7	Feb 2016	0	0	0	0	0
	Mar 2016	0		0	0	0
	Apr 2016	0		0	0	0
SS C505	Feb 2016	0	0	0	0	0
	Mar 2016	0		0	0	0
	Apr 2016	0		0	0	0

9.1.4 Since the construction works at the Contract 4 is not yet commenced, no environmental complaint, summons and prosecution are received in the Reporting Period accordingly.

Warning Letter

9.1.5 A warning letter from EPD was issued to Contract 6 on 1 February 2016 regarding Non Compliance (NC) with APCO for the non-covered dump trucks travelling to Fill Bank at TM Area 38 on 14 and 18 January 2016 respectively. The Contractor has explained to the EPD that all dump trucks under the Contract were well covered before leaving the site, however, some drivers of the dump trucks immediately opened the cover when they just get into Fill Bank at TM Area 38 and captured by the CCTV. A briefing and warning letter has given to the relevant drivers to prevent reoccurrence of similar case.

10 IMPLEMENTATION STATUS OF MITIGATION MEASURES

10.1 GENERAL REQUIREMENTS

10.1.1 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*.

10.1.2 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 10-1*.

Table 10-1 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.

11 CONCLUSIONS AND RECOMMENDATIONS

11.1 CONCLUSIONS

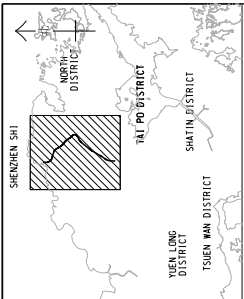
- 11.1.1 This is the 11th Quarterly EM&A Summary Report presenting the monitoring results and inspection findings for the Reporting Period from **1 February 2016 to 30 April 2016**.
- 11.1.2 For air quality monitoring, no 1-hour and 24-hour TSP monitoring results triggered the Action or Limit Levels were recorded. No NOEs or the associated corrective actions were therefore issued.
- 11.1.3 One noise complaint (which is an Action Level exceedance) was received. Hence, one Action Level exceedance of construction noise was recorded in the Reporting Period. The investigation report for the complaint was conducted by ET and it was concluded that the complaint was not related to the project. The IR has submitted to relevant parties.
- 11.1.4 For water quality monitoring, a total of ninety-two (92) Action/ Limit Level exceedances namely 48 exceedances of turbidity and 44 exceedances of SS were recorded. NOEs were issued to relevant parties upon confirmation of the results. The investigation reports for cause of exceedances were conducted by ET and submitted to relevant parties.
- 11.1.5 During the Reporting Period, weekly joint site inspections for Contract 2, Contract 3, Contract 5, Contract 6, Contract 7 and Contract SS C505 were undertaken to evaluate the site environmental performance. No non-compliances were observed during the weekly site inspection and environmental audit of the Reporting Period, indicating the implemented mitigation measures for air quality, construction noise and water quality were effective. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.
- 11.1.6 In this Reporting Period, nine (9) documented environmental complaints were received and lodged. Follow up actions have been undertaken by the Contractor to resolve the deficiencies. The investigation reports conducted by the ET were all completed and submitted to all relevant parties. In brief, all complaints were unlikely due to the project. However, the Contractor was reminded to fully implement the recommended mitigation measures as per the EM&A Manual.
- 11.1.7 A warning letter from EPD was issued to Contract 6 on 1 February 2016 regarding Non Compliance (NC) with APCO for the non-covered dump trucks travelling to Fill Bank at TM Area 38 on 14 and 18 January 2016 respectively. The Contractor explained that all dump trucks under the Contract were well covered before leaving the site, however, some drivers immediately opened the cover when they just get into Fill Bank and captured by the CCTV. The Contractor has issue warning letter to the relevant drivers to ensure no reoccurrence of similar case.
- 11.1.8 No environmental summons or successful prosecutions were recorded in the Reporting Period.

11.2 RECOMMENDATIONS

- 11.2.1 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 properly.
- 11.2.2 The Contractor was also reminded to prevent muddy water or other water pollutants from site surface flow to local stream such as Kong Yiu Channel and Ma Wat Channel or public area. Water quality mitigation measures to prevent surface runoff into nearby water bodies or public areas should paid attention and fully implemented.
- 11.2.3 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.

Appendix A

Layout plan of the Project

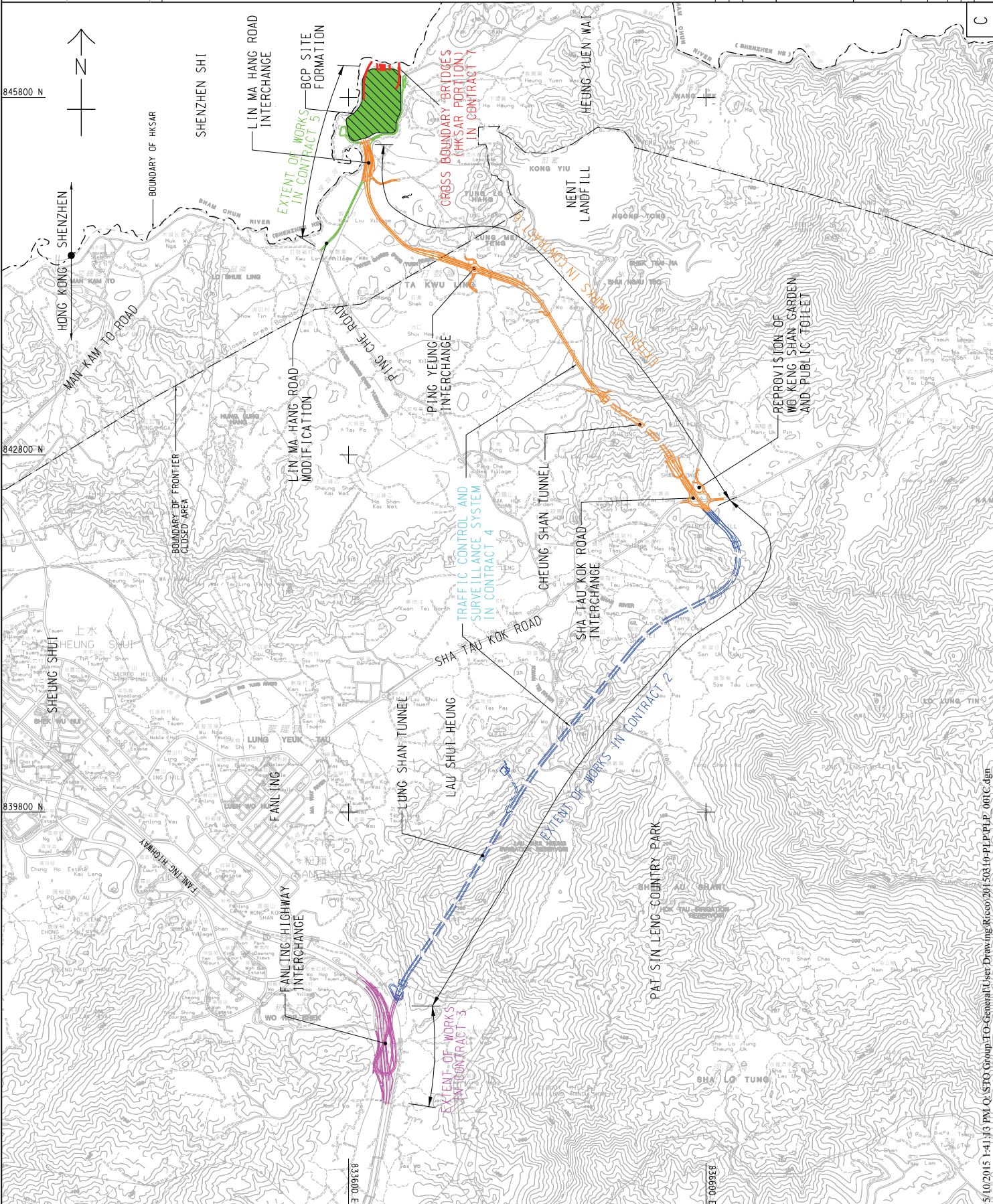


LOCATION PLAN
SCALE 1 : 3000

LEGEND:

--- UNDERGROUND WORKS

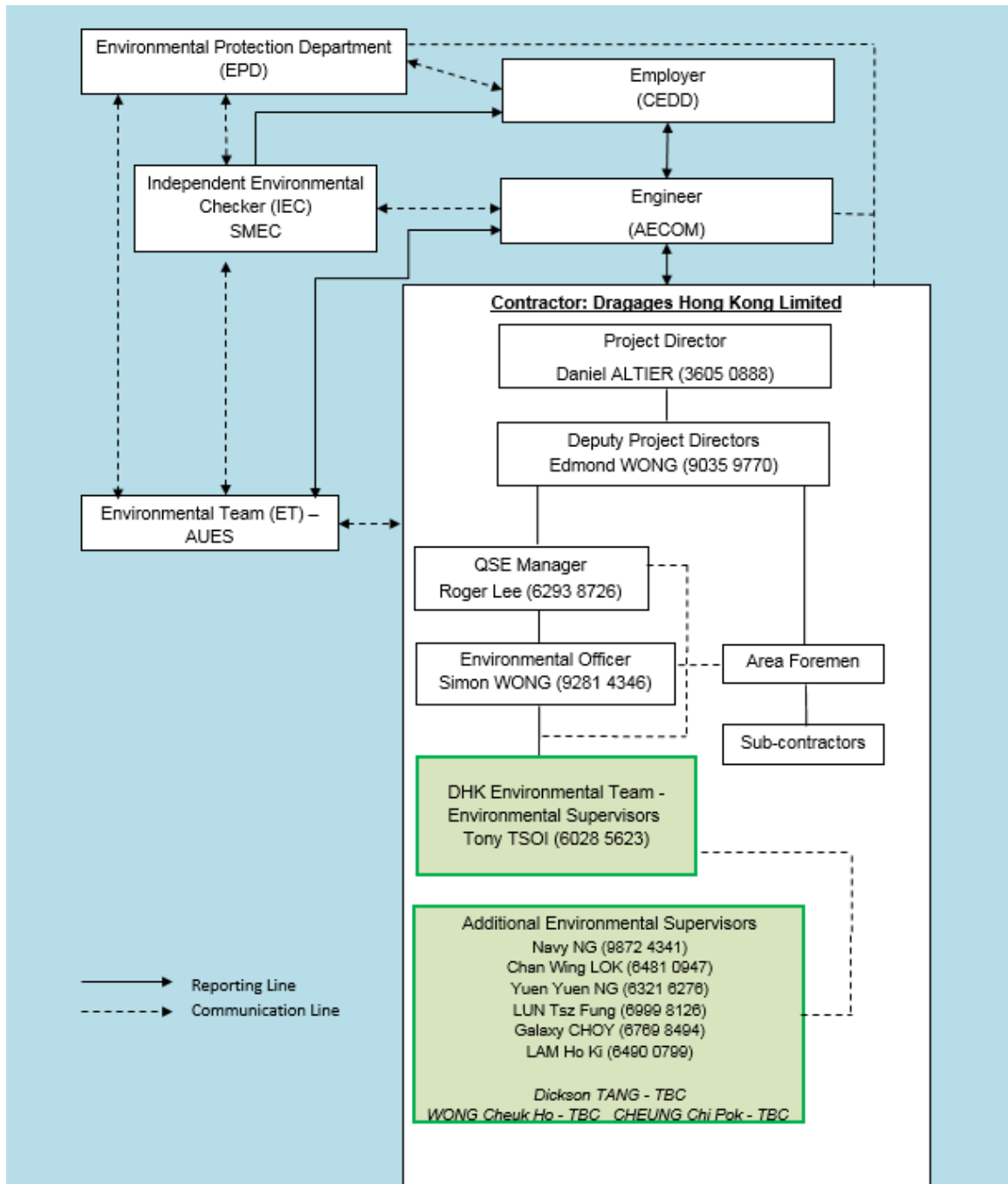
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DATE	2/1/2015
SCALE	1:3000
PROJECT	PROJECT LAYOUT PLAN
DESIGNER	CECO Civil Engineering and Construction Department
CLIENT	LANJIAN/HEUNG YUEN WAI BOUNDARY CROSS BRIDGES (HKSAR PORTION) (SITE FORMATION AND INFRASTRUCTURES) DESIGN AND CONSTRUCTION
PROJECT NO.	60212563/PLP/001
DATE	2/1/2015
SCALE	1:3000
PROJECT	PROJECT LAYOUT PLAN
DESIGNER	CECO Civil Engineering and Construction Department
CLIENT	LANJIAN/HEUNG YUEN WAI BOUNDARY CROSS BRIDGES (HKSAR PORTION) (SITE FORMATION AND INFRASTRUCTURES) DESIGN AND CONSTRUCTION
PROJECT NO.	60212563/PLP/001
DATE	2/1/2015
SCALE	1:3000
PROJECT	PROJECT LAYOUT PLAN
DESIGNER	CECO Civil Engineering and Construction Department
CLIENT	LANJIAN/HEUNG YUEN WAI BOUNDARY CROSS BRIDGES (HKSAR PORTION) (SITE FORMATION AND INFRASTRUCTURES) DESIGN AND CONSTRUCTION



Appendix B

Environmental Management Organization Chart

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	Gregory Lo	2171 3300	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
DHK	Project Director	Daniel Altier	2171 3004	2171 3299
DHK	Deputy Project Manager	Edmond Wong	2171 3004	2171 3299
DHK	QSE Manager	Roger Lee	6293 8726	2171 3299
DHK	Environmental Officer	Simon Wong	2171 3004	2171 3299
DHK	Environmental Supervisor	Tony Tsoi	6028 5623	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

Legend:

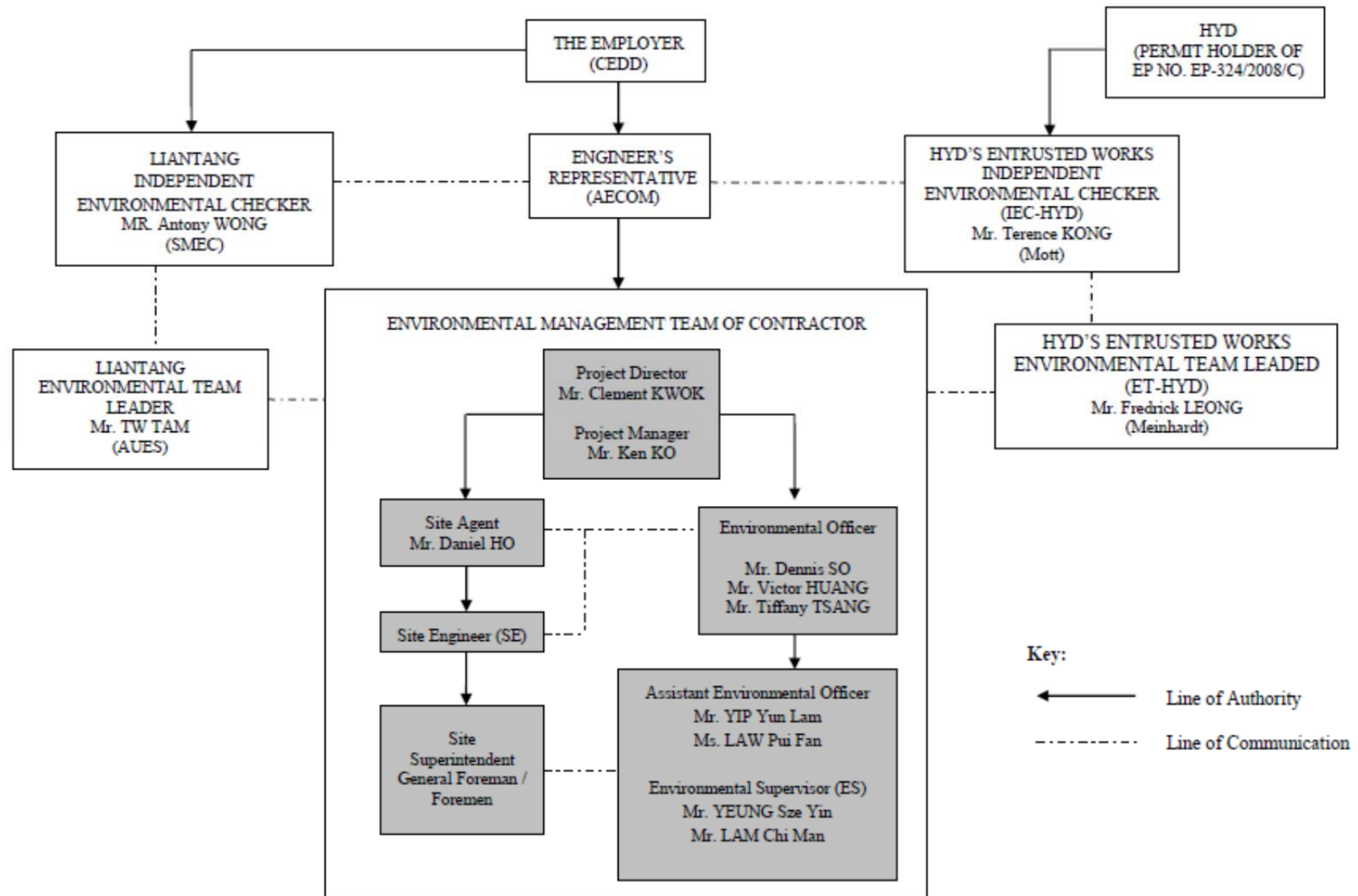
CEDD (Employer) – Civil Engineering and Development Department

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	Clement Kwok	3758 8735	2638 7077
Chun Wo	Project Manager	Ken Ko	2638 6136	2638 7077
Chun Wo	Site Agent	Daniel Ho	2638 6144	2638 7077
Chun Wo	Environmental Officer	Victor Huang Tiffany Tsang Dennis So	2638 6115	2638 7077
Chun Wo	Assistant Environmental Officer	Yip Yun Lam Law Pui Fan	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

Legend:

CEDD (Employer) – Civil Engineering and Development Department

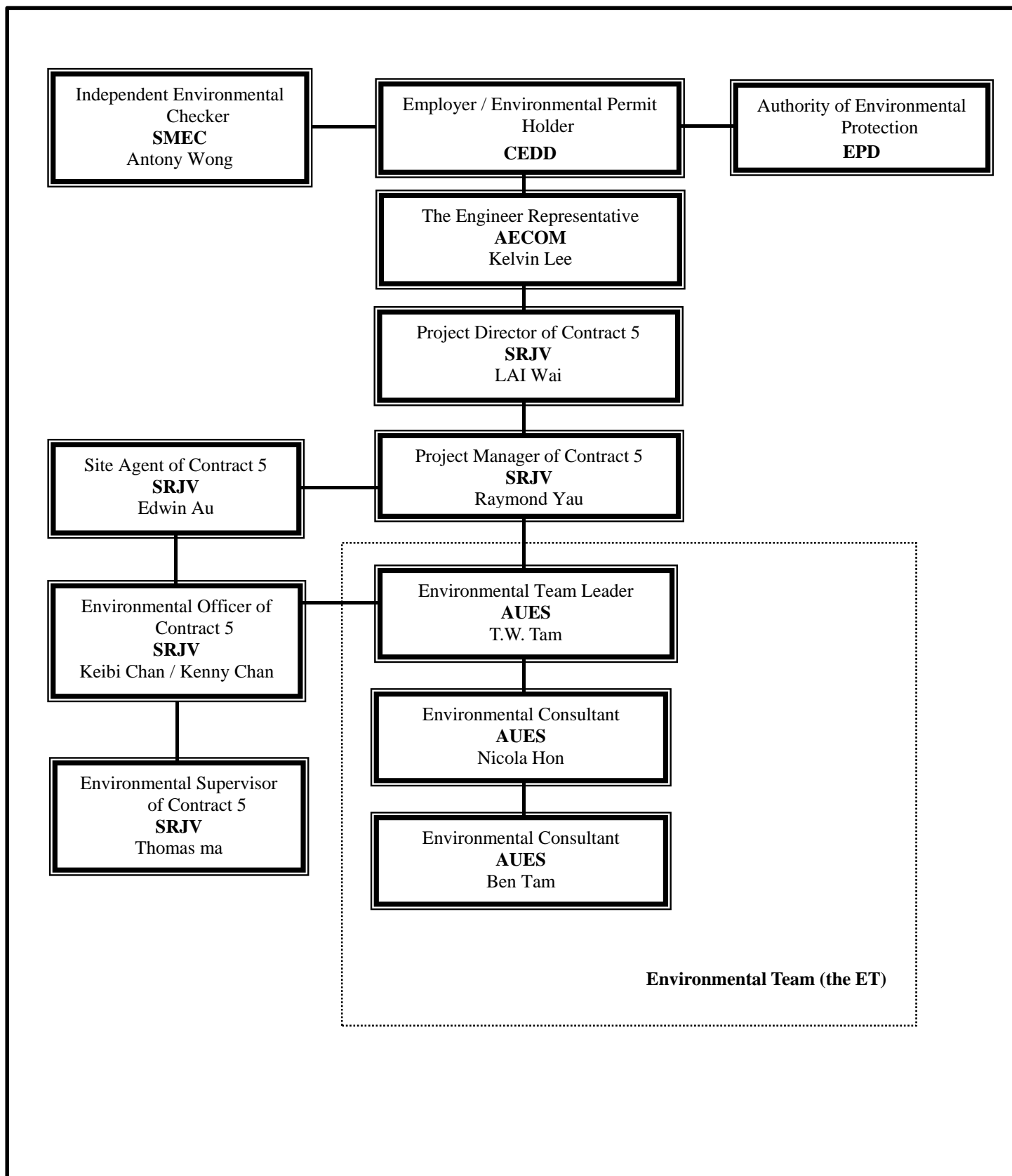
AECOM (Engineer) – AECOM Asia Co. Ltd.

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 5 - (CV/2013/03)



Contact Details of Key Personnel for Contract 5 - CV/2013/03

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
AECOM	Engineer's Representative	Kelvin Lee	2674 2273	2674 7732
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
SRJV	Project Director	LAI Wai	--	2403 1162
SRJV	Contract Manager	Raymond Yu	9041 1620	2403 1162
SRJV	Project Manager	Aaron Mak	9464 7095	2403 1162
SRJV	Site Agent	Edwin Au	9208 7329	2403 1162
SRJV	Environmental Officer	Chan Ng jhon-keibi / Kenny Chan	6090 0183	2403 1162
SRJV	Environmental Supervisor	Thomas Ma	-	2403 1162
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

Legend:

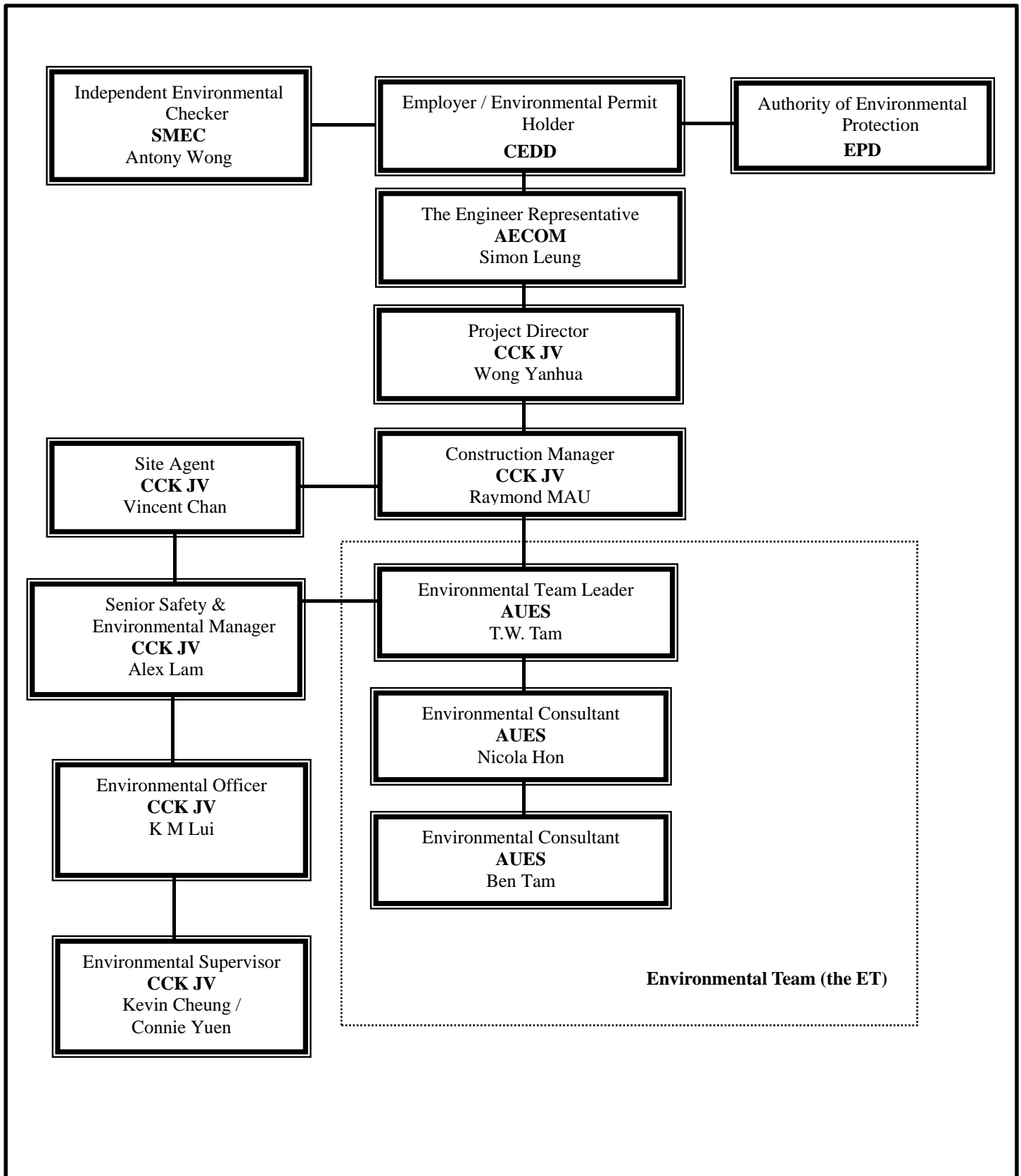
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

SRJV (Main Contractor) – Sang Hing Civil – Richwell Machinery JV

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/2013/03

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
CCK JV	Project Director	Wang Yanhua	6190 4212	2108 9595
CCK JV	Construction Manager	Raymond Mau Sai-Wai	9011 5340	2108 9595
CCK JV	Site Agent	Vincent Chan	9655 9404	2108 9595
CCK JV	Senior Safety & Environmental Manager	Alex Lam	5547 0181	2108 9595
CCK JV	Environmental Officer	K M Lui	5113 8223	2108 9595
CCK JV	Environmental Supervisor	Kevin Cheung/ Connie Yuen	6316 6931 6117 1344	2108 9595
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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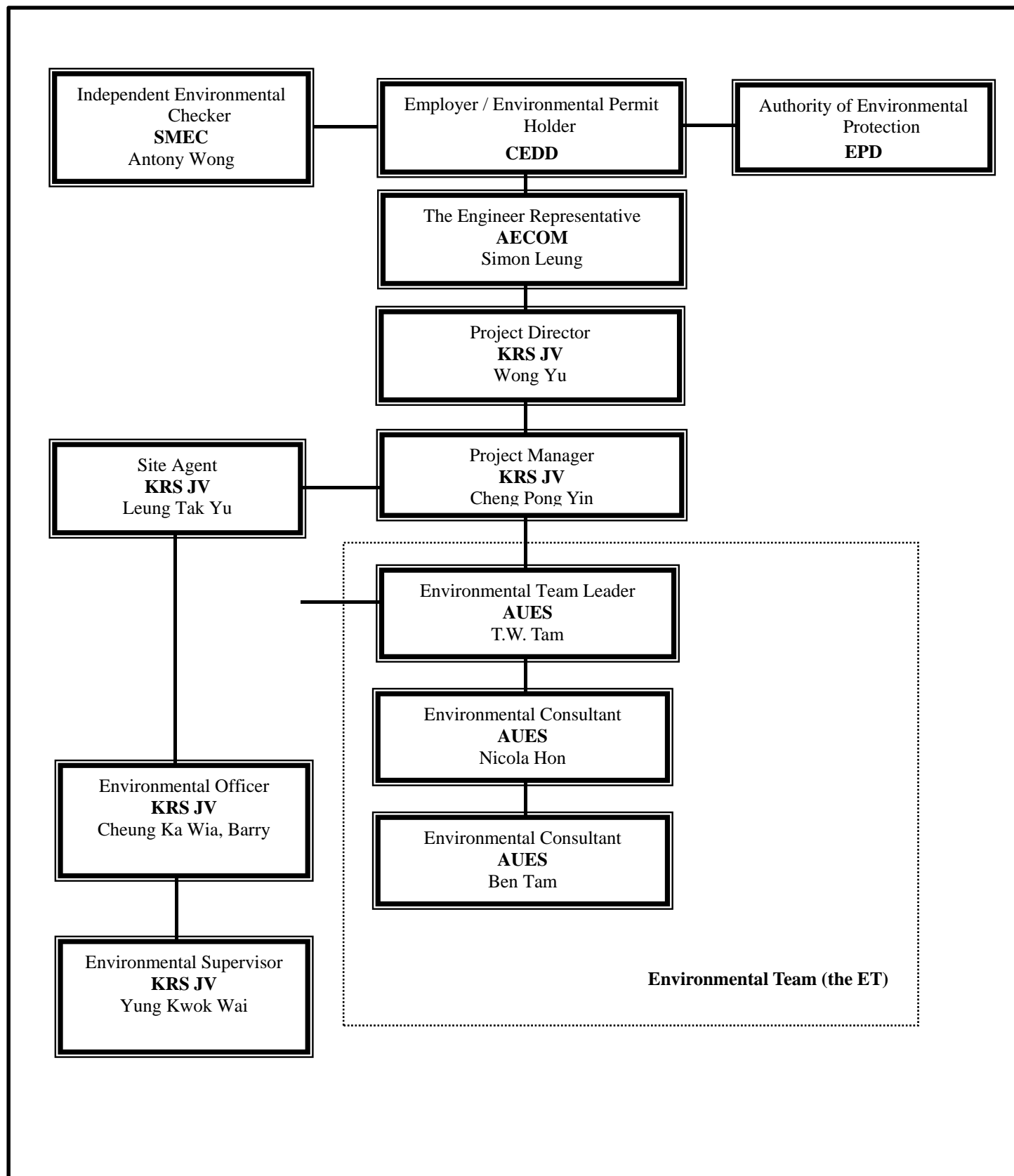
CEDD (Employer) – Civil Engineering and Development Department

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
CCK JV	Project Director	Wong Yu	2682 6691	2682 2783
CCK JV	Project Manager	Cheng Pong Yin	9023 4821	2682 2783
CCK JV	Site Agent	Leung Tak Yu	9705 7536	2682 2783
CCK JV	Environmental Officer	Cheung Ka Wia, Barry	6117 2339	2682 2783
CCK JV	Environmental Supervisor	Yung Kwok Wai	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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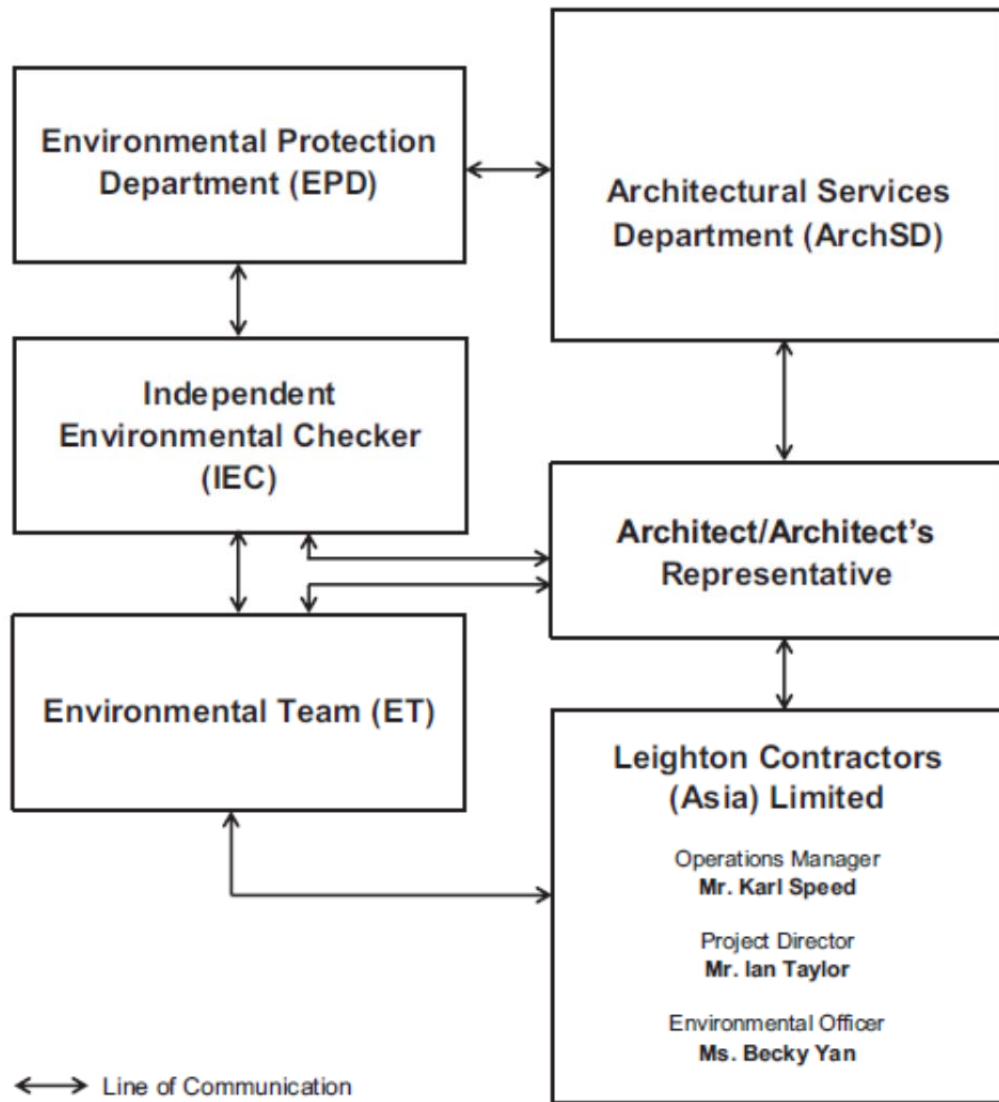
CEDD (Employer) – Civil Engineering and Development Department

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 Cheng	3189 9272	2834 5442
SMEC	Independent Environmental Checker	Mr. Antony Wong	3995 8120	3995 8101
Leighton	Operation Manager	Mr. Karl Speed	2823 1433	25298784
Leighton	Project Director	Mr. Ian Taylor	2858 1519	2858 1899
Leighton	Environmental Officer	Ms. Becky Yan	3973 1069	-
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

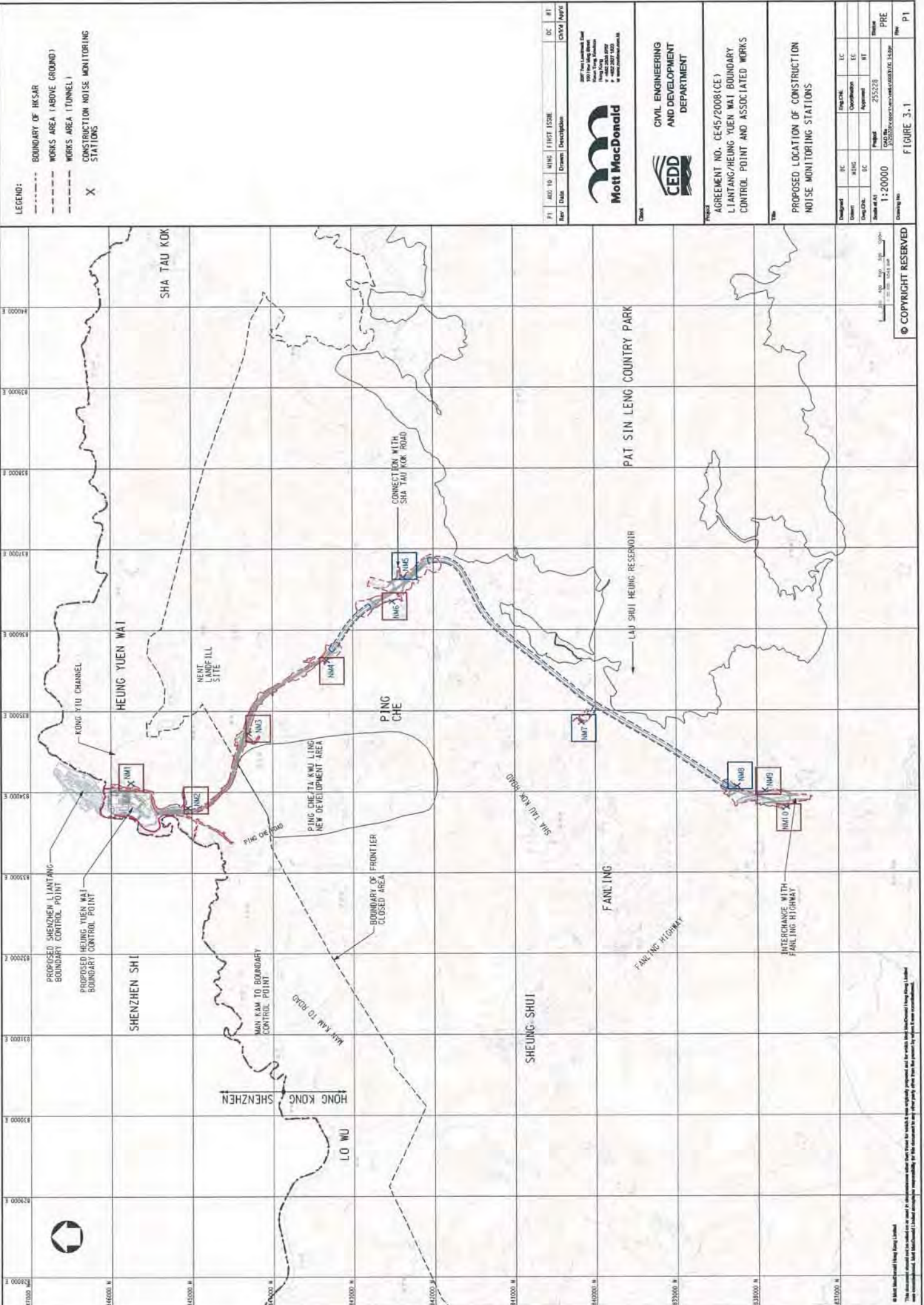
Leighton (Main Contractor) – Leighton Contractors (Asia) Limited

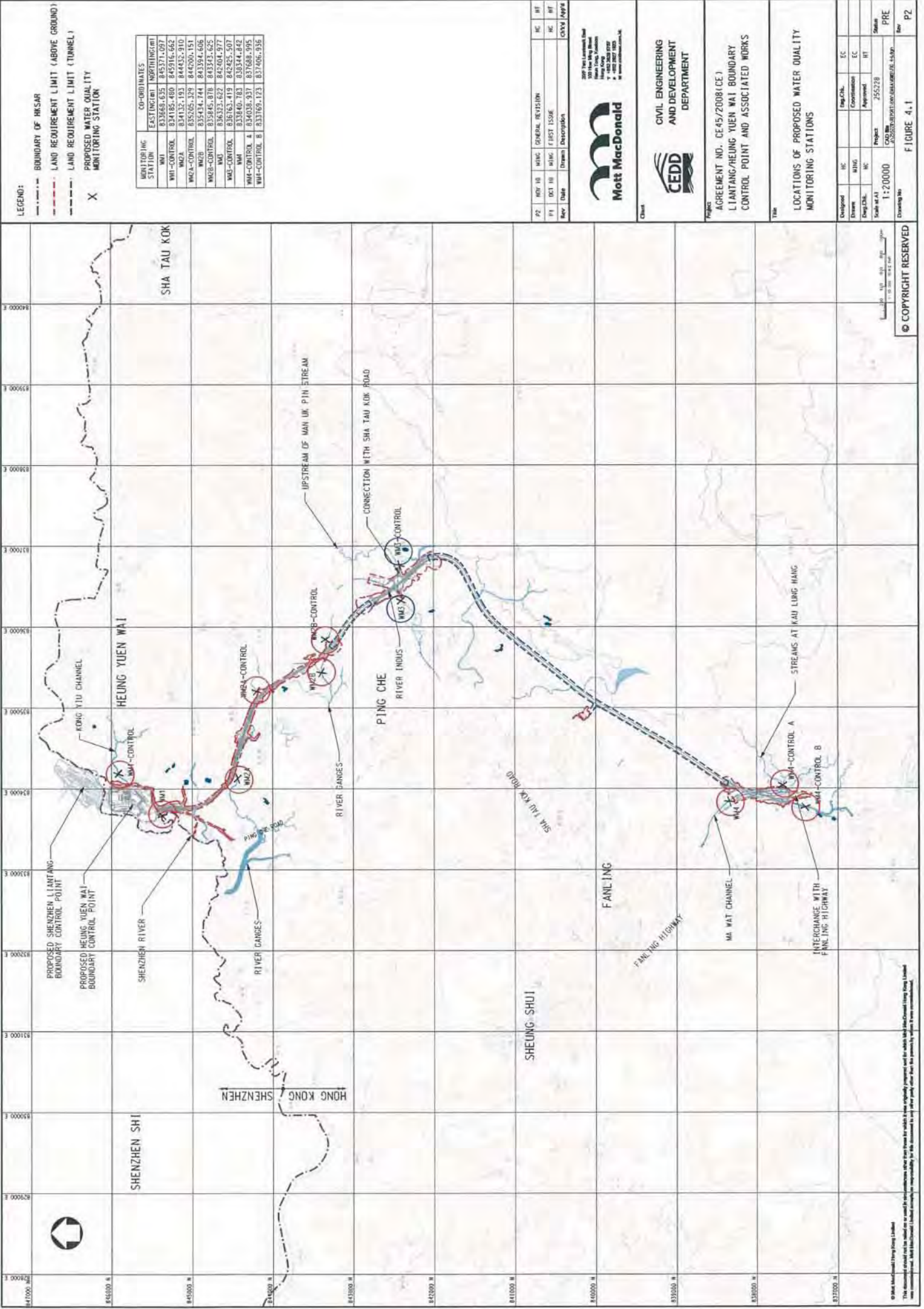
SMEC (IEC) – SMEC Asia Limited

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

Appendix C

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





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

MONITORING STATION	CO-ORDINATES	
	EASTING (M)	NORTHING (M)
WMA	837668.635	845171.097
WMA-CONTROL	834185.400	845916.662
WMA	834132.193	844832.910
WMA-CONTROL	835205.329	844200.151
WMA	835334.744	843384.606
WMA-CONTROL	835845.878	843323.625
WMA	836323.622	842404.977
WMA-CONTROL	836163.419	842425.507
WMA	833940.763	838344.842
WMA-CONTROL A	834038.937	837688.995
WMA-CONTROL B	833769.123	837406.936

No.	Date	Drawn	Description	Checked	Appr'd
P2	07/10	MHC	GENERAL REVISION	HC	HT
P1	02/10	MHC	FIRST ISSUE	HC	HT



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Civil Engineering and Development Department

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

Locations of Proposed Water Quality Monitoring Stations

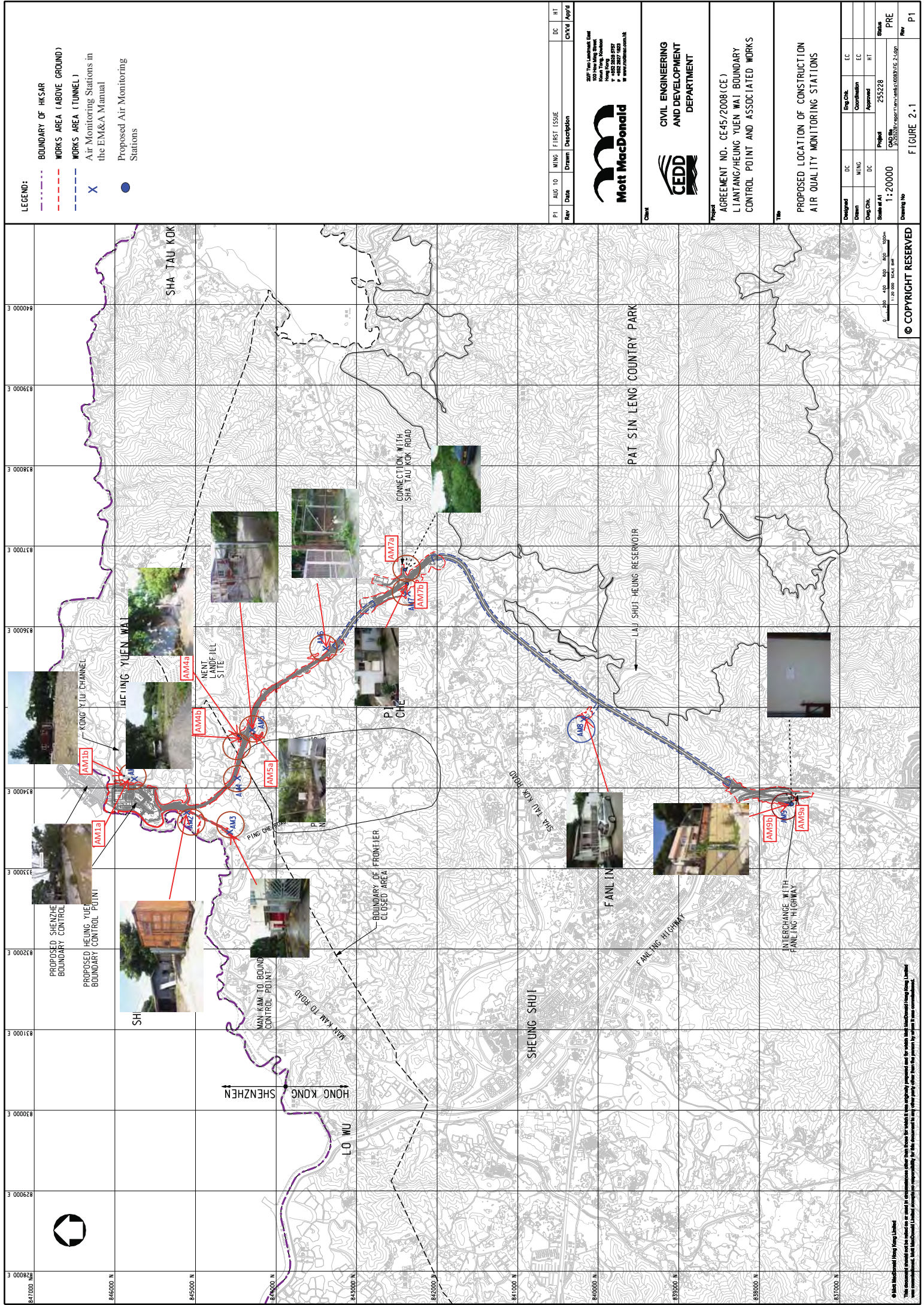
Drawn No.	Scale at A1	Project	Station	PRE
1:20000	2552/8	CAU No. 2552/2008(CE) (CE-45/08)	PRE	P2

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FIGURE 4.1

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Appendix D

Monitoring Locations for Impact Monitoring



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

Rev	Date	Drawn	Description	DC	HT
P1	AUG 10	MING	FIRST ISSUE	DC	HT

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CEDD

CIVIL ENGINEERING
 AND DEVELOPMENT
 DEPARTMENT

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

Title
 PROPOSED LOCATION OF CONSTRUCTION
 AIR QUALITY MONITORING STATIONS

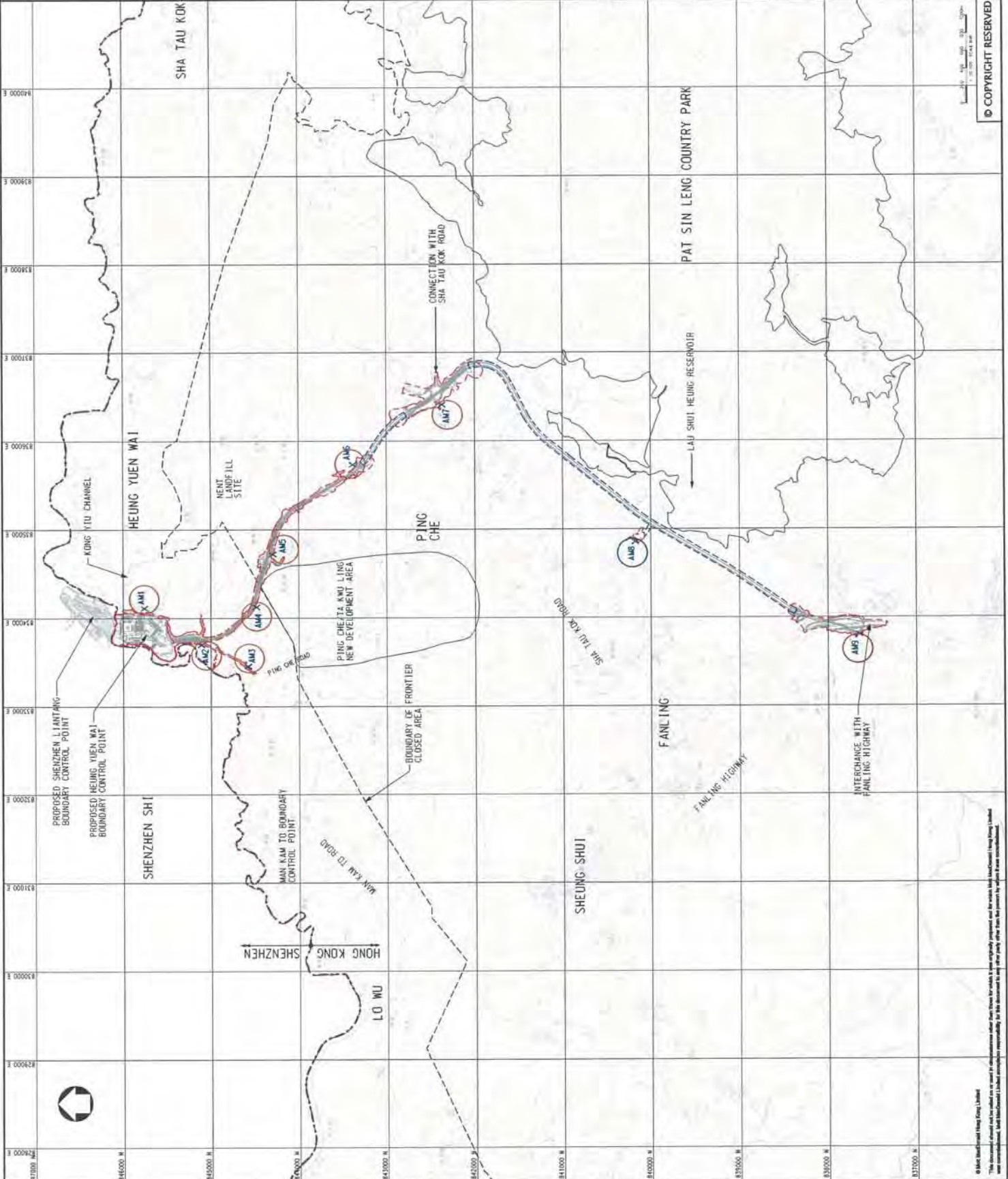
Designed	DC	EC
Drawn	MING	EC
Check/Chk.	DC	HT
Scale at A1	1:20000	Project
Scale at A4	1:20000	253228
Drawing No	CE45/2008/Agree/1/Rev.003/003/02_253228	Sheet
		PRE
		P1

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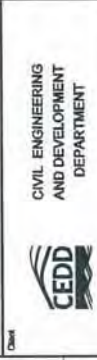
LEGEND:

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



PI	REV. TO	REV.	DESCRIPTION	DATE	BY

100% Project Completion Date
 100% Project Completion Date
 100% Project Completion Date
 100% Project Completion Date
 100% Project Completion Date



CIVIL ENGINEERING
 AND DEVELOPMENT
 DEPARTMENT

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

Designed	Checked	Drawn	Scale	Project	Contract No.	Revision	Date
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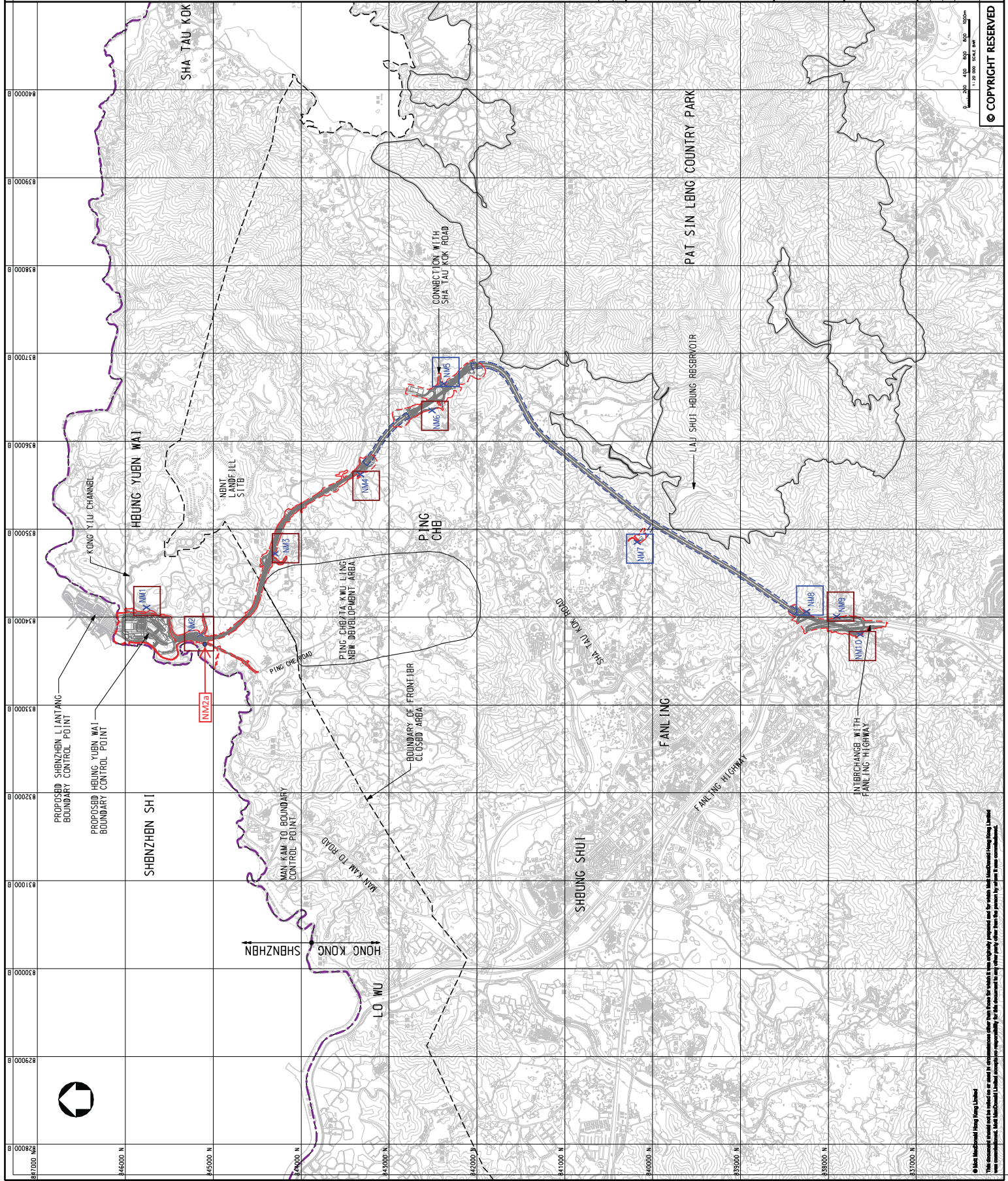
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 FIGURE 2.1



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LEGEND:

- BOUNDARY OF HK SAR
- WORKS AREA (ABOVE GROUND)
- WORKS AREA (TUNNEL)
- CONSTRUCTION NOISE MONITORING STATIONS
- X Proposed Noise Monitoring Stations
- Stations



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PI	Aug 10	MING	FIRST	ISSUB	BC	HT
Rev	Date	Drawn	Description	Checked	App'd	

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CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

CEDD

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

Title
 PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	BC	Eng. Chk.	BC
Drawn	MING	Coordination	BC
App. Chk.	IC	Approved	HT
Scale at A1	1:20000	Project	253228
Sheet No.	000000	Drawn	PRB
Drawing No.		Rev	P1

Scale: 1:20,000
 0 400 800 1200 1600
 1:20,000 Scale

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FIGURE 3.1

LEGEND:

- BOUNDARY OF HKSAR
- LAND REQUIREMENT LIMIT (ABOVE GROUND)
- LAND REQUIREMENT LIMIT (TUNNEL)
- X Water Quality Monitoring Location Recommended in EMS&A Manual
- O Alternative Water Quality Monitoring Location for EMS&A Programme
- △ New Proposed Water Quality Monitoring Location in November 2015

Station ID	Location recommended in EMS&A Manual	Location found during site visit	
Existing	Existing	Northings	
WM2A	84485.480	84516.627	84418.5
WM2B	84412.320	84442.010	84171.7
WM2A-C	85705.320	84420.131	85270.0
WM2B-C	85548.744	84358.606	85143.5
WM2E	85545.978	84353.573	85193.5
WM2F	85512.627	84240.377	85123.0
WM2G	85548.744	84353.573	85193.5
WM2A-C (Proposed)	85705.320	84420.131	85270.0
WM2B-C (Proposed)	85548.744	84358.606	85143.5
WM2E (Proposed)	85545.978	84353.573	85193.5
WM2F (Proposed)	85512.627	84240.377	85123.0
WM2G (Proposed)	85548.744	84353.573	85193.5
WM2A-C (New Proposed)	85705.320	84420.131	85270.0
WM2B-C (New Proposed)	85548.744	84358.606	85143.5
WM2E (New Proposed)	85545.978	84353.573	85193.5
WM2F (New Proposed)	85512.627	84240.377	85123.0
WM2G (New Proposed)	85548.744	84353.573	85193.5

New Proposed Water Quality Monitoring Location in November 2015

Location ID	Existing	Northings
WM2A-C (Original)	083570	084243
WM2A-C (Proposed)	083577	084188
WM2B (Original)	083634	084207
WM2B (Proposed)	083626	084270

Rev	Date	Drawn	Description	CHKD	Apprd
P2	NOV 10	MING	GENERAL REVISION	HC	HT
P1	OCT 10	MING	FIRST ISSUE	HC	HT

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 F +852 2028 1028
 mottmacdonald.com.hk

Civil Engineering and Development Department

Client

Civil Engineering and Development Department

Project
 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	EC
Drawn	MING	EC
Drawn	MING	EC
Checked	HT	HT
Approved	HT	HT

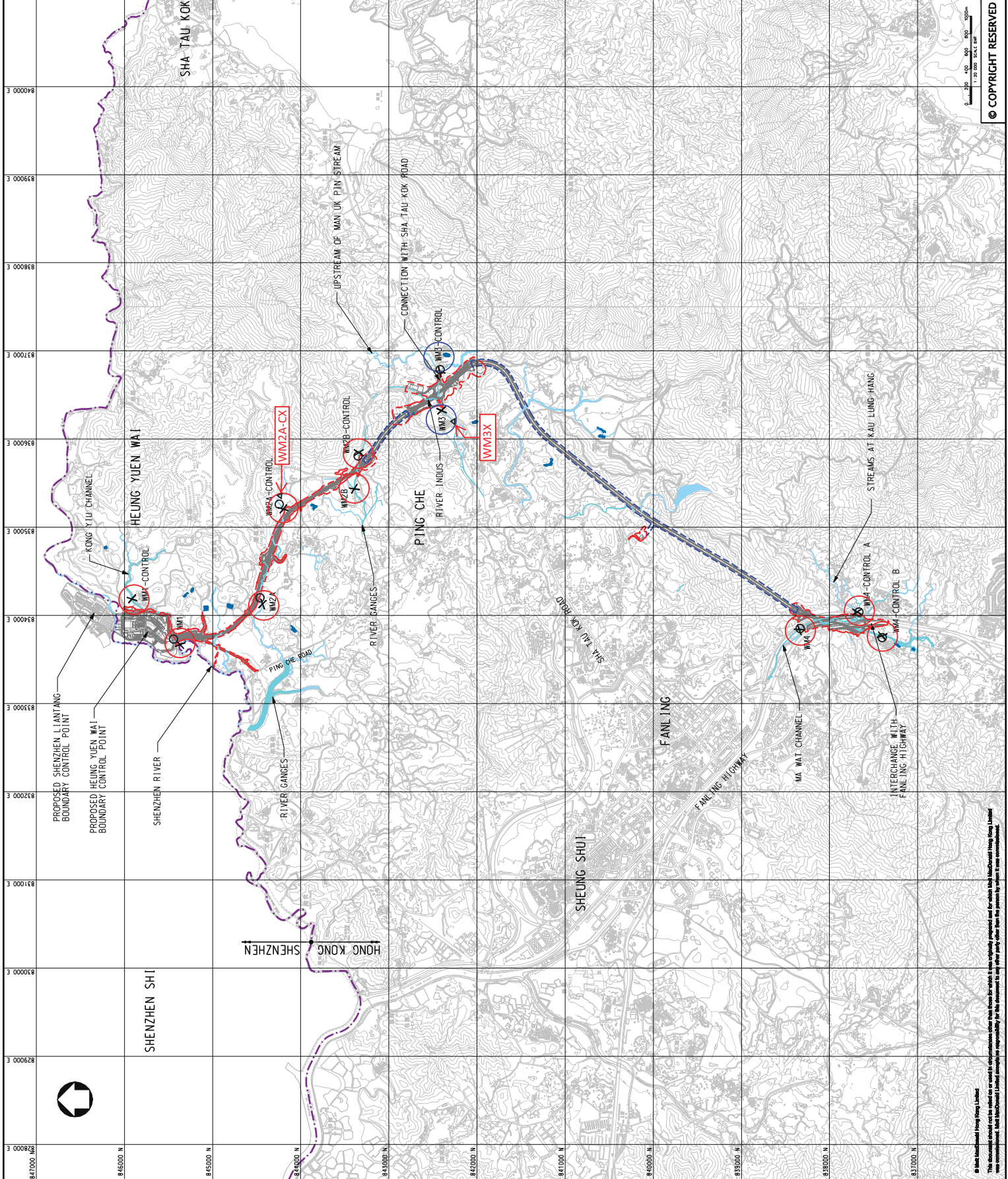
Scale at A1
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Project
 255228

Status
 PRE

Drawing No
 Appendix C

Rev
 P2



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Photographic Records for Water Quality Monitoring Location



Alternative Location of WM1



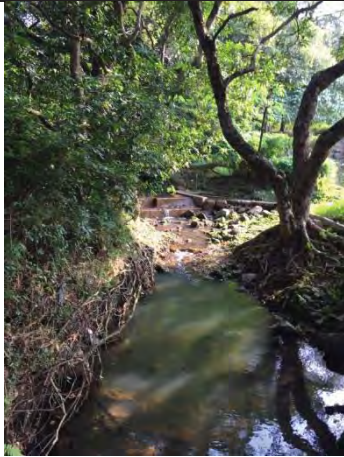
Alternative Location of WM1 – Control (WM1-C)



Alternative Location of WM2A



Alternative Location of WM2-Control (WM2-C)



Alternative Location of WM2- Control X (WM2-CX)



Location of WM2B-Control (WM2B-C)



Location of WM2B



Location of WM3-Control (WM3-C)



Location of WM3



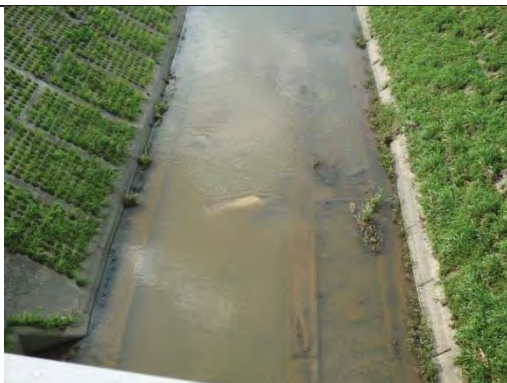
Alternative Location of WM3X



Location of WM4-Control A (WM4-CA)



Location of WM4-Control B (WM4-CB)



Location of WM4

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. 	

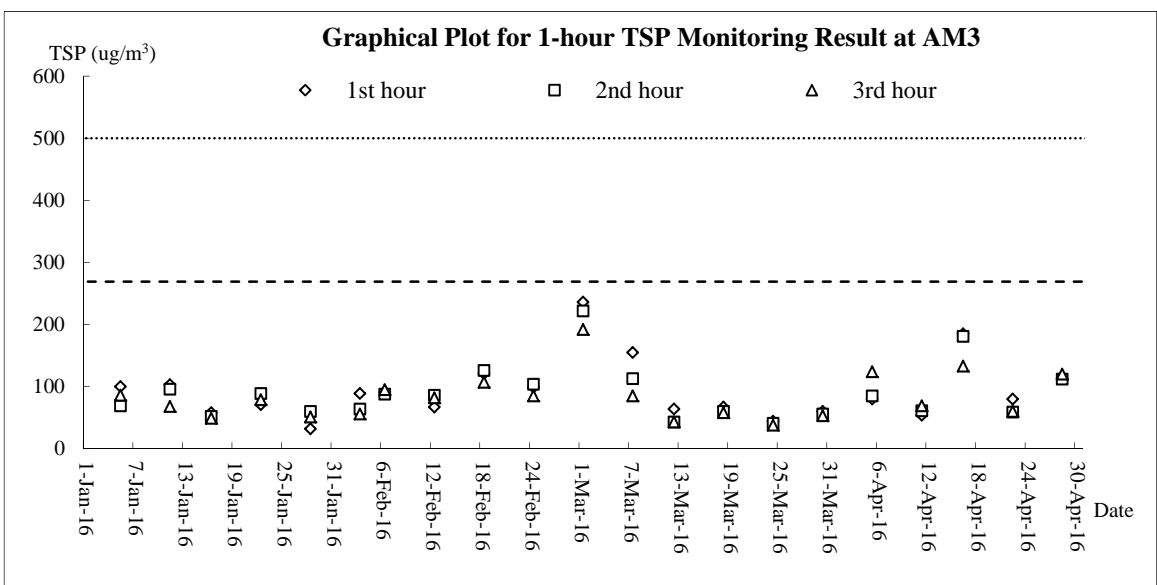
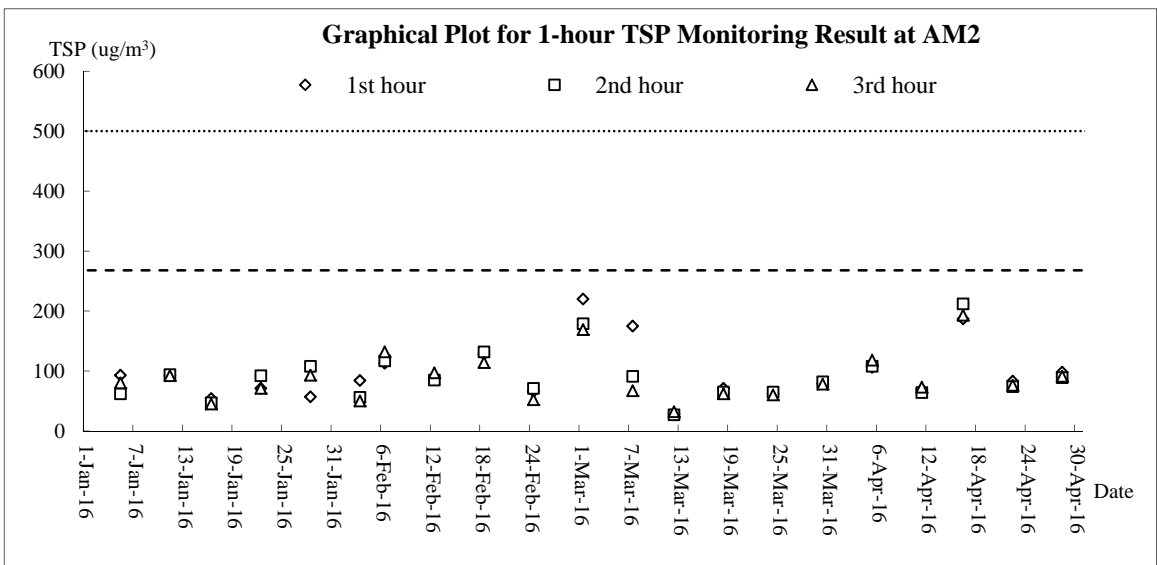
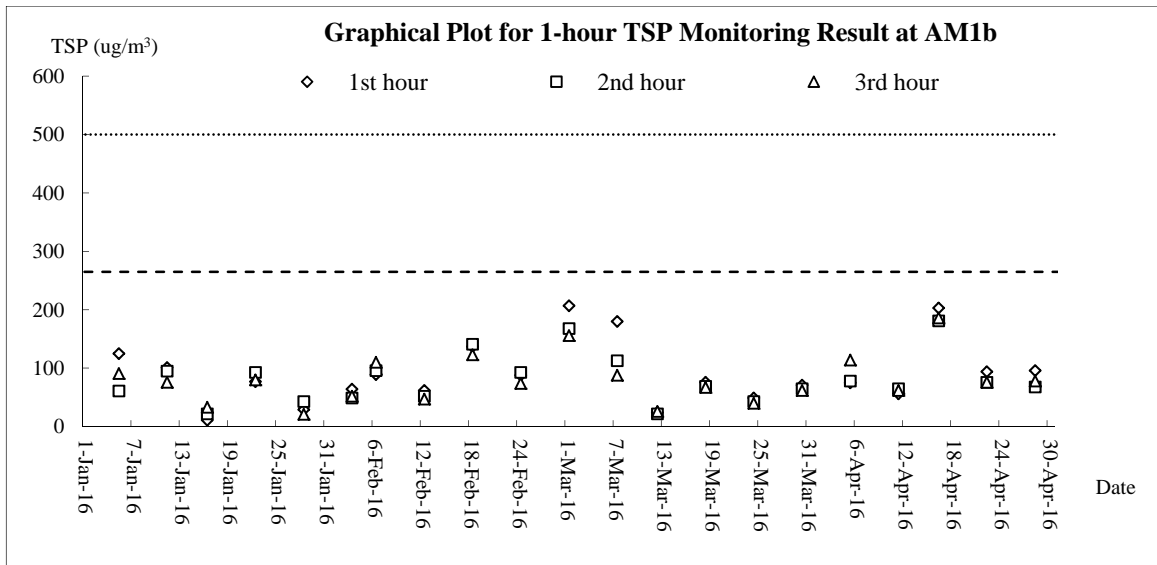
Event and Action Plan for Water Quality

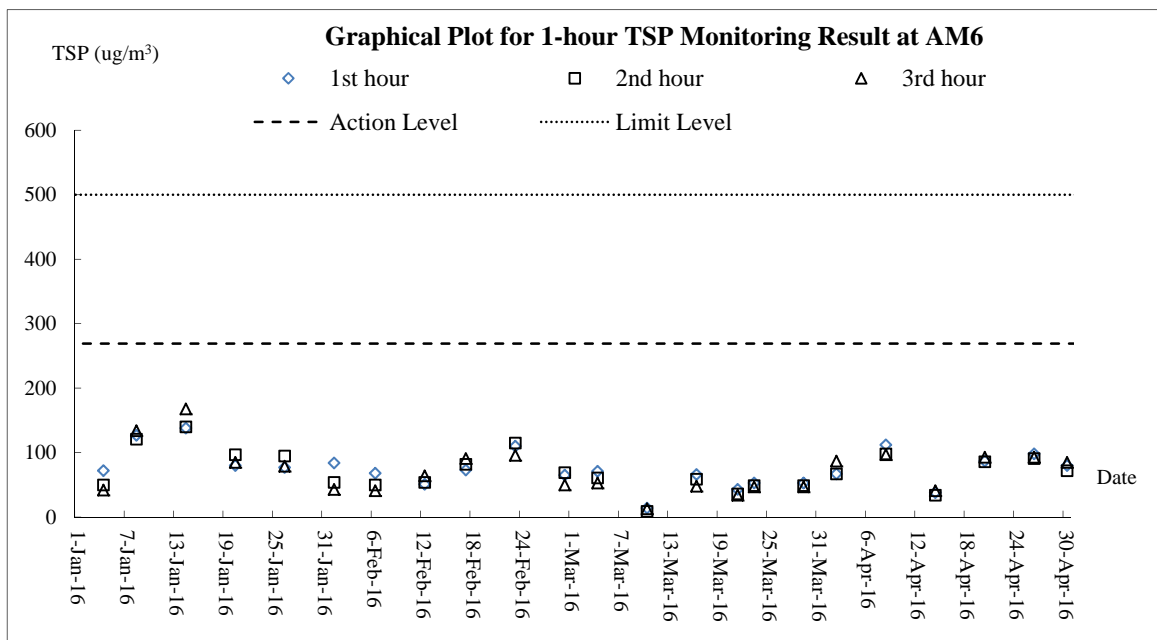
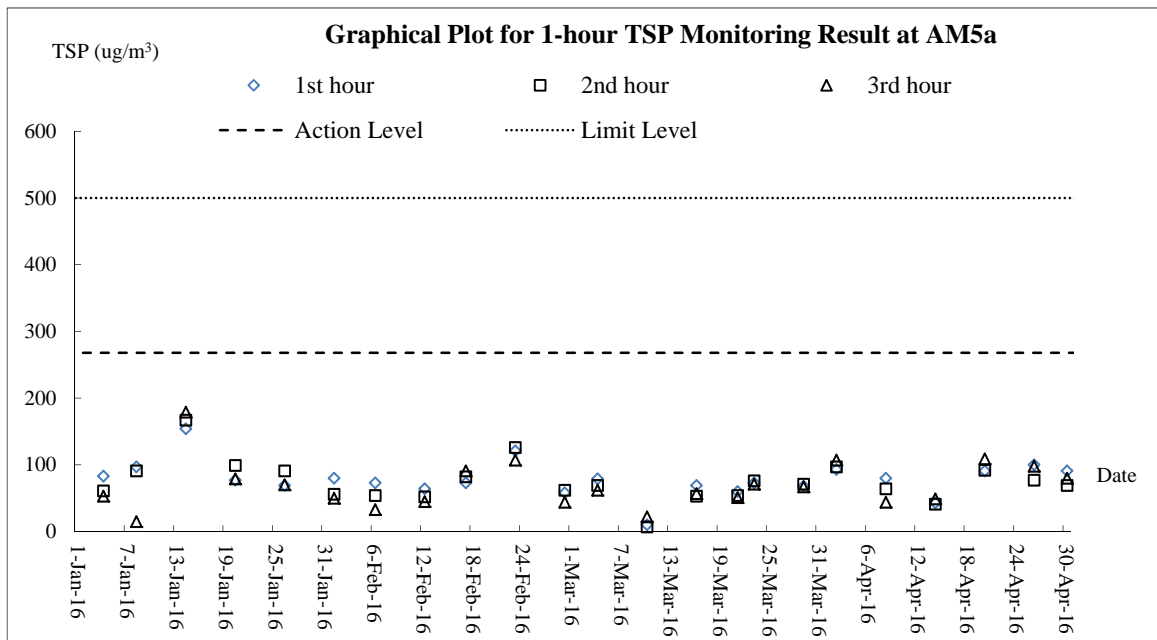
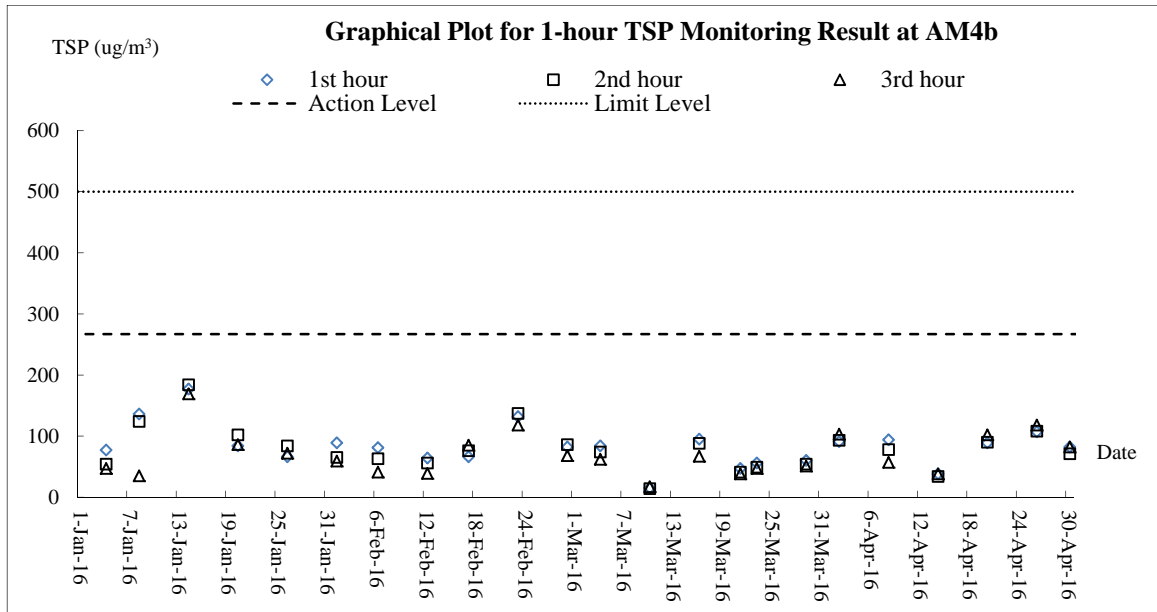
EVENT	ET	IEC	ER	ACTION CONTRACTOR
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER; 6. Implement the agreed mitigation measures.
Action Level being exceeded by more than two consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; 8. Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit Level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level. 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days. 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures; 5. 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"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures; 7. As directed by the ER, to slow down or to stop all or part of the construction activities.

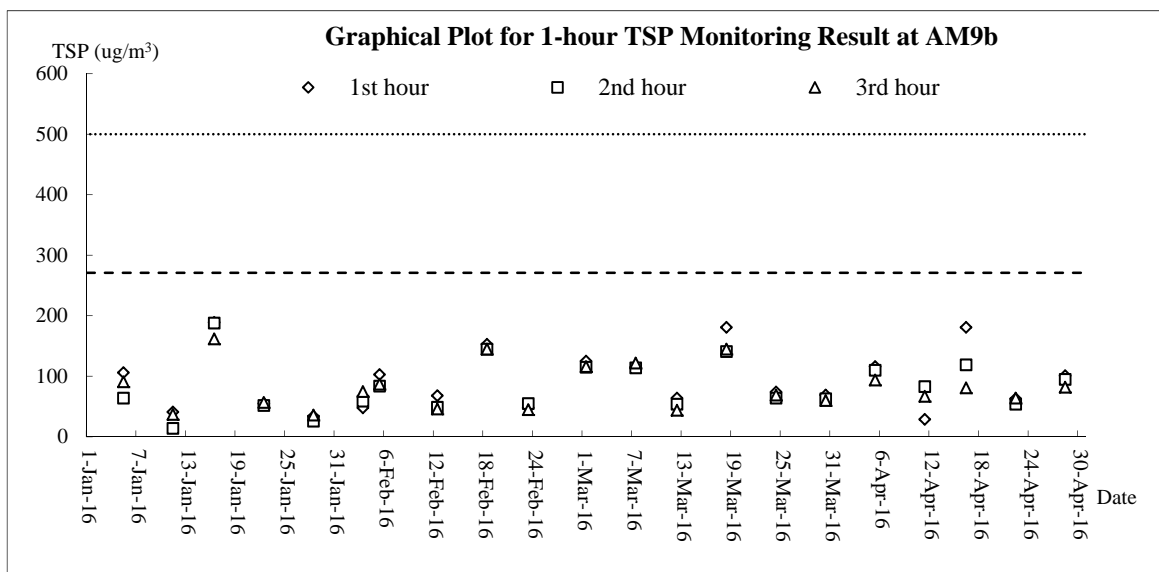
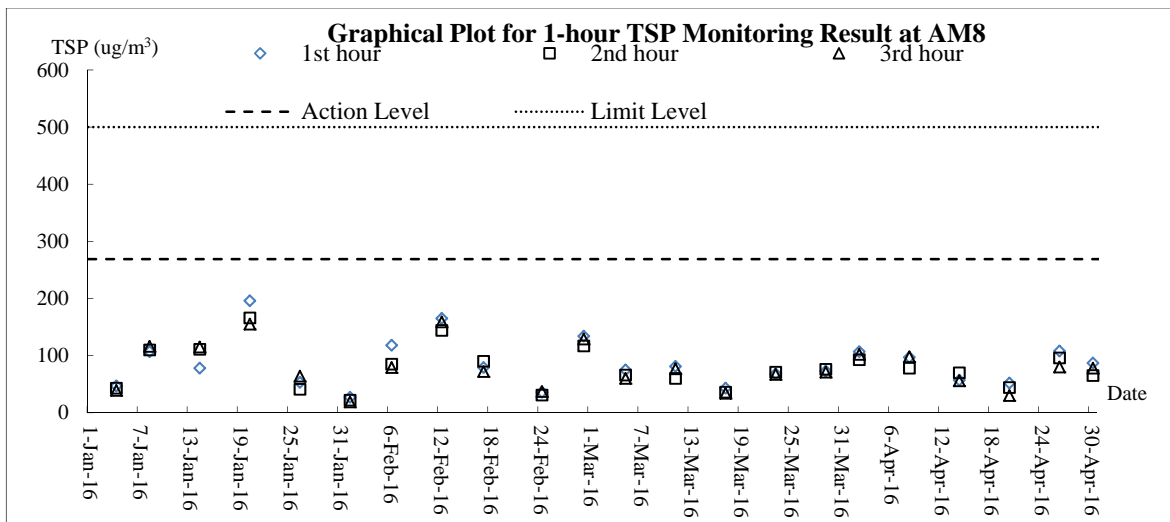
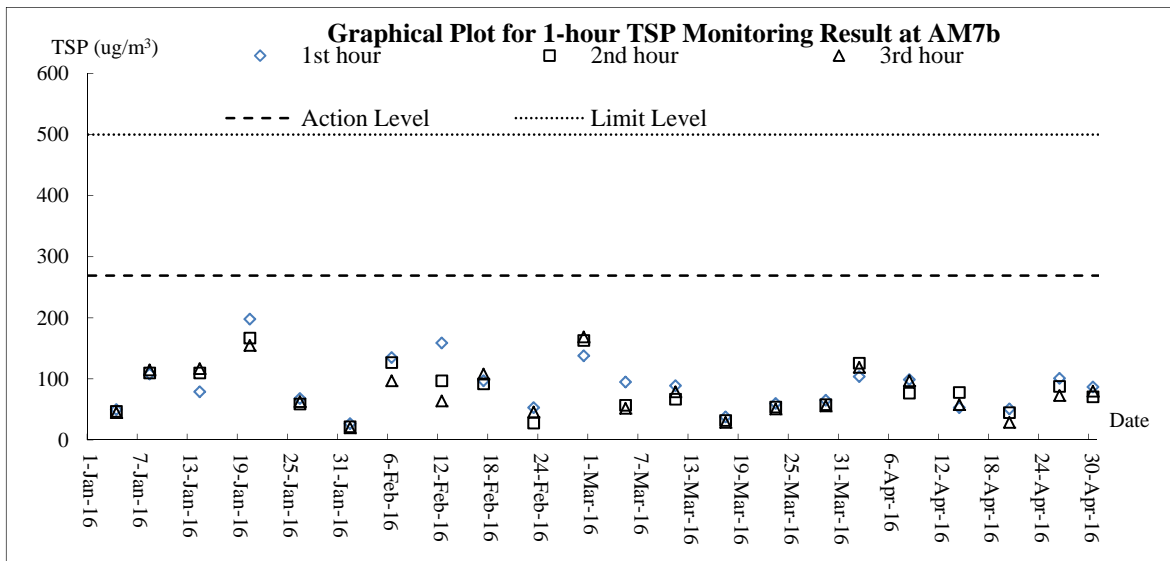
Appendix F

Graphical Plots for Monitoring Result

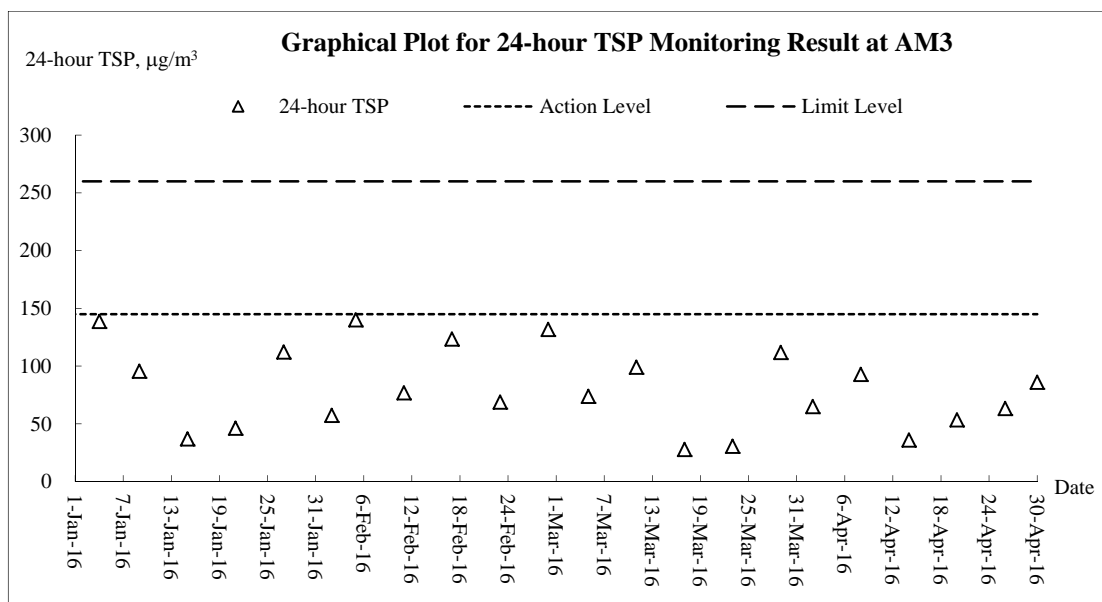
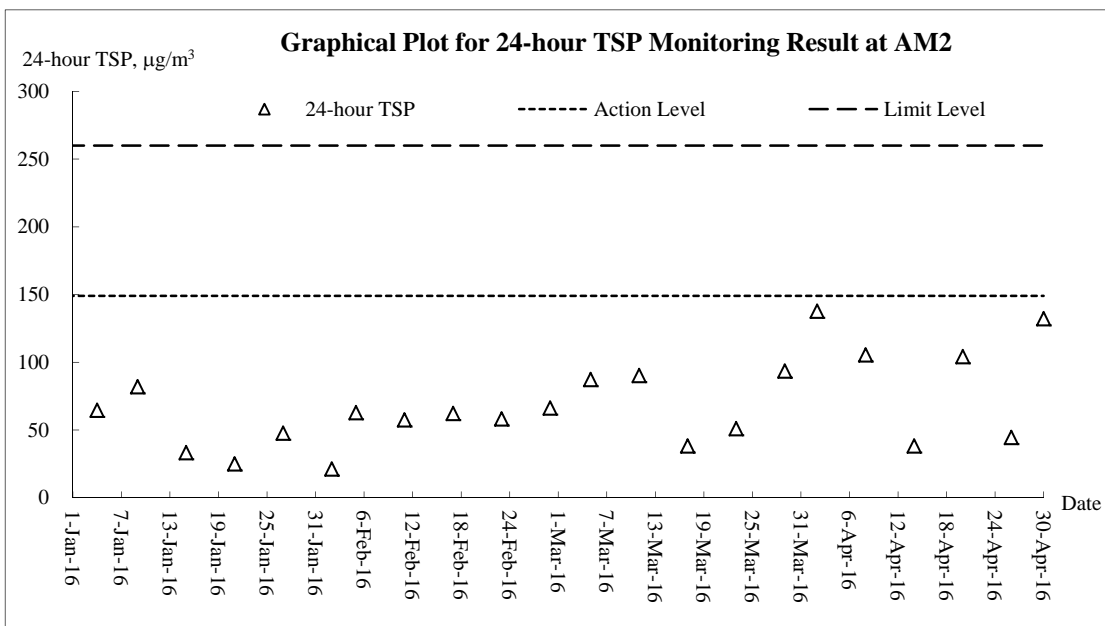
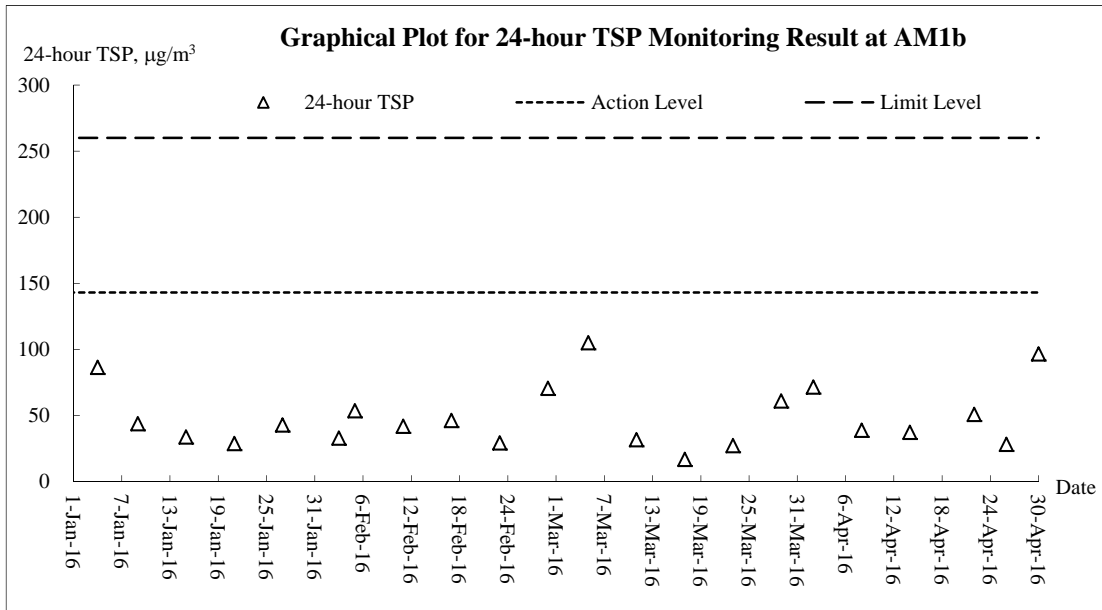
Air Quality – 1-hour TSP

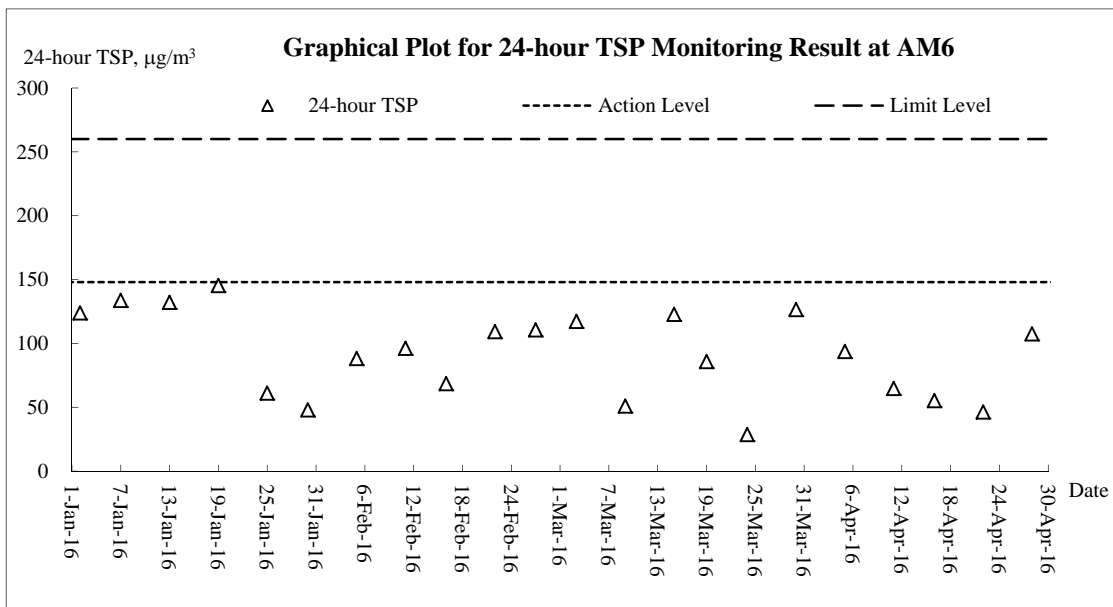
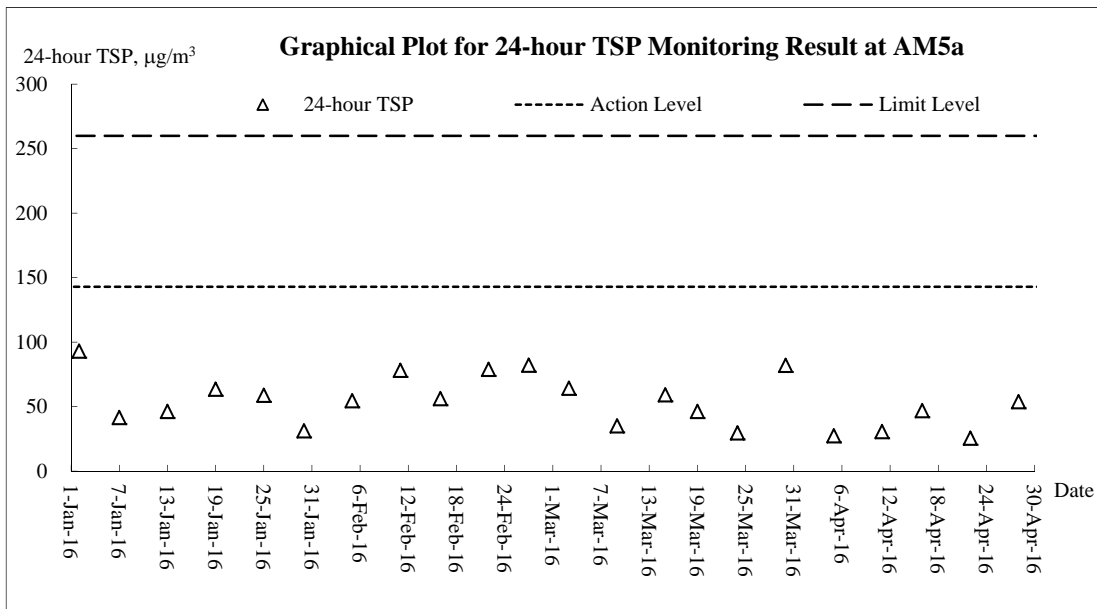
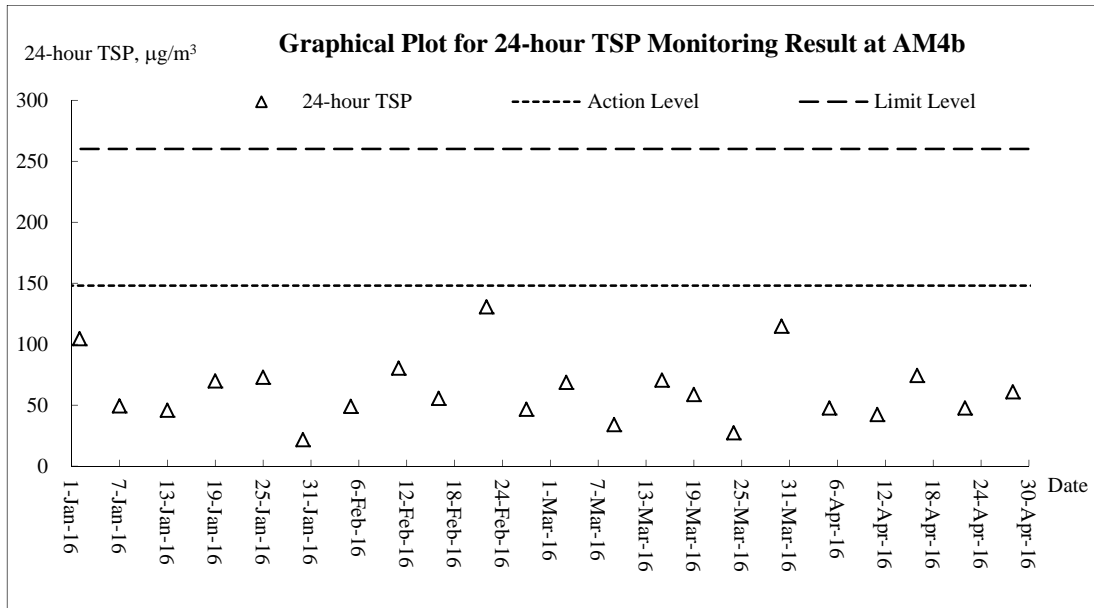


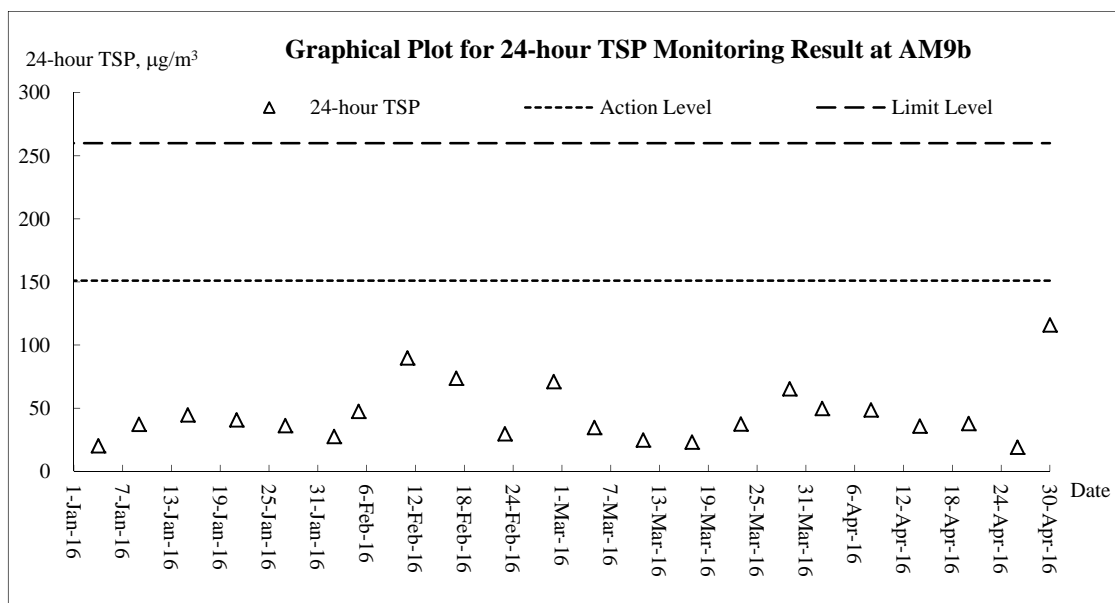
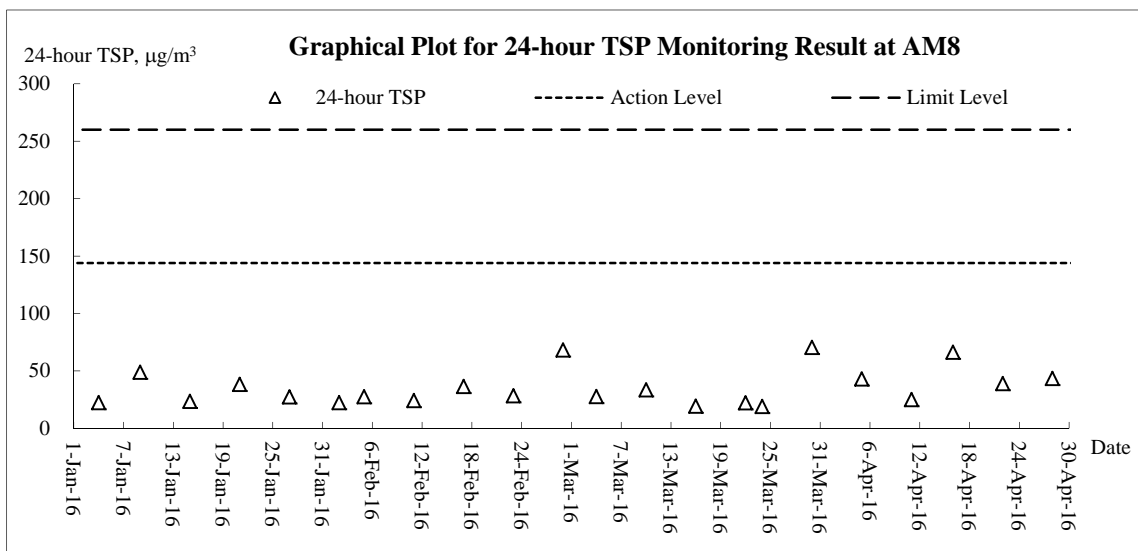
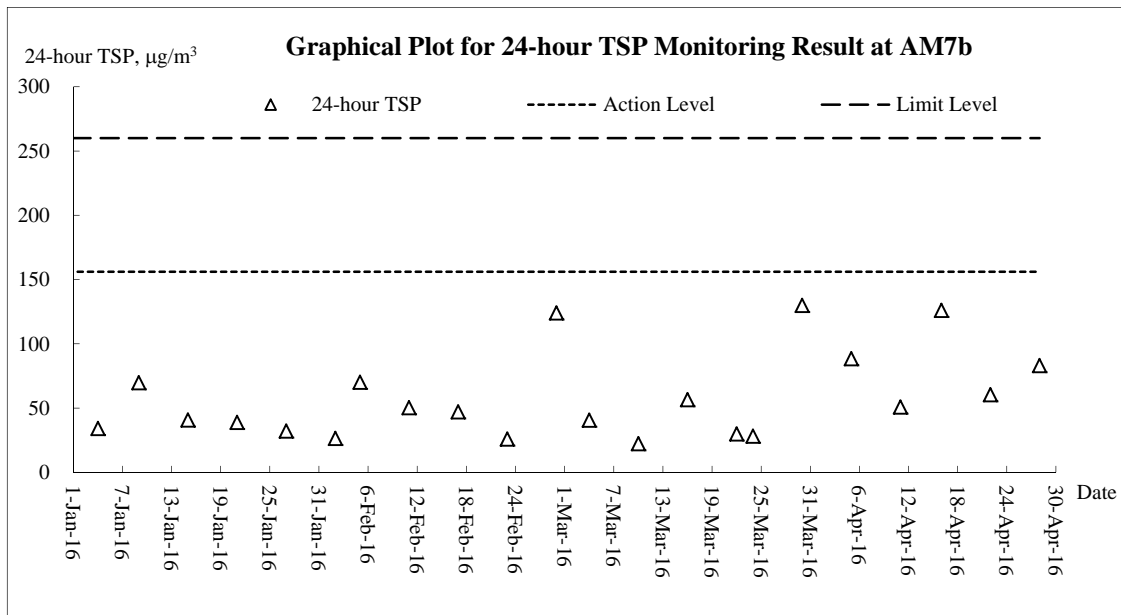




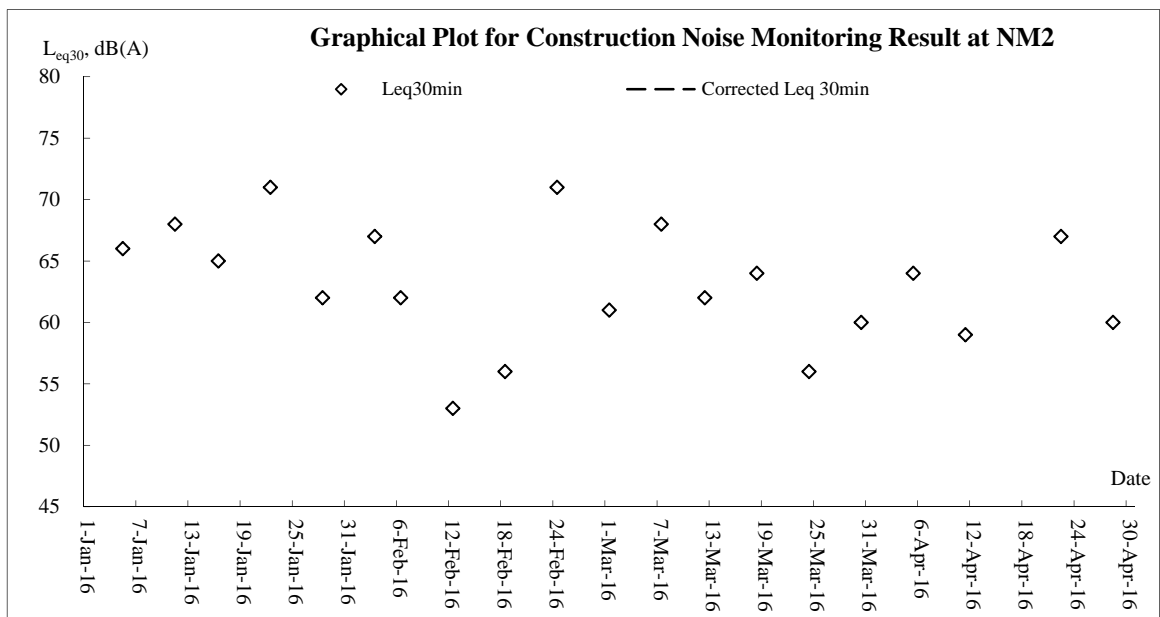
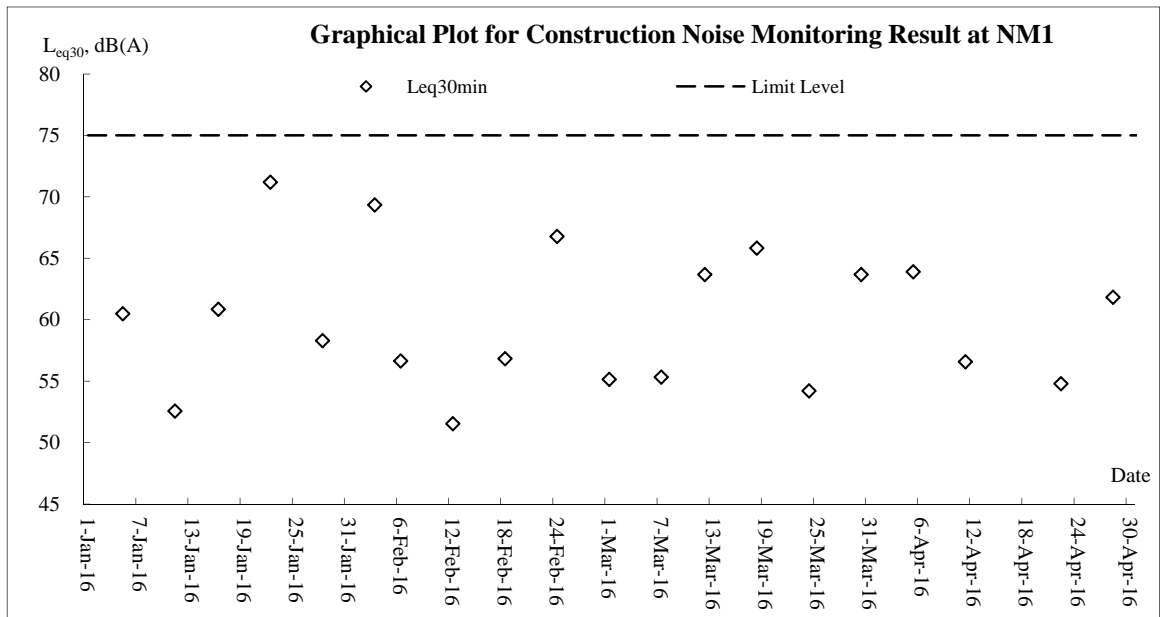
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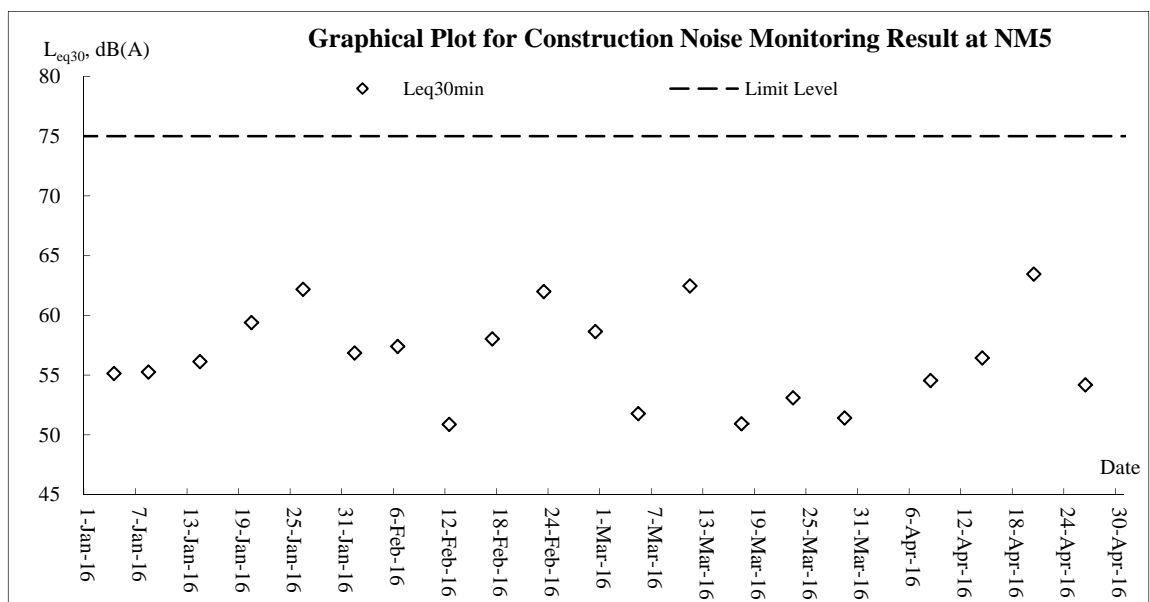
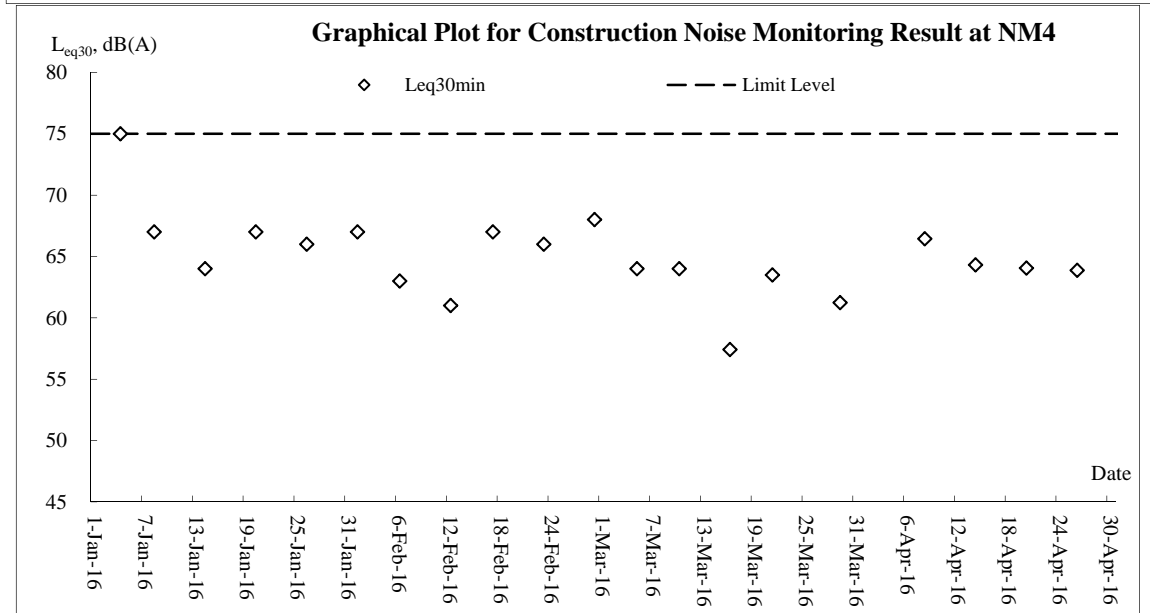
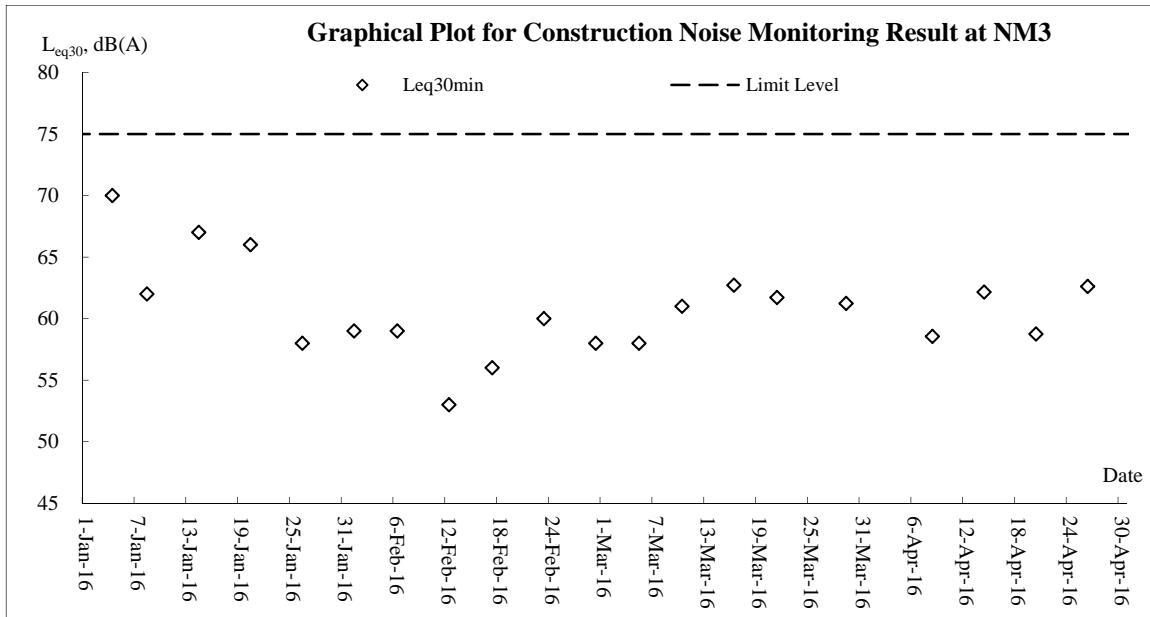


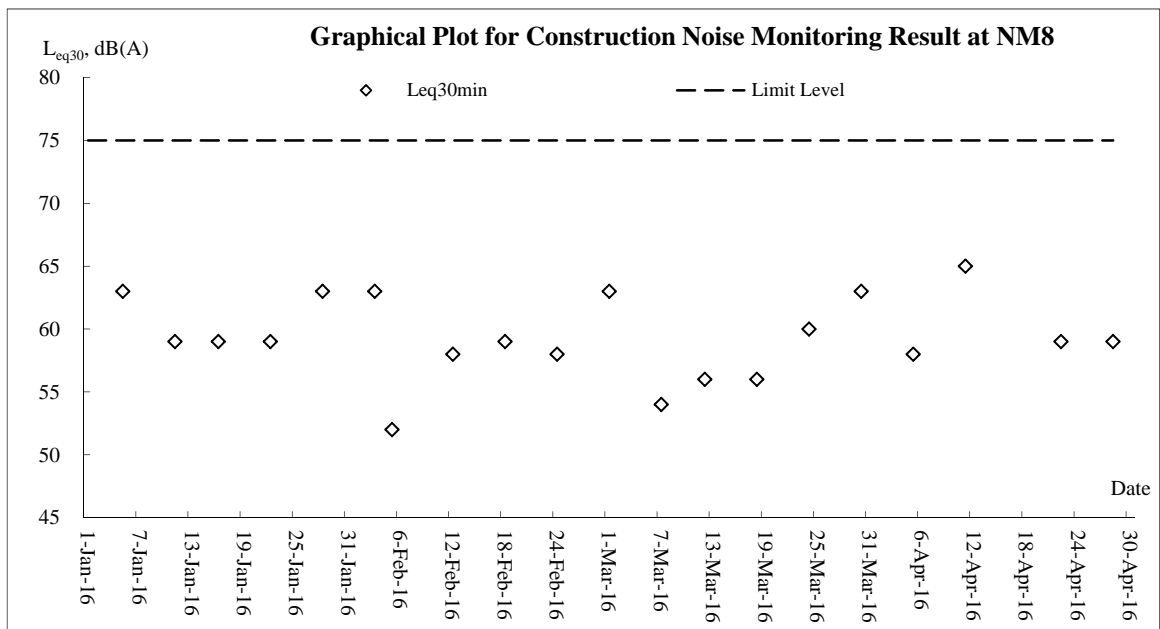
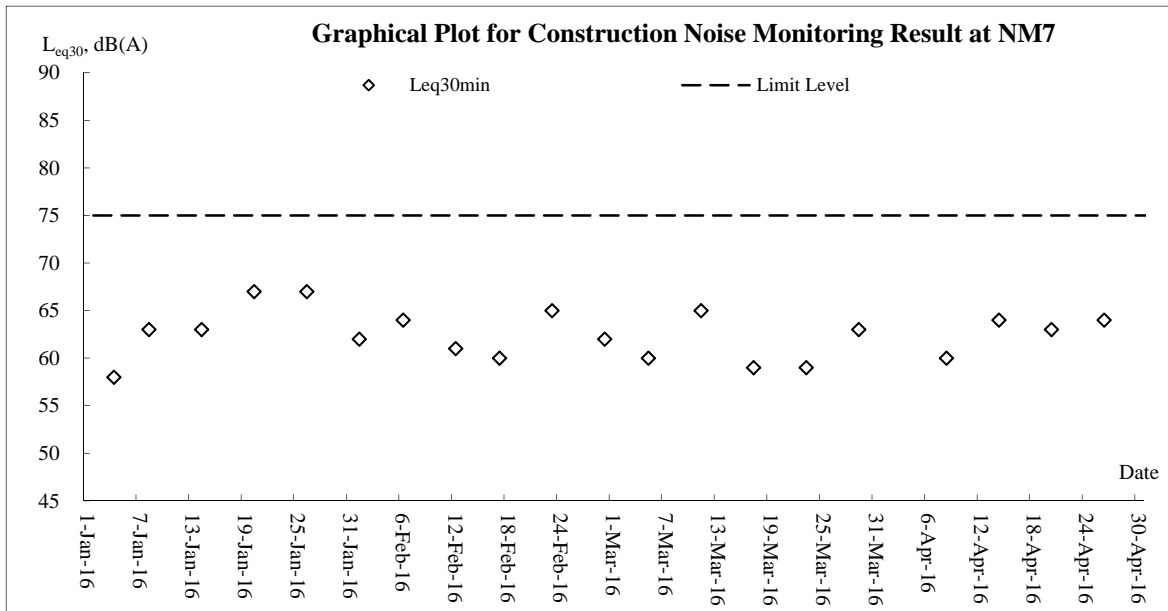
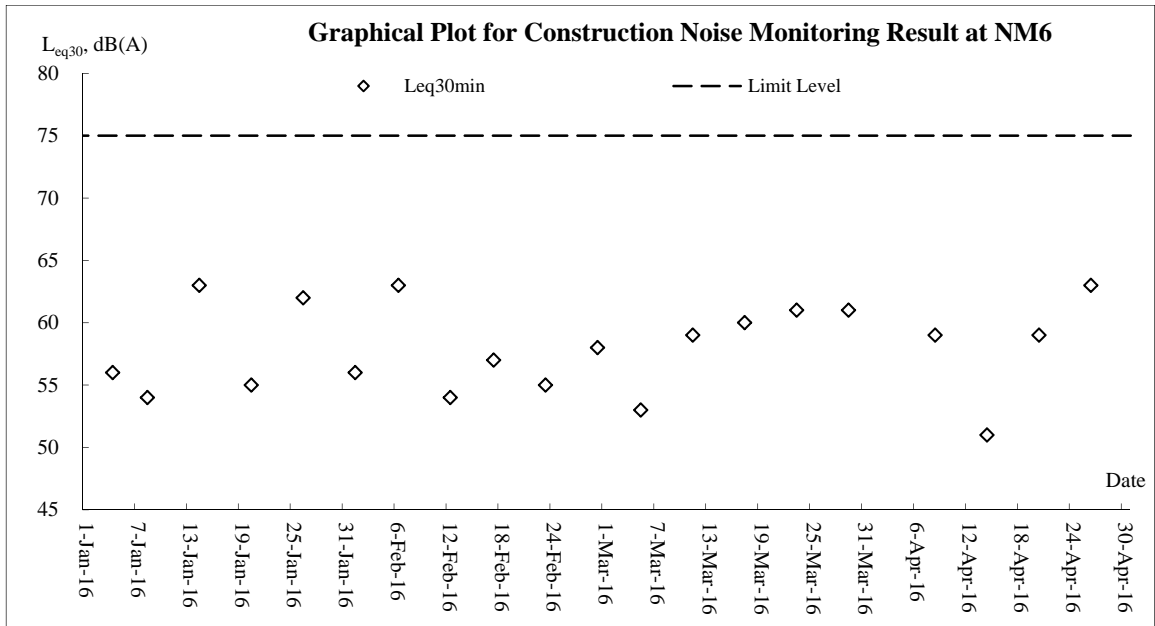


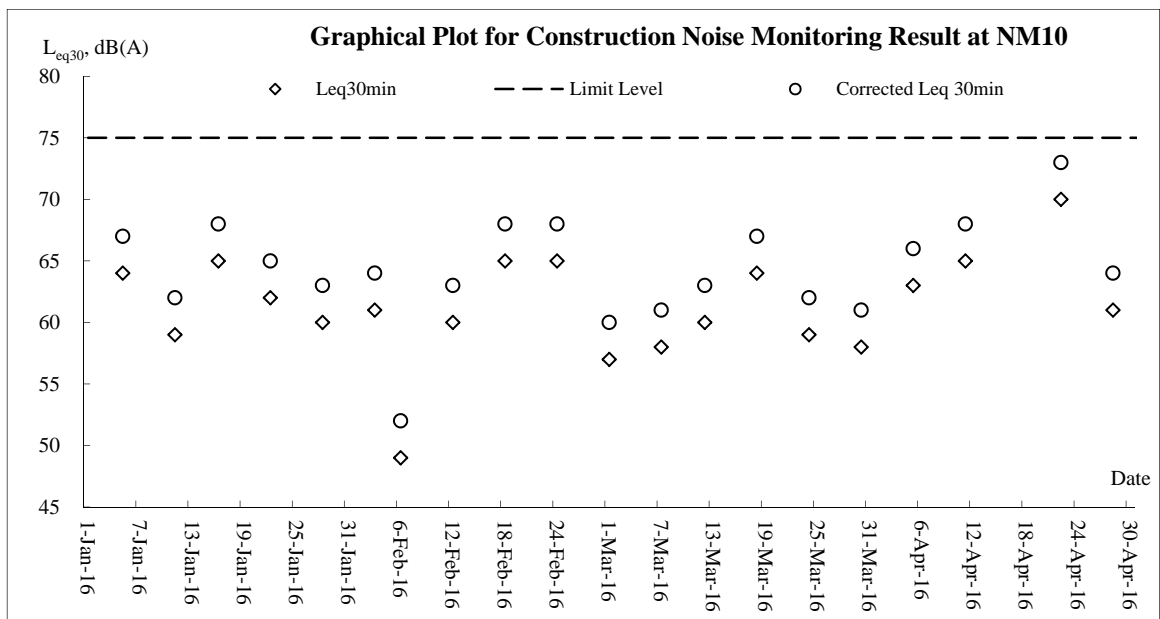
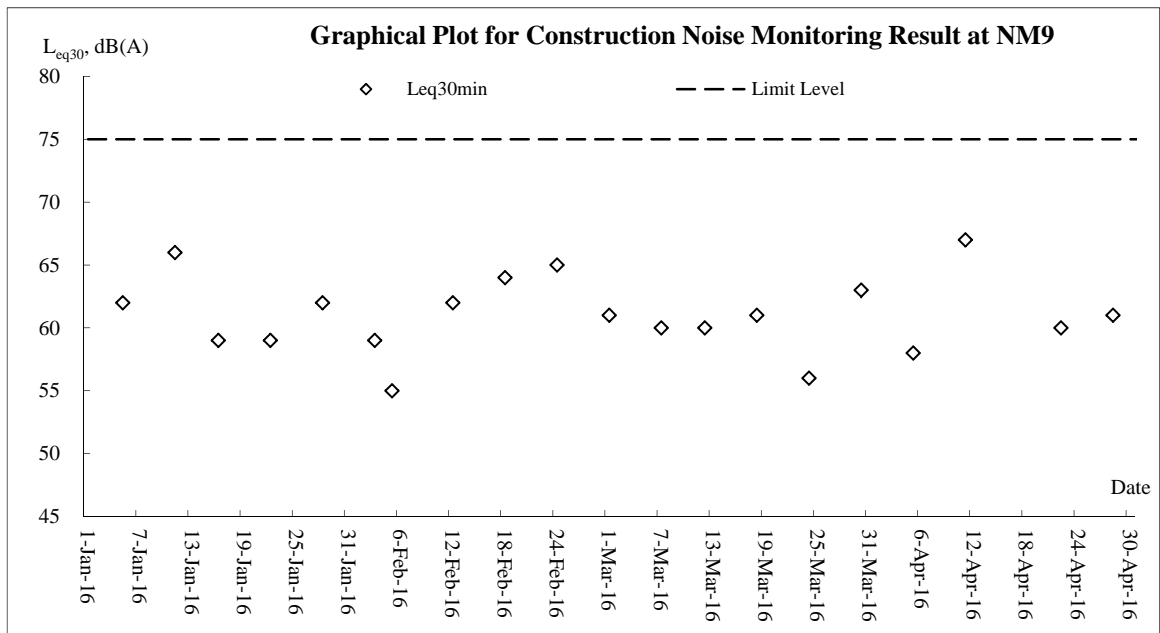


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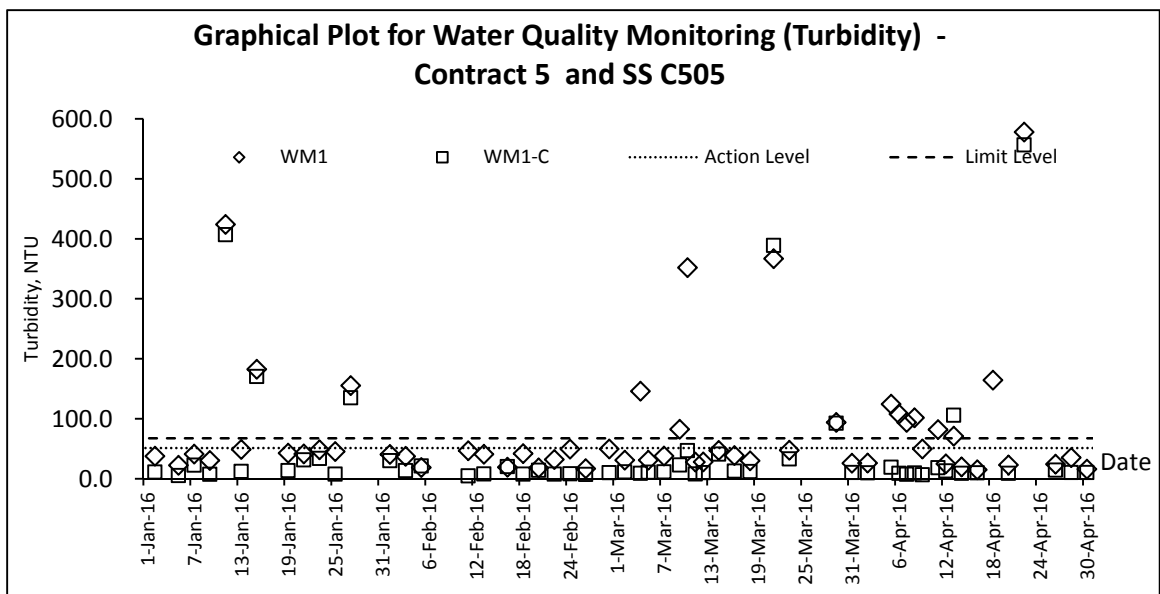
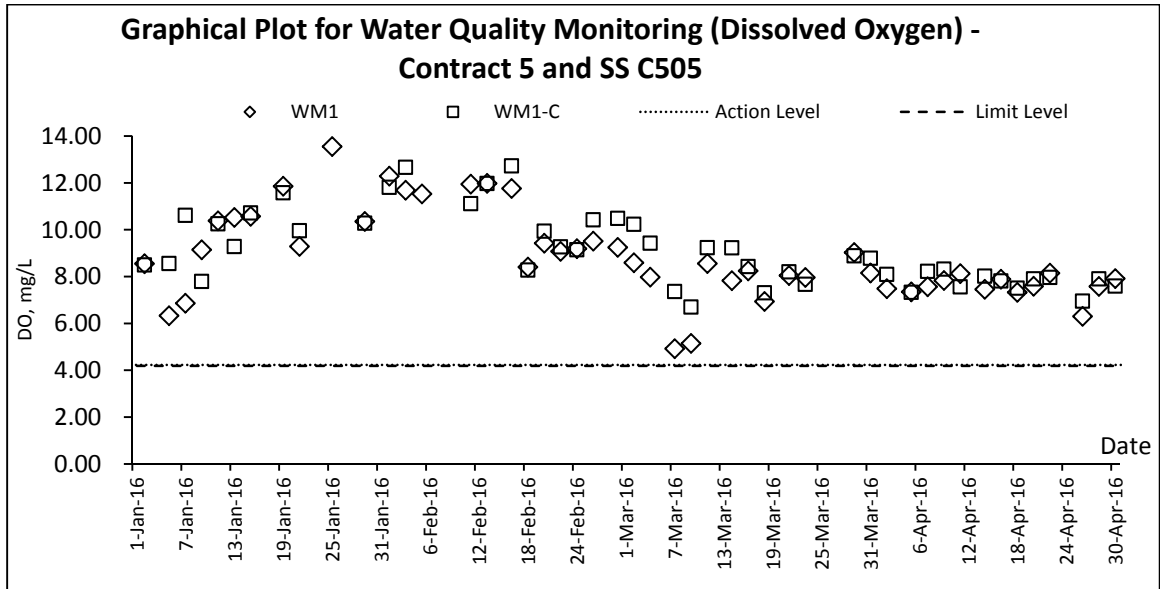


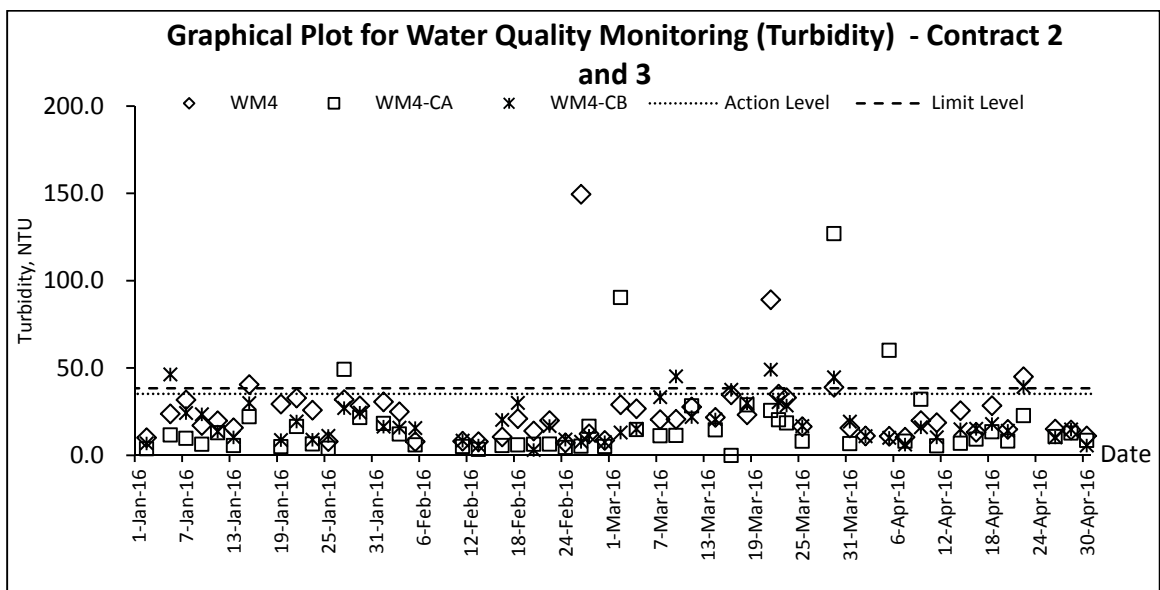
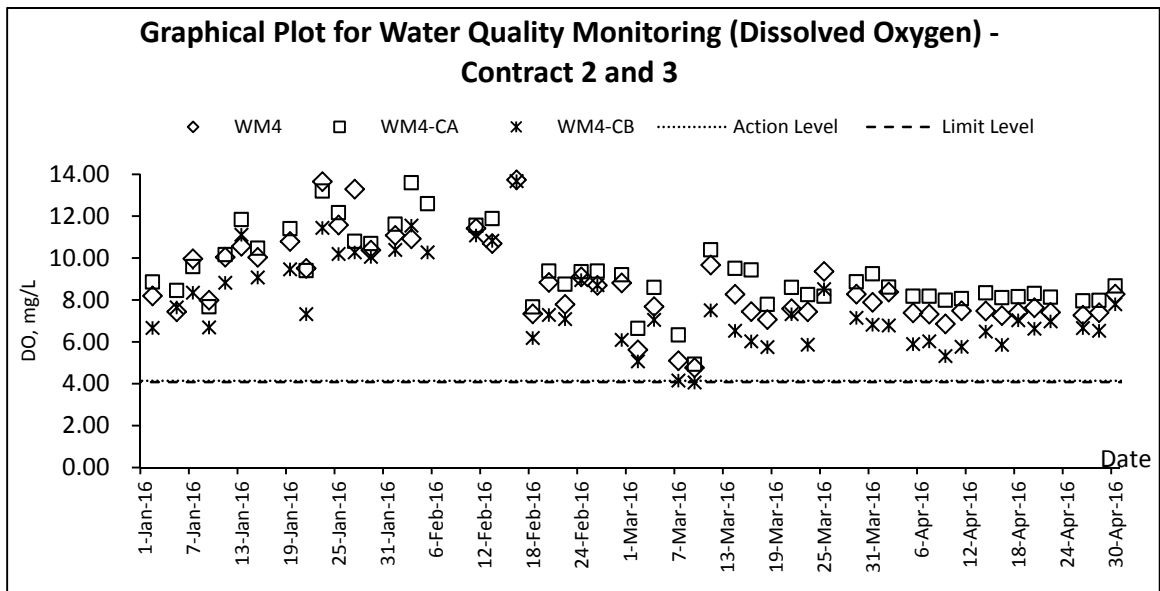
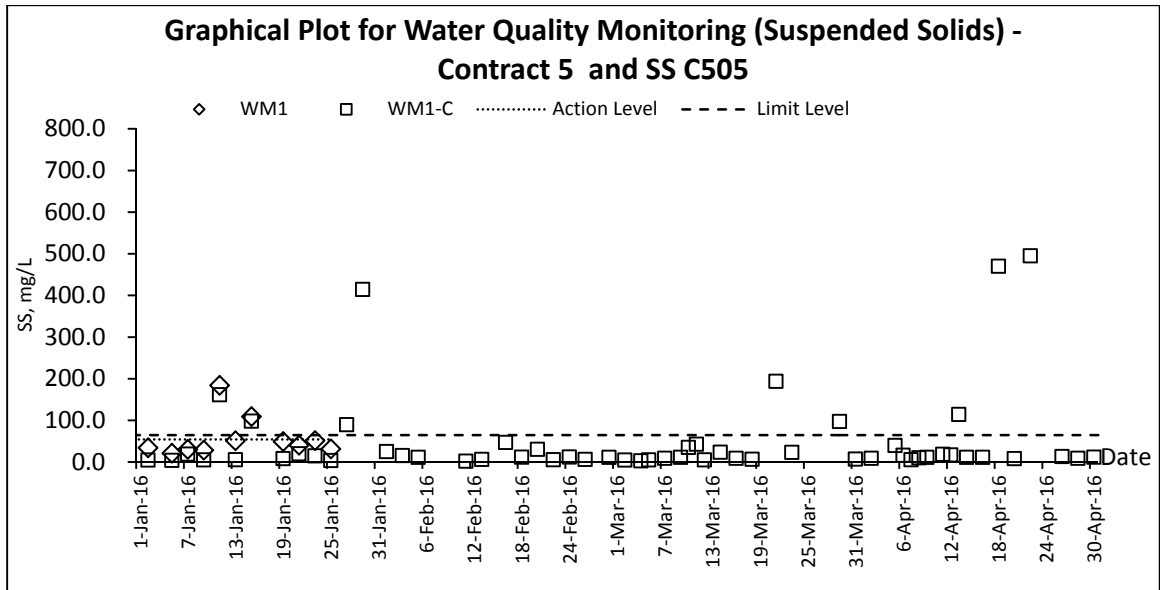


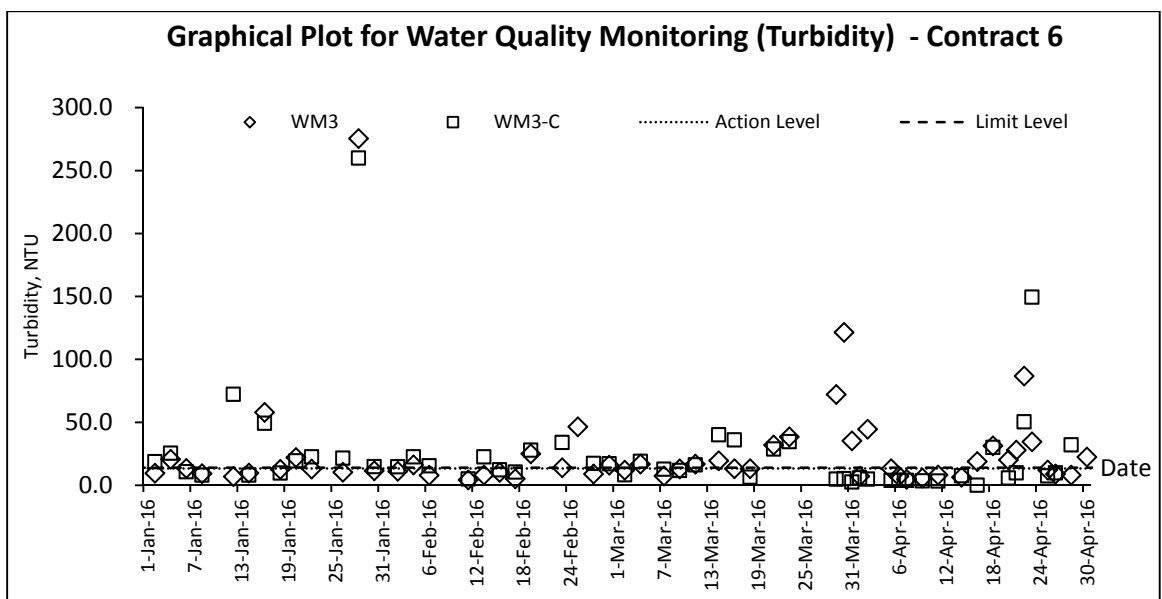
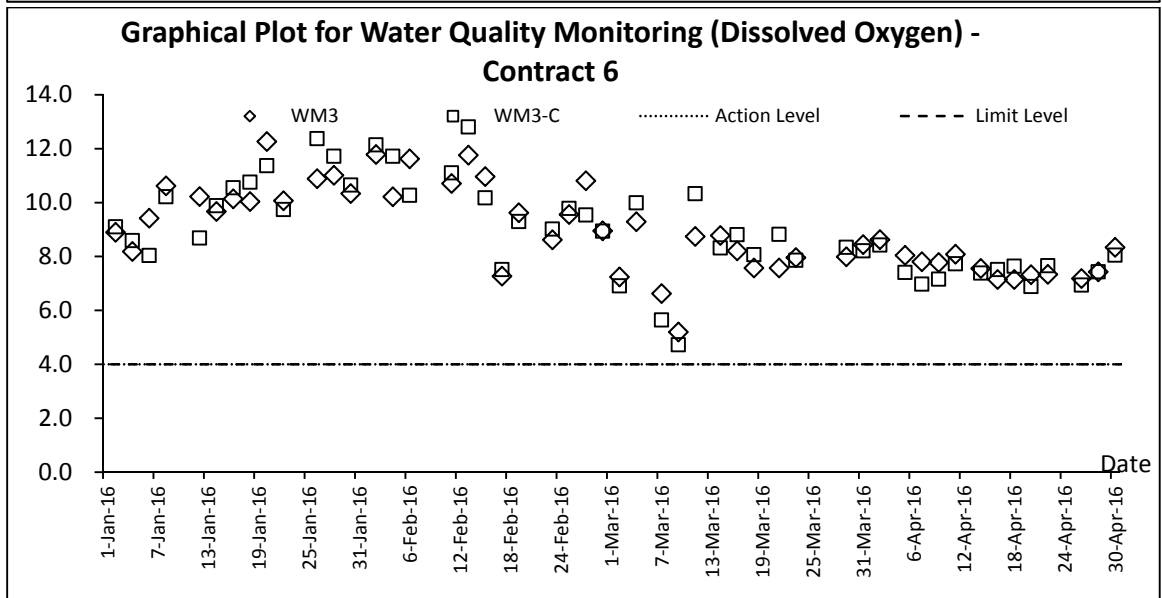
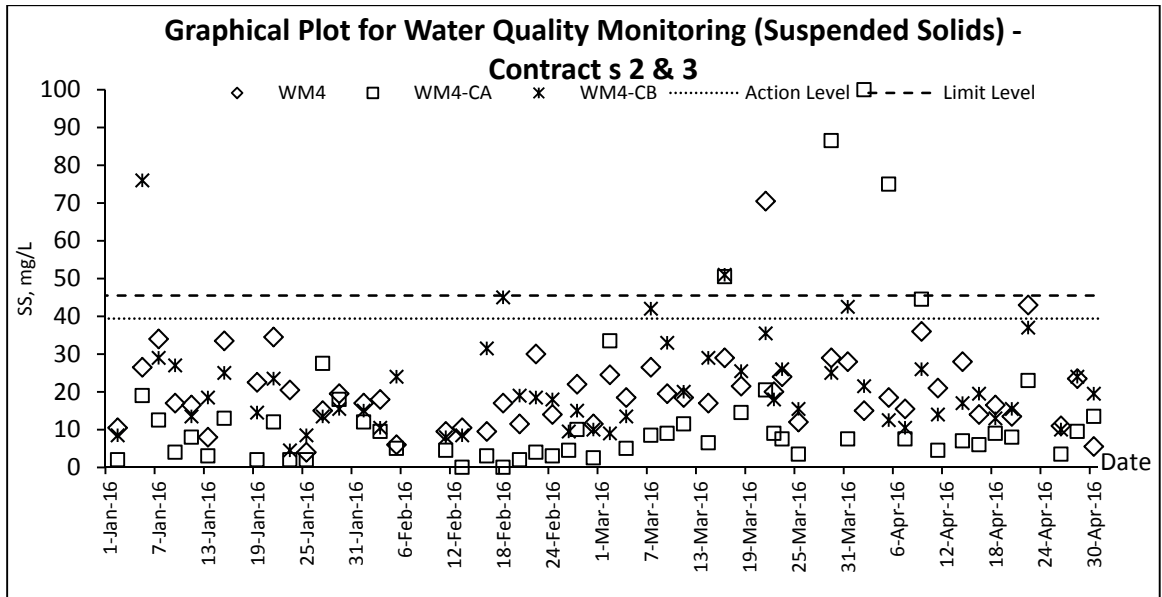


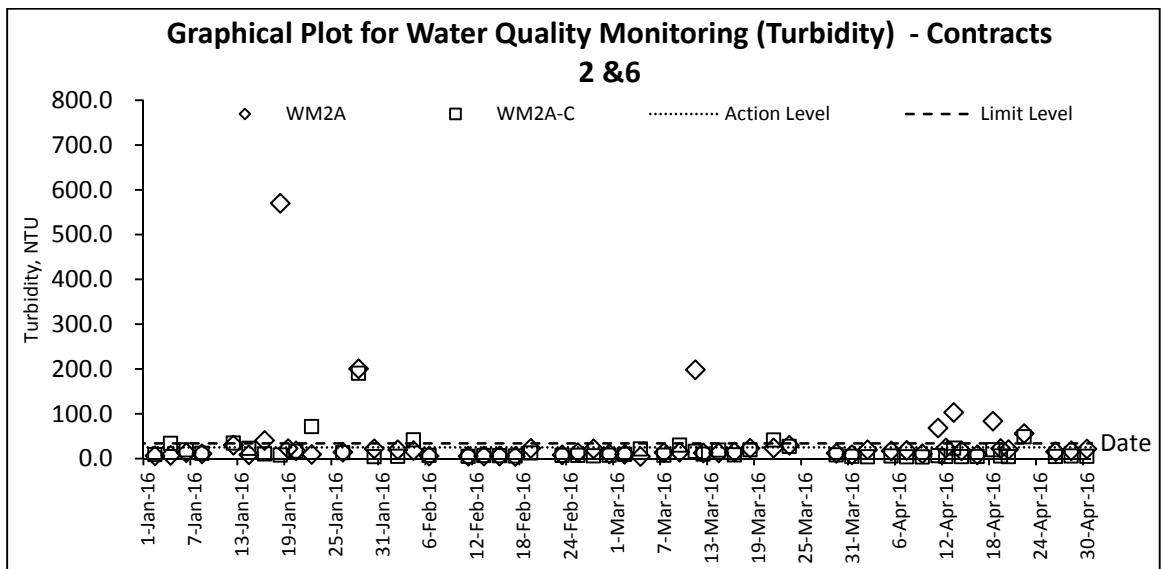
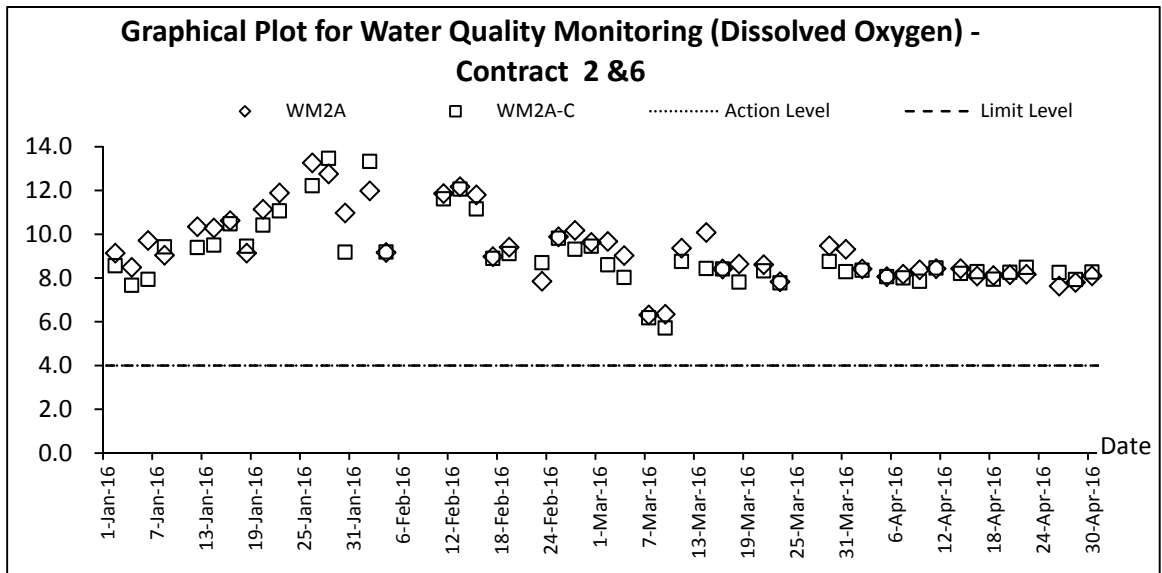
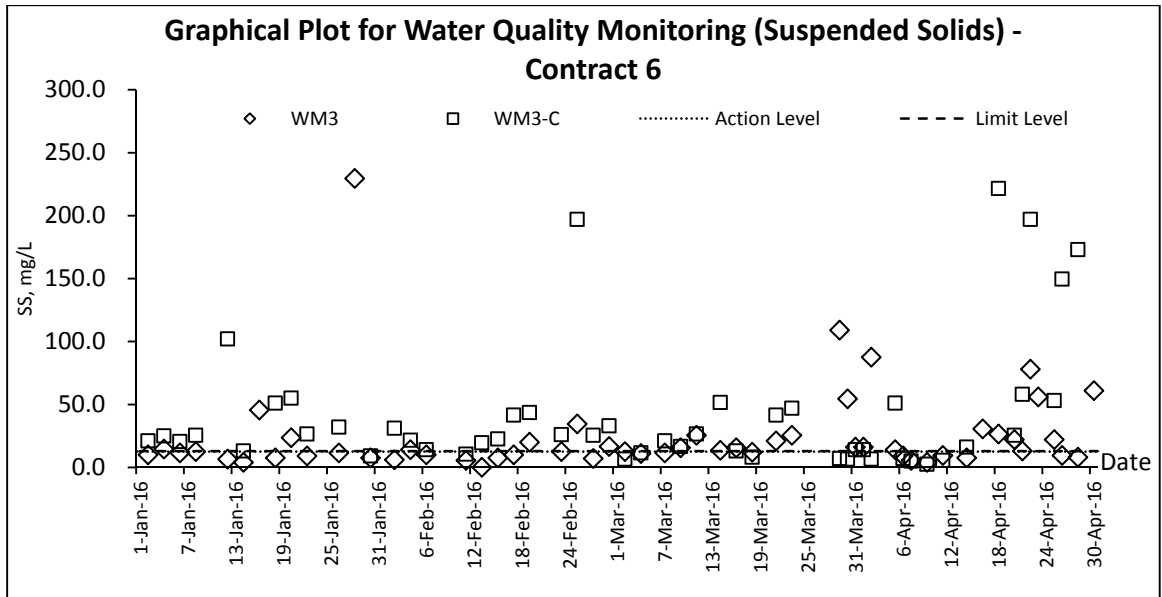


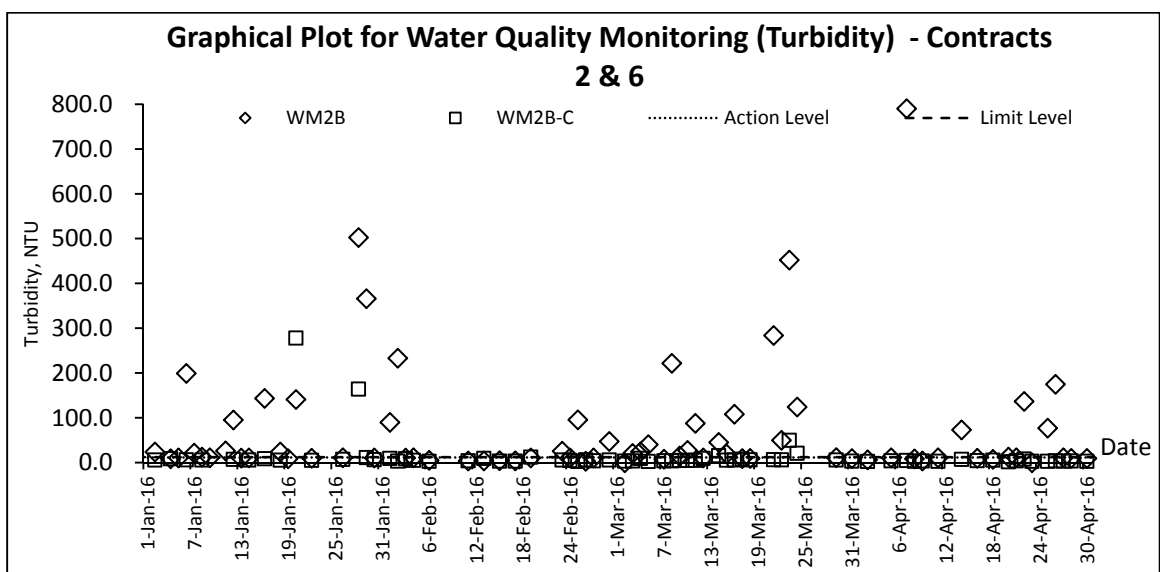
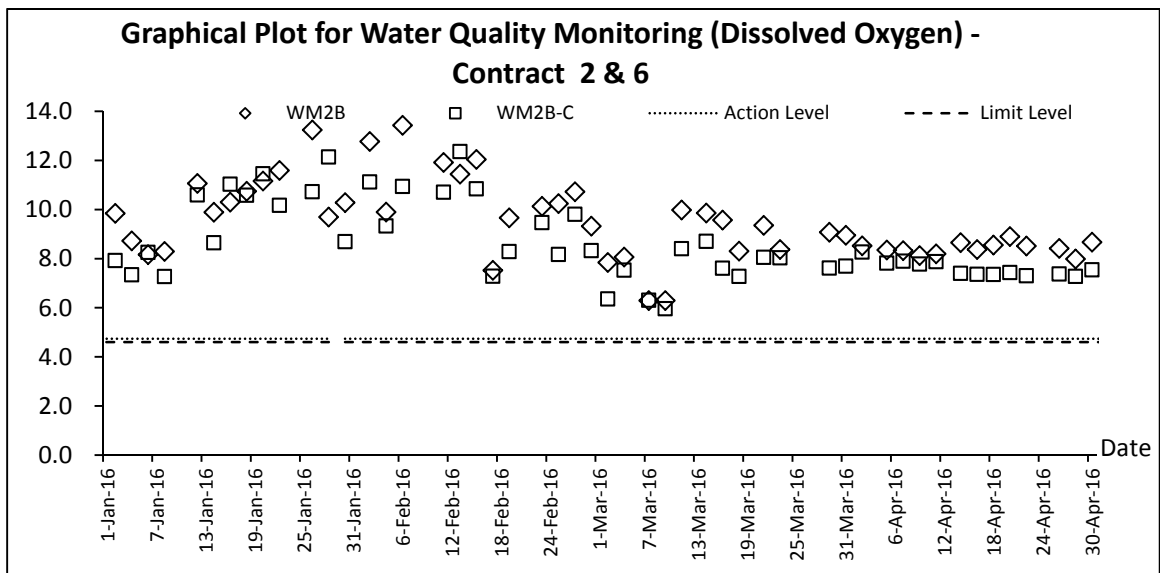
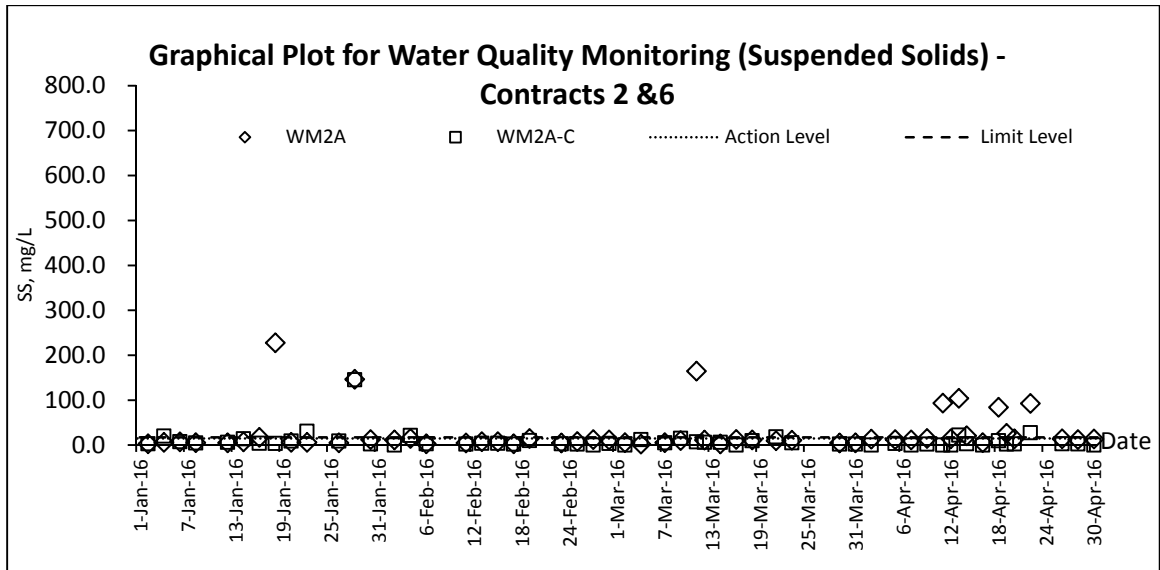
Water Quality

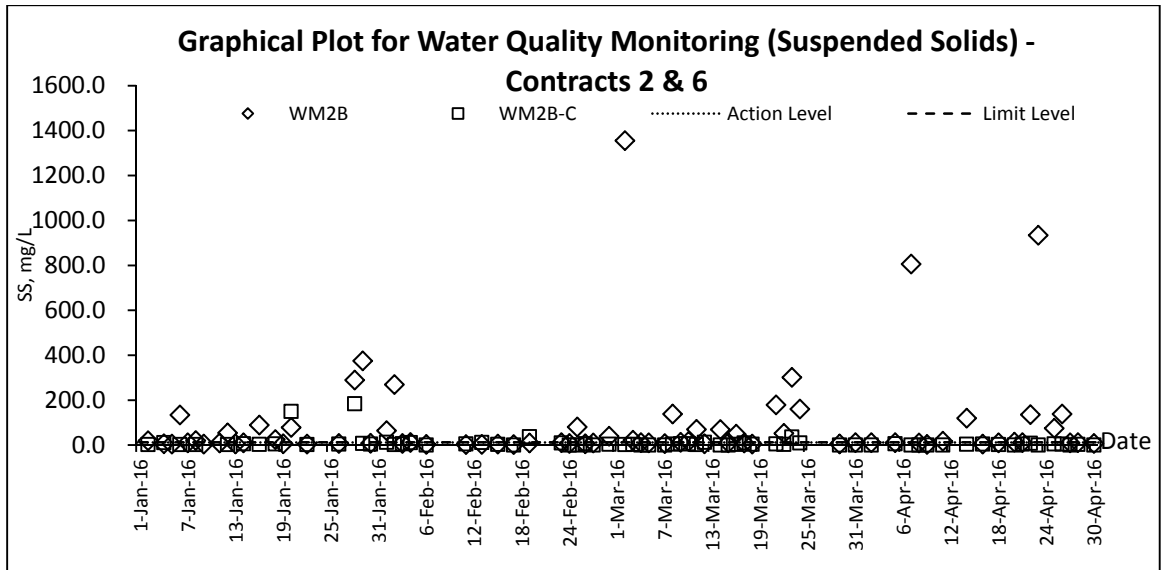












Appendix G

Weather information

Weather Condition Extracted from HKO

The weather of February 2016

With frequent replenishments of the winter monsoon, February 2016 was cooler than usual. The monthly mean temperature was 15.5 degrees, 1.3 degrees below the normal figure of 16.8 degrees. The month was also drier than usual with 24.8 millimetres of rainfall, only about 46 percent of the normal figure of 54.4 millimetres. However, due to an extremely rainy January, the accumulated rainfall of 291.7 millimetres in the first two months of the year was more than three times the normal figure of 79.1 millimetres for the same period.

The weather of March 2016

With the northeast monsoon and a humid maritime airstream competing for dominance over the south China coast, March 2016 in Hong Kong was characterized by gloomy, rainy and humid weather with fluctuating temperatures. Overall, the month was cooler than usual with rainfall above normal. The monthly mean temperature was 17.5 degrees, 1.6 degrees lower than the normal figure of 19.1 degrees. The monthly total rainfall was 148.7 millimetres, about 81 percent more than the normal figure of 82.2 millimetres. The accumulated rainfall of 440.4 millimetres in the first three months of the year was about 1.7 times above the normal figure of 161.3 millimetres for the same period.

The weather of April 2016

With a maritime airstream trying to exert control over the coastal areas of Guangdong in a change of seasons, the weather of April 2016 was exceptionally humid and gloomy. The monthly mean relative humidity was 89 percent, six percent higher than normal and also the most humid for April since 1961. Under long spells of clouds, fog or mist, the sunshine duration of 6.9 hours on 6 April already made it the sunniest day in the month. The total duration of bright sunshine recorded in the month was only 55.4 hours, around 54 percent of normal and the sixth lowest for April on record. The month was also warmer and rainier than usual. The monthly mean temperature was 23.6 degrees, 1.0 degrees above the normal figure of 22.6 degrees. The monthly total rainfall was 211.4 millimetres, about 21 percent more than the normal figure of 174.7 millimetres. The accumulated rainfall of 651.8 millimetres in the first four months of the year was nearly double the normal figure of 336.1 millimetres for the same period.

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

Appendix H

Waste Flow Table

Name of Department : CEDD

Contract No./ Work Order No. : CV/2012/08

Appendix I - Monthly Summary Waste Flow Table for 2016

(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	Broken Concrete (including rock for recycling into aggregates)	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported C&D Material	Metal	Paper/ Cardboard Packaging	Plastic (bottles/containers, plastic sheets/ foams from package material)	Chemical Waste	Others (e.g. General Refuse etc.)
	[a+b+c+d]	(a)	(b)	(c)	(d)		(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m3)
January	72.2029	0.0000	0.6482	31.8061	39.7486	0.9345	26.2000	0.0000	0.0000	1.2320	0.1247
February	55.6715	0.0000	1.0145	38.3484	16.3085	1.3108	8.3800	0.9800	0.0000	1.4080	0.1089
March	34.1757	0.0000	0.3241	29.3514	4.5003	1.0325	44.1700	0.0000	0.0000	11.9680	0.0732
April	86.9048	0.0000	0.7045	32.8811	53.3191	1.3786	23.6420	0.4000	0.0000	1.6456	0.1306
May	77.5386	0.0000	0.1268	38.9050	38.5068	4.4426	44.8000	0.3500	0.0000	2.7280	0.1246
June	62.4192	0.0000	0.5848	45.2952	16.5392	1.0836	67.7300	0.0000	0.0000	0.0000	0.0916
Half-year total	388.9127	0.0000	3.4030	216.5873	168.9224	10.1826	214.9220	1.7300	0.0000	18.9816	0.6536
July	0.0000										
August	0.0000										
September	0.0000										
October	0.0000										
November	0.0000										
December	0.0000										
Yearly Total	388.9127	0.0000	3.4030	216.5873	168.9224	10.1826	214.9220	1.7300	0.0000	18.9816	0.6536

(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	Broken Concrete (including rock for recycling into aggregates)	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported C&D Material	Metal	Paper/ Cardboard Packaging	Plastic (bottles/containers, plastic sheets/ foams from package material)	Chemical Waste	Others (e.g. General Refuse etc.)
	[a+b+c+d]	(a)	(b)	(c)	(d)		(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m3)
2013	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	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	14.1300	3.9220	1.5000	16.1920	1.1696
2016	388.9127	0.0000	3.4030	216.5873	168.9224	10.1826	214.9220	1.7300	0.0000	18.9816	0.6536
2017											
2018											
Total	1385.2992	0.0000	26.9550	1136.1980	222.1461	20.3562	232.2620	6.0910	1.5070	46.0536	4.0841

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 2016 (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	2.683	0.253	0.030	0.000	2.400	0.799	0.001	0.000	0.000	0.000	0.115
Feb	1.877	0.651	0.020	0.000	1.205	1.141	0.000	0.000	0.000	0.000	0.110
Mar	1.501	0.417	0.000	0.000	1.084	0.831	0.000	0.000	0.001	0.000	0.090
Apr	0.472	0.046	0.018	0.000	0.408	0.647	0.000	0.000	0.000	0.000	0.135
May	0.488	0.013	0.000	0.000	0.475	2.479	0.000	0.000	0.000	0.000	0.105
Jun	0.523	0.103	0.000	0.000	0.420	0.716	0.000	0.000	0.001	0.000	0.135
Sub-total	7.544	1.483	0.068	0.000	5.993	6.613	0.001	0.000	0.002	0.000	0.690
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	7.544	1.483	0.068	0.000	5.993	6.613	0.001	0.000	0.002	0.000	0.690

- 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.

Name of Department: CEDD

Monthly Summary Waste Flow Table for 2016

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 '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
JAN	0	0	0	0	0	0.235	0	0	0	0	0.06
FEB	0	0	0	0	0	0.141	0	0	0	0	0.045
MAR	0	0	0	0	0	0.1785	0	0	0	0	0.055
APRIL	0	0	0	0	0	0	0	0	0	0	0.03
MAY	0	0	0	0	0	0	0	0	0	0	0.015
JUN	0	0	0	0	0	0	0	0.062	0	0	0.01
Sub Total	0	0	0	0	0	0.5545	0	0.062	0	0	0.215
JUL											
AUG											
SEP											
OCT											
NOV											
DEC											
Total	0	0	0	0	0	0.55	0	0.062	0	0	0.215

Notes:

Name of Department: CEDD

Forecast of Total Quantities of C&D Materials to be Generated from the Contract (see Note 4)										
Total Quantity Generated	Hard Rocks and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metal	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 '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
0	0	0	0	0	350	30	4	2	1	4

Notes:

- (1) The performance targets are given in PS clause 6(14) above.
- (2) The waste flow table shall also include C&D materials that are specified in the Contractor to be imported for use at the Site.
- (3) Plastic 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
 - Hard Rocks and Large Broken Concrete = Cannot be defined at this stage
 - Imported Fill = Estimated by the Contractor = 1 loading = 8m³
 - Metal = Estimated by the Contractor
 - Paper/cardboard packaging = Estimated by the Contractor
 - Plastics = Estimated by the Contractor
 - Chemical Waste = Estimated by the Contractor (Spent lubricating oil, assume density 0.9kg/L)
 - Other, e.g. general refuse = Estimated by the Contractor

Monthly Summary Waste Flow Table for 2016 (year)

Name of Person completing the record: KM 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	58.943	0	3.811	12.131	43.001	31.248	0	0	0	0	0.695
Feb	74.418	0	8.785	39.85	25.783	6.552	0	0.097	0	0	0.339
Mar	43.764	0	6.438	12.034	25.292	3.288	0	0.206	0.007	0	0.042
Apr	33.767	0	1.933	5.759	26.075	0	0	0.221	0	0	0.070
May	51.115	0	3.229	17.469	30.417	0.928	0	0.211	0	0	0.079
Jun	61.126	0	6.921	23.286	30.919	3.693	0	0.166	0	0	0.043
Sub-total	323.133	0	31.117	110.529	181.487	45.709	0	0.901	0.007	0	1.268
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	492.356	0	49.651	127.313	315.392	52.958	0	1.195	0.007	32.28	4.344

- 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

Name of Department: CEDD

Contract Title: Liantang/ Heung Yuen Wai Boundary Control Point
Site Formation and Infrastructure Works – Contract 7

Contract No.: NE/2014/03

Monthly Summary Waste Flow Table for 2016 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of 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	0	0	0	0
Feb	0.16	0	0	0	0.16	0	0	0	0	0	0
Mar	0.135	0	0	0	0.135	0	0	0	0	0	0.005
Apr	0.313	0	0	0	0.313	0	0	0	0	0	0.005
May	0.505	0	0	0	0.505	0	0	0	0	0	0
June	0.613	0	0	0	0.613	0	0	0.005	0.001	0	0
Sub-total	1.726	0	0	0	1.726	0	0	0.005	0.001	0	0.01
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total	1.726	0	0	0	1.726	0	0	0.005	0.001	0	0.01

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 2016** [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	0.800	0	0	0	0.800
Feb	0.858	0	0	0	0.858
Mar	0.793	0	0	0	0.793
Apr	0.1105	0	0	0	0.1105
May	1.087	0	1.074	0	0.013
Jun	8.645	0	8.541	0	0.104
Sub-total	12.293	0	9.615	0	2.678
Jul					
Aug					
Sep					
Oct					
Nov					
Dec					
Total	12.293	0	9.615	0	2.678

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	4.73	4.73	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.072
Feb	0.000	0.000	0.0004	0.0004	0.0186	0.0186	0.000	0.000	0.000	0.000	0.021	0.021	0.065
Mar	0	0	52.752	52.752	0.044	0.044	0	0	0	0	0.05	0.05	0.059
Apr	0	0	1465.5906	1465.5906	0.09	0.09	0	0	0	0	0.084	0.084	0.091
May	0	0	1587.5818	1587.5818	0	0	0.004	0.004	0	0	0.153	0.153	0.156
Jun	0	0	725.0582	725.0582	0.33	0.33	0.004	0.004	0	0	0.067	0.067	0.117
Sub-total	0	0	3818.7330	3818.7330	0.4826	0.4826	0.008	0.008	0	0	0.375	0.375	0.559
Jul													
Aug													
Sep													
Oct													
Nov													
Dec													
Total	0	0	3818.733	3818.733	0.4826	0.4826	0.008	0.008	0	0	0.375	0.375	0.559

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					
10kg of cans and 330kg of papers were sent to Wong Kei for recycling.	4kg of plastic bottles and 57kg of glass bottles were sent to Action Health for recycling	653.6782 tons of scrap metals from LCAL were sent for recycling.	71.38 tons of scrap metals from subcontractors were sent for recycling.	0	0

- 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