

**JOB NO.: TCS00694/13**



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

**12<sup>th</sup> QUARTERLY ENVIRONMENTAL MONITORING &  
AUDIT SUMMARY REPORT –  
(May to July 2016)**

**PREPARED FOR**

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

**Quality Index**

<b>Date</b>	<b>Reference No.</b>	<b>Prepared By</b>	<b>Certified By</b>
21 December 2016	TCS00694/13/600/R0672v1	 Nicola Hon (Environmental Consultant)	 T.W. Tam (Environmental Team Leader)

<b>Version</b>	<b>Date</b>	<b>Description</b>
1	15 November 2016	First Submission
2	21 December 2016	Amended against the IEC's comments on 30 November 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.



Member of the Surbana Jurong Group

Unit A-C, 27/F Ford Glory Plaza  
37-39 Wing Hong Street  
Cheung Sha Wan, Kowloon, Hong Kong  
T +852 3995 8100 F +852 3995 8101 E hongkong@smec.com  
[www.smec.com](http://www.smec.com)

29 December 2016

Our ref: 7076192/L21326/AB/AW/MC/lh

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

**By Email & Post**

Attention: Mr Simon LEUNG

Dear Sirs

**Agreement No. CE 45/2008 (CE)**  
**Liantang/Heung Yuen Wai Boundary Control Point and Associated Works**  
**Independent Environmental Checker – Investigation**  
**Quarterly EM&A Summary Report (No. 12) – May 2016 to Jul 2016**

With reference to the Quarterly EM&A Report No. 12 for May 2016 to Jul 2016 (Version 2) certified by the ET Leader and received by us on 21 December 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](mailto:antony.wong@smec.com); or our Mr Man Kit CHEUNG on tel. 3995 8132 or by email to [man.cheung@smec.com](mailto:man.cheung@smec.com).

Yours faithfully  
for and on behalf of  
SMEC Asia Limited



**Antony WONG**

Independent Environmental Checker

cc	CEDD/BCP	-	Mr Desmond LAM	by fax: 3547 1659
	ArchSD	-	Mr William WL CHENG	by fax: 2804 6805
	AECOM	-	Mr Pat LAM / Mr Perry YAM	by email
	Ronald Lu	-	Mr Peter YAM / Mr Justin CHEUNG	by email
	AUES	-	Mr TW TAM	by email

## EXECUTIVE SUMMARY

ES.01. This is the 12<sup>th</sup> 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 May 2016 to 31 July 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, Contract 7 and Contract SS C505. Environmental monitoring activities under the EM&A programme in the Reporting Period are summarized in the following table.

Environmental Aspect	Monitoring Parameters / Inspection	Reporting Period	
		Monitoring Locations / Contracts	Total Occasions
Air Quality	1-hour TSP	9	432
	24-hour TSP	9	140
Construction Noise	$L_{eq(30min)}$ Daytime	10	130
Water Quality	Water measurement in-situ and/or sampling	WM1 & WM1-C,	39 scheduled and 3 extra of sampling days
		WM2A & WM2A-C	39 scheduled and 21 extra of sampling days
		WM2B & WM2B-C	39 scheduled and 6 extra of sampling days
		WM3 & WM3-C	39 scheduled and 4 extra of sampling days
		WM4, WM4-CA & WM4-CB	39 scheduled and 1 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	13
		Contract 5	13
		Contract 6	13
		Contract 7	13
		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, two (2) noise complaints were received for Contract 2 and Contract SS C505 which triggered the Action Level (AL). Moreover, a total of 103 of Action/ Limit Level exceedance were recorded for water quality monitoring which included turbidity and Suspended Solids. The summary of exceedance for the Reporting Period is shown below.

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	$L_{eq(30min)}$ Daytime	2	0	0	The noise complaint was not project related.	N/A
Water Quality	DO	0	0	0	--	--

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
	Turbidity	4	49	53	9 exceedances were Project related 44 exceedances were not Project related	The Contractors of C6 shall implement water quality mitigation measures in accordance with ISEMM of the EM&A Manual requirements
	SS	0	50	50	9 exceedances were Project related 41 exceedances were not Project related	

#### ENVIRONMENTAL COMPLAINT

ES.04. In this Reporting Period, eleven (11) documented environmental complaints were received for the Project. Upon receipt of the complaint, follow up action has been undertaken by both Contractor promptly to resolve the complaints and deficiencies. Investigation for the complaint was carried out by ET independently and the associated investigation reports were submitted to relevant parties. In the Reporting Period, one (1) out of eleven (11) complaints was considered as project related and remedial action had undertaken by the Contractor.

#### NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

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

#### REPORTING CHANGES

ES.06. In the Reporting Period, the construction noise monitoring location NM2 was relocated to NM2a which effective on 9 May 2016.

#### FUTURE KEY ISSUES

ES.07. During 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 paid special attention on water quality mitigation measures and fully implement according ISEMM of the EM&A Manual, in particular for working areas near Ma Wat Channel and Ping Yuen River. Moreover, all effluent discharge shall be ensure to fulfill Technical Memorandum of Effluent Discharged into Drainage and Sewerage Systems, inland and Coastal Waters criteria or discharge permits stipulation.

ES.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.

**TABLE OF CONTENTS**

<b>1</b>	<b>INTRODUCTION</b>	<b>1</b>
1.1	PROJECT BACKGROUND	1
1.2	REPORT STRUCTURE	1
<b>2</b>	<b>PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS</b>	<b>2</b>
2.1	CONSTRUCTION CONTRACT PACKAGING	2
2.2	PROJECT ORGANIZATION	4
2.3	CONCURRENT PROJECTS	6
2.4	CONSTRUCTION PROGRESS	6
2.5	SUMMARY OF ENVIRONMENTAL SUBMISSIONS	8
<b>3</b>	<b>PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS</b>	<b>13</b>
3.1	GENERAL	13
3.2	MONITORING PARAMETERS	13
3.3	MONITORING LOCATIONS	13
3.4	MONITORING FREQUENCY AND PERIOD	15
3.5	MONITORING EQUIPMENT	16
3.6	MONITORING METHODOLOGY	18
3.7	EQUIPMENT CALIBRATION	20
3.8	DERIVATION OF ACTION/LIMIT (A/L) LEVELS	20
3.9	DATA MANAGEMENT AND DATA QA/QC CONTROL	21
<b>4</b>	<b>AIR QUALITY MONITORING</b>	<b>22</b>
4.1	GENERAL	22
4.2	SUMMARY OF MONITORING RESULTS	22
<b>5</b>	<b>CONSTRUCTION NOISE MONITORING</b>	<b>24</b>
5.1	GENERAL	24
5.2	SUMMARY OF MONITORING RESULTS	24
<b>6</b>	<b>WATER QUALITY MONITORING</b>	<b>26</b>
6.1	GENERAL	26
6.2	SUMMARY OF MONITORING RESULTS	26
<b>7</b>	<b>WASTE MANAGEMENT</b>	<b>29</b>
7.1	GENERAL WASTE MANAGEMENT	29
7.2	RECORDS OF WASTE QUANTITIES	29
<b>8</b>	<b>SITE INSPECTIONS</b>	<b>31</b>
8.1	REQUIREMENTS	31
<b>9</b>	<b>NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS AND PROSECUTIONS</b>	<b>34</b>
9.1	STATUS OF NON-COMPLIANCE ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION	34
<b>10</b>	<b>IMPLEMENTATION STATUS OF MITIGATION MEASURES</b>	<b>38</b>
10.1	GENERAL REQUIREMENTS	38
<b>11</b>	<b>CONCLUSIONS AND RECOMMENDATIONS</b>	<b>39</b>
11.1	CONCLUSIONS	39
11.2	RECOMMENDATIONS	39

## **LIST OF TABLES**

TABLE 2-1	STATUS OF ENVIRONMENTAL LICENSES AND PERMITS OF THE CONTRACTS
TABLE 3-1	SUMMARY OF EM&A REQUIREMENTS
TABLE 3-2	IMPACT MONITORING STATIONS - AIR QUALITY
TABLE 3-3	IMPACT MONITORING STATIONS - CONSTRUCTION NOISE
TABLE 3-4	IMPACT MONITORING STATIONS - WATER QUALITY
TABLE 3-5	AIR QUALITY MONITORING EQUIPMENT
TABLE 3-6	CONSTRUCTION NOISE MONITORING EQUIPMENT
TABLE 3-7	WATER QUALITY MONITORING EQUIPMENT
TABLE 3-8	ACTION AND LIMIT LEVELS FOR AIR QUALITY MONITORING
TABLE 3-9	ACTION AND LIMIT LEVELS FOR CONSTRUCTION NOISE
TABLE 3-10	ACTION AND LIMIT LEVELS FOR WATER QUALITY
TABLE 4-1	SUMMARY OF AIR QUALITY MONITORING RESULTS
TABLE 4-2	SUMMARIES OF BREACHES OF AIR QUALITY A/L LEVELS
TABLE 5-1	SUMMARY OF CONSTRUCTION NOISE MONITORING RESULTS
TABLE 5-2	SUMMARIES OF BREACHES OF CONSTRUCTION NOISE A/L LEVELS
TABLE 6-1	SUMMARY OF THE WATER QUALITY MONITORING RESULTS – CONTRACT 5
TABLE 6-2	SUMMARY OF THE WATER QUALITY MONITORING RESULTS – CONTRACT 2 & 3
TABLE 6-3	SUMMARY OF THE WATER QUALITY MONITORING RESULTS – CONTRACT 6
TABLE 6-4	SUMMARY OF THE WATER QUALITY MONITORING RESULTS – CONTRACT 2 & 6
TABLE 6-5	SUMMARIES OF BREACHES OF THE EXISTING WATER QUALITY A/L LEVELS
TABLE 6-6	SUMMARY OF WATER QUALITY EXCEEDANCE IN THE REPORTING PERIOD
TABLE 7-1	SUMMARY OF QUANTITIES OF INERT C&D MATERIALS
TABLE 7-2	SUMMARY OF QUANTITIES OF C&D WASTES
TABLE 8-1	SUMMARY OF REMINDERS/OBSERVATIONS OF SITE INSPECTION – CONTRACT 2
TABLE 8-2	SUMMARY OF REMINDERS/OBSERVATIONS OF SITE INSPECTION – CONTRACT 3
TABLE 8-3	SUMMARY OF REMINDERS/OBSERVATIONS OF SITE INSPECTION – CONTRACT 5
TABLE 8-4	SUMMARY OF REMINDERS/OBSERVATIONS OF SITE INSPECTION – CONTRACT 6
TABLE 8-5	SUMMARY OF REMINDERS/OBSERVATIONS OF SITE INSPECTION – CONTRACT SS C505
TABLE 9-1	STATISTICAL SUMMARY OF ENVIRONMENTAL COMPLAINTS
TABLE 9-2	STATISTICAL SUMMARY OF ENVIRONMENTAL SUMMONS
TABLE 9-3	STATISTICAL SUMMARY OF ENVIRONMENTAL PROSECUTION
TABLE 10-1	ENVIRONMENTAL MITIGATION MEASURES

## **LIST OF ANNEXES**

APPENDIX A	LAYOUT PLAN OF THE PROJECT
APPENDIX B	ENVIRONMENTAL MANAGEMENT ORGANIZATION CHART
APPENDIX C	DESIGNATED MONITORING LOCATIONS AS RECOMMENDED IN THE APPROVED EM&A MANUAL
APPENDIX D	MONITORING LOCATIONS FOR IMPACT MONITORING
APPENDIX E	EVENT AND ACTION PLAN
APPENDIX F	GRAPHICAL PLOTS FOR MONITORING RESULT
APPENDIX G	WEATHER INFORMATION
APPENDIX H	WASTE FLOW TABLE
APPENDIX I	IMPLEMENTATION SCHEDULE FOR ENVIRONMENTAL MITIGATION MEASURES

## 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 12<sup>th</sup> 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 May 2016 to 31 July 2016**.

### 1.2 REPORT STRUCTURE

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

<b>Section 1</b>	Introduction
<b>Section 2</b>	Project Organization and Construction progress
<b>Section 3</b>	Summary of Impact monitoring Requirements
<b>Section 4</b>	Air Quality Monitoring
<b>Section 5</b>	Construction Noise Monitoring
<b>Section 6</b>	Water Quality Monitoring
<b>Section 7</b>	Waste Management
<b>Section 8</b>	Non-compliance, Complaints, Notifications of Summons and Prosecutions
<b>Section 9</b>	Implementation Status of Mitigation Measures
<b>Section 10</b>	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       | • Tube excavation (NB + SB)   |
| Portal         | • Adit invert slab, waterproofing and lining, post-excavation grouting      |
|                | • Ventilation building superstructure                                       |
| North Portal   | • Slope stabilization and retaining wall                                    |
|                | • Southbound TBM excavation   |
|                | • Northbound top heading and bottom bench excavation and tunnel enlargement |
|                | • Tunnel Boring Machine (TBM) excavation                                    |
|                | • Ventilation building foundation   |
| South Portal   | • Southbound and Northbound Drill and Blast (D&B) excavation                |
|                | • Building works superstructure   |
|                | • Blast curtain inside the tunnel   |
| Admin Building | • 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.

- Pre-drilling works for noise barrier
- Cable detection and trial trenches
- Filling works at Tong Hang East
- Installation of Stone Cladding
- Storm drain laying
- Noise barrier construction
- Pier / pier table construction
- Pile cap works
- Portal beam construction
- Pre-drilling Works and Piling Works for Viaduct
- Pre-drilling Works and Piling Works for Noise Barrier
- Retaining Wall construction
- Road works
- Sewer works
- Slope works
- Socket H-pile Installation
- Steel Posts and Panels Installation of Noise Barrier
- Tree Felling Works
- Utilities Duct Laying
- Viaduct segment erection
- Waterworks

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
- Bituminous laying at existing LMH road
- Brick laying at footpath of LMH road
- Planting at proposed and existing LMH road
- Installation of Underground Utility (UU) at proposed and existing LMH road
- Irrigation at proposed 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:

- Slope Works
- Site Clearance
- Site Accesses Construction
- Ground Investigation Works
- Bored Piling
- Soil Nail
- Abutment and Pier Construction
- Sewage Treatment Plant Construction
- Road Works

- Tunnel Excavation
- Pile Cap Construction
- Tunnel Excavation
- Sewage Treatment Plant Construction

Contract 7 (NE/2014/03)

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

- Ground Investigation Works for Bridge A, C and E
- Piling Works for Bridge A, B, C, D
- Pile Caps Construction at Bridges B and C

Contract SS C505

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

- General Site Setup
- CLP temporally sub-station works
- Erection of Welfare Shelter
- Building number 4, 5, 6, 9, 11 and 36 construction
- Excavation waterproofing works for Building no. 4, 6 & 11
- Pile cap construction for Building no. 4, 6 & 7
- Tower crane operation and Tower crane TC10 construction
- H-pile works and load test
- Disassembly of crawler crane
- Grouting and full core to completed bored piles
- Bridge construction works including construction of bridge column, retaining wall, pile cap
- Underground drainage works
- Prototype “A” Construction works
- Prototype “B” footing construction works
- Mock up for south entrance double curve cladding
- Formwork and falsework for PTB’s slab construction
- Construction PTB M/F flat slab
- Pile cap construction for PTB, including excavation and backfilling works
- Footing construction
- Steel beam works for maintenance platform for PTB
- Bridge deck construction for Bridges 1, 2 & 3

## 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
<b>Contract 2</b>				
1	Air pollution Control (Construction Dust) Regulation	Ref No.: 368864	31 Dec 2013	Till Contract ends
2	Chemical Waste Producer Registration	<i>North Portal</i> Waste Producers Number: No.5213-652-D2523-01	25 Mar 2014	Till Contract ends
		<i>Mid-Vent Portal</i> Waste Producers Number: No.5213-634-D2524-01	25 Mar 2014	Till Contract ends
		<i>South Portal</i> Waste Producers Number: No.5213-634-D2526-01	9 Apr 2014	Till Contract ends
3	Water Pollution Control Ordinance - Discharge License	No.WT00018374-2014	8 Oct 2014	30 Sep 2019
		No.: W5/11389	28 Mar 2014	31 Mar 2019
		No. WT00023063-2015	18 Dec 2015	31 Mar 2019
		No.: W5/11392	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-RN0795-15	7 Dec 2015	6 Jun 2016
		GW-RN0893-15	01-Jan-2016	27-Jun-2016
		GW-RN0057-16	28-Feb-2016	27-May-2016
		GW-RN0067-16	28-Feb-2016	27-May-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-RN0321-16	30-Apr-2016	29-Jun-2016
		GW-RN0323-16	30-Apr-2016	29-Jun-2016
		GW-RN0359-16	20-May-2016	19-Aug-2016
		GW-RN0378-16	30-May-2016	29-Aug-2016
		GW-RN0332-16	09-May-2016	08-Aug-2016
		GW-RN0435-16	27-Jun-2016	26-Dec-2016
		GW-RN0451-16	24-Jun-2016	19-Sep-2016
		GW-RN0457-16	22-Jun-2016	14-Dec-2016
GW-RN0519-16	1 Aug 2016	30 Oct 2016		
GW-RN0543-16	18 Jul 2016	13 Jan 2017		

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
6	Specified Process License (Mortar Plant Operation)	L-3-251(1)	12-Apr-2016	11-Apr-2021
<b>Contract 3</b>				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 362101	17 Jul 2013	Till Contract ends
2	Chemical Waste Producer Registration	Waste Producers Number: No.:5113-634-C3817-01	7 Oct 2013	Till Contract ends
3	Water Pollution Control Ordinance - Discharge License	No.:WT00016832 – 2013	28 Aug 13	31 Aug 2018
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7017914	2 Aug 13	Till Contract ends
5	Construction Noise Permit	GW-RN0892-15	9 Jan 2016	8 July 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-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-RN0158-16	8 Mar 2016	31 Aug 2016
		GW-RN0168-16	15 Mar 2016	14 Jun 2016
		GW-RN0170-16	11 Mar 2016	10 Sep 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-RN0307-16	10 May 2016	9 Sep 2016
GW-RN0308-16	10 May 2016	9 Sep 2016		
GW-RN0309-16	30 April 2016	29 Oct 2016		
GW-RN0305-16	5 May 2016	4 Aug 2016		
GW-RN0414-16	18 June 2016	17 Dec 2016		
GW-RN0419-16	21 June 2016	30 Sep 2016		
GW-RN0421-16	21 June 2016	30 Sep 2016		
GW-RN0434-16	22 June 2016	21 Dec 2016		



Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
		GW-RN0446-16	24 June 2016	31 Aug 2016
		GW-RN0509-16	16 Jul 2016	31 Aug 2016
		GW-RN0514-16	16 Jul 2016	15 Oct 2016
		GW-RN0525-16	20 Jul 2016	7 Jan 2017
		GW-RN0541-16	5 Aug 2016	4 Nov 2016
		GW-RN0544-16	30 Jul 2016	31 Jul 2016
		GW-RN0549-16	30 Jul 2016	9 Jan 2017
<b>Contract 5</b>				
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
<b>Contract 6</b>				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 390614	29 Jun 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producers Number No.: 5213-652-C3969-01	31 Aug 2015	Till the end of Contract
3	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7022707	9 Jul 2015	Till the end of Contract
4	Water Pollution Control Ordinance - Discharge License	No.: WT00024574-2016	31 May 2016	31 May 2021
		No.: WT00024576-2016	31 May 2016	31 May 2021
		No.: WT00024742-2016	14 June 2016	30 June 2021
		No.: WT00024746-2016	14 June 2016	30 June 2021
<b>Contract SS C505</b>				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 390974	13 Jul 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producer No.: 5213-642-L1048-07	16 Sep 2015	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: WT00022774-2015	17 Nov 2015	30 Nov 2020
4	Waste Disposal Regulation - Billing Account for Disposal	Account No. 7022831	23 Jul 2015	Till the end of Contract

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
	of Construction Waste			
5	Construction Noise Permit	PP-RN0013-16	14 April 2016	22 May 2016
		GW-RN0197-16	23 Mar 2016	22 May 2016
		GW-RN0209-16	23 Mar 2016	22 May 2016
		PP-RN0007-16	10 Mar 2016	9 May 2016
		PP-RN0015-16	16 May 2016	15 July 2016
		GW-RN0337-16	23 May 2016	22 July 2016
		GW-RN0396-16	5 June 2016	4 Nov 2016
		PP-RN0015-16	16 May 2016	15 July 2016
<b>Contract 7</b>				
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.: WT00022774-2015	10 May 2016	31 May 2021
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7024129	21 Jan 2016	Till the end of Contract
5	Construction Noise Permit	GW-RN0162-16	23 Mar 2016	22 May 2016
		GW-RN0329-16	23 May 2016	22 July 2016
		GW-RN0538-16	23 Jul 2016	4 Nov 2016
<b>Contract 4</b>				
1	Air pollution Control (Construction Dust) Regulation	Form of Notification of Construction work has submitted to EPD in July 2016.		
2	Chemical Waste Producer Registration	Application is under preparation		
3	Water Pollution Control Ordinance - Discharge License	Application is under preparation		
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Application is under preparation		

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

**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 <sup>^</sup>	House no. 10B1 Nga Yiu Ha Village	LMH to Frontier Closed Area	Contract 6
AM5a <sup>^</sup>	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 <sup>@</sup>	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 <sup>#</sup>	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 Contract 7
NM2a <sup>#</sup>	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

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

**Table 3-4 Impact Monitoring Stations - Water Quality**

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

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
	of Kong Yiu Channel			at upstream 51m of the designated location	C505 Contract 5
WM1-Control	Upstream of Kong Yiu Channel	834 185	845 917	NA	ArchSD SS 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 29<sup>th</sup> 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
<i>24-Hour TSP</i>	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Model TE-5025A
<i>1-Hour TSP</i>	
Portable Dust Meter	Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter

Wind Data Monitoring Equipment

3.5.4 According to the approved EM&A Manual, wind data monitoring equipment shall also be provided and set up for logging wind speed and wind direction near the dust monitoring locations. The equipment installation location shall be proposed by the ET and agreed with the IEC. For installation and operation of wind data monitoring equipment, the following points shall be observed:

- 1) The wind sensors should be installed 10 m above ground so that they are clear of obstructions or turbulence caused by buildings.
- 2) The wind data should be captured by a data logger. The data shall be downloaded for analysis at least once a month.
- 3) The wind data monitoring equipment should be re-calibrated at least once every six months.
- 4) Wind direction should be divided into 16 sectors of 22.5 degrees each.

3.5.5 ET has liaised with the landlords of the successful granted HVS installation premises. However, the owners rejected to provide premises for wind data monitoring equipment installation.

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

Noise Monitoring

- 3.5.7 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m s<sup>-1</sup>.
- 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 or Rion NC-74
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/ YSI Professional DSS
pH meter	AZ8685 pH pen-style meter / YSI Professional Plus / YSI 6820/650MDS
Turbidimeter	Hach 2100Q / 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 4<sup>0</sup>C 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 or YSI Professional DSS 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 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<sup>®</sup> 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 (µg /m <sup>3</sup> )		Limit Level (µg/m <sup>3</sup> )	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AM1b	265	143	500	260
AM2	268	149		
AM3	269	145		
AM4b	267	148		
AM5a	268	143		
AM6	269	148		
AM7b	275	156		
AM8	269	144		
AM9b	271	151		

**Table 3-9 Action and Limit Levels for Construction Noise**

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

*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
		AND 130% of upstream control station of the same day				
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, 7 and Contract SS C505 and air quality monitoring was performed at all designated locations.

### 4.2 SUMMARY OF MONITORING RESULTS

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

**Table 4-1 Summary of Air Quality Monitoring Results**

Monitoring Location	1-hour TSP ( $\mu\text{g}/\text{m}^3$ )			24-hour TSP ( $\mu\text{g}/\text{m}^3$ )		
	Max	Min	Mean	Max	Min	Mean
AM1b	104	30	70	83	21	49
Record Date	13-May-16	31-May-16	48 events	4-Jun-16	6-May-16	15 events
AM2	124	25	73	148	50	96
Record Date	9-Jul-16	31-May-16	48 events	13-May-16	14-Jul-16	15 events
AM3	131	27	75	144	29	82
Record Date	13-May-16	31-May-16	48 events	4-Jun-16	26-Jul-16	15 events
AM4a	98	28	72	94	18	46
Record Date	11-May-16	6-Jul-16	48 events	4-May-16	6-Jul-16	16 events
AM5a	139	23	74	55	6	29
Record Date	11-May-16	2-Jun-16	48 events	16-May-16	6-Jul-16	16 events
AM6	97	27	72	146	13	73
Record Date	20-Jun-16	2-Jun-16	48 events	16-May-16	4-May-16	16 events
AM7b	139	23	71	124	27	60
Record Date	29-Jul-16	25-Jun-16	48 events	29-Jun-16	6-Jul-16	16 events
AM8	131	14	65	58	18	32
Record Date	29-Jul-16	8-Jun-16	48 events	21-May-16	6-Jul-16	16 events
AM9b	111	17	49	88	10	45
Record Date	13-May-16	23-Jun-16	48 events	24-May-16	16-Jun-16	15 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
	Limit Level	0	0	0

Location	Exceedance	1-hour TSP	24- hour TSP	Total
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, 7 and Contract SS C505 and noise monitoring was performed at all designated locations.

### 5.2 SUMMARY OF MONITORING RESULTS

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

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

**Table 5-1 Summary of Construction Noise Monitoring Results**

Monitoring Location	Leq, 30min (dB(A))	
	Max	Min
NM1	72	52
Record Date	25-May-16	19-May-16
NM2/ NM2a(*)	73	59
Record Date	17-Jun-16	31-May-16
NM3	66	56
Record Date	8-Jun-16	20-Jun-16
NM4	69	59
Record Date	8-Jun-16	14-Jun-16
NM5	64	54
Record Date	30-Jun-16	5-May-16 and 2-Jun-16
NM6	65	51
Record Date	11-May-16	17-May-16
NM7	70	61
Record Date	30-Jun-16	17-May-16 & 14-Jun-16 & 6-Jul-16
NM8	60	54
Record Date	6-Jun-16 & 15-Jul-16	31-May-16
NM9	68	59
Record Date	19-May-16	31-May-16
NM10(*)	68	60
Record Date	23-Jun-16 4-Jul-16	3-May-16 & 31-May-16 & 28-Jun-16 & 21-Jul-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	2	26 May 2016 (Contract 2) 20 June 2016 (Contract SS C505)
NM2/ NM2a	0		
NM3	0		
NM4	0		
NM5	0		
NM6	0		
NM7	0		
NM8	0		
NM9	0		
NM10	0		

- 5.2.4 In this Reporting Period, the noise level measured at all designated monitoring locations were below 75dB(A). No Limit Level exceedance was triggered and no corrective action was required.
- 5.2.5 Furthermore, there were two (2) noise complaints (Action Level exceedance) received for Contract 2 and Contract SS C505 and Action Level exceedances were triggered. Investigation reports for the complaints were conducted by ET and the results revealed that both complaints were not related to the Project. The complaint details could be referred to Section 9.

## 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, 7 and Contract SS C505 and water quality monitoring was performed at all designated locations.

### 6.2 SUMMARY OF MONITORING RESULTS

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

6.2.2 In accordance with “*Event and Action Plan*”, the water quality monitoring frequency shall be increased to daily when exceedance recorded at the exceeded monitoring location. In the Reporting Period, 39 days of scheduled water monitoring were conducted. Moreover, 3, 21, 6, 4 and 1 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	5.3	5.3	10.7	8.1	9.5	2.0
Max	7.9	8.6	543.5	229.0	409.0	259.5
Average	7.0	7.1	45.4	25.9	47.1	22.2

**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	5.5	5.5	4.8	7.9	4.7	6.5	6.0	3.0	7.5
Max	8.3	8.3	8.3	423.0	761.0	231.5	542.5	435.5	206.5
Average	7.0	7.2	6.5	38.5	53.8	29.0	42.8	49.4	31.2

**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	5.7	4.9	5.9	4.0	4.9	3.5	2.3	2.2	4.5	2.0	2.0	2.0
Max	8.0	8.1	8.5	8.4	579.5	96.0	383.5	96.5	808.0	86.5	362.0	207.5
Average	7.2	7.2	7.5	6.5	111.0	15.1	28.4	6.4	118.7	9.3	30.9	13.3

**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	5.7	5.7	3.1	3.4	3.0	3.0
Max	8.0	7.9	714.5	84.9	900.0	1560.0
Average	6.8	6.8	32.4	13.5	37.5	96.0

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
May-16	15	WM1	0	0	0	2	0	2
	18	WM2A	0	0	0	7	0	7
	13	WM2B	0	0	0	2	0	1
	17	WM3	0	0	0	4	0	2
	13	WM4	0	0	0	0	0	0
Jun-16	14	WM1	0	0	0	1	0	1
	20	WM2A	0	0	0	13	0	13
	14	WM2B	0	0	0	1	0	1
	13	WM3	0	0	0	0	0	0
	14	WM4	0	0	1	0	0	1
Jul-16	13	WM1	0	0	0	0	0	0
	22	WM2A	0	0	2	15	0	17
	18	WM2B	0	0	1	4	0	5
	13	WM3	0	0	0	0	0	0
	13	WM4	0	0	0	0	0	0
Total	42	WM1	0	0	0	3	0	3
	60	WM2A	0	0	2	35	0	37
	45	WM2B	0	0	1	7	0	7
	43	WM3	0	0	0	4	0	2
	40	WM4	0	0	1	0	0	1
Sum			0	0	4	49	0	50

6.2.4 In the Reporting Period, a total of 103 Action Level (AL)/ Limit Level (LL) exceedances namely 53 AL/LL exceedances of turbidity and 50 LL 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 were presented in the relevant monthly EM&A reports.

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

Date of Exceedance	Location	Exceeded Parameter	Investigation Result
17 and 19 May 2016	WM1 (C5, C6 and SS C505)	NTU & SS	The exceedances were not Project related.
11 May 2016	WM2A (C6)	NTU and/or SS	<ul style="list-style-type: none"> <li>A worker incorrectly connected inlet pipe which carried wastewater collected from the site to the tank which received effluent from the AquaSed. Wastewater was therefore discharged into the river through the outlet pipe of the tank. The exceedances were related to the Contract 6.</li> <li>The Contractor was reminded to enhance the checkup of the pipe connect to avoid reoccurrence of incident.</li> </ul>
17, 21, 27, 28, 30, 31 May 2016	WM2A (C6)	NTU and/or SS	The exceedances were not Project related.
7 and 21 May 2016	WM2B (C6)	NTU and/or SS	The exceedances were not Project related.

Date of Exceedance	Location	Exceeded Parameter	Investigation Result
9, 10, 12, 21 May 2016	WM3 (C2 and C6)	NTU and/or SS	The exceedances were not Project related.
6 June 2016	WM1 (C5, C6 and SS C505)	NTU & SS	The exceedances were not Project related.
4,6, 7, 8, 30 June 2016	WM2A (C6)	NTU &SS	The exceedances were not Project related.
13, 14, 15 16, 17, 18, 20, 21 June	WM2A (C6)	NTU &SS	<ul style="list-style-type: none"> <li>Excessive water was cumulated on uneven ground/ cracks due to continuous spraying by a series of sprinklers installed along the haul road. When vehicles passed the puddles, muddy water trapped on the uneven ground/ cracks was spilled from the road into a channel connecting to Ping Yuen River. The exceedances were related to the Contract 6.</li> <li>To resolve the deficiency, the Contractor has filled the uneven ground and reduce the frequency of water spraying on that area. Also, the haul road was levelled up to avoid muddy runoff. The situation was found improved during site inspection on 7 July 2016.</li> </ul>
6 June 2016	WM2B (C6)	NTU &SS	The exceedances were not Project related.
6 June 2016	WM4 (C2 and C3)	NTU &SS	The exceedances were not Project related.
2, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15,16, 18, 19, 20, 21 and 22 July 2016	WM2A(a) (C6)	NTU &SS	The exceedances were not Project related.
8, 9, 11, 13 and 18 July 2016	WM2B (C6)	NTU &SS	The exceedances were not Project related.

## 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
		May 2016	Jun 2016	Jul 2016		
C&D Materials (Inert) (in '000m <sup>3</sup> )	2	77.5386	62.4192	65.3701	406.55 09	-
	3	0.488	0.523	0.565		-
	5	0	0	0		-
	6	51.115	61.126	73.407		-
	7	0.505	0.613	0.207		-
	SS C505	1.087	8.645	2.9420		-
Reused in this Project (Inert) (in '000m <sup>3</sup> )	2	0.1268	0.5848	0.4227	24.733 8	-
	3	0	0	0		-
	5	0	0	0		-
	6	3.229	6.921	0.951		-
	7	0	0	0		-
	SS C505	1.074	8.541	2.8835		-
Reused in other Projects (Inert) (in '000m <sup>3</sup> )	2	38.9050	45.2952	25.0255	182.83 87	C6 / NENT# & other project approved by the ER
	3	0	0	0		-
	5	0	0	0		-
	6	17.469	23.286	32.858		C5 and other project approved by the ET
	7	0	0	0		-
	SS C505	0	0	0		-
Disposal as Public Fill (Inert) (in '000m <sup>3</sup> )	2	38.5068	16.5392	39.9219	198.84 34	Tuen Mun 38
	3	0.475	0.420	0.546		
	5	0	0	0		
	6	30.417	30.919	39.598		
	7	0.505	0.613	0.207		
	SS C505	0.013	0.104	0.0585		

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
		May 2016	Jun 2016	Jul 2016		
Recycled Metal ('000kg) #	2	44.8000	67.7300	11.4000	2599.5002	By licensed collector
	3	0	0	0		
	5	0	0	0		
	6	0	0	0		
	7	0	0	0		
	SS C505	1587.582	725.0582	162.93		
Recycled Paper / Cardboard Packing ('000kg) #	2	0.3500	0.3700	0	0.001# +1.971	By licensed collector
	3	0	0	0.001		
	5	0	0.062	0		
	6	0.211	0.166	0		
	7	0	0.005	0.047		
	SS C505	0	0.33	0.43		
Recycled Plastic ('000kg) #	2	0	0	0	0.005# +0.0285	By licensed collector
	3	0	0.001	0.004		
	5	0	0	0		
	6	0	0	0		
	7	0	0	0		
	SS C505	0.004	0.0045	0.02		
Chemical Wastes ('000kg) #	2	2.7280	1.7600	2.9920	8.48	By licensed collector
	3	0	0	1.000		
	5	0	0	0		
	6	0	0	0		
	7	0	0	0		
	SS C505	0	0	0		
General Refuses ('000m <sup>3</sup> )	2	0.1246	0.0916	0.1794	1.6386	NENT
	3	0.105	0.135	0.085		
	5	0.015	0.01	0.215		
	6	0.079	0.043	0.094		
	7	0	0	0		
	SS C505	0.156	0.117	0.189		

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

- 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
May 2016	6, 13, 20, 27 May 2016	4	Completed
June 2016	3, 10, 17, 24, 29 June 2016	6	Completed
July 2016	8, 15, 22 and 29 July 2016	0	Completed

8.1.3 In the Reporting Period, no non-compliance was recorded; however, **10** 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
May 2016	5, 9, 18, 23, 30 May 2016	5	Completed
June 2016	6, 13, 22, 27 June 2016	3	Completed
July 2016	4, 11, 19 and 25 July 2016	3	Completed

8.1.5 In the Reporting Period, no non-compliance was recorded; however, **11** 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
May 2016	3, 10, 17, 24, 31 May 2016	1	Completed
June 2016	7, 14, 22, 28 June 2016	0	Completed
July 2016	5, 12, 19 and 26 July 2016.	1	Completed

8.1.7 In the Reporting Period, no non-compliance was recorded; however, **2** 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
May 2016	5, 12, 19, 26 May 2016	8	Completed
June 2016	2, 10, 16, 23, 30 June 2016	8	Completed
July 2016	7, 14, 21 and 28 July 2016	4	Completed

8.1.9 In the Reporting Period, no non-compliance was recorded; however, **20** observations/ reminders were recorded during the site inspections. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

**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
May 2016	4, 11, 18, 25 May 2016	6	Completed
June 2016	1, 8, 15, 22, 29 June 2016	6	Completed
July 2016	5, 13, 20 and 27 July	5	Completed

8.1.11 In the Reporting Period, no non-compliance was recorded; however, **17** observations/ reminders were recorded during the site inspections. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

Contract 7

8.1.12 During the Reporting Period, **13** events of the joint site inspections were undertaken at Contract SS C505 to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in **Table 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
May 2016	3, 10, 17, 24, 31 May 2016	3	Completed
June 2016	7, 14, 22, 28 June 2016	3	Completed
July 2016	5, 12, 19 and 26 July 2016	0	Completed

8.1.13 In the Reporting Period, no non-compliance was recorded; however, **6** 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 eleven (11) documented environmental complaints. The summary of complaint received in the Reporting Period is listed below.

- 3 May 2016 - EPD conducted an inspection on construction site of Contract 2 (DHK) North Portal. EPD noted that water was bursting out from one of the wastewater treatment facilities and muddy water was discharging into a channel connecting another channel outside the site. Also, it was observed that the open channel was accumulated with thick mud. Remedial measures were undertaken by DHK immediately and no adverse water impact was observed at the open channel during follow up inspection by ET on 20 May 2016. In our investigation, it was advised that the Contractor shall properly maintain all wastewater treatment facilities. Dragages is advised to remove silt in the stormwater tank regularly or increasing the frequency if necessary in order to prevent the reoccurrence of the same issue. (Contract 2)
- 28 May 2016 - A complaint was received from 1823, regarding to the mud found on Sha Tau Kok Road -Wo Keng Shan was suspected from the construction site of Contract 2 and Contract 6. Site inspection for complaint investigation was conducted by ET on 2 and 3 June 2016. It was observed that the wheel washing facilities were installed at all site exits and conditions of site exits were satisfactory. Since there were many other heavy vehicles using the Sha Tau Kok -Wo Keng Shan Road, it is considered that the mud on Sha Tau Kok -Wo Keng Shan Road is unlikely due to the Contracts. (Contract 2 and Contract 6)
- 26 May 2016 - A complaint was received from CEDD on 26 May 2016, regarding noise nuisance from the construction site of Contract 2 (North Portal). Loi Tung Villagers complained that noise was made at midnight from the construction site. Also, early in the morning at 5, dump trucks were suspected to operate in the construction site, making noise thus affecting the daily lives of villagers. The Contractor advised that the noise source may come from the dump trucks queuing outside the site on Sha Tau Kok Road early in the morning at around 5 to 6, waiting to enter the construction site at around 7 am on working days (not included on Sunday or public holidays). To address public concern, DHK has requested the dump trucks' drivers to arrive after 6:30am on working days (not included on Sunday or public holidays). In the ET's investigation, there was no non-compliance of construction noise permit conditions. DHK was reminded to fully follow the conditions under the construction noise permit. (Contract 2)
- 31 May 2016 - A complaint was received from 1823, regarding water spraying over dump trucks was suspected to be carried out outside site area. The above action resulted in muddy water on Sha Tau Kok Road - Wo Hang and Sha Tau Kok Road - Ma Mei Ha, affecting other road users. As advised by Contractor (DHK), vehicles were thoroughly washed in the wheel washing facilities within the site area. As observed during ET's site inspections on 2 and 3 June 2016, no water spraying activities outside the work area could be observed. Therefore, the complaint regarding water spraying to dump trucks outside the work area is not evidenced based on the site observations, the Contractor was reminded to fully implement the mitigation measures as specified in the implementation schedule of the EM&A manual. (Contract 2)
- 10 June 2016 - A complaint was received from 1823 regarding to the mud found on Lin Ma Hang Road was suspected from the construction site. Considering the site areas located along Lin Ma Hang Road, four contracts which under the Project may involve in this complaint, are included Contract 5 (SRJV), Contract 6 (CCKJV), Contract 7 (KRSJV) and SS C505 (Leighton). Inspection for complaint investigation was carried out on 14 June 2016. Generally, no adverse dust impact were observed for all Contracts and public road cleaning was provided on Lin Ma Hang Road by the Contractor of Contract 5 and Contract 6



continuously. It is considered that the complaint was not related to the Project. Contract 5, Contract 6, Contract 7 and SS C505)

- 20 June 2016 - A noise complaint was received via 1823 on 20 June 2016 from a villager residing in Tsung Yuen Ha Village. The complainant said that the piling works carried out by Leighton subcontractor Kwan Shing (均城) at BCP site recently generated high noise level. Also, he queried why no noise abatement measures such as fabric cover being available. Site inspection was carried out by the ET on 22 and 29 June 2016 as well as 6 July 2016 and no adverse findings about the piling work were observed. Leighton has followed the conditions as stipulated in the CNP such as piling location and operation period 0930 hrs to 1130 hrs and 1400 hrs to 1700 hrs on all days except general holidays. To minimize the noise nuisance to the public, a noise shield act as a moveable noise barrier was adopted on piling machine during hard driving. In our conclusion, the piling works carried out by Leighton did not violate any NCO, EP and EM&A requirement. (Contract SS C505)
- 20 June 2016 - A complaint was received from ICC, regarding uneven ground and muddy water found on Lin Ma Hang Road. Since Lin Ma Hang Road is a public road and frequent used by heavy vehicles, it is believed that the uneven ground was due to over usage and not created by construction of Contract 6. During weekly joint site inspection by RE, IEC, ET and Contractor (CCKJV) on 30 June 2016, it was observed that muddy water was cumulated in the puddles created from the uneven ground after road cleaning by water truck and rainfall. However, the muddy water found on Lin Ma Hang Road was unlikely caused by the works of CCKJV. To address public concern, C6 has repaired the uneven ground by paving asphalt on 8 July 2016 to minimize the impact to the public. (Contract 6)
- 10 July 2016 - A complaint was received from 1823, regarding dust and muddy trails at junction of Sha Tau Kok Road and Wo Keng Sha Road. Also, it was suspected that water barriers were lack of maintenance, water leakage from water barriers occurred. Site inspection was carried out on 14 and 15 July 2016 for the complaint investigation. During the site inspection, no dusty materials were brought by vehicles from the site was observed. As dust suppression measures, road cleansing by water bowsers was provided by the Contractors (both Contract 2 of DHK and Contract 6 of CCKJV) along Wo Keng Shan Road and Sha Tau Kok Road every day and the water trails on the road left after road cleansing was observed. In view of the implemented mitigation measures such as wheel washing facilities and the cleanliness of roads condition during site inspection, it is considered that dust impact and muddy trails are not likely caused by the Contracts. (Contract 2 and Contract 6)
- 14 July 2016 - A complaint was received from EPD, regarding muddy water was discharged at Sha Tau Kok Road. Joint inspection was conducted by RE and Contractor of C6 (CCKJV) immediately on 13 July 2016. In our investigation, there were no construction activities near the complaint location. Therefore, it is considered that the muddy water discharge at Sha Tai Kok Road was not caused by the project. Moreover, the complaint location is actually out of the site boundary. To address the public concern, they had voluntarily carry out one-off cleaning of the drainage system of the concern area. (Contract 6)
- 4 July 2016 - A complaint was received from ICC on 4 July 2016 regarding muddy water found on Lin Ma Hang Road. According to the information provided, the complainant has already complained the same issue via 1823 on 20 June 2016 and the investigation report conducted by ET was issued on 13 July 2016. In our previous investigation, it was addressed that Lin Ma Hang Road is a public road and frequent used by heavy vehicles and uneven ground was formed due to over usage. Then, it may happen that muddy water was cumulated in the puddles created from the uneven ground after road cleansing by water truck and rainfall. To address public concern, CCKJV has already repaired the uneven ground by paving asphalt on 8 July 2016 to minimize the impact to the public. Based on the findings from site observation, it is considered that the muddy water found on Lin Ma Hang Road was unlikely caused by the works of CCKJV.

- 22 July 2016 - A complaint was received from EPD on 22 July 2016 related to mud and slurry discharged out of the construction sites near Sha Tau Kok Road – Ma Mei Ha and Wo Keng Shan Road when worker was washing a truck at the entrance of the construction site. Secondly, two trucks outside the construction site along Wo Keng Shan Road pouring water which carried mud from the trucks during rainy day. Site inspection was carried out by ET on 23 July 2016. It was observed that wheel washing facilities were provided within the construction site and no mud or dusty materials would be brought by the vehicles out of the construction site. For the second complaint, inspection was carried out along Wo Keng Shan Road during rainy day on 4 August 2016. It was observed that all the dump trucks leaving the sites of C6 were properly covered and no muddy water leaking come from the dump trucks. In our investigation, it is considered that the complaint was not related to the Contract. (Contract 2 and 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. Investigation for the complaint was carried out by ET independently and the associated investigation reports were submitted to relevant parties. In the Reporting Period, one (1) out of eleven (11) complaints was considered as project related.

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	May 2016	4	21	<ul style="list-style-type: none"> <li>• (11) Water Quality</li> <li>• (7) Construction Dust</li> <li>• (3) Noise</li> </ul>
	Jun 2016	0		
	Jul 2016	2		
3	May 2016	0	4	<ul style="list-style-type: none"> <li>• (1) Construction Dust</li> <li>• (2) Water quality</li> <li>• (1) Noise</li> </ul>
	Jun 2016	0		
	Jul 2016	0		
5	May 2016	0	4	<ul style="list-style-type: none"> <li>• (3) Construction Dust</li> <li>• (1) Noise</li> </ul>
	Jun 2016	2		
	Jul 2016	0		
6	May 2016	1	21	<ul style="list-style-type: none"> <li>• (16) Water Quality</li> <li>• (4) construction Dust</li> <li>• (1) Noise</li> </ul>
	Jun 2016	3		
	Jul 2016	4		
7	May 2016	0	2	<ul style="list-style-type: none"> <li>• (1) Construction Dust</li> <li>• (1) Noise</li> </ul>
	Jun 2016	2		
	Jul 2016	0		
SS C505	May 2016	0	2	<ul style="list-style-type: none"> <li>• (1) Construction Dust</li> <li>• (1) Noise</li> </ul>
	Jun 2016	2		
	Jul 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	May 2016	0	0	0	0	0
	Jun 2016	0		0	0	0
	Jul 2016	0		0	0	0
3	May 2016	0	0	0	0	0

Contract No	Reporting Period	Environmental Summons Statistics				
		Frequency	Cumulative since commencement of project	Complaint Nature		
				Water	Air	Noise
	Jun 2016	0		0	0	0
	Jul 2016	0		0	0	0
5	May 2016	0	0	0	0	0
	Jun 2016	0		0	0	0
	Jul 2016	0		0	0	0
6	May 2016	0	0	0	0	0
	Jun 2016	0		0	0	0
	Jul 2016	0		0	0	0
7	May 2016	0	0	0	0	0
	Jun 2016	0		0	0	0
	Jul 2016	0		0	0	0
SS C505	May 2016	0	0	0	0	0
	Jun 2016	0		0	0	0
	Jul 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	May 2016	0	0	0	0	0
	Jun 2016	0		0	0	0
	Jul 2016	0		0	0	0
3	May 2016	0	0	0	0	0
	Jun 2016	0		0	0	0
	Jul 2016	0		0	0	0
5	May 2016	0	0	0	0	0
	Jun 2016	0		0	0	0
	Jul 2016	0		0	0	0
6	May 2016	0	0	0	0	0
	Jun 2016	0		0	0	0
	Jul 2016	0		0	0	0
7	May 2016	0	0	0	0	0
	Jun 2016	0		0	0	0
	Jul 2016	0		0	0	0
SS C505	May 2016	0	0	0	0	0
	Jun 2016	0		0	0	0
	Jul 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 in May 2016 regarding Non Compliance (NC) with APCO for the non-covered dump trucks travelling from Contract 6's site to TM38-FB on 2 and 23 April 2016 without proper cover. To address the concern from EPD, CCKJV has conducted briefing 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"> <li>Wastewater to be treated by the filtration systems i.e. sedimentation tank or AquaSed before to discharge.</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>Maintain damp / wet surface on access road</li> <li>Keep slow speed in the sites</li> <li>All vehicles must use wheel washing facility before off site</li> <li>Sprayed water during breaking works</li> <li>A cleaning truck was regularly performed on the public road to prevent fugitive dust emission</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday.</li> <li>Keep good maintenance of plants</li> <li>Place noisy plants away from residence or school</li> <li>Provide noise barriers or hoarding to enclose the noisy plants or works</li> <li>Shut down the plants when not in used.</li> </ul>
Waste and Chemical Management	<ul style="list-style-type: none"> <li>On-site sorting prior to disposal</li> <li>Follow requirements and procedures of the “Trip-ticket System”</li> <li>Predict required quantity of concrete accurately</li> <li>Collect the unused fresh concrete at designated locations in the sites for subsequent disposal</li> </ul>
General	<ul style="list-style-type: none"> <li>The site was generally kept tidy and clean.</li> </ul>

## 11 CONCLUSIONS AND RECOMMENDATIONS

### 11.1 CONCLUSIONS

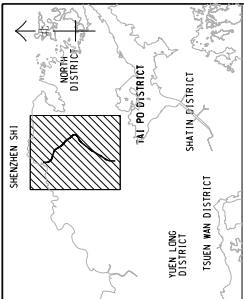
- 11.1.1 This is the 12<sup>th</sup> Quarterly EM&A Summary Report presenting the monitoring results and inspection findings for the Reporting Period from **1 May 2016 to 31 July 2016**.
- 11.1.2 For air quality monitoring, no 1-hour and 24-hour TSP monitoring results triggered the Action or Limit Levels were recorded. No NOEs or the associated corrective actions were therefore issued.
- 11.1.3 In the Reporting Period, two noise complaints (one for Contract 2 and another for Contract SS C505) were received which triggered the Action Level exceedances. The investigation reports for the complaints have been conducted by ET and it was concluded that both complaints were not related to the project. The IR has submitted to relevant parties.
- 11.1.4 For water quality monitoring, a total of 103 Action Level (AL)/ Limit Level (LL) exceedances namely 53 AL/LL exceedances of turbidity and 50 LL exceedances of SS were recorded. The investigation reports for cause of exceedances were conducted by ET and submitted to relevant parties. In the Reporting Period, 18 out of 103 exceedances were considered as project related and remedial action had undertaken by the Contractor.
- 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, eleven (11) documented environmental complaints were received for the Project. Upon receipt of the complaint, follow up action has been undertaken by both Contractor promptly to resolve the complaints and deficiencies. Investigation for the complaint was carried out by ET independently and the associated investigation reports were submitted to relevant parties. In the Reporting Period, one (1) out of eleven (11) complaints was considered as project related and remedial action had undertaken by the Contractor.
- 11.1.7 No environmental summons or successful prosecutions were recorded in the Reporting Period.

### 11.2 RECOMMENDATIONS

- 11.2.1 During 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 paid special attention on water quality mitigation measures and fully implement according ISEMM of the EM&A Manual, in particular for working areas near Ma Wat Channel and Ping Yuen River. Moreover, all effluent discharge shall be ensure to fulfill Technical Memorandum of Effluent Discharged into Drainage and Sewerage Systems, inland and Coastal Waters criteria or discharge permits stipulation.
- 11.2.2 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.
- 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**

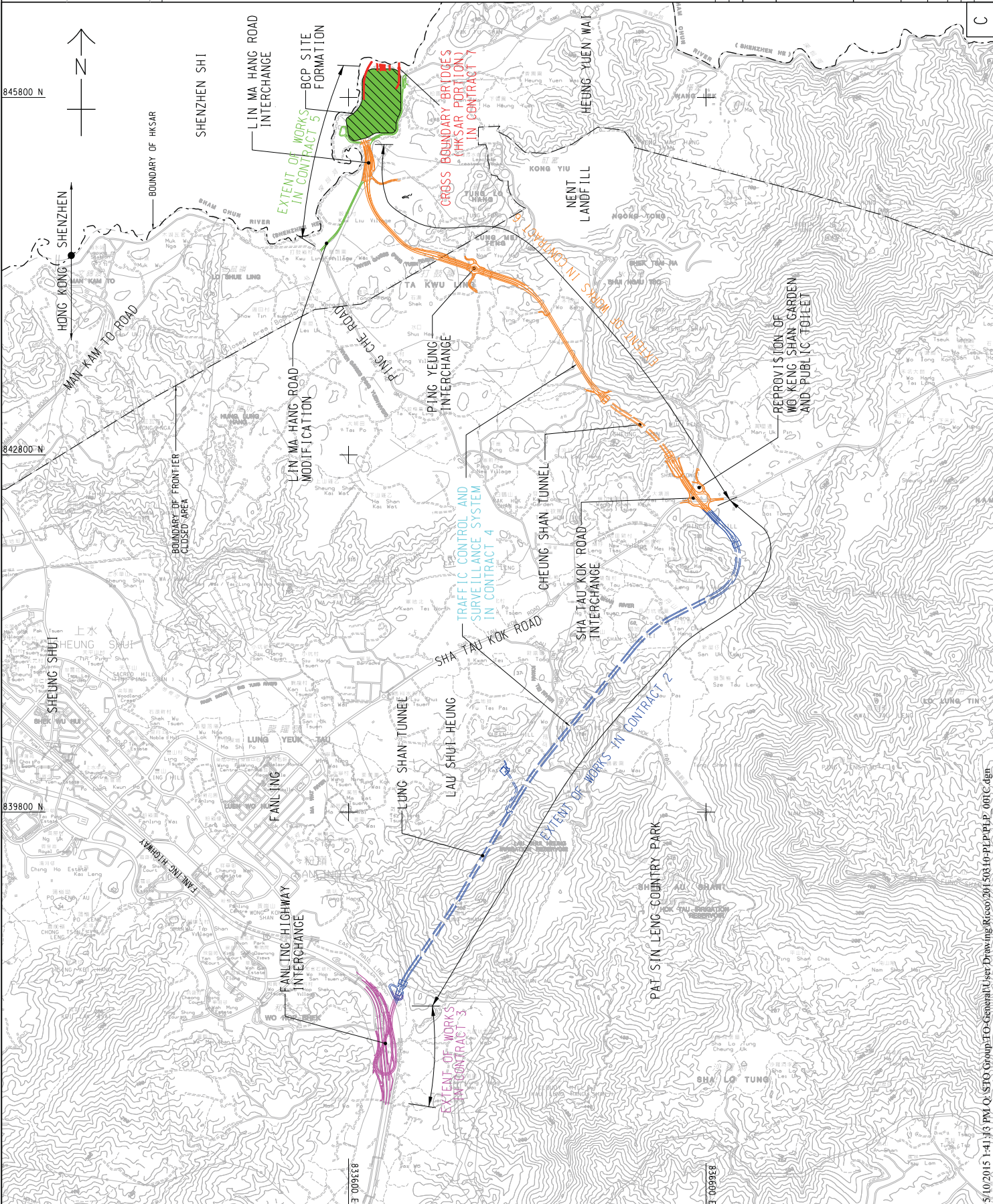


**LOCATION PLAN**  
SCALE 1 : 3000

**LEGEND:**

--- UNDERGROUND WORKS

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

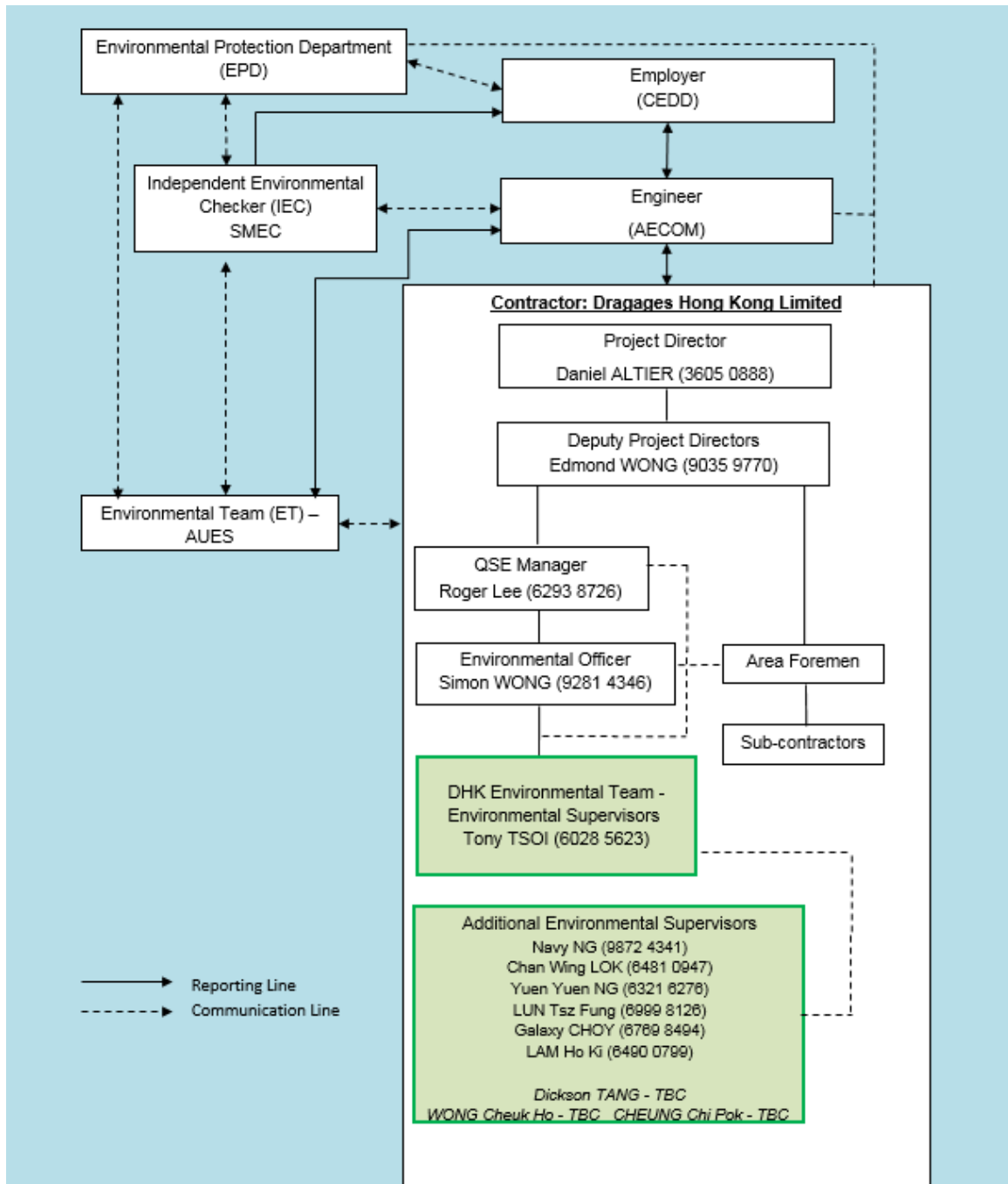


## **Appendix B**

### **Environmental Management Organization Chart**



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



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

<b>Organization</b>	<b>Project Role</b>	<b>Name of Key Staff</b>	<b>Tel No</b>	<b>Fax No.</b>
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:**

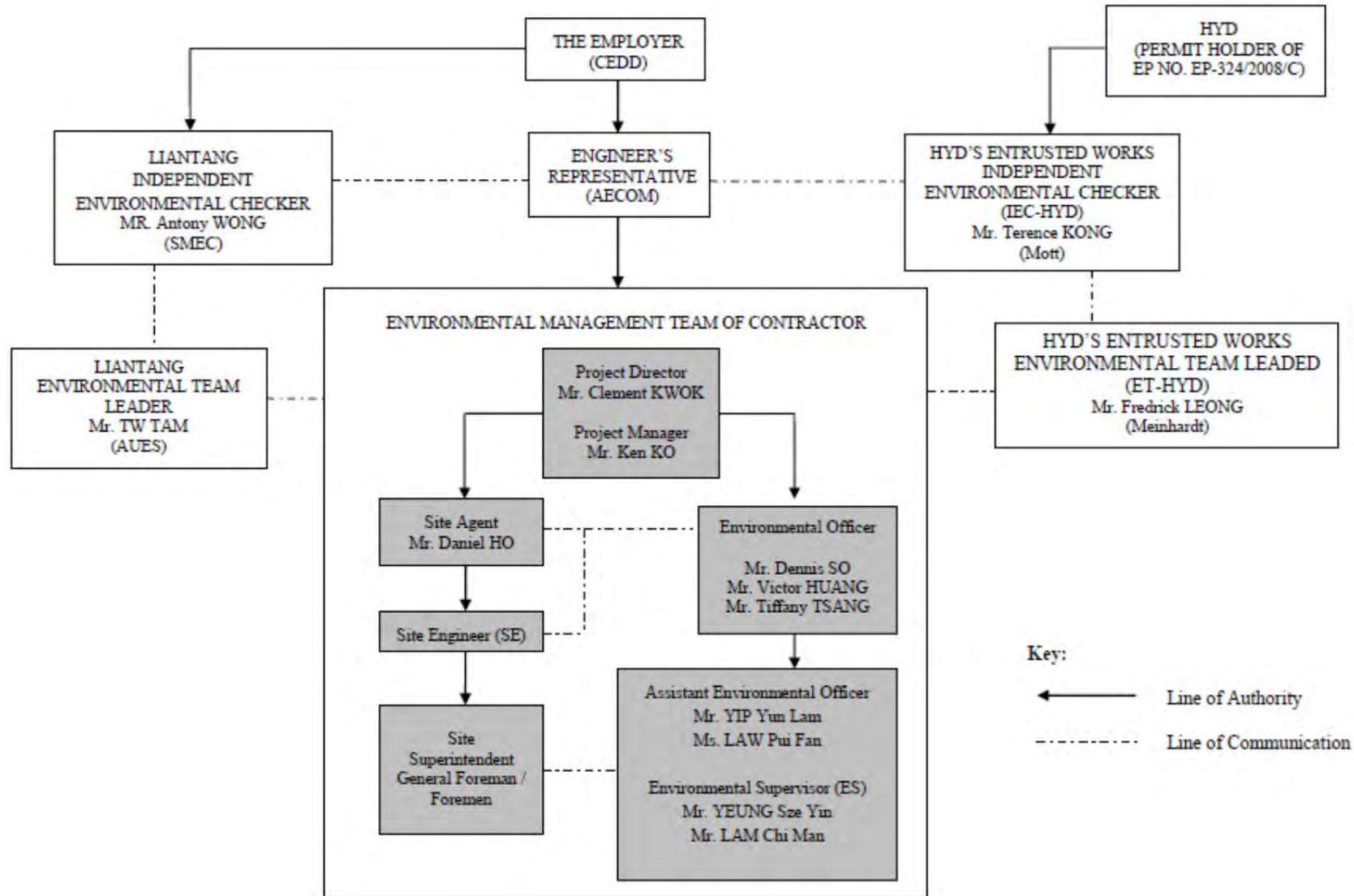
*CEDD (Employer) – Civil Engineering and Development Department*

*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	Bobby Hung	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*

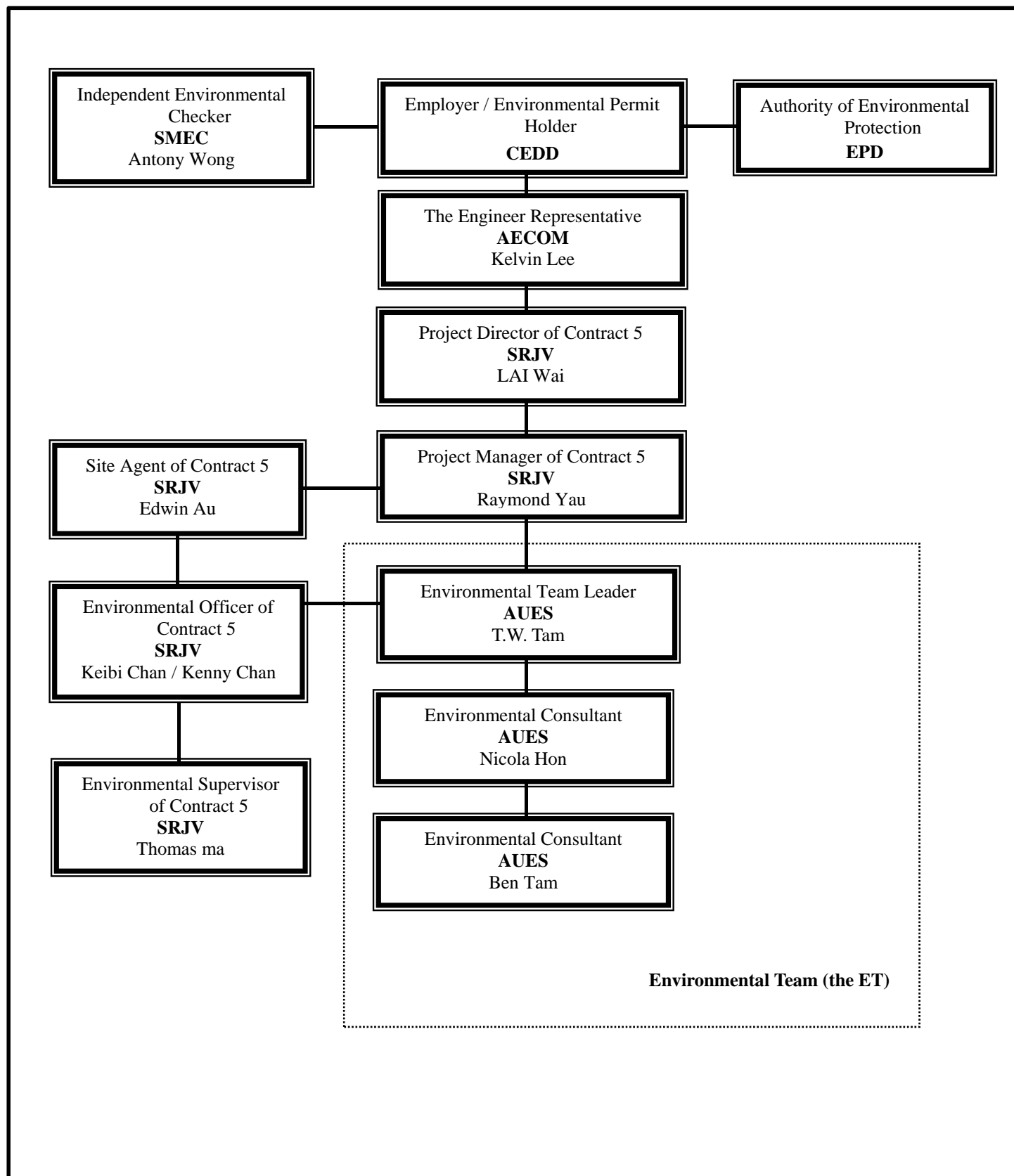
*AECOM (Engineer) – AECOM Asia Co. Ltd.*

*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:**

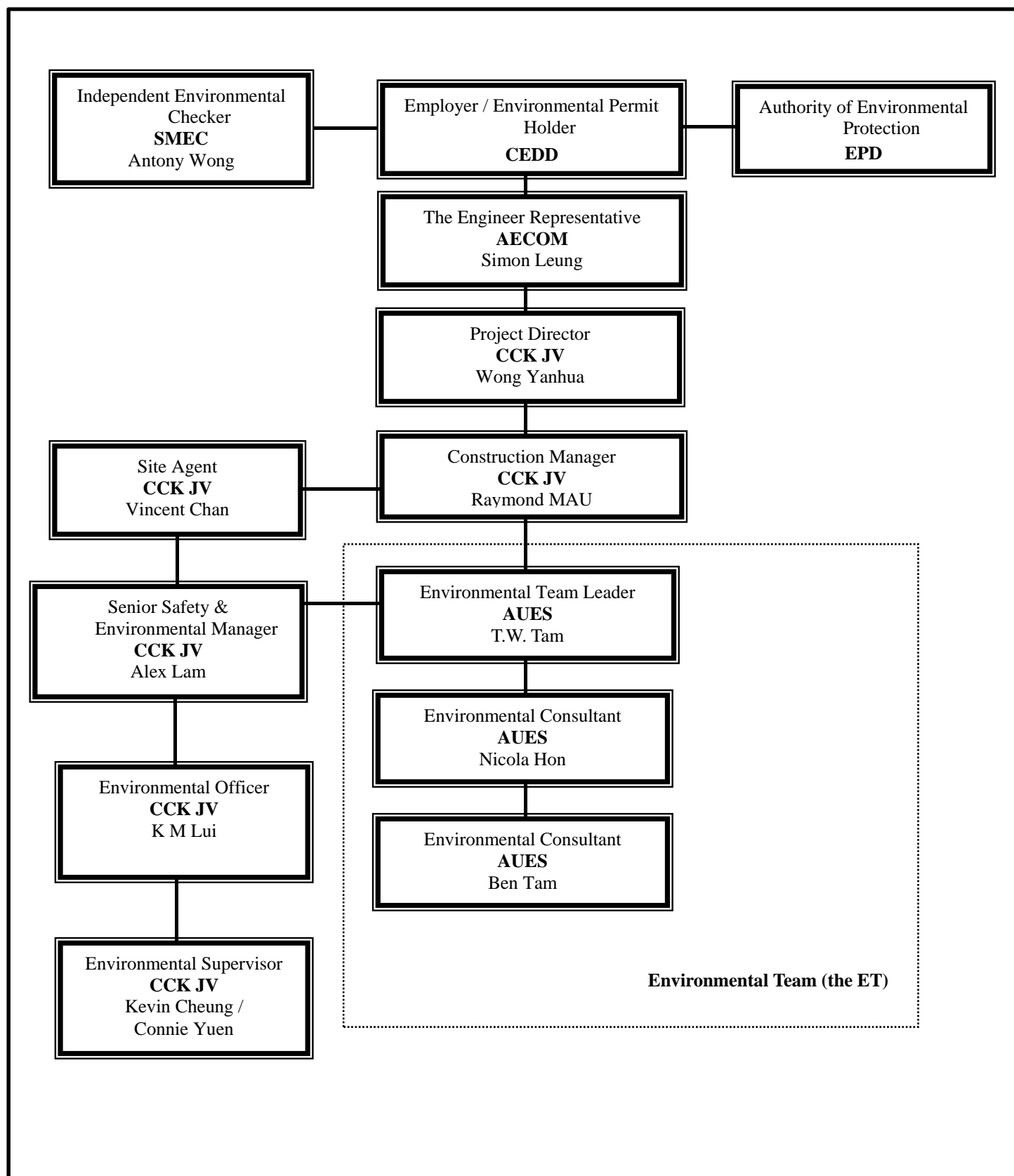
*CEDD (Employer) – Civil Engineering and Development Department*

*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/2013/08

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
AECOM	Engineer's Representative	Simon Leung	2674 2273	2674 7732
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
CCK JV	Project Director	Wang Yanhua	6190 4212	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

Legend:

*CEDD (Employer) – Civil Engineering and Development Department*

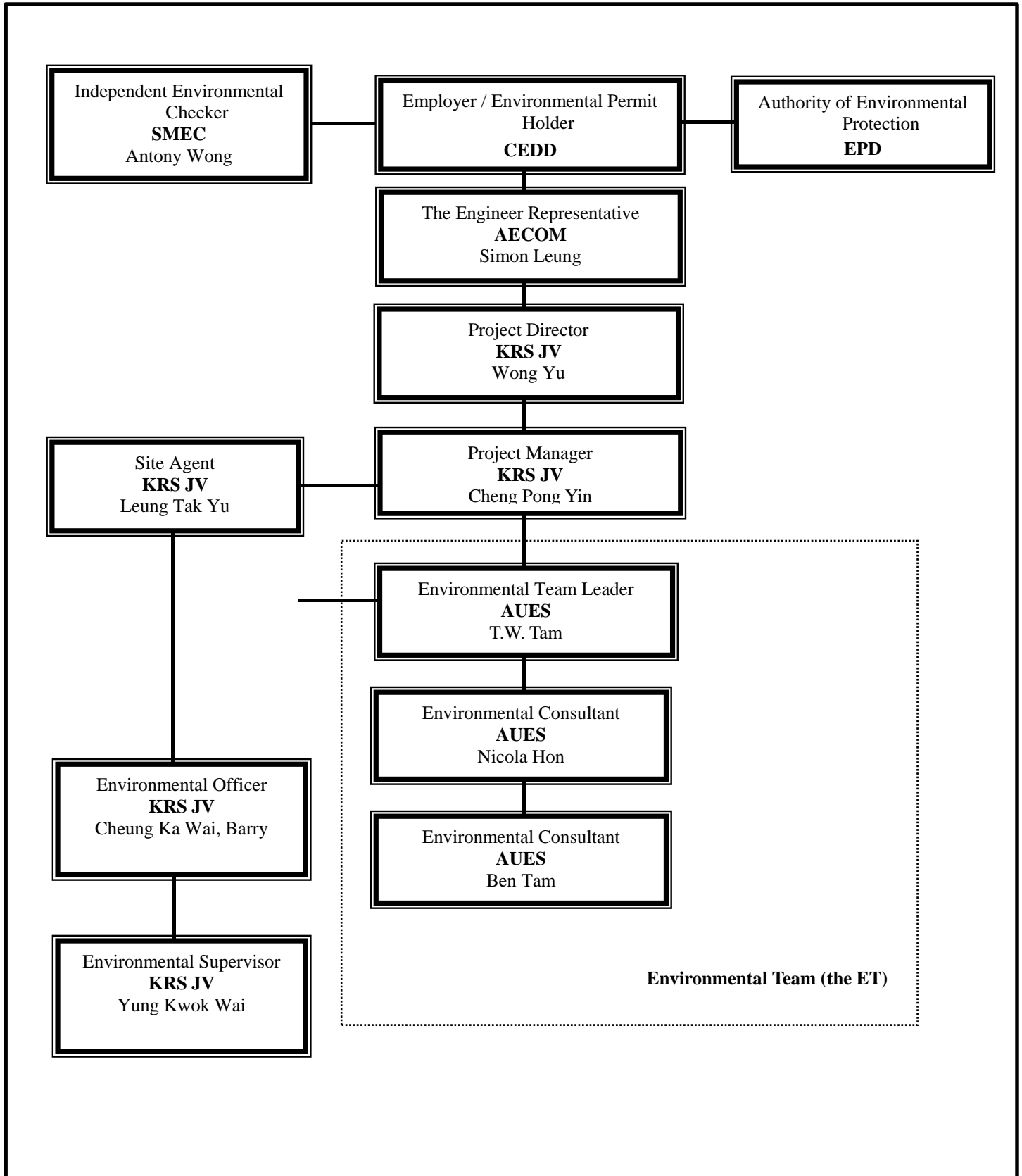
*AECOM (Engineer) – AECOM Asia Co. Ltd.*

*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

Legend:

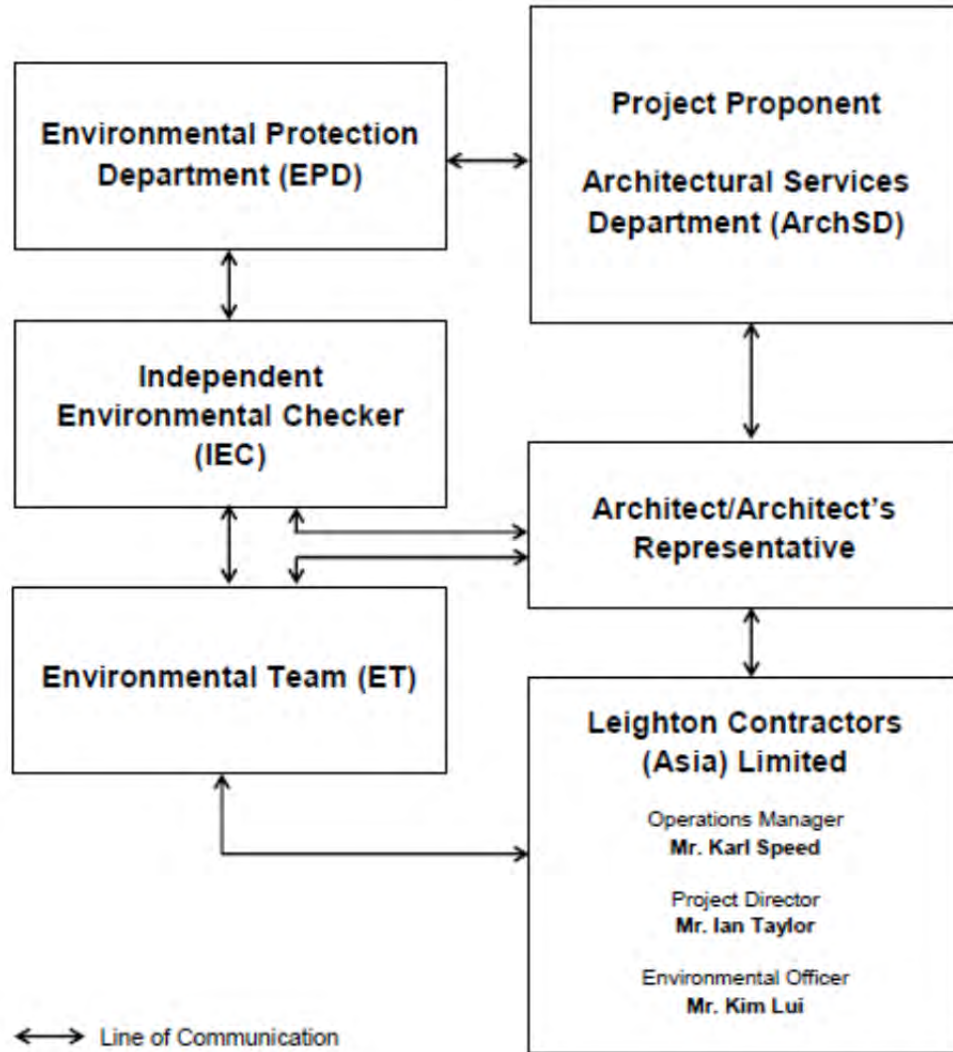
*CEDD (Employer) – Civil Engineering and Development Department*

*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	Mr. Kim Lui	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*

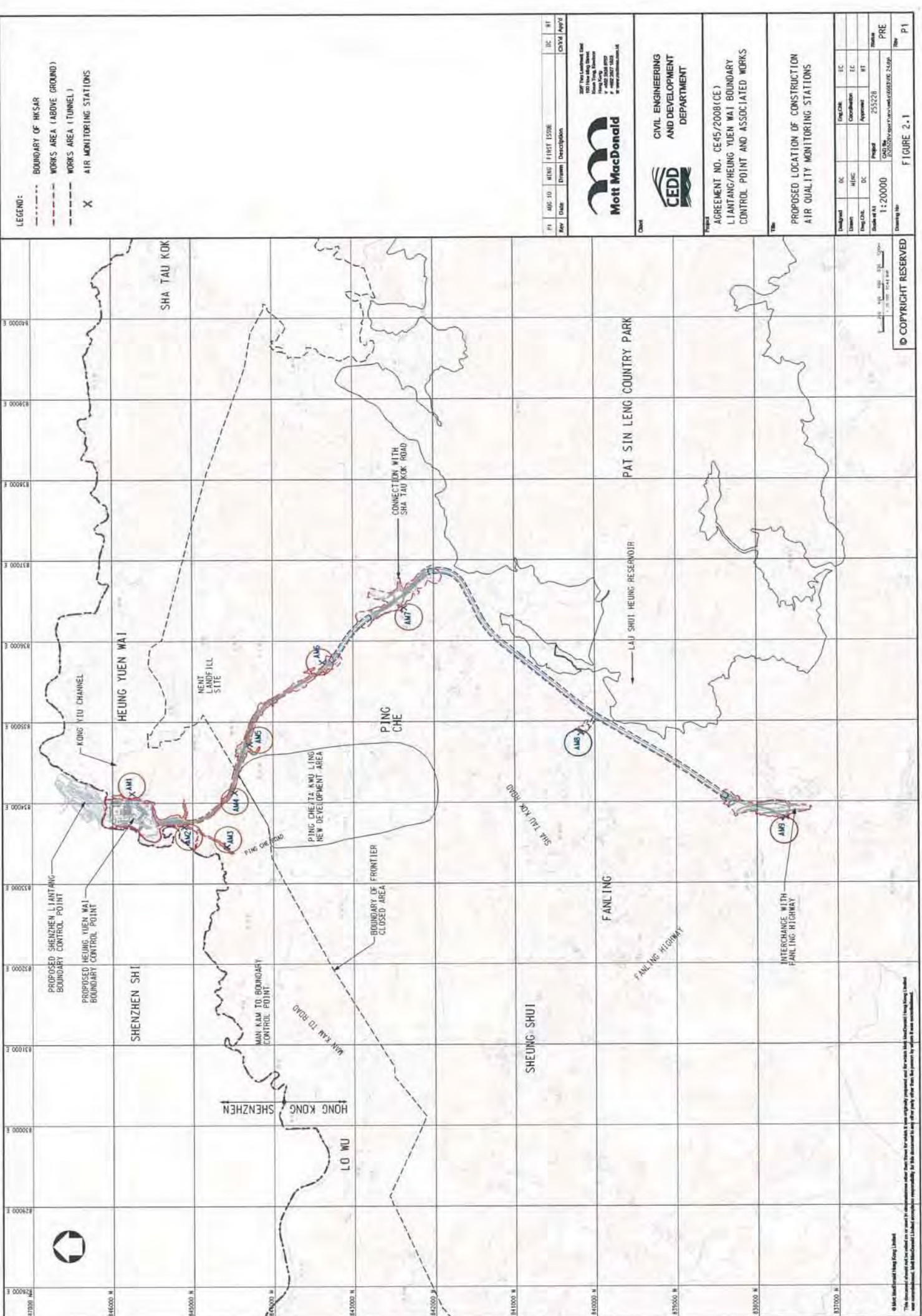
*AUES (ET) – Action-United Environmental Services & Consulting*

## **Appendix C**

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

**LEGEND:**

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



Rev	Date	Drawn	Description	DC	WT
1			FIRST ISSUE		



CIVIL ENGINEERING  
AND DEVELOPMENT  
DEPARTMENT

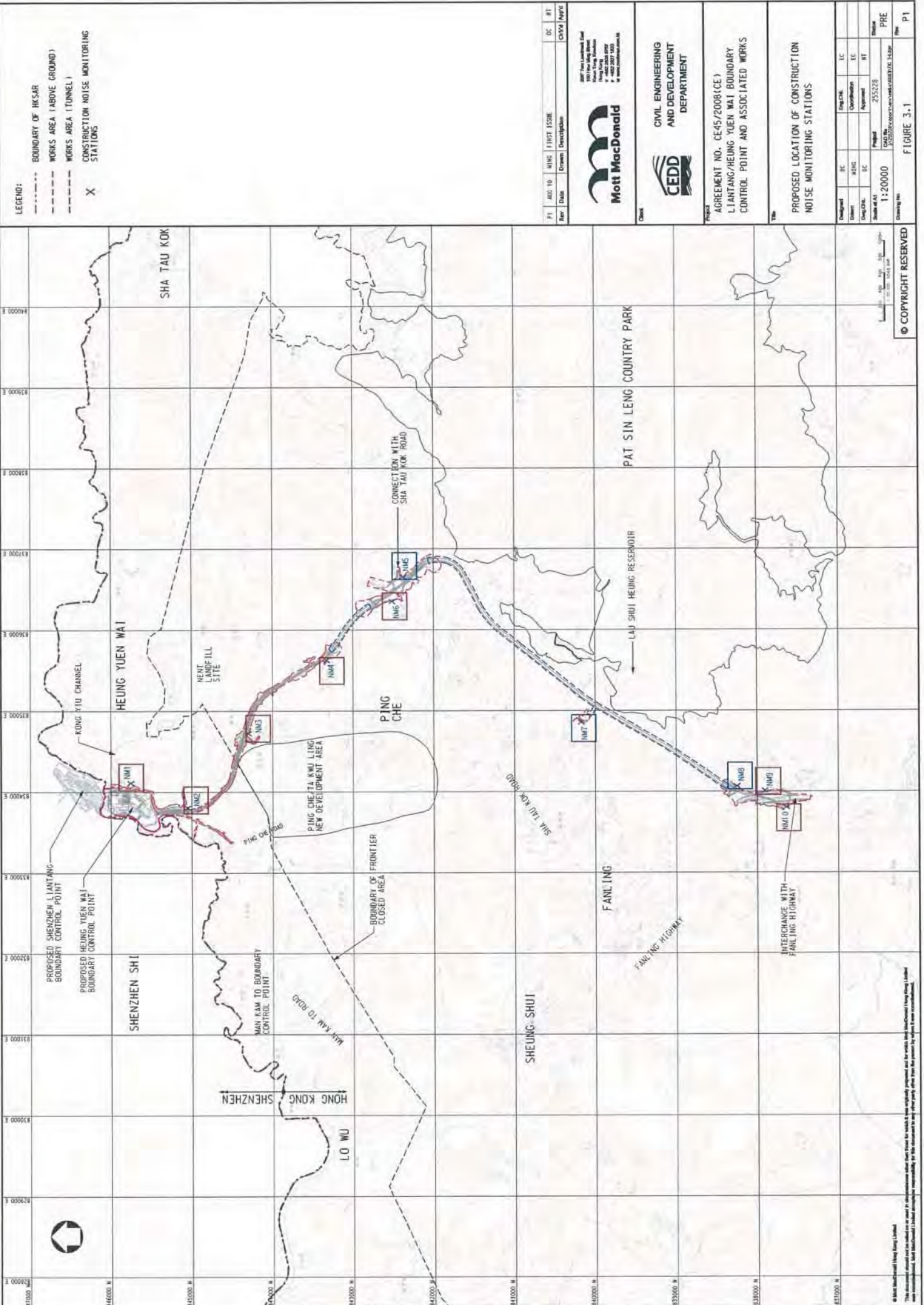


Project: AGREEMENT NO. CE-45/2008(CE)  
LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Scale of A1: 1:20000  
Project No: 253228  
Drawing No: P2008/06/03/01/001/0001/001/001/001/001  
Revision: PRE  
Date: P1

© COPYRIGHT RESERVED  
FIGURE 2.1

This document is issued on the understanding that the recipient will not use it for any purpose other than that for which it was prepared and is not to be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of Mott MacDonald Limited.



LEGEND:

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

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



100 The Landmark East  
100 The Landmark West  
Hong Kong, China  
Tel: +852 2500 8222  
Fax: +852 2500 8223  
www.mottmacdonald.com.hk



CIVIL ENGINEERING  
AND DEVELOPMENT  
DEPARTMENT

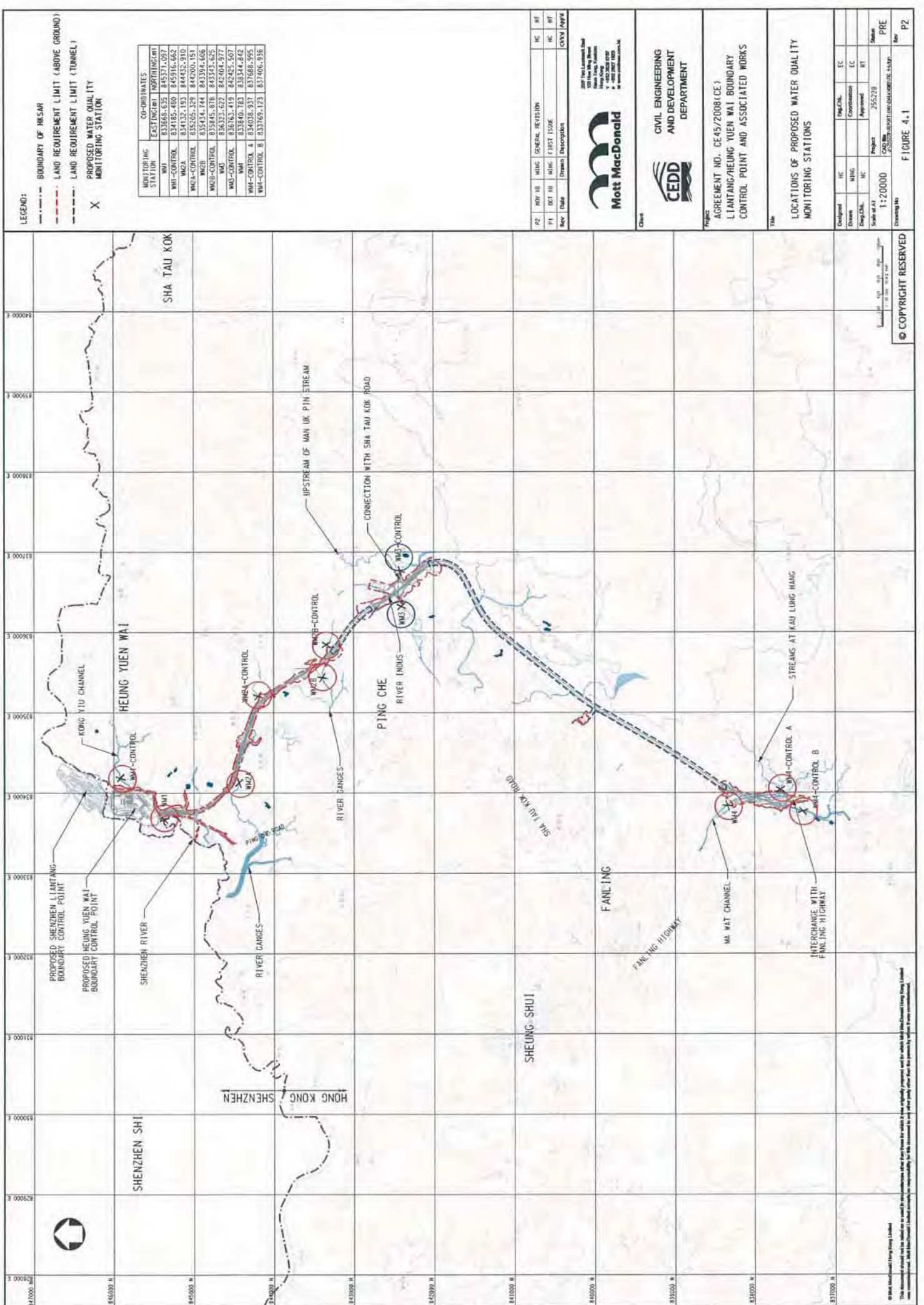
Project  
AGREEMENT NO. CE-45/2008(CE)  
LIANTANG/HEUNG YUEN WAI BOUNDARY  
CONTROL POINT AND ASSOCIATED WORKS

Proposed  
LOCATION OF CONSTRUCTION  
NOISE MONITORING STATIONS

Designated	IC	Pre-CHK	EC
Station	N/ING	Description	EC
Design/CHK	DC	Approval	BT
Scale at A1	1:20000	Project	255228
Scale at A2		CD/ID No.	CE45/2008(CE)001/001/016.1-019
Drawing No.		Sheet	PRE
		Rev	P1

© COPYRIGHT RESERVED

Mott MacDonald (Hong Kong) Limited  
This document is intended for use as a design document and is not to be used for construction purposes. It is the property of Mott MacDonald (Hong Kong) Limited and its contents are confidential. All rights reserved. No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written permission of Mott MacDonald (Hong Kong) Limited.



**LEGEND:**

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

MONITORING STATION	CO-ORDINATES	
	EASTING (M)	NORTHING (M)
WMA	837668.635	845371.097
WMA-COMB	834185.460	845916.662
WMA-A	834132.193	844832.910
WMA-COMB-A	835205.329	844200.151
WMA-B	835334.744	843384.606
WMA-COMB-B	835845.878	843323.625
WMA-COMB-C	836323.622	842404.977
WMA-COMB-D	836163.419	842425.507
WMA-COMB-E	833940.763	838344.842
WMA-COMB-F	834038.937	837688.995
WMA-COMB-G	833769.123	837406.936

REV	NOY	DATE	BY	CHK	DESCRIPTION	DATE
P2	01	10/10/10	MM	MM	GENERAL REVISION	10/10/10
P1	01	10/10/10	MM	MM	FIRST ISSUE	10/10/10

**Mott MacDonald**

100 The Quadrant Road  
 25th Floor, The Quadrant  
 Hong Kong, China  
 Tel: +852 2500 8888  
 Fax: +852 2500 8889  
 www.mottmac.com

**CEDD**

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

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

**Title:** LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

**Scale:** 1:20000

**Project No.:** 255278

**Drawn by:** PRE

**Checked by:** P2

© COPYRIGHT RESERVED

This document is intended for use as a reference only. It is not to be used for any other purpose without the prior written consent of Mott MacDonald. The information contained herein is confidential and its disclosure to any other party may be subject to legal proceedings.



## **Appendix D**

### **Monitoring Locations for Impact Monitoring**

**LEGEND:**

- BOUNDARY OF HK SAR
- 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

**Mott MacDonald**  
 2207 Yue Lan Street  
 Kowloon, Hong Kong  
 Tel: +852 2500 8787  
 Fax: +852 2507 1623  
 www.mottmacdonald.com.hk

**CEDD**  
 CIVIL ENGINEERING  
 AND DEVELOPMENT  
 DEPARTMENT

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

**Title**  
 PROPOSED LOCATION OF CONSTRUCTION  
 AIR QUALITY MONITORING STATIONS

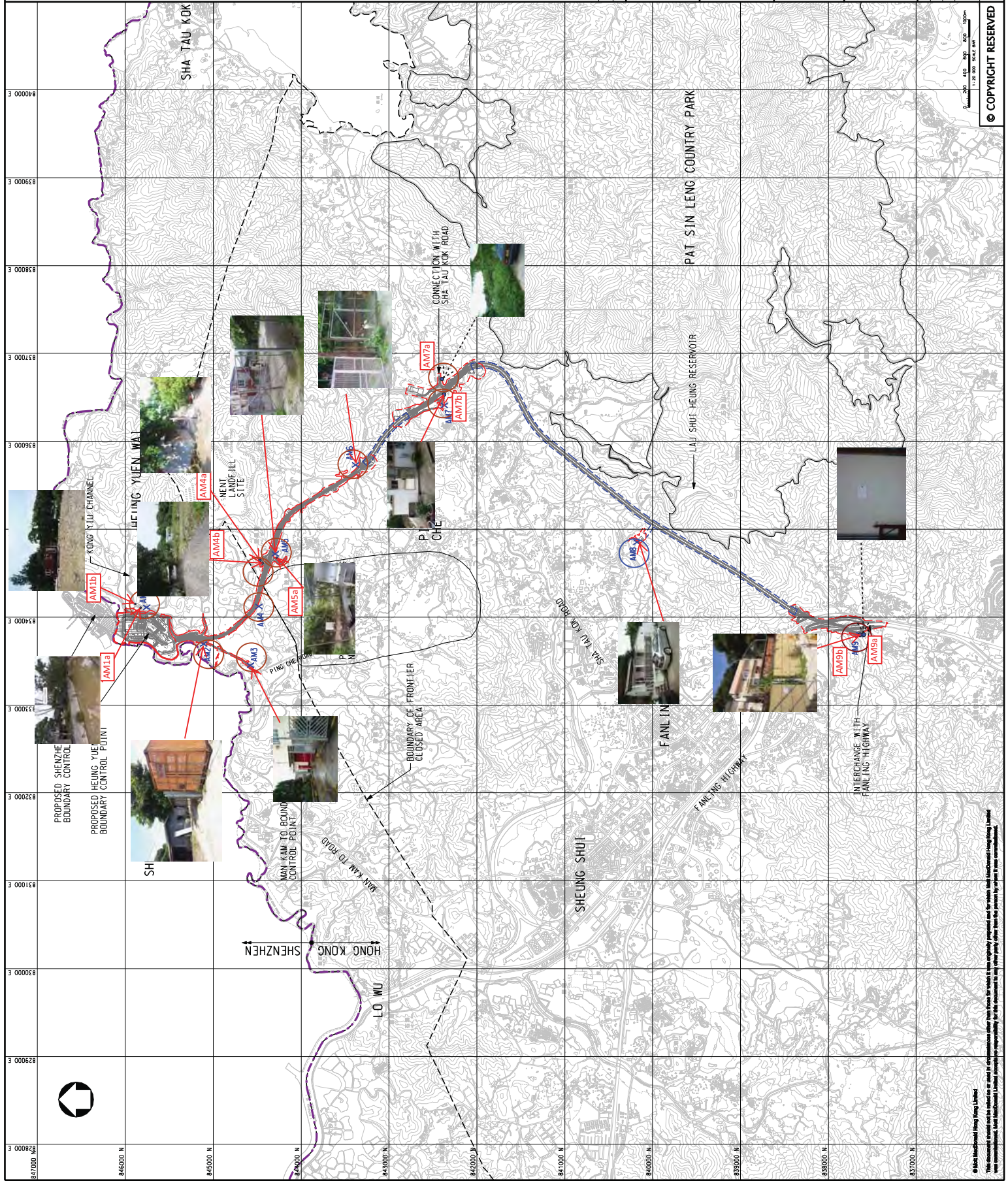
Designed	DC	EC

Drawn	MING	EC

Check/Chk.	DC	HT

Scale at A1	Project	Sheet	PRE
1:20000	253228	CE45/2008/Agmt/1/Rev/003/02_253228	P1

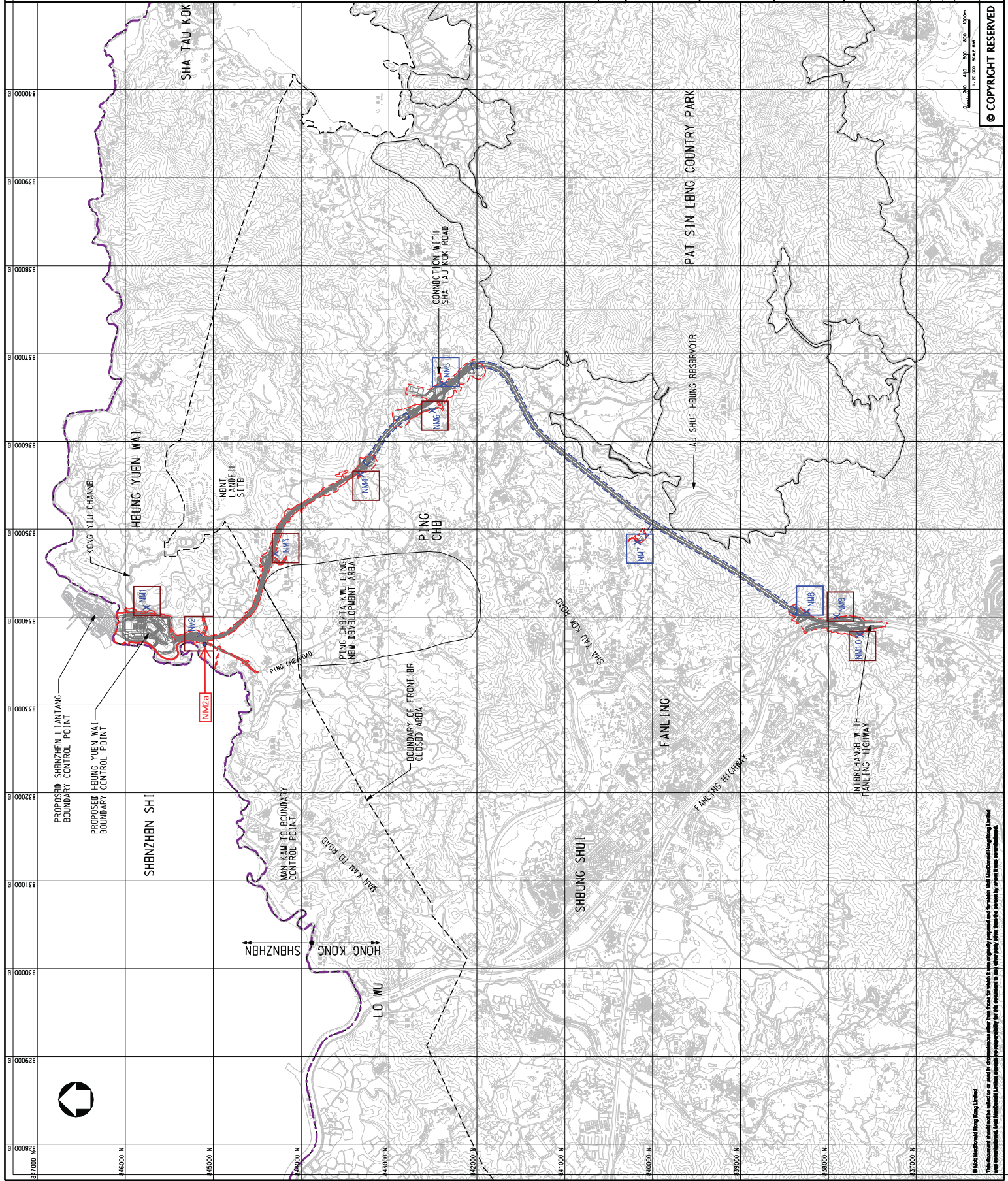
Drawing No: P1



© COPYRIGHT RESERVED

Mott MacDonald Hong Kong Limited  
 This document shall not be relied on or used in circumstances other than those for which it has originally prepared and for which Mott MacDonald Hong Kong Limited has assumed Mott MacDonald Limited accepts responsibility, for this document by any other party other than the person by whom it was issued.

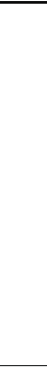
- LEGEND:**
- BOUNDARY OF HK SAR
  - WORKS AREA ( ABOVE GROUND )
  - WORKS AREA ( TUNNEL )
  - CONSTRUCTION NOISE MONITORING STATIONS
  - X Proposed Noise Monitoring Stations
  - Stations



© Mott MacDonald Hong Kong Limited  
 This document shall not be used or copied in any manner without the prior written consent of Mott MacDonald Hong Kong Limited.  
 The information contained herein is confidential and its disclosure to any other party other than the person to whom it is issued is prohibited.

No.	Date	Drawn	Description	BC	HT
PT	AUG 10	MING	FIRST ISSUE		

2027 Yuen Lam Street  
 Mott MacDonald  
 Room 1501, Yuen Lam  
 Hong Kong  
 Tel: +852 2552 8727  
 Fax: +852 2552 1623  
 www.mottmacdonald.com.hk



**CIVIL ENGINEERING  
 AND DEVELOPMENT  
 DEPARTMENT**



**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

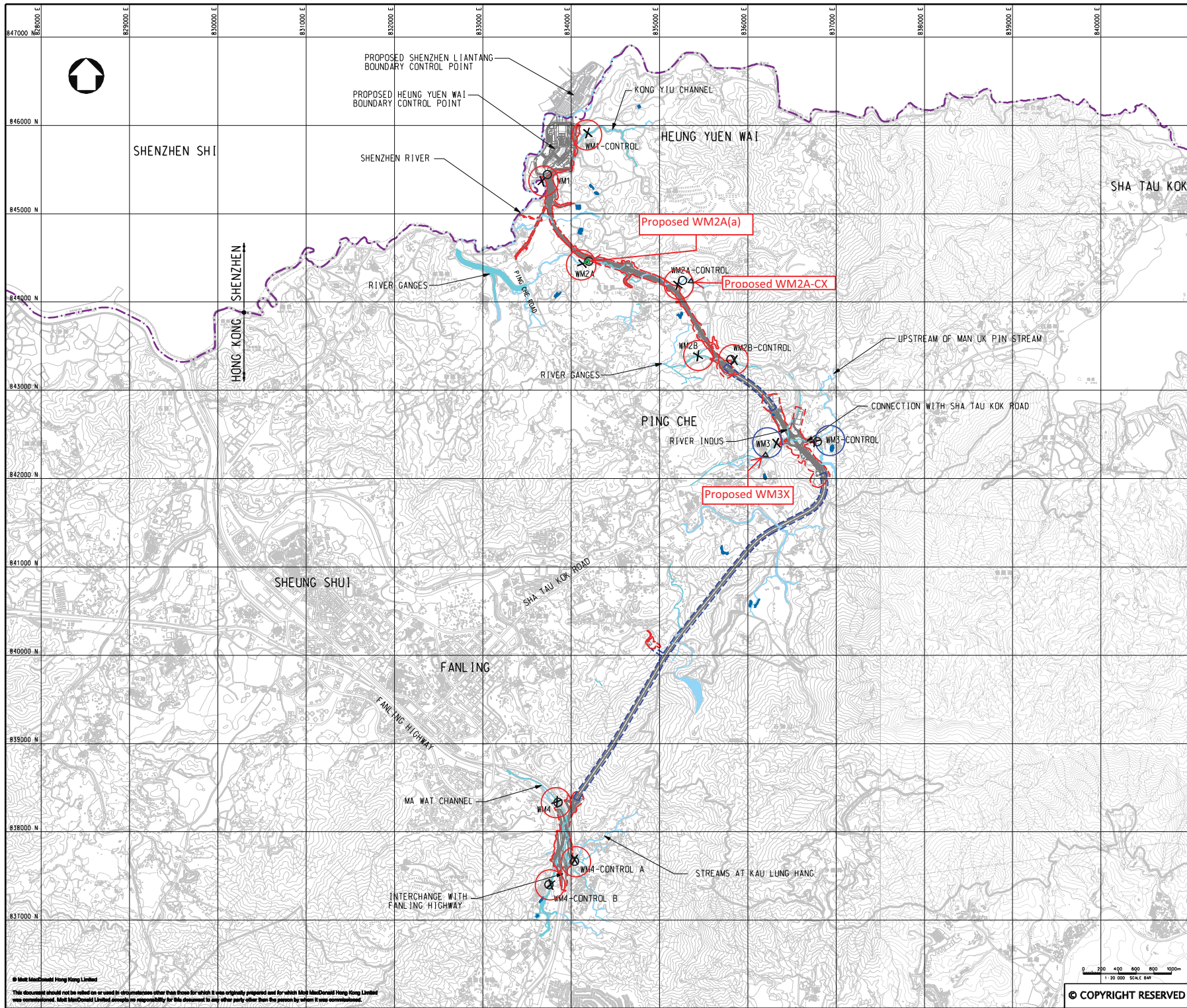
App. Chk.	JC	Approved	HT

Scale at A1	Project	Sheet	Sheet No.
1:20000	253228		

Drawing No.	Revision

FIGURE 3.1

© COPYRIGHT RESERVED



- LEGEND:**
- BOUNDARY OF HKSAR
  - LAND REQUIREMENT LIMIT (ABOVE GROUND)
  - LAND REQUIREMENT LIMIT (TUNNEL)
  - X Water Quality Monitoring Location Recommended in EM&A Manual
  - O Alternative Water Quality Monitoring Location for EM&A Programme
  - △ New Proposed Water Quality Monitoring Location in November 2015
  - △ New Proposed Water Quality Monitoring Location in May 2016

Station ID	Location recommended in EM&A Manual		Location found during site visit	
	Easting	Northing	Easting	Northing
WM1	83456.833	84577.072	83457.1	84542.1
WM1-Control	83418.480	84591.667	83418.5	84517.1
WM2A	83412.319	84432.910	83420.4	84517.1
WM2A-Control	83505.329	84400.151	83527.0	84474.1
WM2B	83514.744	84339.606	83543.5	84339.7
WM2B-Control	83565.878	84343.625	83535.1	84355.1
WM3	83623.622	84265.377	83632.4	84240.7
WM3-Control	83675.410	84243.507	83675.1	84240.7
WM4	83540.781	83834.842	83550.1	83838.1
WM4-Control A	84018.937	83764.995	84028.1	83765.1
WM4-Control B	83769.123	83740.916	83760.1	83739.1

**New Proposed Water Quality Monitoring Location in November 2015**

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

**New Proposed Water Quality Monitoring Location in May 2016**

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

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



**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	Eng.Chk.	EC
Drawn	MING	Coordination	EC
Draw.Chk.	HC	Approved	HT
Scale at A1	1:20000	Project	255228
Drawing No	Appendix C	Status	PRE
		Rev	P2

© Mott MacDonald Hong Kong Limited  
 This document should not be relied on or used in circumstances other than those for which it was originally prepared and for which Mott MacDonald Hong Kong Limited was commissioned. Mott MacDonald Limited accepts no responsibility for this document to any other party other than the person to whom it was commissioned.

## **Appendix E**

### **Event and Action Plan**

### Event and Action Plan for Air Quality

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

### Event and Action Plan for Water Quality

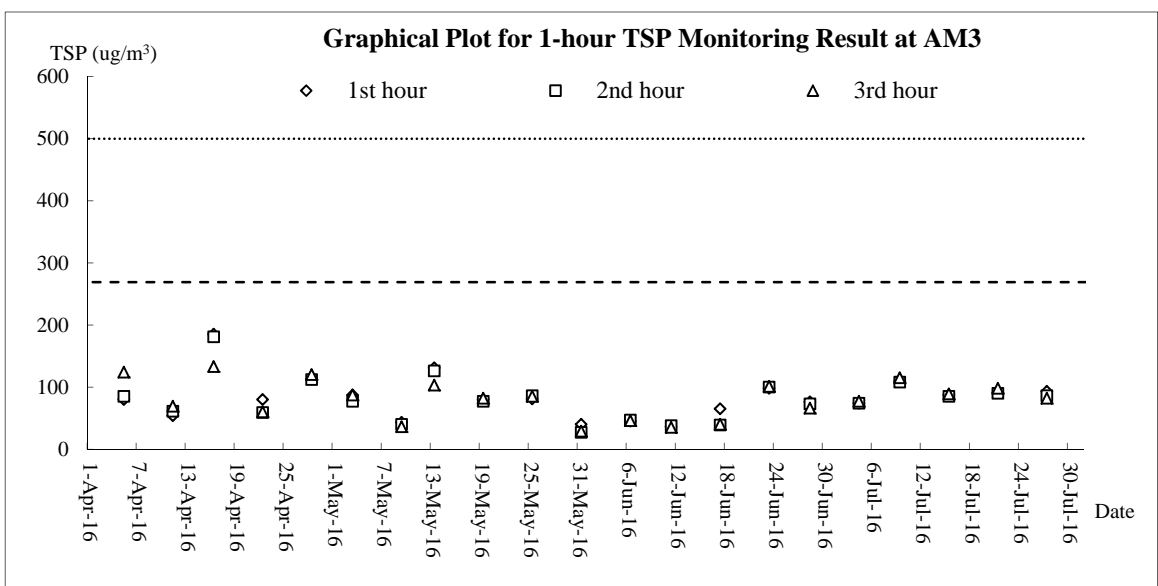
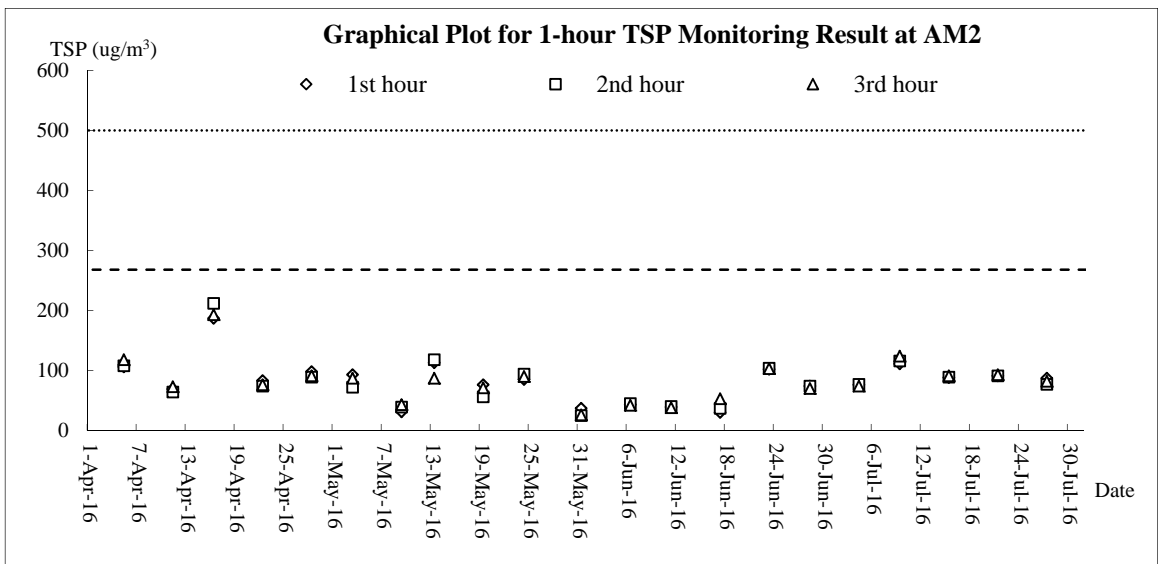
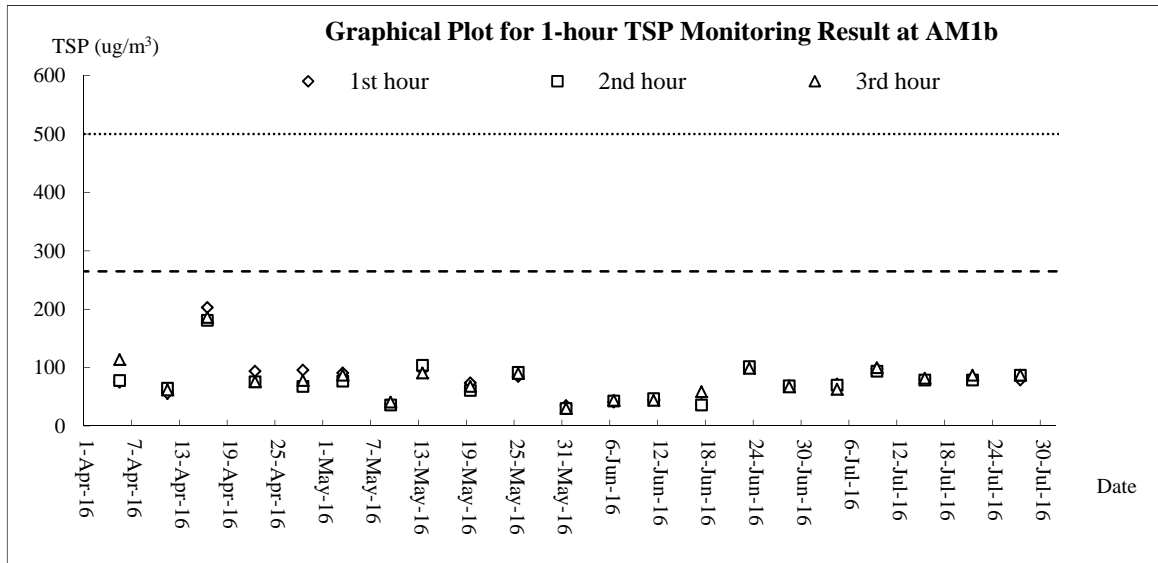
EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings;</li> <li>2. Identify reasons for non-compliance and sources of impact;</li> <li>3. Inform IEC and Contractor;</li> <li>4. Check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

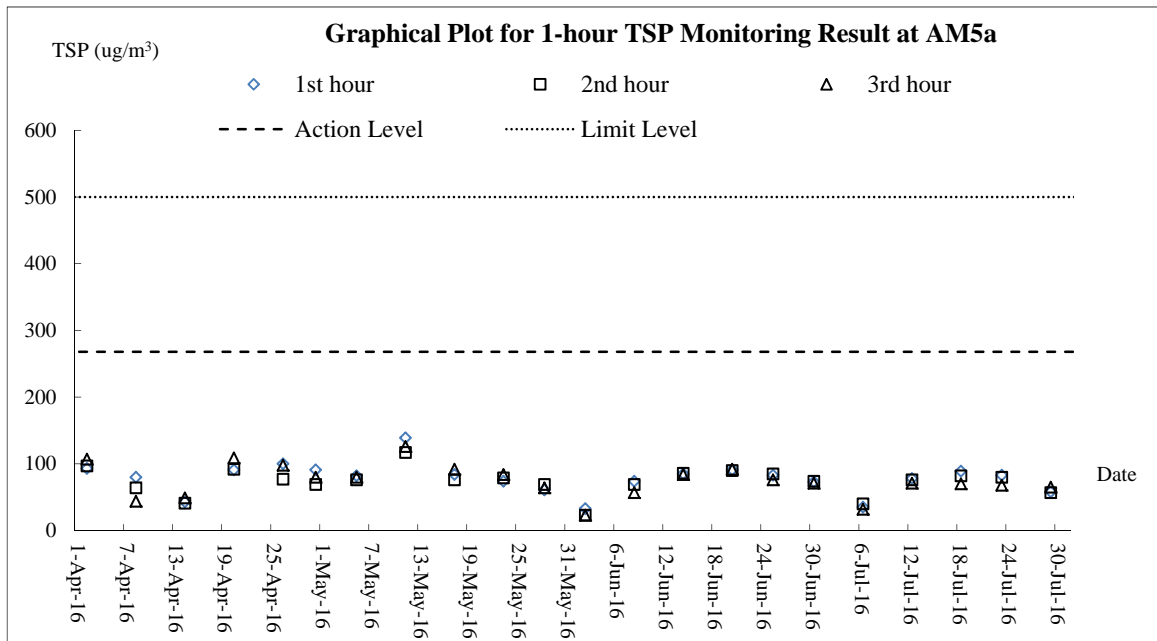
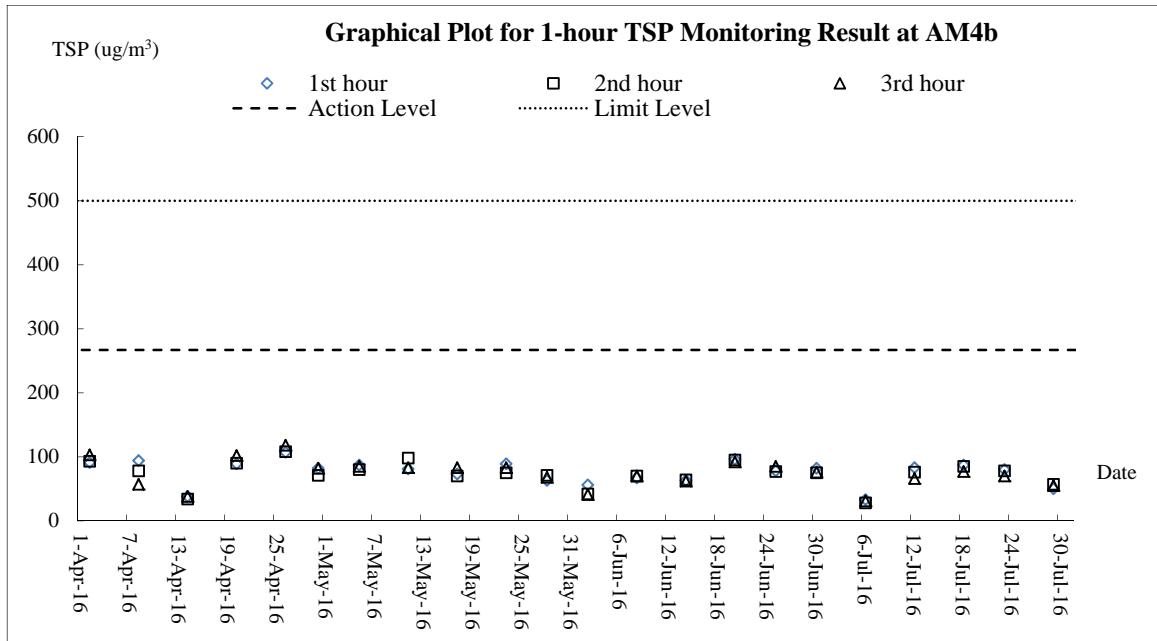


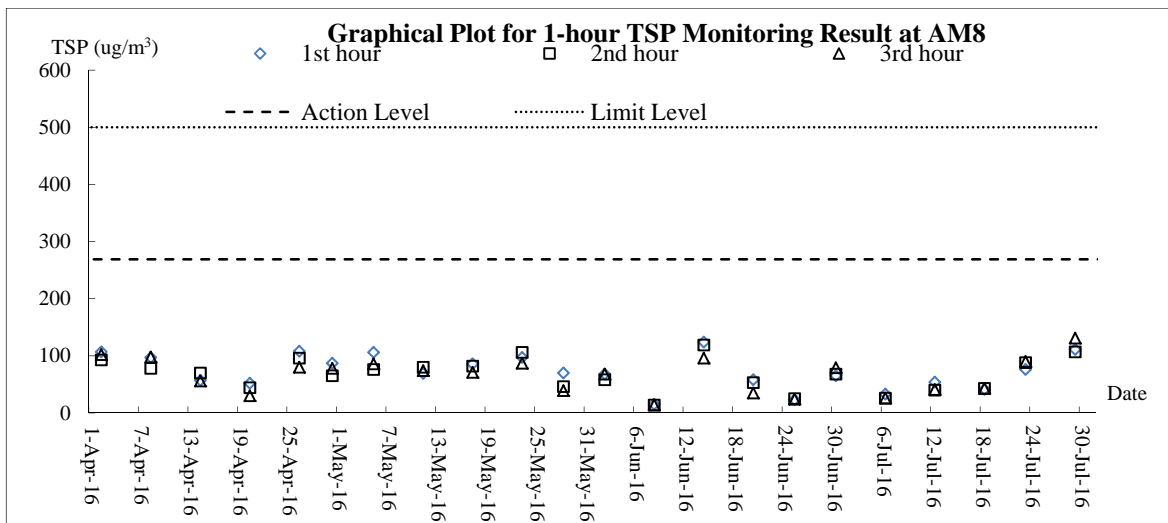
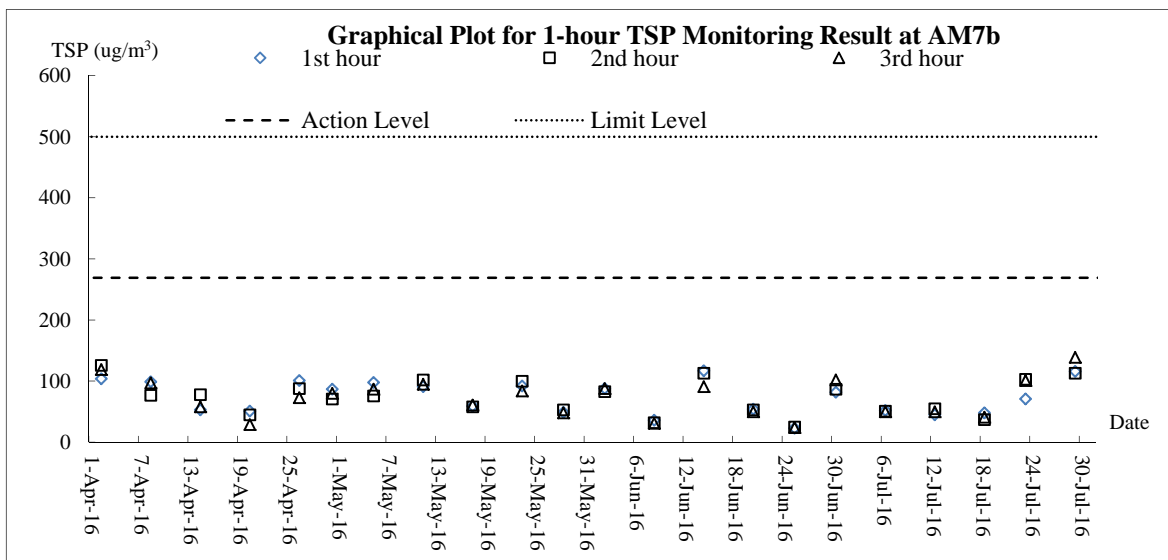
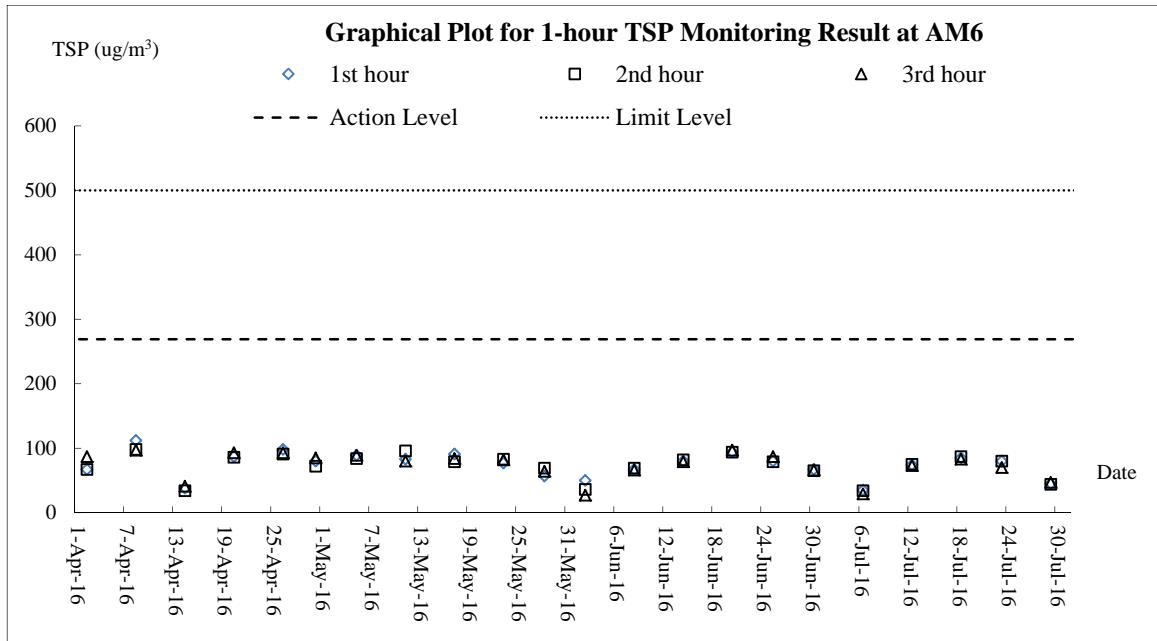
## Appendix F

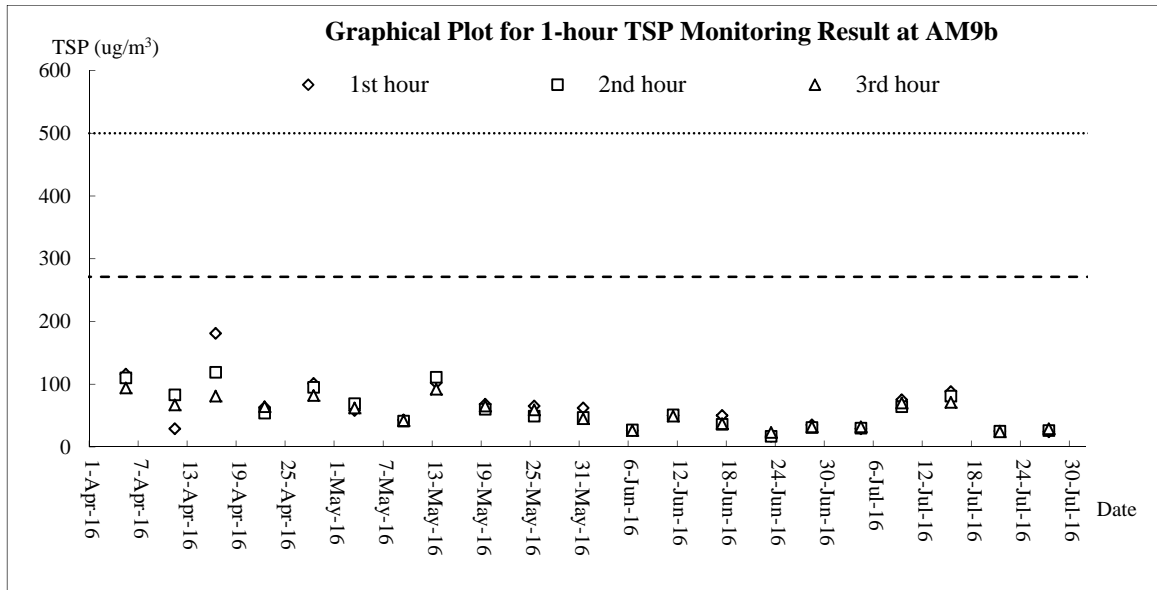
### Graphical Plots for Monitoring Result

**Air Quality – 1-hour TSP**

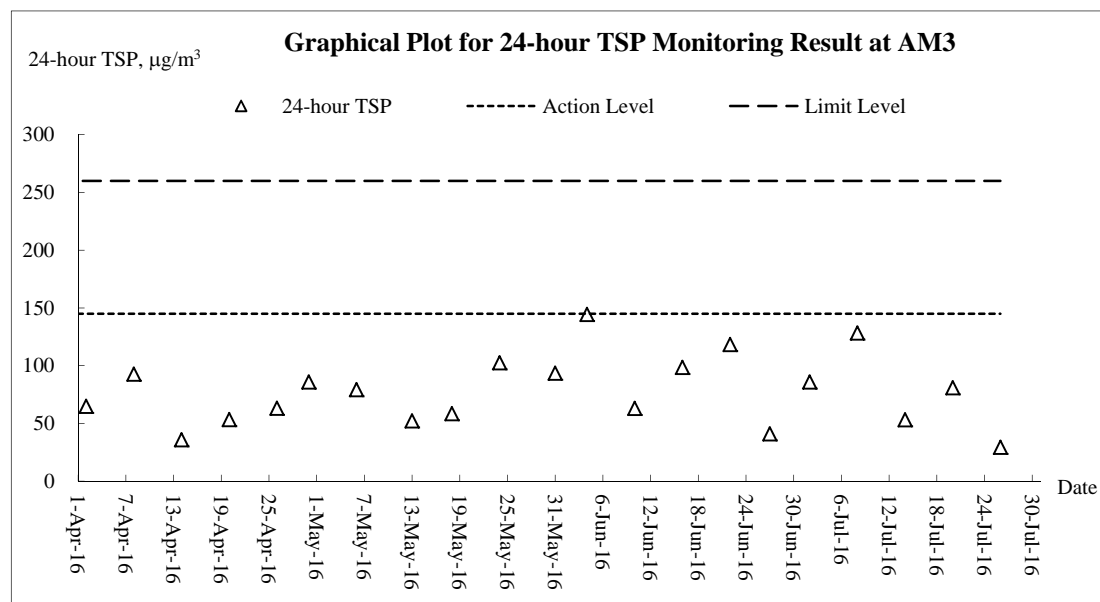
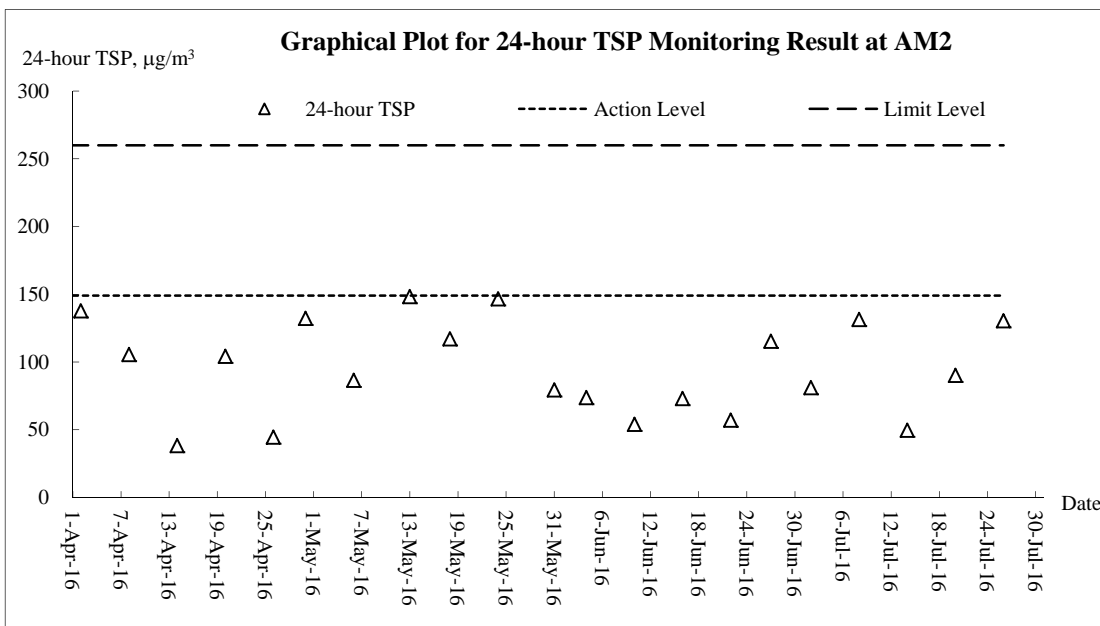
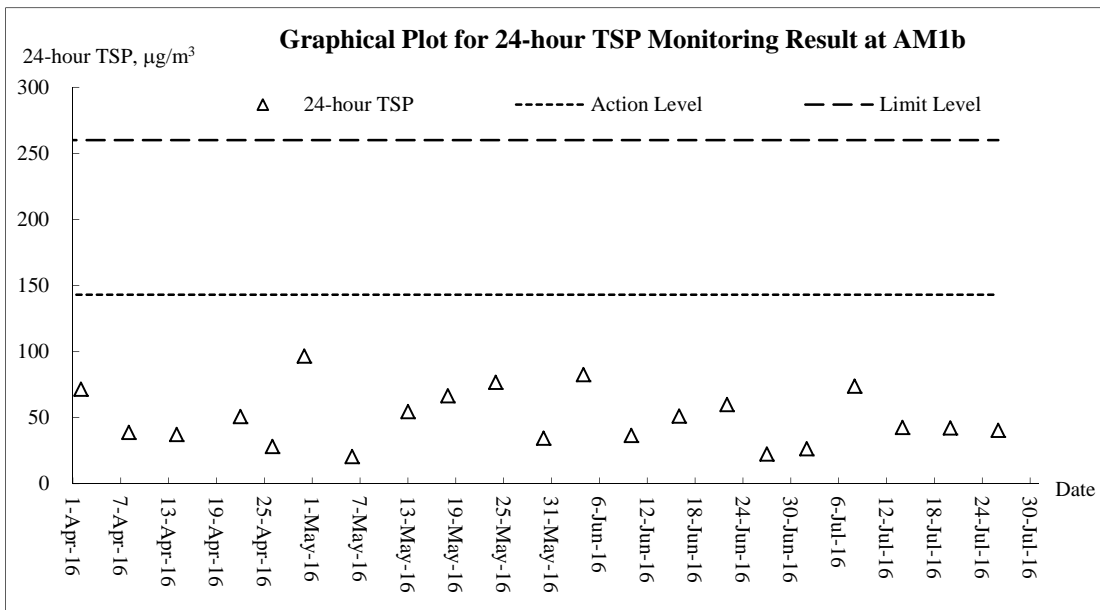


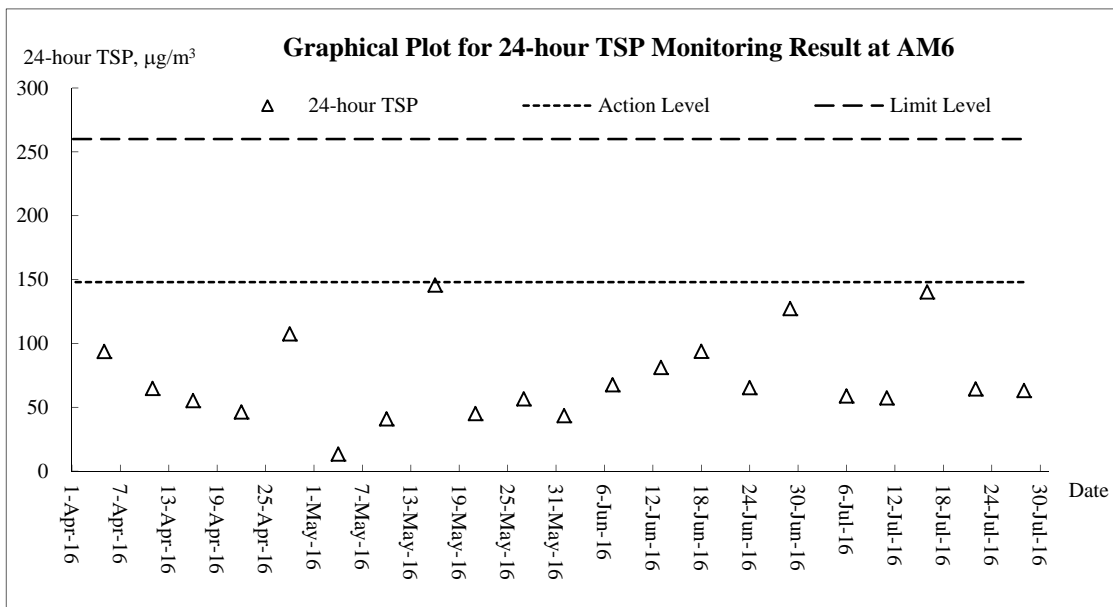
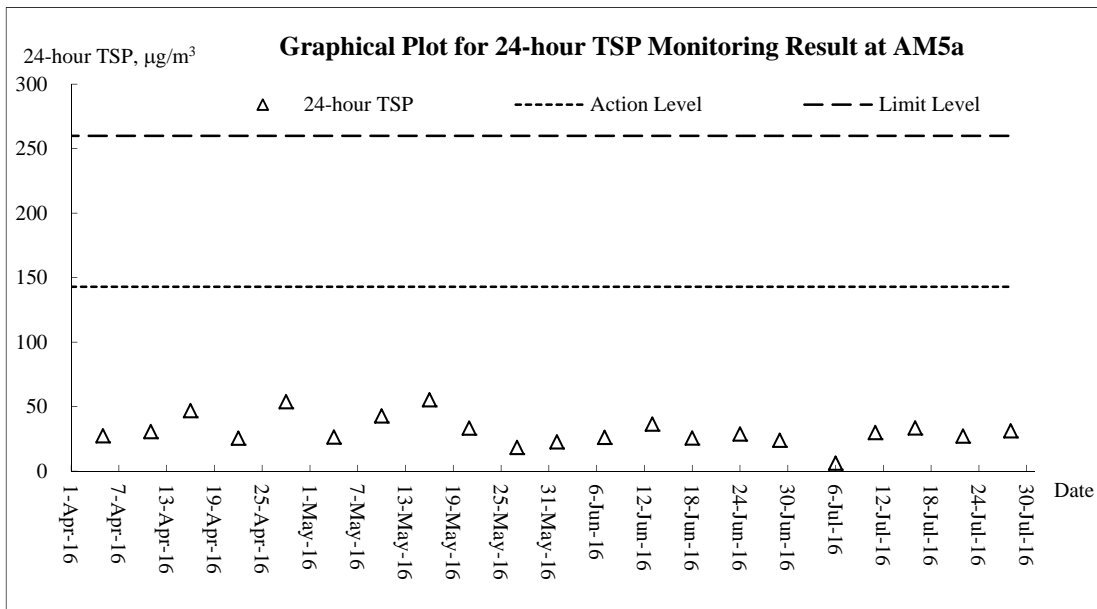
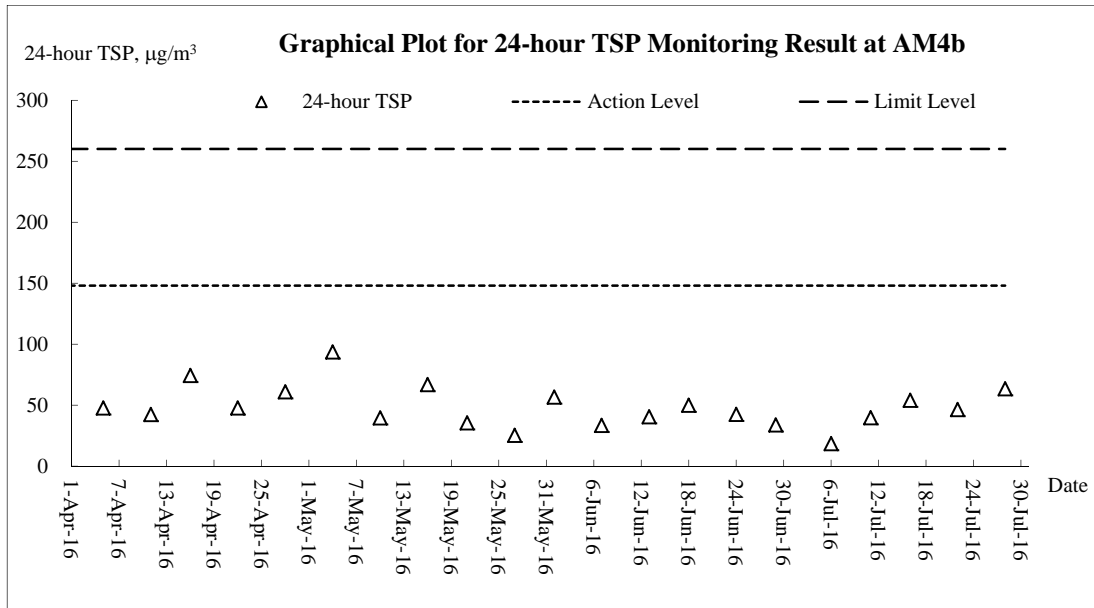


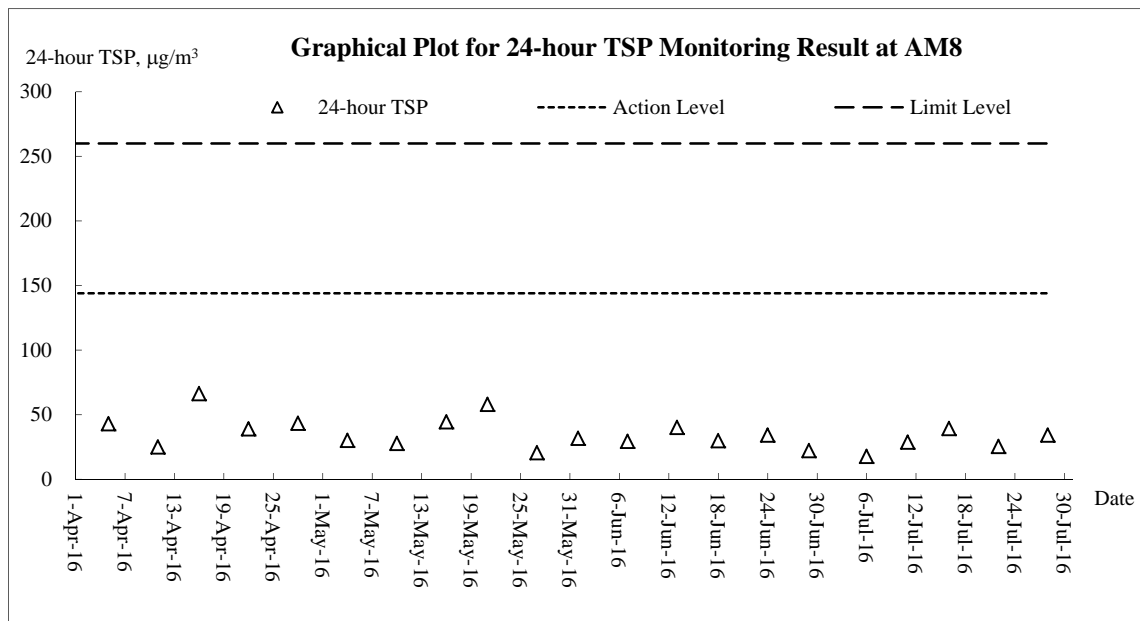
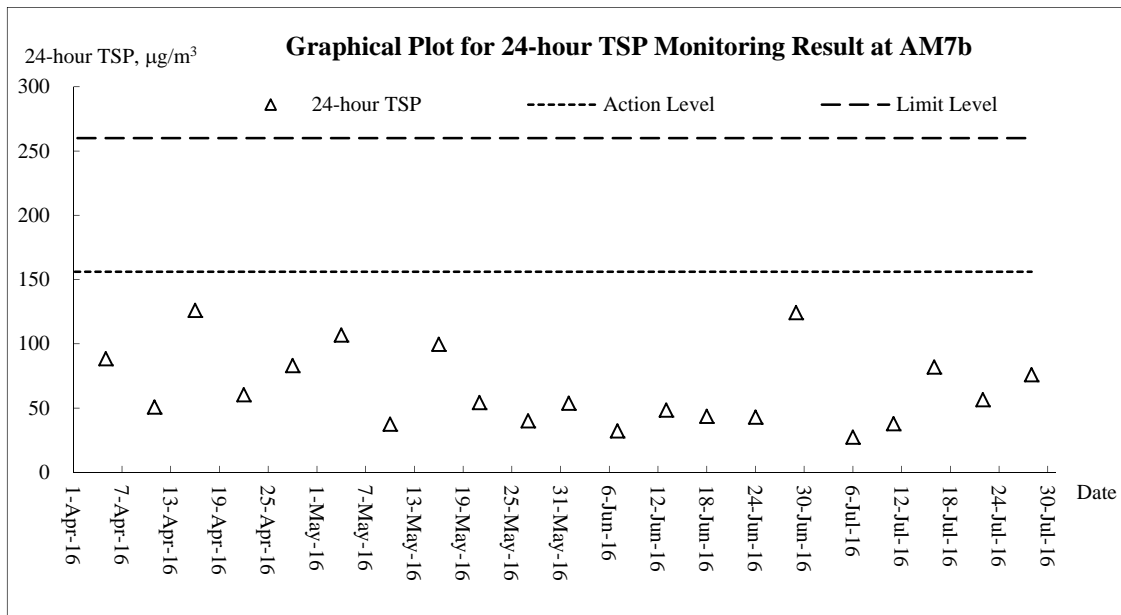




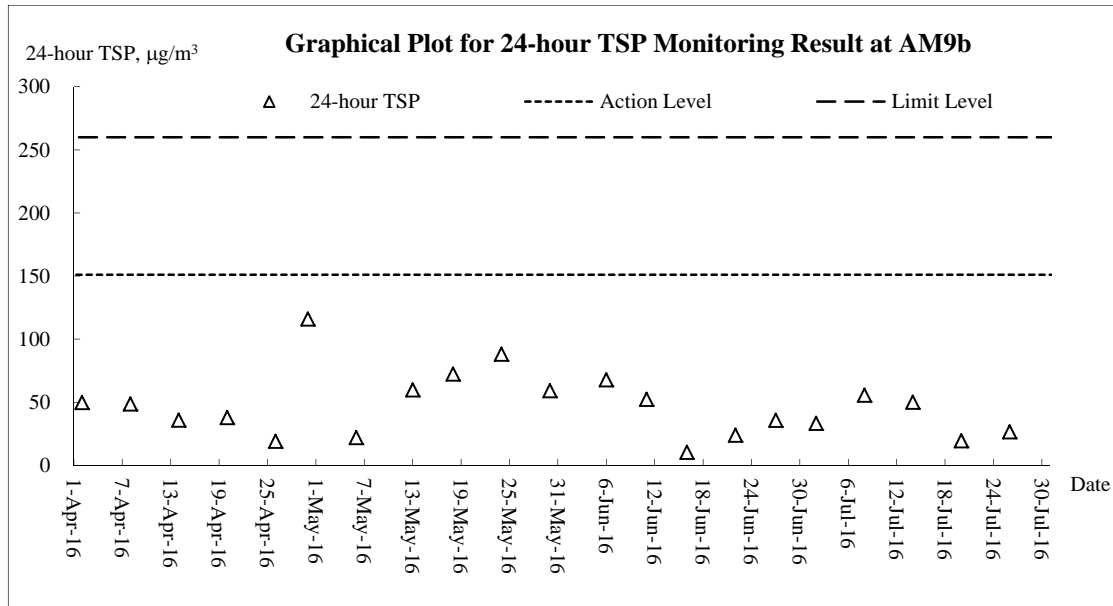
**Air Quality – 24-hour TSP**



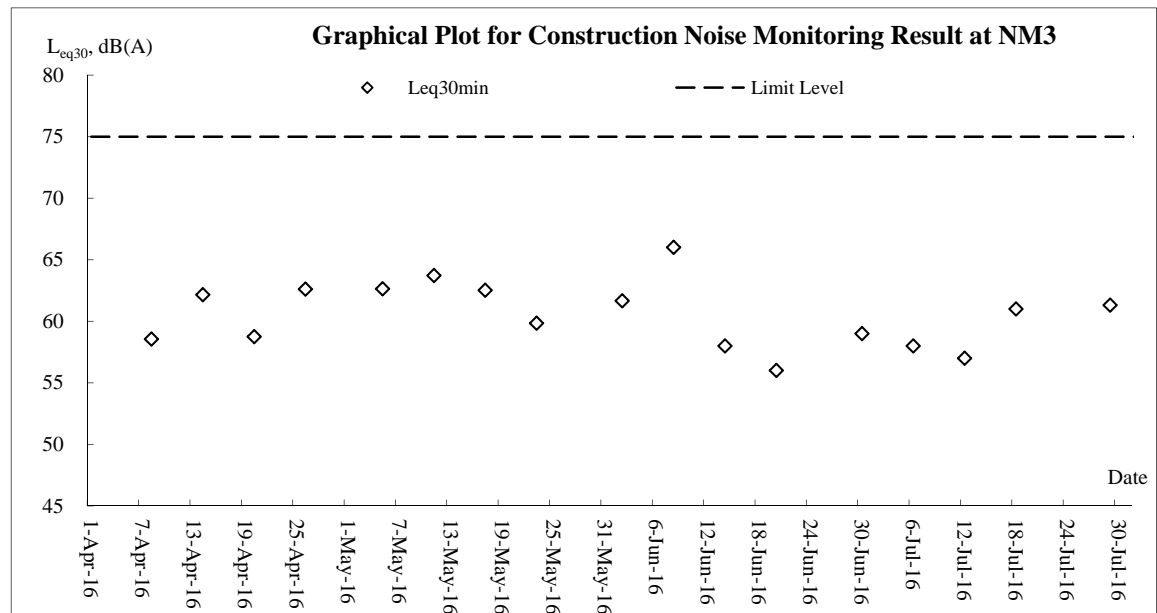
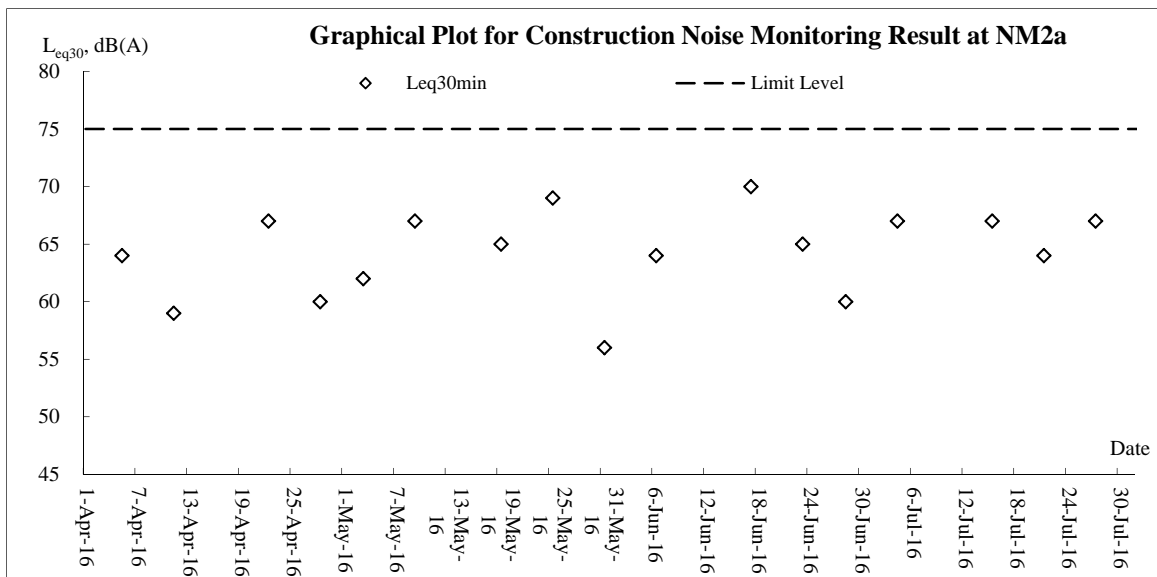
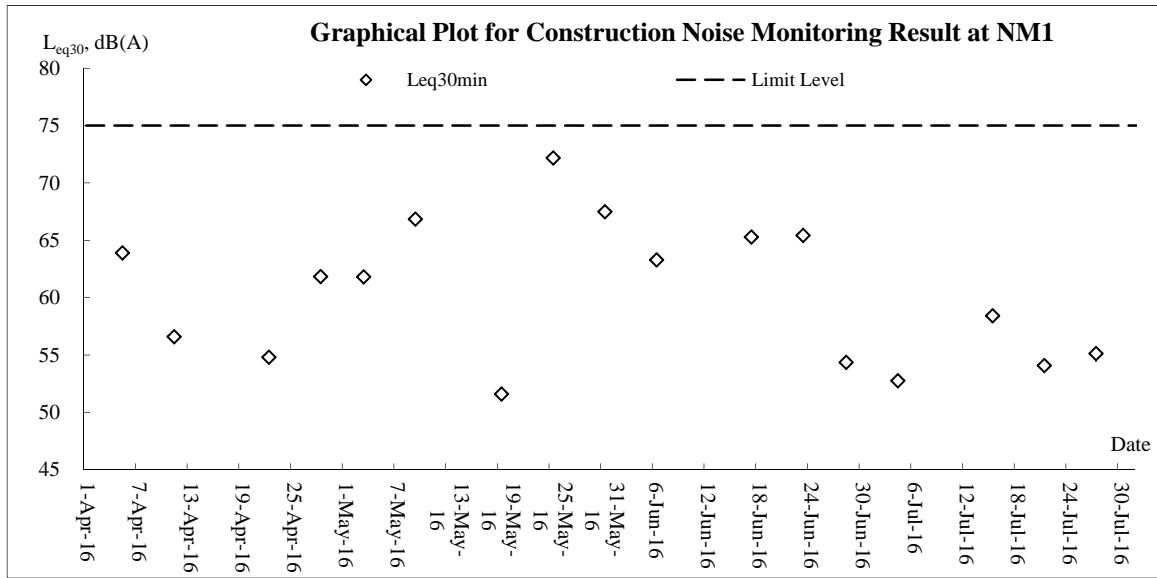


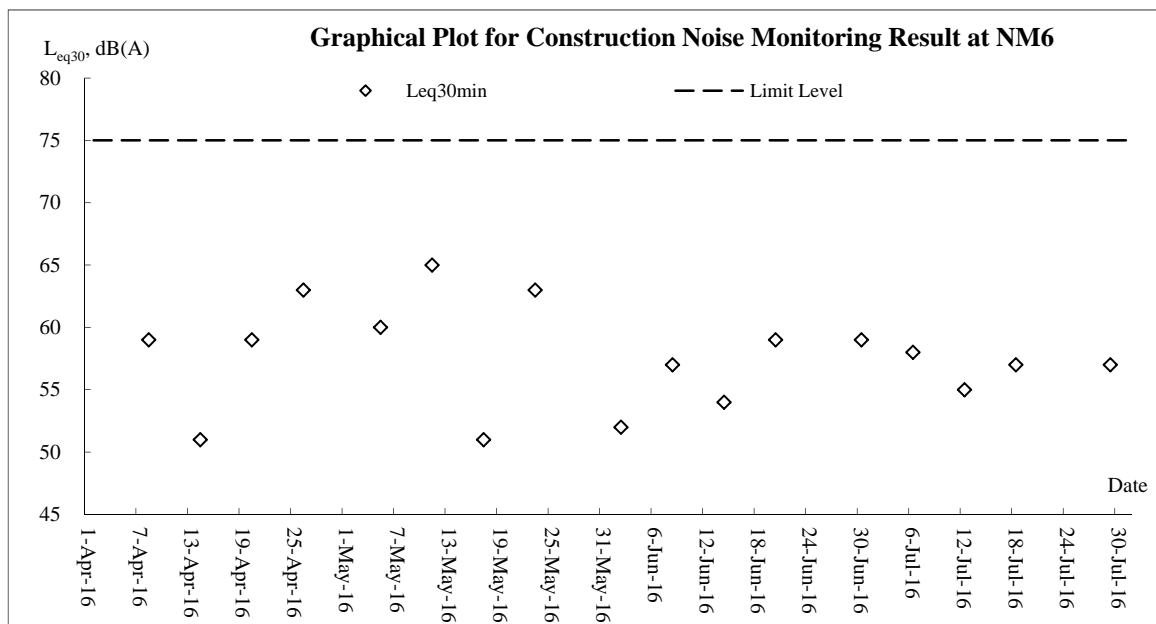
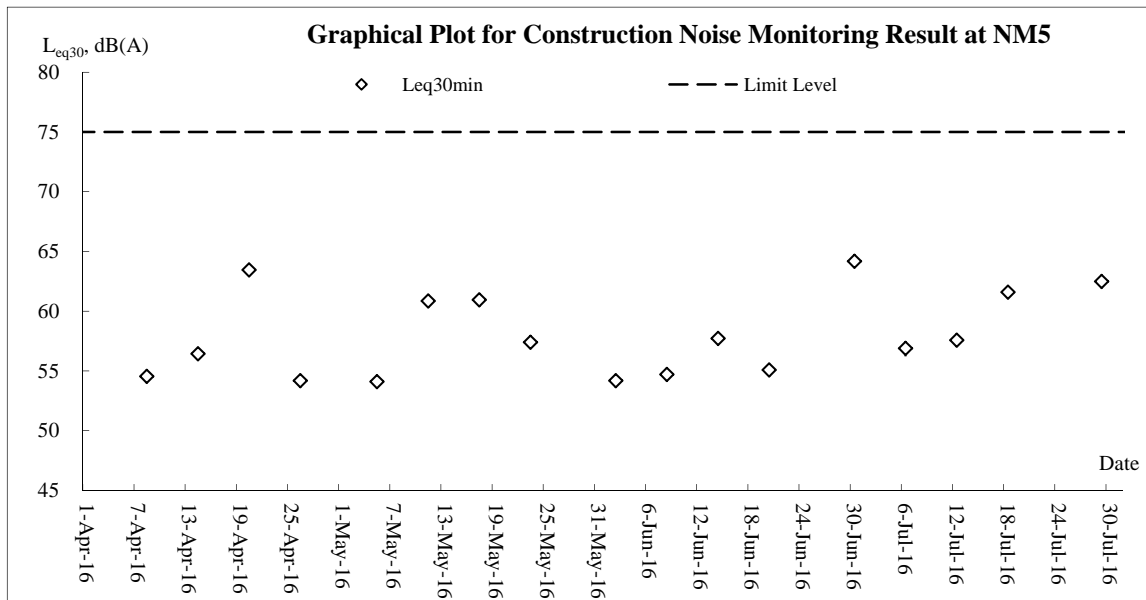
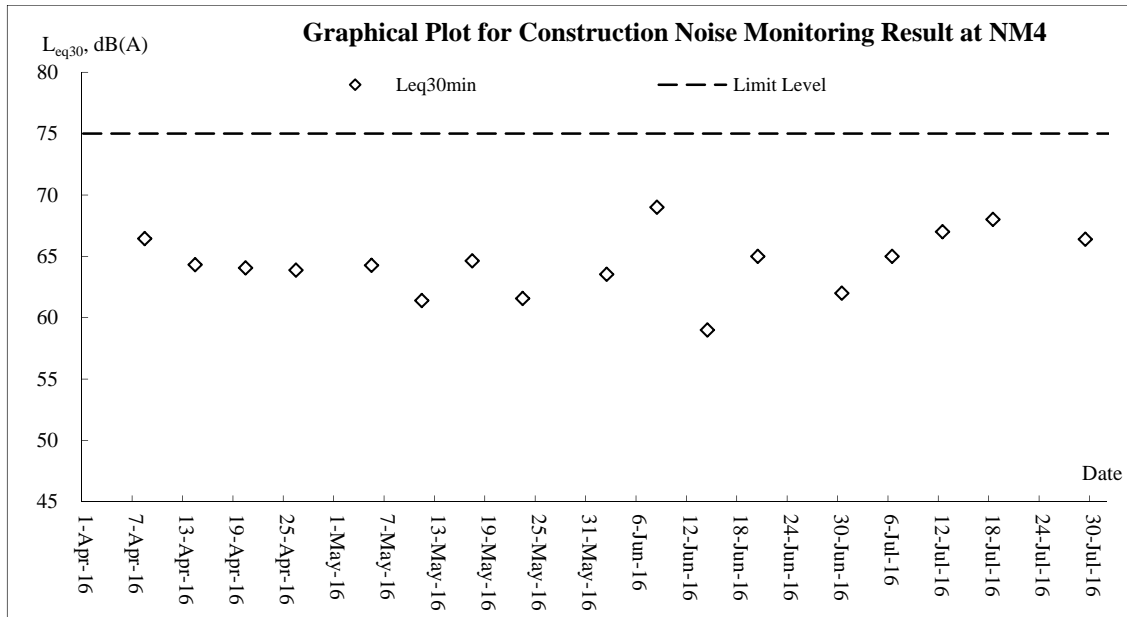


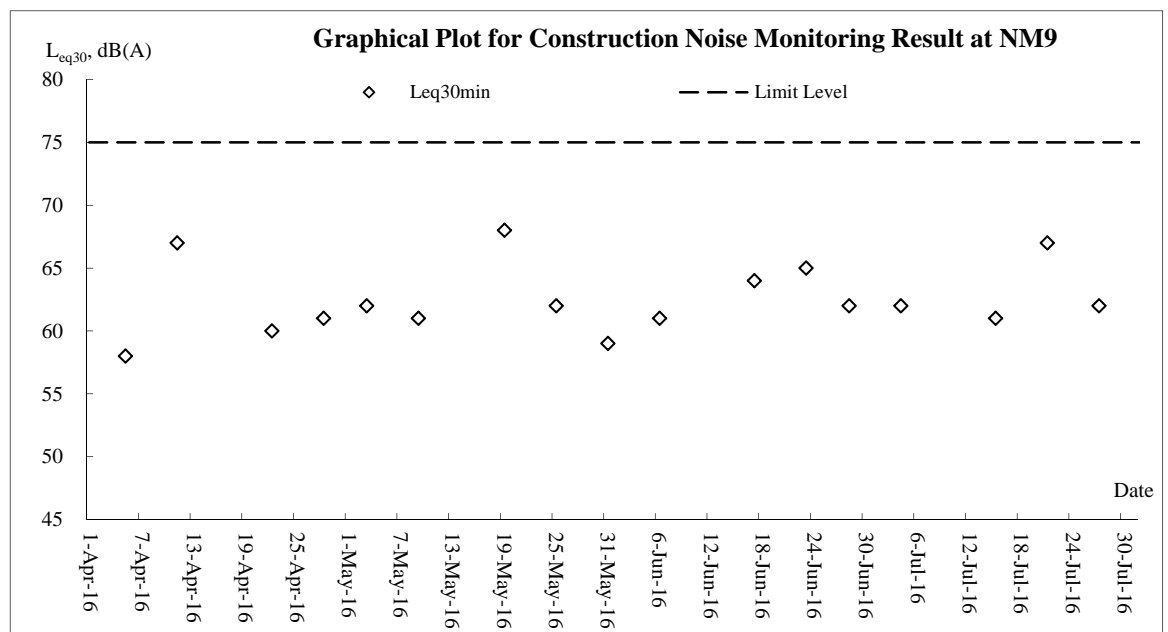
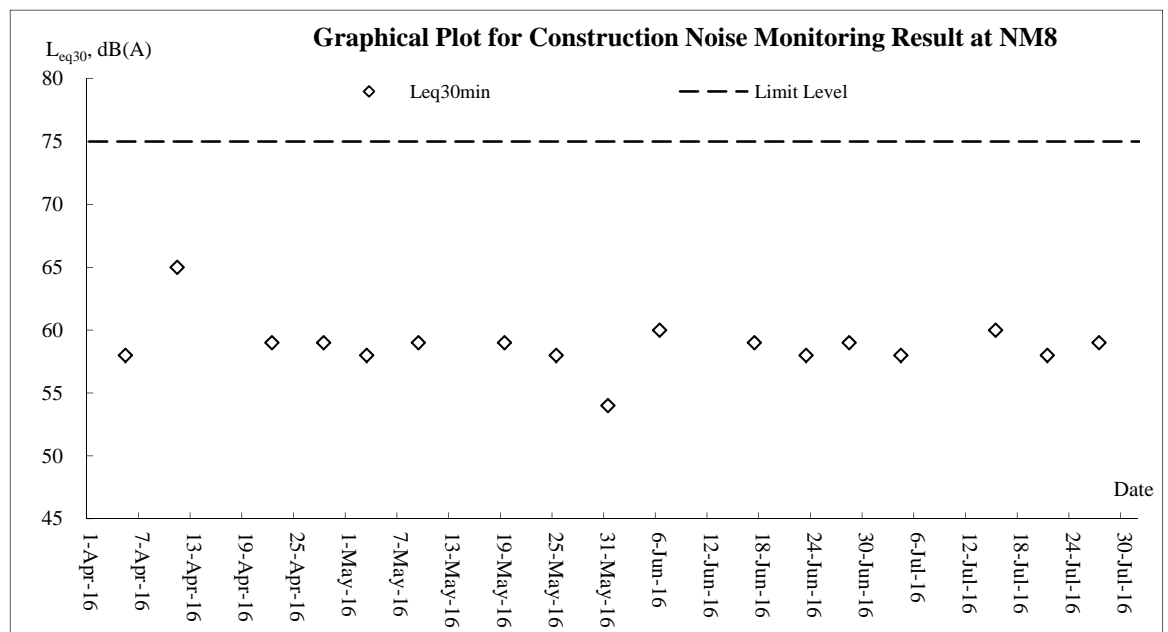
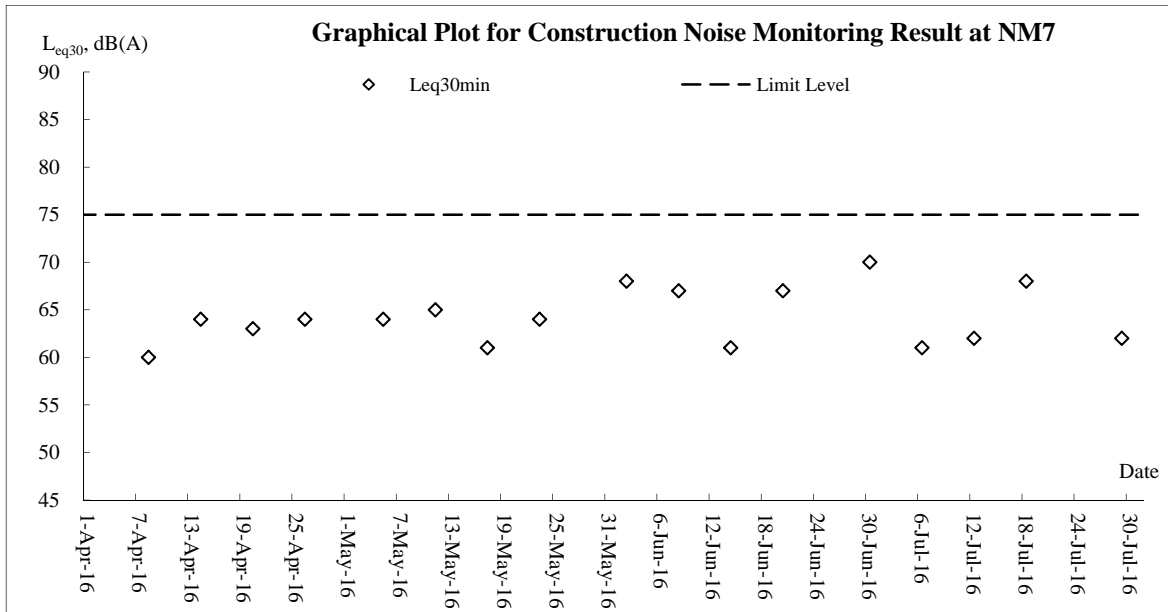


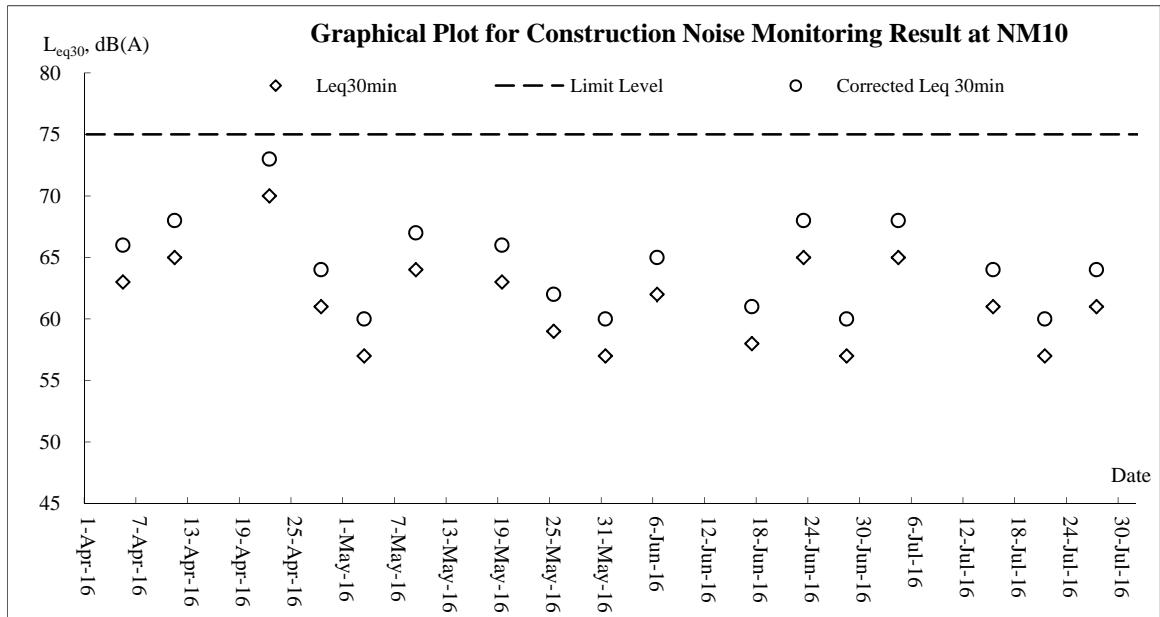


**Noise**

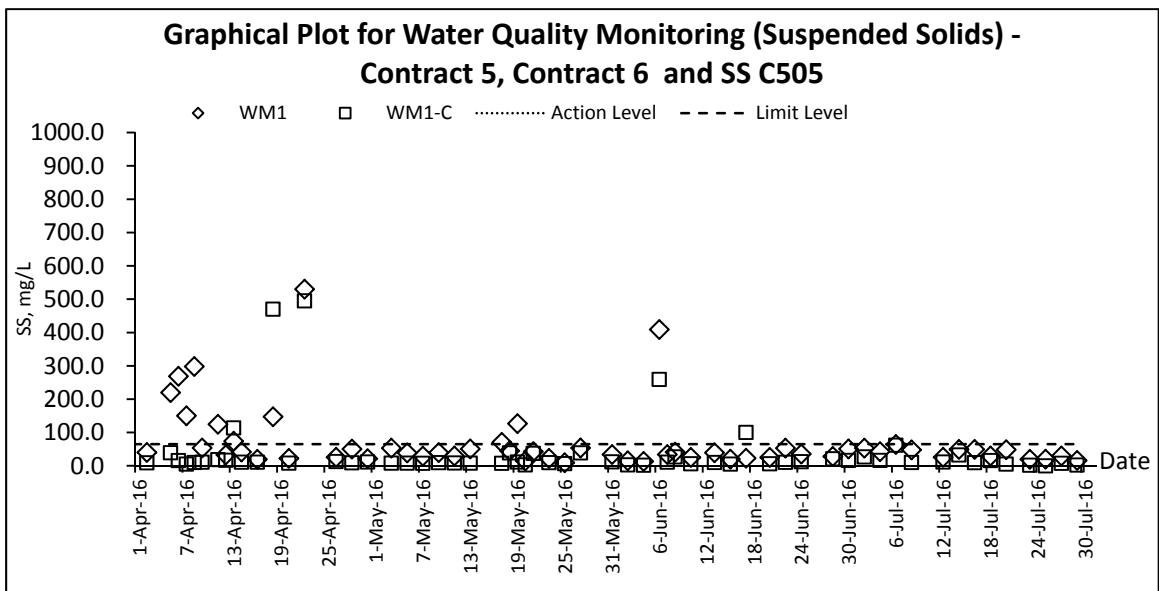
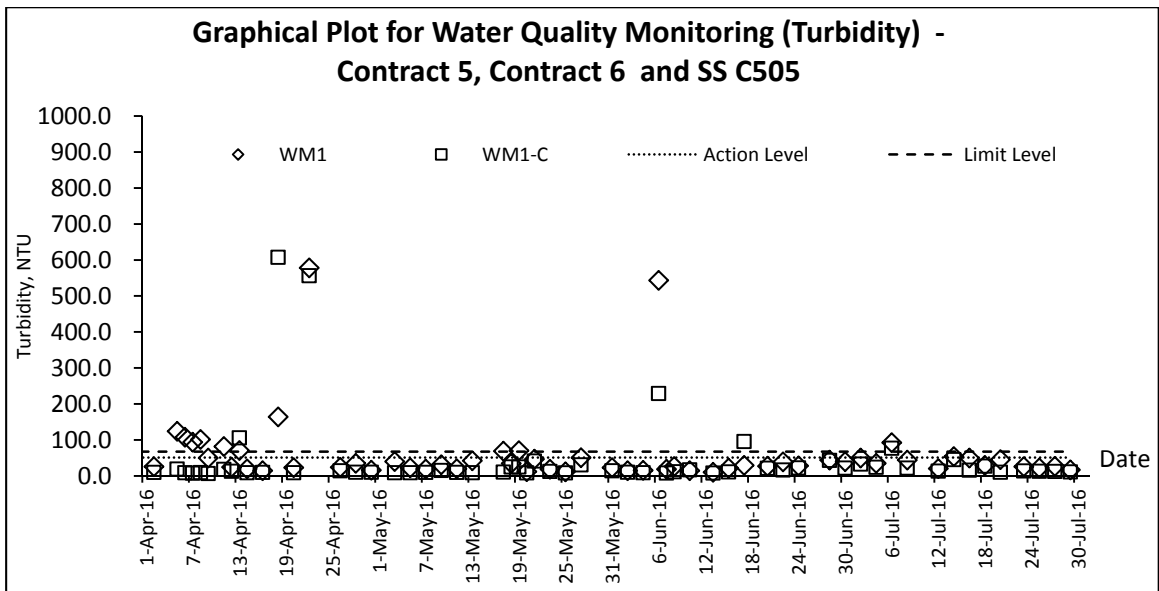
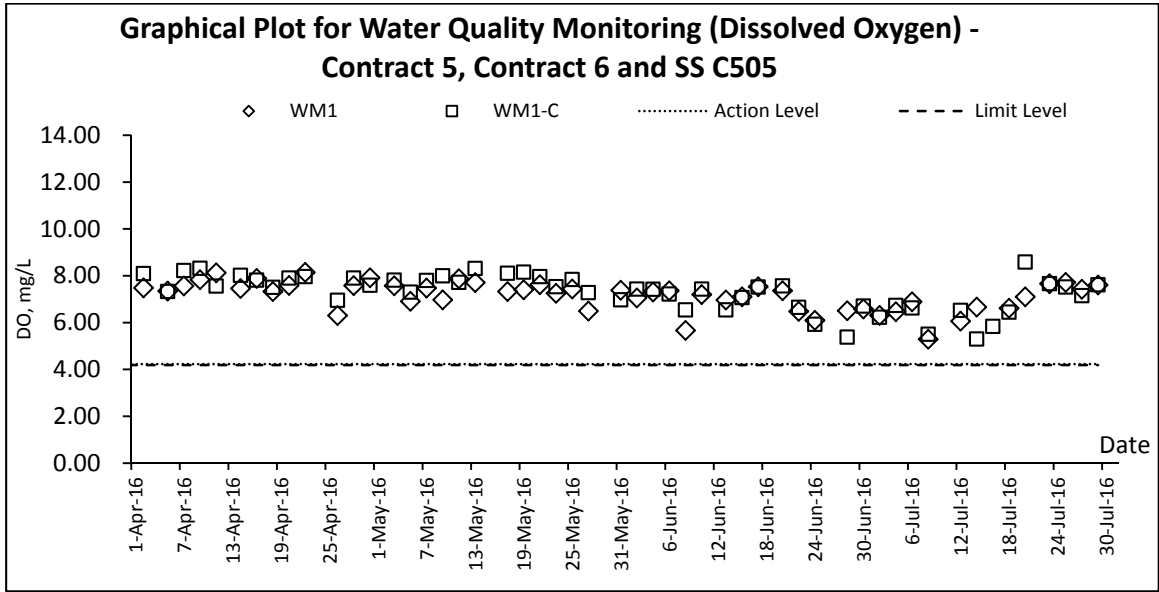


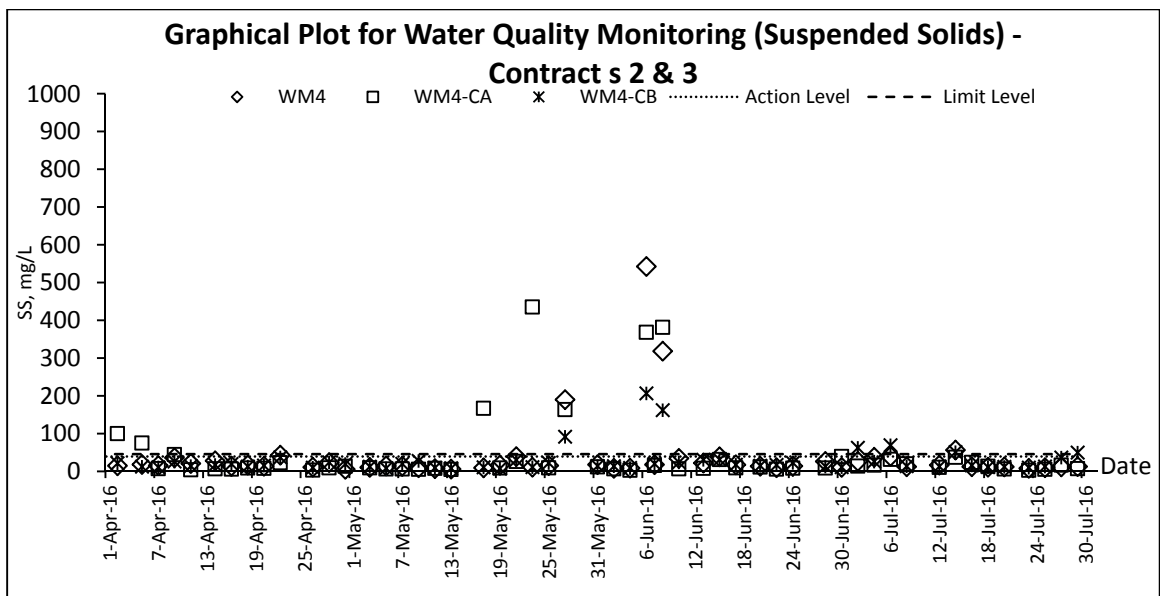
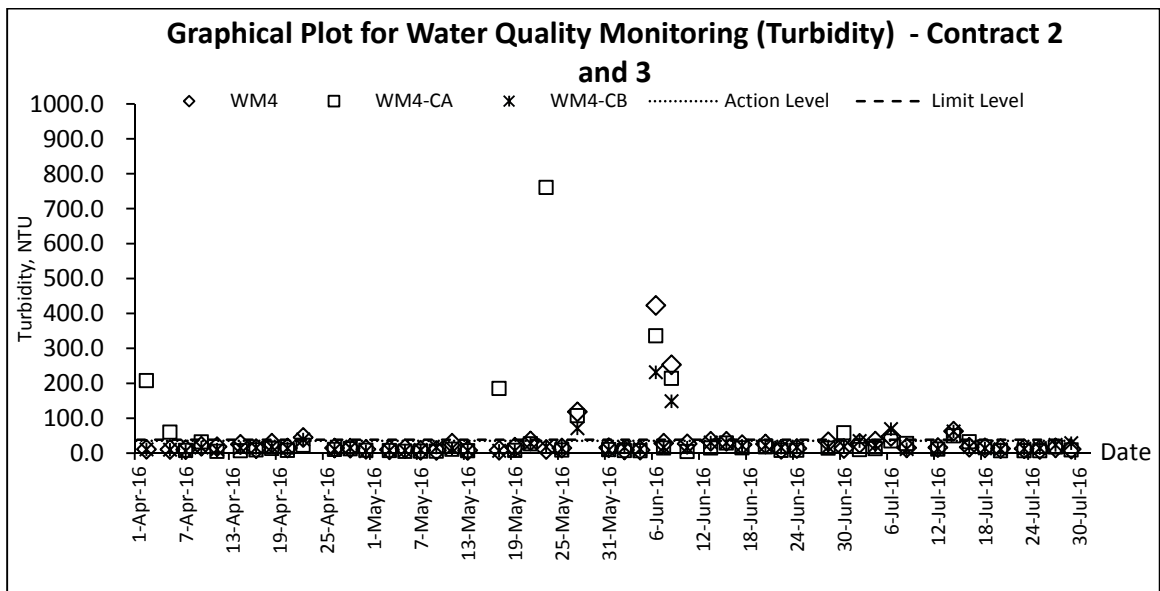
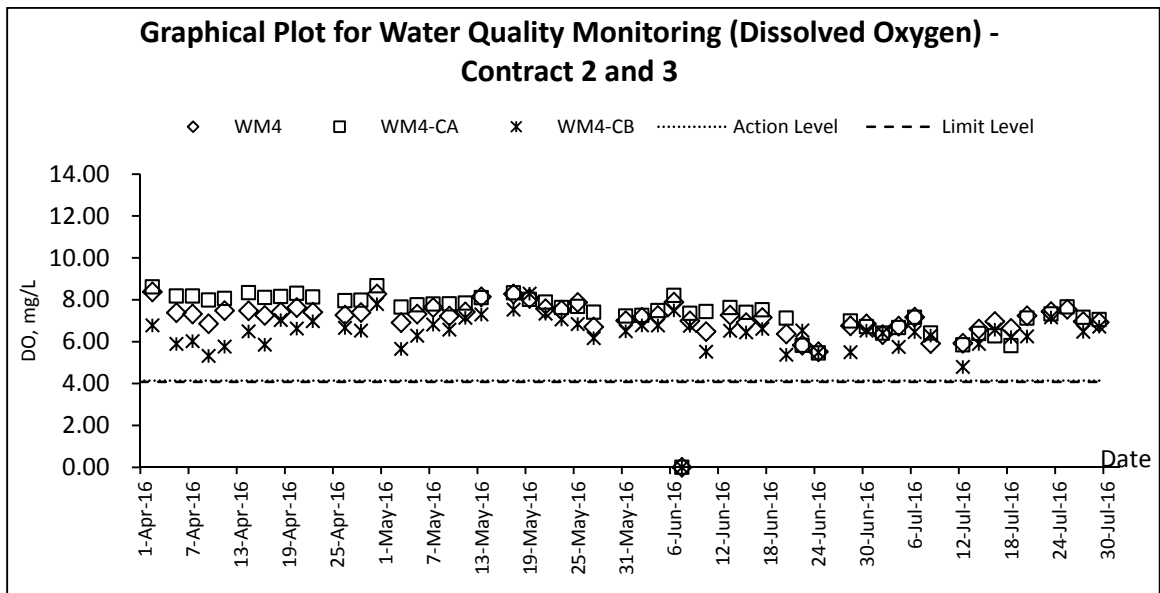


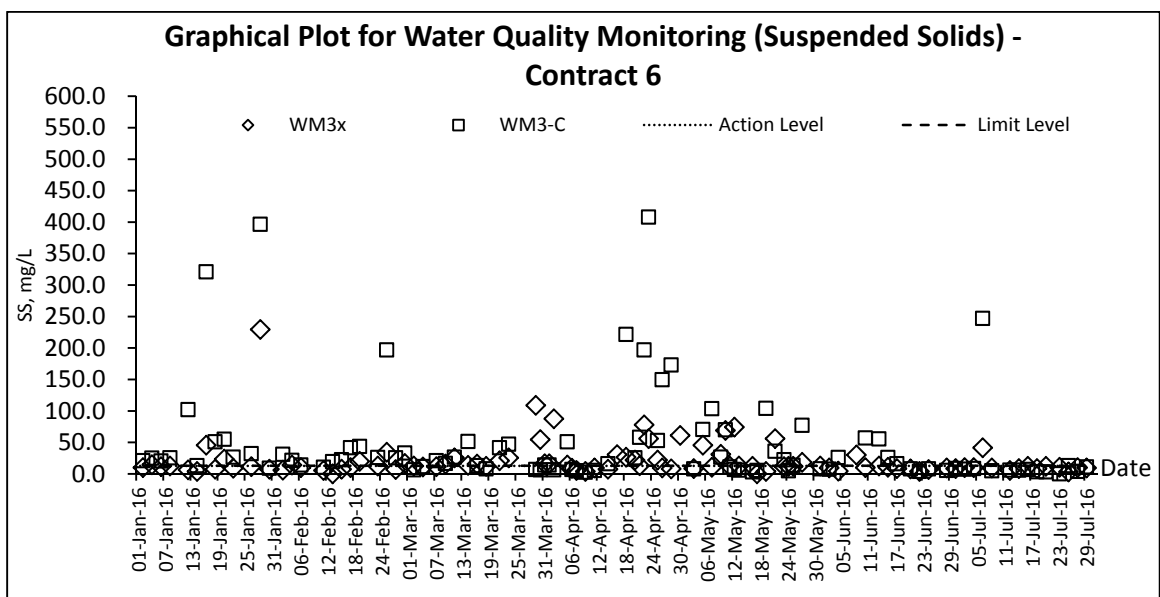
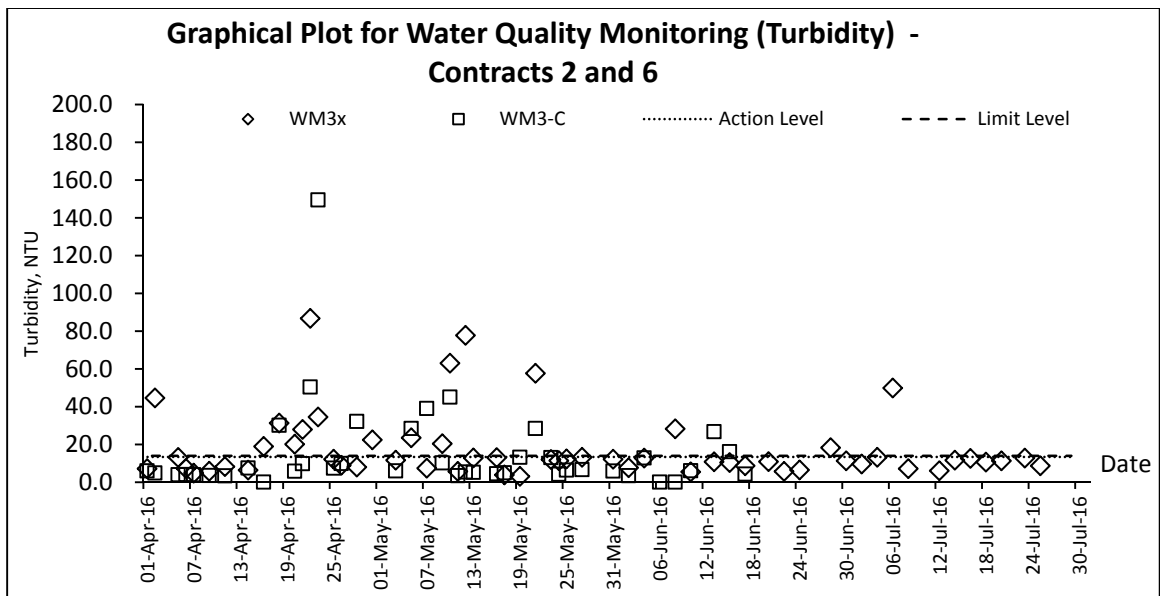
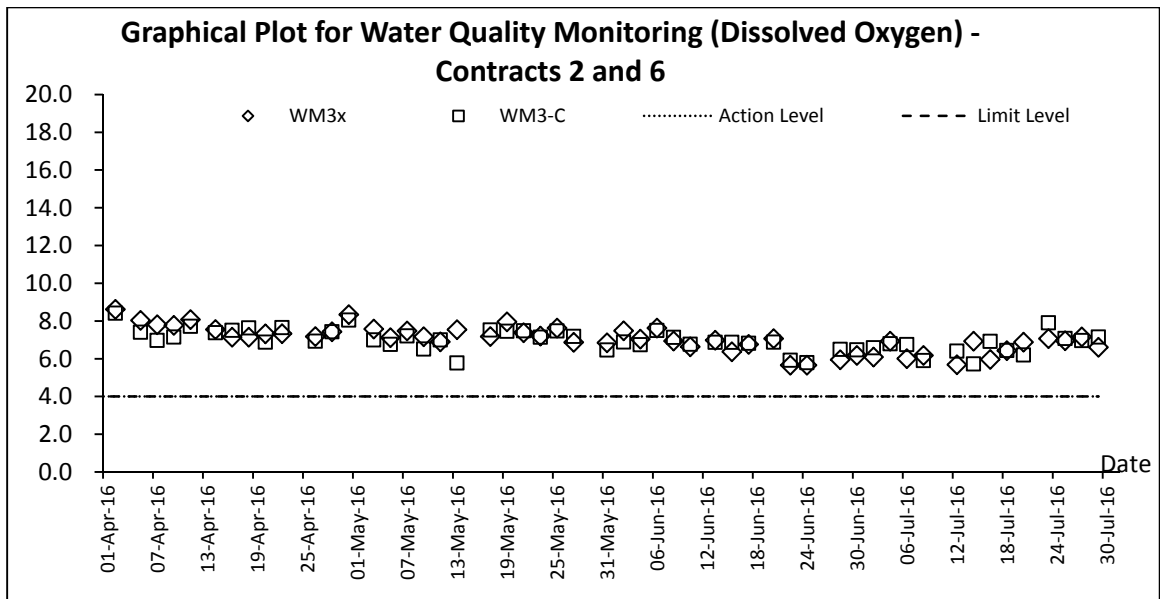




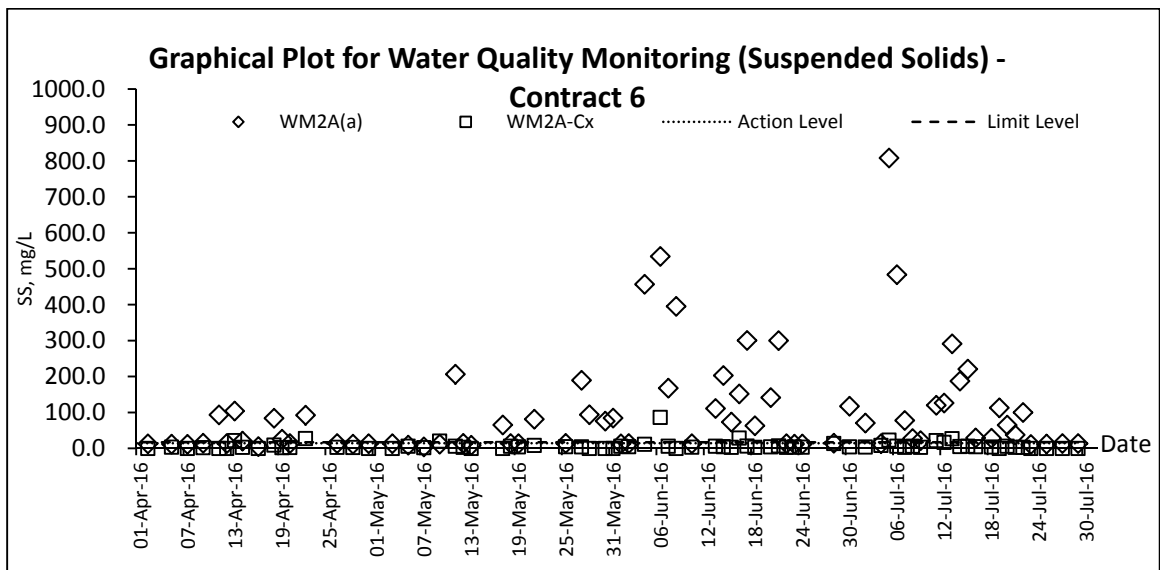
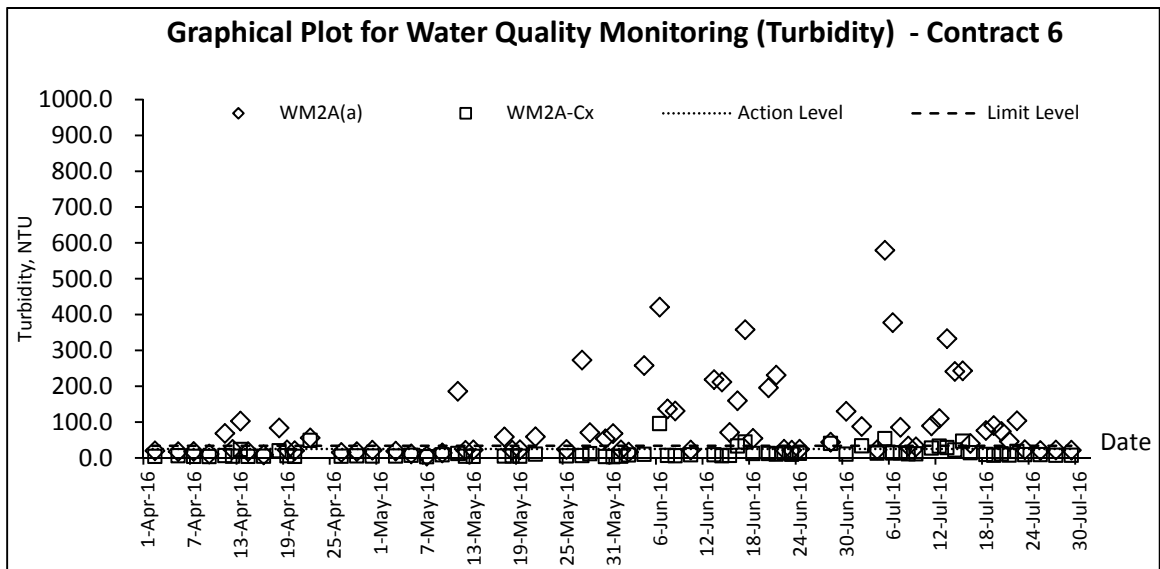
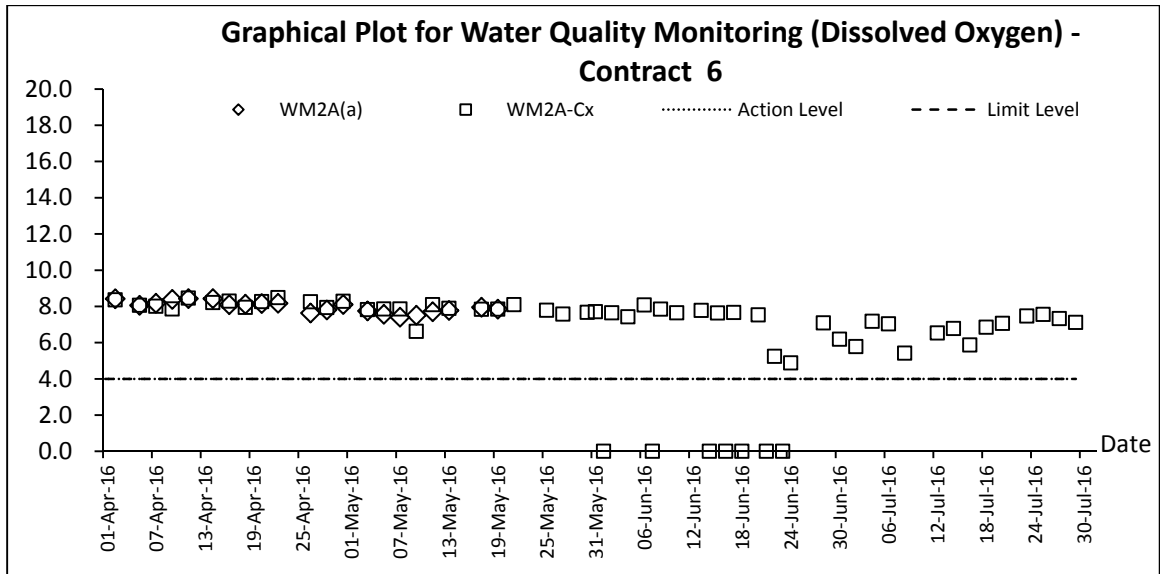
**Water Quality**

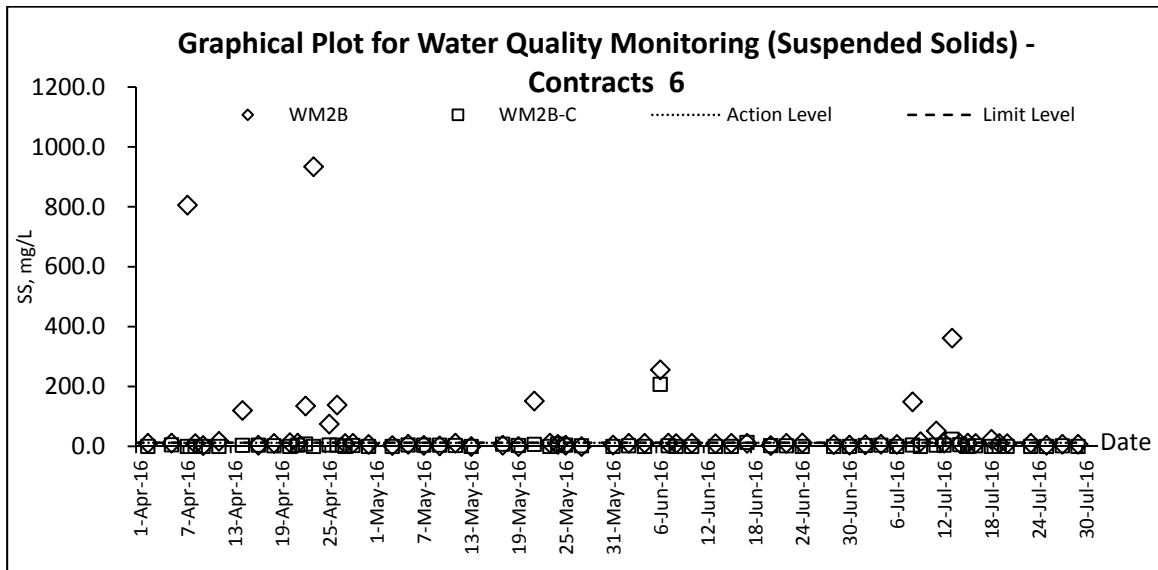
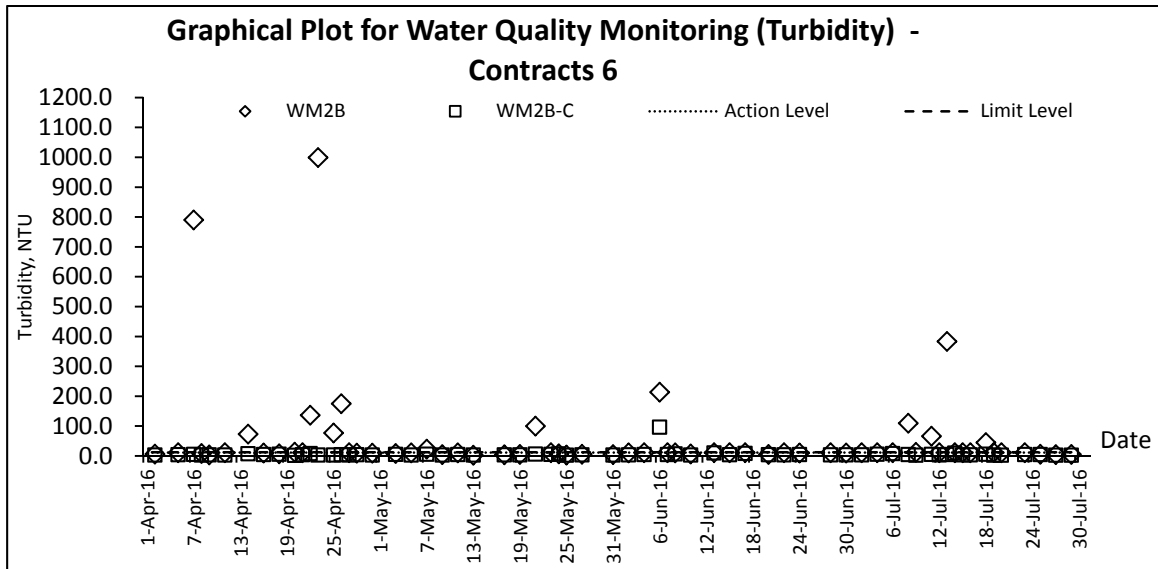
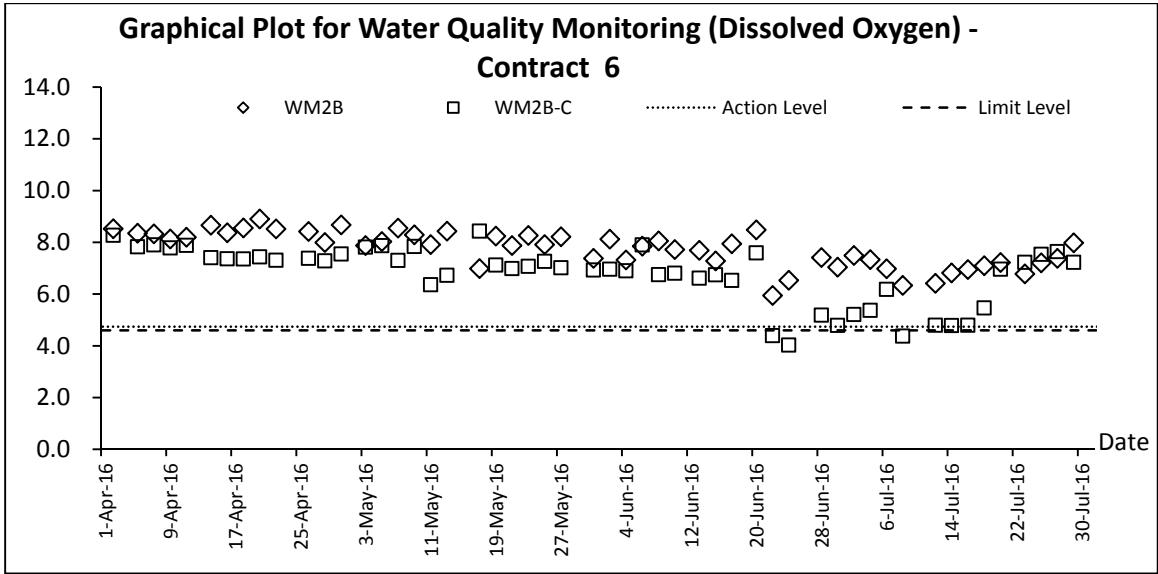












## **Appendix G**

### **Weather information**

## Weather Condition Extracted from HKO

### **The weather of May 2016**

The weather for May 2016 was warmer and drier than usual. The monthly mean temperature was 26.7 degrees, 0.8 degree above the normal figure of 25.9 degrees. Despite several rainstorms in the month, the monthly total rainfall was only 233.6 millimetres, about 23 percent below the normal figure of 304.7 millimetres. However, the accumulated rainfall of 885.4 millimetres in the first five months of the year was still about 38 percent more than the normal figure of 640.8 millimetres for the same period.

### **The weather of June 2016**

June 2016 was characterized by rainy weather during the first part of the month and persistent very hot weather in the latter part. Overall, the month was exceptionally hot. The monthly mean temperature was 29.4 degrees, 1.5 degrees higher than the normal figure of 27.9 degrees and the second hottest June on record. The monthly mean maximum temperature of 32.4 degrees and minimum temperature of 27.5 degrees were respectively the highest and the second highest for June. Despite there were several heavy rain episodes in the first half of the month, the monthly total rainfall was only 347.4 millimetres, about 24 percent below the normal figure of 456.1 millimetres. The accumulated rainfall for the first half year of 1232.8 millimetres was about 12 percent above the normal figure of 1096.9 millimetres for the same period.

### **The weather of July 2016**

With long spells of sunny skies under the dominance of the subtropical ridge, the weather was unusually hot in July 2016. The monthly mean temperature of 29.8 degrees was 1.0 degree higher than the normal figure of 28.8 degrees, equalling the previous highest record set in 2014. The month was much drier than usual with only 175.9 millimetres of rainfall, less than half of the July normal of 376.5 millimetres. The accumulated rainfall of 1408.7 millimetres for the first seven months was about 4 percent below the normal figure of 1473.3 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 [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (bottles/containers, plastic sheets/ foams from package material) (in '000kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (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	0.3700	0.0000	1.7600	0.0916
Half-year total	388.9127	0.0000	3.4030	216.5873	168.9224	10.1826	214.9220	2.1000	0.0000	20.7416	0.6536
July	65.3701	0.0000	0.4227	25.0255	39.9219	0.0000	11.4000	0.0000	0.0000	2.9920	0.1794
August	0.0000										
September	0.0000										
October	0.0000										
November	0.0000										
December	0.0000										
Yearly Total	454.2827	0.0000	3.8257	241.6127	208.8443	10.1826	226.3220	2.1000	0.0000	23.7336	0.8330

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

Year	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (bottles/containers, plastic sheets/ foams from package material) (in '000kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (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	454.2827	0.0000	3.8257	241.6127	208.8443	10.1826	226.3220	2.1000	0.0000	23.7336	0.8330
2017											
2018											
Total	1450.6692	0.0000	27.3778	1161.2235	262.0680	20.3562	243.6620	6.4610	1.5070	50.8056	4.2635

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 <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in m <sup>3</sup> )	(in '000m <sup>3</sup> )
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
<b>Sub-total</b>	<b>7.544</b>	<b>1.483</b>	<b>0.068</b>	<b>0.000</b>	<b>5.993</b>	<b>6.613</b>	<b>0.001</b>	<b>0.000</b>	<b>0.002</b>	<b>0.000</b>	<b>0.690</b>
Jul	0.565	0.019	0.000	0.000	0.546	1.407	0.000	0.001	0.004	1.000	0.085
Aug											
Sep											
Oct											
Nov											
Dec											
<b>Total</b>	<b>8.109</b>	<b>1.503</b>	<b>0.068</b>	<b>0.000</b>	<b>6.538</b>	<b>8.021</b>	<b>0.001</b>	<b>0.001</b>	<b>0.006</b>	<b>1.000</b>	<b>0.775</b>

- Note:**
1. Assume the density of soil fill is 2 ton/m<sup>3</sup>.
  2. Assume the density of rock and broken concrete is 2.5 ton/m<sup>3</sup>.
  3. Assume each truck of C&D wastes is 5m<sup>3</sup>.
  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/m<sup>3</sup>.

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 <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
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	0	0	0	0	0	0	0	0	0	0	0.005
AUG											
SEP											
OCT											
NOV											
DEC											
Total	0	0	0	0	0	0.55	0	0.062	0	0	0.22

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 <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
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 = 8m<sup>3</sup>
  - 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: K.M. Lui (EO)

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

Contract No.: CV/2013/08

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m <sup>3</sup> )
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	73.407	0	0.951	32.858	39.598	0.827	0	0	0	0	0.094
Aug											
Sep											
Oct											
Nov											
Dec											
Total	565.763	0	50.602	160.171	354.99	53.785	0	1.195	0.007	32.28	4.438

- 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 <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
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	0.207	0	0	0	0.207	0	0	0.047	0.001	0	0
Aug											
Sept											
Oct											
Nov											
Dec											
Total	1.933	0	0	0	1.933	0	0	0.052	0.002	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 15<sup>th</sup> 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 <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )
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	2.94201	0	2.88351	0	0.0585
Aug					
Sep					
Oct					
Nov					
Dec					
Total	15.235	0	12.49851	0	2.737

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 <sup>3</sup> )
	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	0.0045	0.0045	0	0	0.067	0.067	0.117
Sub-total	0	0	3818.7330	3818.7330	0.4826	0.4826	0.0085	0.0085	0	0	0.375	0.375	0.559
Jul	0	0	162.93	162.93	0.43	0.43	0.02	0.02	0	0	0.1937	0.1937	0.189
Aug													
Sep													
Oct													
Nov													
Dec													
Total	0	0	3981.663	3981.663	0.9126	0.9126	0.0285	0.0285	0	0	0.5687	0.5687	0.748

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					
12.7kg of cans were sent to Wong Kei and Pui Kei for recycling.	430kg of papers were sent to Kin Xun for recycling.	20kg of plastic bottles and 181kg of glass bottles were sent to Action Health for recycling.	126.88 tons of scrap metals from LCAL were sent for recycling.	36.05 tons of scrap metals from subcontractors were sent for recycling	

- Notes:
- (1) The performance targets are given in the Particular Specification on Environmental Management Plan.
  - (2) The waste flow table shall also include construction waste that are specified in the Contract to be imported for use at the site.
  - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
  - (4) Broken concrete for recycling into aggregates.
  - (5) If necessary, use the conversion factor: 1 full load of dumping truck being equivalent to 6.5 m<sup>3</sup> 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?
<b>Air Quality Impact (Construction)</b>							
3.6.1.1	2.1	<p><b>General Dust Control Measures</b></p> <p>The following dust suppression measures should be implemented:</p> <ul style="list-style-type: none"> <li>■ 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</li> <li>■ 80% of stockpile areas should be covered by impervious sheets</li> <li>■ Speed of trucks within the site should be controlled to about 10 km/hr</li> <li>■ All haul roads within the site should be paved to avoid dust emission due to vehicular movement</li> </ul>	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><b>Best Practice for Dust Control</b></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"> <li>■ The Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust.</li> <li>■ 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.</li> <li>■ Any piles of materials accumulated on or around the work areas should be cleaned up regularly.</li> <li>■ 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.</li> <li>■ The material should be handled properly to prevent fugitive dust emission before cleaning.</li> </ul> <p><i>Disturbed Parts of the Roads</i></p> <ul style="list-style-type: none"> <li>■ Each and every main temporary access should be paved with</li> </ul>	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"> <li>Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet.</li> </ul> <p><i>Exposed Earth</i></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><i>Loading, Unloading or Transfer of Dusty Materials</i></p> <ul style="list-style-type: none"> <li>All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet.</li> </ul> <p><i>Debris Handling</i></p> <ul style="list-style-type: none"> <li>Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides.</li> <li>Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped.</li> </ul> <p><i>Transport of Dusty Materials</i></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><i>Wheel washing</i></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><i>Use of vehicles</i></p> <ul style="list-style-type: none"> <li>Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels.</li> <li>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.</li> </ul>					

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"> <li>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.</li> </ul> <p><i>Blasting</i></p> <ul style="list-style-type: none"> <li>The areas within 30m from the blasting area should be wetted with water prior to blasting.</li> </ul>					
<b><u>Air Quality Impact (Operation)</u></b>							
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"> <li>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.</li> <li>Further odour containment will be achieved by covering or confining the sewage channels, sewage tanks, and equipment with potential odour emission.</li> <li>Proper mixing will be provided at the equalization and sludge holding tanks to prevent sewage septicity.</li> <li>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.</li> </ul>	To minimize potential odour impact from operation of the proposed sewage treatment work at BCP	DSD	BCP	Operation Phase	EIA recommendation
<b><u>Noise Impact (Construction)</u></b>							
4.4.1.4	3.1	<p><b>Adoption of Quieter PME</b></p> <p>Use of the recommended quieter PME such as those given in the BS5228: Part 1:2009 and presented in <b>Table 4.14</b>, 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><b>Use of Movable Noise Barrier</b></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/m<sup>2</sup> 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><b>Use of Noise Enclosure/ Acoustic Shed</b></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><b>Use of Noise Insulating Fabric</b></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><b>Good Site Practice</b></p> <p>The good site practices listed below should be followed during each phase of construction:</p> <ul style="list-style-type: none"> <li>• Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme;</li> <li>• Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction programme;</li> <li>• Mobile plant, if any, should be sited as far from NSRs as possible;</li> <li>• 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;</li> <li>• 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</li> <li>• Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.</li> </ul>	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
<b>Noise Impact (Operation)</b>							
<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"> <li>Choose quieter plant such as those which have been effectively silenced;</li> <li>Include noise levels specification when ordering new plant (including chillier and E/M equipment);</li> <li>Locate fixed plant/louver away from any NSRs as far as practicable;</li> <li>Locate fixed plant in walled plant rooms or in specially designed enclosures;</li> <li>Locate noisy machines in a basement or a completely separate building;</li> <li>Install direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosure where necessary; and</li> <li>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.</li> </ul>	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
<b>Water Quality Impact (Construction)</b>							
5.6.1.1	4.1	<p><b>Construction site runoff and drainage</b></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"> <li>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.</li> <li>The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas.</li> </ul>	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"> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ The overall slope of the site should be kept to a minimum to reduce</li> </ul>					

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"> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ 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.</li> </ul>					
5.6.1.1	4.1	<p><b>Good site practices for works within water gathering grounds</b></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"> <li>▪ Adequate measures should be implemented to ensure no pollution or siltation occurs to the catchwaters and catchments.</li> <li>▪ 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.</li> <li>▪ All surplus spoil should be removed from water gathering grounds as soon as possible.</li> <li>▪ Temporary drains with silt traps should be constructed at the site boundary before the commencement of any earthworks.</li> <li>▪ Regular cleaning of silt traps should be carried out to ensure proper operation at all time.</li> <li>▪ All excavated or filled surfaces which have the risk of erosion should always be protected form erosion.</li> <li>▪ Facilities for washing the wheels of vehicles before leaving the site should be provided.</li> <li>▪ Any construction plant which causes pollution to catchwaters or catchments due to the leakage of oil or fuel should be removed off site immediately.</li> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ Drainage plans should be submitted for approval by the Director of</li> </ul>			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"> <li>▪ An unimpeded access through the waterworks access road should always be maintained.</li> <li>▪ Earthworks near catchwaters or streamcourses should only be carried out in dry season between October and March,</li> <li>▪ Advance notice must be given before the commencement of works on site quoting WSD's approval letter reference.</li> </ul>					
5.6.1.2	4.1	<p><b>Good site practices of general construction activities</b></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><b>Sewage effluent from construction workforce</b></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><b>Hydrogeological Impact</b></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
<b><u>Water Quality Impact (Operation)</u></b>							
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?
<b><u>Sewage and Sewerage Treatment Impact (Construction)</u></b>							
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
<b><u>Sewage and Sewerage Treatment Impact (Operation)</u></b>							
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
<b><u>Waste Management Implication (Construction)</u></b>							
7.6.1.1	6	<p><b>Good Site Practices</b></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"> <li>▪ 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</li> <li>▪ Training of site personnel in proper waste management and chemical handling procedures</li> <li>▪ Provision of sufficient waste disposal points and regular collection of waste</li> <li>▪ 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</li> <li>▪ General refuse shall be removed away immediately for disposal. As</li> </ul>	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"> <li>▪ Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction from public road</li> <li>▪ Covers and water spraying system should be provided for the stockpiled C&amp;D material to prevent dust impact or being washed away</li> <li>▪ Designate different locations for storage of C&amp;D material to enhance reuse</li> <li>▪ Well planned programme for transportation of C&amp;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&amp;D material is not anticipated</li> <li>▪ 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</li> <li>▪ Provision of cover for the stockpile material, sand bag or earth bund as barrier to prevent material from washing away and entering the drains</li> </ul>					
7.6.1.2	6	<p><b>Waste Reduction Measures</b></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"> <li>▪ 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</li> <li>▪ 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</li> <li>▪ Proper storage and site practices to minimise the potential for damage or contamination of construction materials</li> <li>▪ Plan and stock construction materials carefully to minimise amount</li> </ul>	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"> <li>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.</li> </ul>					
7.6.1.3	6	<p><b>C&amp;D Materials</b></p> <p>In order to minimise impacts resulting from collection and transportation of C&amp;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&amp;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&amp;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"> <li>A Waste Management Plan should be prepared and implemented in accordance with ETWB TC(W) No. 19/2005 Environmental Management on Construction Site; and</li> <li>In order to monitor the disposal of C&amp;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.</li> </ul>	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><b>General refuse</b></p> <p>General refuse should be stored in enclosed bins or compaction units separated from other C&amp;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><b>Chemical waste</b></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