JOB NO.: TCS00694/13

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

22nd QUARTERLY ENVIRONMENTAL MONITORING & AUDIT SUMMARY REPORT – (November 2018 to January 2019)

PREPARED FOR

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT (CEDD)

Quality Index

Date	Reference No.	Prepared By	Certified By
8 April 2019	TCS00694/13/600/R2015v3	 Nicola Hon (Environmental Consultant)	 T.W. Tam (Environmental Team Leader)

Version	Date	Description
1	1 April 2019	First Submission
2	2 April 2019	Amended against IEC's comment on 2 April 2019
3	8 April 2019	Amended against IEC's comment on 3 April 2019

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8 April 2019

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

By Email & Post

Attention: Mr Simon LEUNG

Dear Sir

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. 22) – November 2018 to January 2019

With reference to the Quarterly EM&A Report No. 22 for November 2018 to January 2019 (Version 3) certified by the ET Leader and received by us on 8 April 2019, please be noted that we have no adverse comments on the captioned submission. We herewith verify the captioned submission in accordance with Section 13.4 of the EM&A Manual.

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

Yours faithfully

Antony WONG
Independent Environmental Checker

cc	CEDD/BCP	-	Mr LU Pei Yu / Mr William CHEUNG	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
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EXECUTIVE SUMMARY

ES.01. This is the **22nd** Quarterly EM&A Summary Report for the "*Liantang/Heung Yuen Wai Boundary Control Point and Associated Works"* under Environmental Permit No. EP-404/2011/D (hereinafter ''the EP''), covering the period from **1 November 2018 to 31 January 2019** (hereinafter "Reporting Period").

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

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

Environmental Aspect	Monitoring Parameters / Inspection	Reporting Period	
		Monitoring Locations / Contracts	Total Occasions
Air Quality	1-hour TSP	9	417
	24-hour TSP	9	140
Construction Noise	$L_{eq(30min)}$ Daytime	10	130
Water Quality	Water in-situ measurement and/or sampling	WM1 & WM1-C,	39 scheduled and 1 extra of sampling day
		WM2A & WM2A-Cx	39 scheduled and 5 extra of sampling day
		WM2B & WM2B-C	(*) 39 Scheduled
		WM3 &WM3-C	39 scheduled and 3 extra of sampling day
		WM4, WM4-CA &WM4-CB	39 scheduled and 0 extra of sampling day
Ecology	Woodland compensation i) General Health condition of planted species ii) Survival of planted species	9 Quadrats	1
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	Contract 2	13
		Contract 3	14
		Contract 4	13
		Contract 6	14
		Contract 7	13
		Contract SS C505 (#)	13

Note: Extra monitoring day was due to measurement results exceedance
(#) IEC only joined inspection for Contract SS C505 once per month.
(*) During the whole reporting period, water sampling was unable to carry out at WM2B and WM2B-C due to shallow water (water depth under 150mm)

BREACHES OF ACTION/LIMIT LEVELS

ES.03. In the Reporting Period, no noise exceedance and valid noise complaint was registered for construction noise. For air quality, no exceedance recorded for 1-hour TSP monitoring, however, one (1) Action Level exceedances of 24-hour TSP monitoring was recorded. For water quality monitoring, a total of 13 Limit Level exceedances were recorded under the Project. 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	**1**	0	**1**	Not project related	0

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--
Water Quality	DO	0	0	0	--	--
	Turbidity	0	**6**	**6**	• Refer to ES.05	The Contractor should fully implement water quality mitigation measure.
	SS	0	**7**	**7**		

ES.04. There was one (1) Action Level exceedance of 24-hour TSP recorded at Location AM2. Investigation result revealed that the Contractor has implemented dust mitigation measures to control the dust generated under the Project. It was concluded that the exceedance was related to other dust source such as frequent road traffic apart from the project and work area owned by other project without proper maintenance site exit along Lin Ma Hang Road and unlikely due to the works under Contract works.

ES.05. Investigation Report for all water quality exceedances was completed by ET. Most of investigation results revealed that the Contractor had properly implemented water quality mitigation measures such as well-maintained the wastewater treatment facility and covered the expose area with impervious sheet and it was concluded that the exceedances were related to the unknown source of muddy water contributed from outside the project area and not caused by the works under the Project. However, one investigation result revealed that exceedances recorded at WM3x on 10 November 2018 concluded that the exceedances were caused to the isolated incident of burst water pipe which related to the works under Contract 6. Nevertheless, the Contractor was reminded to fully implement the water quality mitigation measure throughout the constriction phase as far as practicable.

ENVIRONMENTAL COMPLAINT

ES.06. In this Reporting Period, five (5) documented environmental complaints were received under the EM&A programme with respective to the dust issues at Kau Lung Hang; the dust and water quality issues at Lin Ma Hang Road and dust issues at Chun Wo construction site near FEHD's RCP. The Investigation Reports for the complaints were completed by ET without further comments from IEC.

ES.07. In addition, EPD's recently ambush operation in Wo Keng Shan Road revealed that a dump truck carrying dusty construction waste materials from LT/HYW- C6 travelling to NENT Landfill on 14 December 2018 without proper cover. A warning letter has been sent to the Contractor (CCKJV). To prevent recurrence of the case, CCKJV rejected the subject dump truck and the related driver from entering the site to perform the disposal activities effective immediately. Also, specific training was provided to the representative of sub-contractor and urged him to convey the message to all of their dump truck drivers that the mechanical cover of the dump truck should be maintained fully close for the whole trip of the dumping activities. To ensure the mechanical cover shall be covered properly before leaving the Site, the CHIT will only provide to the dump truck driver after checked the mechanical cover has been covered properly at site exit.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.08. No environmental summons or successful prosecutions were recorded in the Reporting Period.

REPORTING CHANGES

ES.09. No reporting changes were made in the Reporting Period.

FUTURE KEY ISSUES

ES.10. During dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to villages. The Contractor should fully implement the construction dust mitigation measures as appropriately.

ES.11. Preventive measures for muddy water or other water pollutants from site surface flow to local stream such as Kong Yiu Channel, Ma Wat Channel, Ping Yuen River, Kwan Tei River or public area should be properly maintained. The Contractors should paid special attention on water quality mitigation measures and fully implement according ISEMM of the EM&A Manual, in particular for working areas near Ma Wat Channel and Ping Yuen River.

ES.12. In addition, all effluent discharge shall be ensure to fulfill Technical Memorandum of Effluent Discharged into Drainage and Sewerage Systems, inland and Coastal Waters criteria or discharge permits stipulation.

ES.13. 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.14. Since most of construction sites under the Project are located adjacent to villages, the Contractors should fully implement air quality mitigation measures to reduce construction dust emission.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1. Civil Engineering and Development Department is the Project Proponent and the Permit Holder of *Agreement No. CE 45/2008 (CE) Liantang / Heung Yuen Wai Boundary Control Point and Associated Works*, which is a Designated Project to be implemented under Environmental Permit number EP-404/2011/C granted on 12 March 2015 and the latest Environmental Permit number EP-404/2011/D granted on 20 January 2017.

1.1.2. The Project consists of two main components: Construction of a Boundary Control Point (hereinafter referred as "BCP"); and Construction of a connecting road alignment. Layout plan of the Project is shown in ***Appendix A***.

1.1.3. The proposed BCP is located at the boundary with Shenzhen near the existing Chuk Yuen Village, comprising a main passenger building with passenger and cargo processing facilities and the associated customs, transport and ancillary facilities. The connecting road alignment consists of six main sections:

1) Lin Ma Hang to Frontier Closed Area (FCA) Boundary – this section comprises at-grade and viaducts and includes the improvement works at Lin Ma Hang Road;
2) Ping Yeung to Wo Keng Shan – this section stretches from the Frontier Closed Area Boundary to the tunnel portal at Cheung Shan and comprises at-grade and viaducts including an interchange at Ping Yeung;
3) North Tunnel – this section comprises the tunnel segment at Cheung Shan and includes a ventilation building at the portals on either end of the tunnel;
4) Sha Tau Kok Road – this section stretches from the tunnel portal at Wo Keng Shan to the tunnel portal south of Loi Tung and comprises at-grade and viaducts including an interchange at Sha Tau Kok and an administration building;
5) South Tunnel – this section comprises a tunnel segment that stretches from Loi Tung to Fanling and includes a ventilation building at the portals on either end of the tunnel as well as a ventilation building in the middle of the tunnel near Lau Shui Heung;
6) Fanling – this section comprises the at-grade, viaducts and interchange connection to the existing Fanling Highway.

1.1.4. Action-United Environmental Services & Consulting has been commissioned as an Independent ET to implement the relevant EM&A program in accordance with the approved EM&A Manual, as well as the associated duties.

1.1.5. This is the **22nd** Quarterly EM&A Summary Report presenting the monitoring results and inspection findings for the Reporting Period from **1 November 2018 to 31 January 2019**.

1.2 REPORT STRUCTURE

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

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

Section 12 Conclusions and Recommendations

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 CONSTRUCTION CONTRACT PACKAGING

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

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

2.1.2 The details of each contracts is summarized below and the delineation of each contracts is shown in ***Appendix A***.

Contract 2 (CV/2012/08)

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

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

Contract 3 (CV/2012/09)

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

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

Contract 4 (NE/2014/02)

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

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

Contract 5 (CV/2013/03)

2.1.6 Contract 5 has awarded in April 2013 and construction work was commenced in August 2013. Major Scope of Work of the Contract 5 is listed below:

- site formation of about 23 hectares of land for the development of the BCP;
- construction of an approximately 1.6 km long perimeter road at the BCP including a 175m long depressed road;
- associated diversion/modification works at existing local roads and junctions including Lin Ma Hang Road;
- construction of pedestrian subway linking the BCP to Lin Ma Hang Road;
- provision of resite area with supporting infrastructure for reprovisioning of the affected village houses; and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 6 (CV/2013/08)

2.1.7 Contract 6 was awarded in June 2015 and construction work was commenced on 23 October 2015. Major Scope of Work of the Contract 6 would be included below:

- construction of an approximately 4.6km long dual two-lane connecting road (with about 0.6km of at-grade road, 3.3km of viaduct and 0.7km of tunnel) connecting the BCP with the proposed Sha Tau Kok Road Interchange and the associated ventilation buildings;
- associated diversion/modification works at access roads to the resite of Chuk Yuen Village;
- provision of sewage collection, treatment and disposal facilities for the BCP and the resite of Chuk Yuen Village;
- construction of a pedestrian subway linking the BCP to Lin Ma Hang Road;
- provisioning of the affected facilities including Wo Keng Shan Road garden; and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 7 (NE/2014/03)

2.1.8 Contract 7 was awarded in December 2015 and the construction work was commenced 15 February 2016. Major Scope of Work of the Contract 7 would be included below:

- construction of the Hong Kong Special Administrative Region (HKSAR) portion of four vehicular bridge
- construction of one pedestrian bridge crossing Shenzhen (SZ) River (cross boundary bridges)

ArchSD Contract No. SS C505

2.1.9 SS C505 has been awarded in July 2015 and construction work was commenced on 1 September 2015. Major Scope of Work of the SS C505 would be included below:

- passenger-related facilities including processing kiosks and examination facilities for private cars and coaches, passenger clearance building and halls, the interior fitting works for the pedestrian bridge crossing Shenzhen River, etc.;
- cargo processing facilities including kiosks for clearance of goods vehicles, customs inspection platforms, X-ray building, etc.;
- accommodation for the facilities inside of the Government departments providing services in connection with the BCP;
- transport-related facilities inside the BCP including road networks, public transport interchange, transport drop-off and pick-up areas, vehicle holding areas and associated road furniture etc;
- a public carpark; and
- other ancillary facilities such as sewerage and drainage, building services provisions and electronic systems, associated environmental mitigation measure and landscape works.

2.2 PROJECT ORGANIZATION

2.2.1 The project organization is shown in ***Appendix B***. The responsibilities of respective parties are:

Civil Engineering and Development Department (CEDD)

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

Architectural Services Department (ArchSD)

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

Environmental Protection Department (EPD)

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

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

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

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

Engineer or Engineers Representative (ER)

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

- Monitor the Contractors' compliance with contract specifications, including the implementation and operation of the environmental mitigation measures and their effectiveness
- Monitor Contractors's, ET's and IEC's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual
- Facilitate ET's implementation of the EM&A programme
- Participate in joint site inspection by the ET and IEC
- Oversee the implementation of the agreed Event / Action Plan in the event of any exceedance
- Adhere to the procedures for carrying out complaint investigation

- Liaison with DSD, Engineer/Engineer's Representative, ET, IEC and the Contractor of the "Construction of the DSD's Regulation of Shenzhen River Stage 4 (RSR 4)" Project discussing regarding the cumulative impact issues.

The Contractor(s)

2.2.7 There will be one contractor for each individual works contract. The Contractor(s) should report to the ER. The duties and responsibilities of the Contractor are:

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

Environmental Team (ET)

2.2.8 One ET will be employed for this Project. The ET shall not be in any way an associated body of the Contractor(s), and shall be employed by the Project Proponent/Contractor to conduct the EM&A programme. The ET should be managed by the ET Leader. The ET Leader shall be a person who has at least 7 years' experience in EM&A and has relevant professional qualifications. Suitably qualified staff should be included in the ET, and resources for the implementation of the EM&A programme should be allocated in time under the Contract(s), to enable fulfillment of the Project's EM&A requirements as specified in the EM&A Manual during construction of the Project. The ET shall report to the Project Proponent and the duties shall include:

- Monitor and audit various environmental parameters as required in this EM&A Manual
- Analyse the environmental monitoring and audit data, review the success of EM&A programme and the adequacy of mitigation measures implemented, confirm the validity of the EIA predictions and identify any adverse environmental impacts arising
- Carry out regular site inspection to investigate and audit the Contractors' site practice, equipment/plant and work methodologies with respect to pollution control and environmental mitigation, and effect proactive action to pre-empt problems
- Monitor compliance with conditions in the EP, environmental protection, pollution prevention and control regulations and contract specifications
- Audit environmental conditions on site
- Report on the environmental monitoring and audit results to EPD, the ER, the lEC 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, lEC 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, lEC and the Contractor(s) of the concurrent projects as listed under Section 2.3 below regarding the cumulative impact issues.

2.3 CONCURRENT PROJECTS

2.3.1 The concurrent construction works that may be carried out include, but not limited to, the following:

(a) Regulation of Shenzhen River Stage IV;

(b) Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange – Contract No. HY/2012/06;

(c) Construction of BCP facilities in Shenzhen.

2.4 CONSTRUCTION PROGRESS

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

Contract 2 (CV/2012/08)

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

Mid-Vent Portal	• Ventilation building fit out and E&M installation • T&C for E&M facilities • Construction of flexible barrier, permanent drainage and external works • Demolition of CLP transformer room & external reinstatement works • Soft landscaping works • External reinstatement works and soft landscaping works
North Portal	• Ventilation building fit out and E&M installation • Construction of flexible barrier, permanent drainage and slip road • Cladding installation, road paving and E&M works inside the tunnel • Dismantling of MS water treatment plant and workshop • External landscaping, backfilling and reinstatement works • Soft landscaping works • Repairing works for the drainage inside the tunnel.
South Portal	• Ventilation building fit out and E&M installation • Construction of flexible barrier, permanent drainage and slip road

	• Cladding installation, road paving and E&M works inside the tunnel • External landscaping, backfilling and reinstatement works • Soft landscaping works • Dismantling of temporary steel bridge across the MTR railway track
Admin Building	• Building fit out and E&M installation and defect rectification • T&C for E&M facilities • External reinstatement and soft landscaping works

Contract 3 (CV/2012/09)

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

- Cable detection and trial trenches
- Remaining works on new Footbridge
- Noise barrier construction
- Road pavement works
- Water main laying works (on Grade and on bridge deck)
- Installation of Noise barrier steel column & panel, and sign gantry (on Grade and on bridge deck)
- Road Drainage Works
- Waterproofing works on bridge deck
- Bitumen paving on bridge deck
- Construction of Pavilion and Pai Lau
- Construction of retaining wall
- Landscaping works

Contract 4 (NE/2014/02)

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

- E&M installation at Admin Building
- E&M installation at Ventilation Building
- E&M installation at tunnel
- Cladding installation at Cheung Shan Tunnel
- Sign installation
- T&C at Admin Building

Contract 5 (CV/2013/03)

1.1.1 The construction works under Contract 5 was substantially completed on 31 August 2016.

Contract 6 (CV/2013/08)

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

- Bridge construction
- Tunneling Works
- Sewage Treatment Plant Construction
- Tunnel Ventilation Building Construction
- Slip Road/At-grade Road/Periphery Road Construction

Contract 7 (NE/2014/03)

2.4.6 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:

- Profile barrier construction at Bridges A & E

- Noise barrier construction at Bridge D &E
- Parapet installation at Bridge A, B, D & E
- Waterproofing and Drainage works at roof of Bridge C
- Drainage and watermains at perimeter road
- Bitumen pavement at Bridge A, B, D & E
- Street lighting and CCTV installation at perimeter road
- Shenzhen River Reinstatement

Contract SS C505

2.4.7 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:

- Passenger Terminal Building (PTB) Structure Works - G/F Plant Rooms Structure Works, G/F Backfiling & Drainage, Under Ground Utilities, Fence Wall and On Grade Slab
- PTB - ABWF Works & MEP Installation - Front/Back of House Area, External Staircases, External Staircases, Hall Block External Façade, Southern Entrance Construction, Major Plant Rooms & EAC Doors
- PTB - External Works incl. Building 21-24, M/F External Wall (Ewall), Roof & Upper Roof Roofing Works, Podium Coach Canopy, 21&22 (C&PC KIOSKS) & 23&24 (PC Examination Building & MXRVSS), Podium Open Area Waterproofing, Ambulance Canopy / Glazed Canopy
- Bridge C Integrated ABWF and MEP Installation Works (C7 Portion) - Arrival & Departure Hall, Staircases, Test & Commissioning
- Bldg 1 - C&ED Detector Dog Base Phase 1 - Integrated ABWF & MEP Works at G/F, R/F & External
- Bldg 2 - HKPF Building and Observation Tower Phase 1 - External Works, Integrated ABWF & MEP Works at G/F to 4/F, Observation Tower (incluidng Lift) & External Works
- Bldg 3 - Fire Station and Drill Tower Phase 1 - External Works, Integrated ABWF & MEP Works at G/F to UR/F & Drill Tower
- Bldg 4 - Cargo Examination Building (Inbound) Phase 1 - External Works at G/F under Steel Roof, Integrated ABWF & MEP Works at G/F to R/F & Loading Dock
- Bldg 5 - Cargo Examination Building (Outbound) Phase 2 - External Works at G/F under Steel Roof, Integrated ABWF & MEP Works at G/F to R/F & Loading Dock
- Bldg 6 - Fixed X-ray Vehicle Inspection System (FXRVIS) Buildings (Inbound) Phase 1 - External Works (FXI Fence Wall), Integrated ABWF & MEP Works at G/F to R/F
- Bldg 7 - Fixed X-ray Vehicle Inspection System (FXRVIS) Buildings (Outbound) Phase 2 - External Works, Integrated ABWF & MEP Works at G/F to 1/F & Roof works
- Bldg 8 - MXRVSS (Inbound) Phase 2 - Integrated ABWF and MEP Works at G/F & R/F
- Bldg 9 - MXRVSS (Outbound) Phase 2 - Structure Works at G/F, Integrated ABWF and MEP Works at G/F & Envelope
- Bldg 10 - GV Kiosk (Inbound) Phase 2 - On-Grade Slab, Integrated ABWF and MEP Works at G/F & R/F
- Bldg 11 - GV Kiosk (Outbound) Phase 2 - On-Grade Slab, Integrated ABWF & MEP Works at G/F & R/F
- Bldg 12 - Public Toilets (Inbound) Phase 2 - Integrated ABWF and MEP Works at G/F & Envelope
- Bldg 13 - Public Toilets (Outbound) Phase 2 - Integrated ABWF and MEP Works at G/F & R/F
- Bldg 14 - Disinsection Facilities (Inbound) Phase 2 - Integrated ABWF & MEP Works at G/F & Envelope
- Bldg 15 - Disinsection Facilities (Outbound) Phase 2 - Substructure Works, Integrated ABWF & MEP Works at G/F & Envelope
- Bldg 16 - Weigh Station Phase 2 - Integrated ABWF and MEP Works at G/F & Envelope

- Bldg 17 - EUVSS & Monitoring Room Phase 2 - Structure Works, Integrated ABWF & MEP Works at G/F & R/F
- Bldg 18 - Refuse Collection Point Phase 2 - Integrated ABWF and MEP Works at G/F & Envelope
- Bldg 25 - Traffic Control Office (Inbound) Phase 2 - Integrated ABWF and MEP Works at G/F & Envelope
- Bldg 26 - Traffic Control Office (Outbound) Phase 2 - Integrated ABWF and MEP Works at G/F & Envelope
- Bldg 27 - Inspection Post Phase 2 - Integrated ABWF and MEP Work at G/F & Envelope
- Bldg 28 - Guard Booth (Inbound) Phase 2 - Integrated ABWF and MEP Works at G/F & Envelope
- Bldg 29 - Guard Booth (Vehicle Detention Area) Phase 2 - Integrated ABWF and MEP Works at G/F & Envelope
- Bldg 30 - Guard Booth (Outbound) Phase 2 - Integrated ABWF and MEP Works at G/F & Envelope
- Bldg 31 - Guard Booth (Inbound) Phase 2 - Integrated ABWF and MEP Works at G/F & Envelope
- Bldg 32/33/34/35 - Steel Canopy 1 to 4 Phase 2 - Integrated ABWF and MEP Works
- Bldg 36 - Fire Hydrant Tank & Pump Room Phase 1 - Integrated ABWF and MEP Works at R/F
- Bldg 37/38/39 - Elevated Walkways (E1, E2 & E3) Phase 2 - Structures Works, ABWF and BS Works
- Bldg 40 - Elevated Walkway E4 Phase 2 - Structures Works, ABWF and BS Works
- Vehicular Bridges 1 & 4 Phase 3 - Retaining walls, Road and Finishes Works
- Vehicular Bridges 2, 3 & 5 Phase 3 - Road and Finishes Works
- External Works - Water Meter Room Connection (inbound & outbound)
- External Utilities Works - UU works for phase 2 FS inspection & DSD inspection
- External Road & Pavement Works - for inbound - Phase 1 FS inspection & for Phase 2 FS inspection
- External Landscape - Inbound & Outbound area
- "Testing & Commissioning (T&C) and FSD/SCCU Inspection Phase 1
- T&C - FSD, HKPF, CBI, FXI, DOG & Bldg 36
- FS Inspection - FSD Cert. Issue & Final O&M Manual, Test Report
- SCCU Inspection & Handover "
- "Testing & Commissioning (T&C) and FSD/SCCU Inspection Phase 2
- T&C - CBO, FXO, Inbound & Outbound Groups
- FS Inspection - EVA, CBO & FXO"
- "Testing & Commissioning (T&C) and FSD/SCCU Inspection Phase 3
- T&C - EVA & PTB"

2.5 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

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

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

- Habitat Creation Management Plan
- Wetland Compensation Plan

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

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

Item	Description	License/Permit Status			
		Ref. no.		Effective Date	Expiry Date
Contract 2					
1	Air pollution Control (Construction Dust) Regulation	Ref No.: 368864		31 Dec 2013	Till Contract ends
2	Chemical Waste Producer Registration	***North Portal*** Waste Producers Number: No.5213-652-D2523-01		25 Mar 2014	Till Contract ends
		Mid-Vent Portal Waste Producers Number: No.5213-634-D2524-01		25 Mar 2014	Till Contract ends
		South Portal Waste Producers Number: No.5213-634-D2526-01		9 Apr 2014	Till Contract ends
3	Water Pollution Control Ordinance - Discharge License	No.WT00018374-2014 (South Portal)		3 Mar 2014	28 Feb 2019
		No. WT00023063-2015 (North Portal)		18 Dec 2015	31 Mar 2019
		No.: W5/1I392 (Admin Building)		28 Mar 2014	31 Mar 2019
		No.: WT00025594-2016 (Mid-Vent Portal)		7 Oct 2016	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-RN0211-18	North Portal	10-May-2018	09-Nov-2018
		GW-RN0212-18		10-May-2018	09-Nov-2018
		GW-RN0307-18		18-Jun-2018	17-Dec-2018
		GW-RN0660-18		26-Nov-2018	25-Jan-2019
		GW-RN0661-18		26-Nov-2018	25-Jan-2019
		GW-RN0063-19		31-Jan-2019	31-May-2019
		GW-RN0065-19		31-Jan-2019	31-May-2019
		GW-RN0084-19		11-Feb-2019	31-May-2019
		GW-RN0400-18	Mid Vent	06-Aug-2018	01-Feb-2019
		GW-RN0401-18		06-Aug-2018	31-Jan-2019
		GW-RN0511-18	South Portal	30-Sep-2018	25-Mar-2019
		GW-RN0513-18		30-Sep-2018	25-Mar-2019
		GW-RN0663-18		06-Dec-2018	05-Feb-2019
		GW-RN0052-19		06-Feb-2019	31-Mar-2019
		GW-RN0523-18	Admin	28-Sep-2018	27-Mar-2019

Item	Description	License/Permit Status			
		Ref. no.		Effective Date	Expiry Date
			Bldg		
		GW-RN0522-18	Cheung Shan Tunnel	26-Sep-2018	22-Mar-2019
6	Specified Process License **(**Mortar Plant Operation)	L-3-251(1)		12-Apr-2016	11-Apr-2021
Contract 3					
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 362101		17 Jul 2013	Till Contract ends
2	Chemical Waste Producer Registration	Waste Producers Number: No.:5113-634-C3817-01		7 Oct 2013	Till Contract ends
3	Water Pollution Control Ordinance - Discharge License	No.:WT00032188 – 2018		20 Sep 2018	31 Aug 2023
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-RN0259-18		19 Jun 2018	17 Dec 2018
		GW-RN0305-18		22 Jun 2018	17 Dec 2018
		GW-RN0366-18		9 Jul 2018	18 Dec 2018
		GW-RN0361-18		15 Jul 2018	18 Dec 2018
		GW-RN0388-18		25 Aug 2018	24 Feb 2019
		GW-RN0424-18		01 Sep 2018	21 Feb 2019
		GW-RN0425-18		22 Aug 2018	21 Feb 2019
		GW-RN0454-18		06 Sep 2018	05 Mar 2019
		GW-RN0509-18		10 Oct 2018	17 Dec 2018
		GW-RN0566-18		29 Oct 2018	04 Apr 2019
		GW-RN0693-18		18 Dec 2018	25 May 2019
		GW-RN0694-18		19 Dec 2018	25 May 2019
		GW-RN0696-18		19 Dec 2018	25 May 2019
		GW-RN0699-18		18 Dec 2018	25 May 2019
Contract 6					
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 390614		29 Jun 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producers Number No.: 5213-652-C3969-01		31 Aug 2015	Till the end of Contract
3	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7022707		9 Jul 2015	Till the end of Contract
4	Water Pollution Control Ordinance - Discharge License	No.:WT00024574-2016		31 May 2016	31 May 2021
		No.:WT00024576-2016		31 May 2016	31 May 2021
		No.:WT00024742-2016		14 June 2016	30 June 2021
		No.:WT00024746-2016		14 June 2016	30 June 2021

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
5	Construction Noise Permit	GW-RW0481-18	14 Sep 2018	13 Mar 2019
		GW-RW0595-18	30 Oct 2018	28 Feb 2019
Contract SS C505				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 390974	13 Jul 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producer No.: 5213-642-L1048-07	16 Sep 2015	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: WT00024865-2016	8 Jul 2016	30 Nov 2020
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7022831	23 Jul 2015	Till the end of Contract
5	Construction Noise Permit	GW-RN0637-18	9 Nov 2018	8 Jan 2019
		GW-RW0481-18	14 Sep 2018	13 Mar 2019
		GW-RN0529-18	5 Oct 2018	3 Apr 2019
		GW-RN0754-18	9 Jan 2019	8 Mar 2019
Contract 7				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 397015	21 Dec 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producer No.: 5214-641-K3202-01	24 Mar 2016	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: WT00024422-2016	10 May 2016	31 May 2021
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7024129	21 Jan 2016	Till the end of Contract
5	Construction Noise Permit	GW-RN0206-18	8 May 2018	4 Nov 2018
Contract 4				
1	Air pollution Control (Construction Dust) Regulation	Ref. No. 405353	22 July 2016	Till the end of Contract
2	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7024973	13 May 2016	Till the end of Contract
3	Construction Noise Permit	GW-RN0568-18	15 Oct 2018	14 Dec 2018
		GW-RN0697-18	10 Dec 2018	9 Feb 2019

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	• 1-hour TSP by Real-Time Portable Dust Meter; and • 24-hour TSP by High Volume Air Sampler.
Noise	• $L_{eq(30min)}$ in normal working days (Monday to Saturday) 07:00-19:00 except public holiday; and • 3 sets of consecutive $L_{eq(5min)}$ on restricted hours i.e. 19:00 to 07:00 next day, and whole day of public holiday or Sunday • Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.
Water Quality	**In-situ Measurements** • Dissolved Oxygen Concentration (mg/L); • Dissolved Oxygen Saturation (%); • Turbidity (NTU); • pH unit; • Water depth (m); and • Temperature (℃).
	Laboratory Analysis • Suspended Solids (mg/L)

3.3 MONITORING LOCATIONS

3.3.1 The designated monitoring locations as recommended in the *EM&A Manual* are shown in ***Appendix C***. As the access to some of the designated monitoring locations was questionable due to safety reason or denied by the landlords, alternative locations therefore have had proposed. The latest alternative monitoring locations has been updated in the revised EM&A Programme (Rev.7) which approved by EPD on 7 April 2017. Besides, in view of Location AM1b was demolished and returned to the landlord on 27 April 2018, alterative location AM1c was proposed by ET and approved by EPD on 26 November 2018. ***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
AM1c(*)	Open area of Tsung Yuen Ha Village No.	BCP	SS C505

Station ID	Description	Works Area	Related to the Work Contract
	63		Contract 7
AM2	Village House near Lin Ma Hang Road	LMH to Frontier Closed Area	Contract 6
AM3	Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village.	LMH to Frontier Closed Area	Contract 6
AM4b^	House no. 10B1 Nga Yiu Ha Village	LMH to Frontier Closed Area	Contract 6
AM5a^	Ping Yeung Village House	Ping Yeung to Wo Keng Shan	Contract 6
AM6	Wo Keng Shan Village House	Ping Yeung to Wo Keng Shan	Contract 6
AM7b@	Loi Tung Village House	Sha Tau Kok Road	Contract 2 Contract 6
AM8	Po Kat Tsai Village No. 4	Po Kat Tsai	Contract 2
AM9b#	Nam Wa Po Village House No. 80	Fanling	Contract 3

 # Proposal for the change of air quality monitoring location from AM9a to AM9b was submitted to EPD on 4 Nov 2013 after verified by the IEC and it was approved by EPD (EPD's ref.: (15) in EP 2/N7/A/52 Pt.10 dated 8 Nov 2013).
@ Proposal for the change of air quality monitoring location from 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. Besides, Location AM1b was temporary suspended (24-hour TSP monitoring) since 27 April 2018 as the rented land was demolished and returned to the landlord.
** Revised proposal for alterative location AM1c was submitted to EPD on 31 October 2018 after verified by the IEC and it was approved by EPD (EPD's ref.: ( ) in Ax (1) to EP 2/N7/A/52 Pt.26 dated 26 November 2018)*

Table 3-3 Impact Monitoring Stations - Construction Noise

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

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

Table 3-4 Impact Monitoring Stations - Water Quality

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
WM1	Downstream of Kong Yiu Channel	833 679	845 421	Alternative location located at upstream 51m of the designated location	SS C505 Contract 6
WM1-Control	Upstream of Kong Yiu Channel	834 185	845 917	NA	SS C505 Contract 6
WM2A	Downstream of River Ganges	834 204	844 471	Alternative location located at downstream 81m of the designated location	Contract 6
WM2A(a)*	Downstream of River Ganges	834 191	844 474	Alternative location located at upstream 70m of the designated location	Contract 6
WM2A-Controlx#	Upstream of River Ganges	835 377	844 188	Alternative location located at upstream 160m of the designated location	Contract 6
WM2B	Downstream of River Ganges	835 433	843 397	NA	Contract 6
WM2B-Control	Upstream of River Ganges	835 835	843 351	Alternative location located at downstream 31m of the designated location	Contract 6
WM3x#	Downstream of River Indus	836 206	842 270	Alternative location located at downstream 180m of the designated location	Contract 2 Contract 6
WM3-Control	Upstream of River Indus	836 763	842 400	Alternative location located at downstream 26m of the designated location	Contract 2# Contract 6
WM4	Downstream of Ma Wat Channel	833 850	838 338	Alternative location located at upstream 11m of the designated location	Contract 2 Contract 3
WM4–Control A	Kau Lung Hang Stream	834 028	837 695	Alternative location located at downstream 28m of the designated location	Contract 2 Contract 3
WM4–Control B	Upstream of Ma Wat Channel	833760	837395	Alternative location located at upstream 15m of the designated location	Contract 2 Contract 3

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

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

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

3.4 MONITORING FREQUENCY AND PERIOD

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

Air Quality Monitoring

3.4.2 Frequency of impact air quality monitoring is as follows:

- 1-hour TSP 3 times every six days during course of works
- 24-hour TSP Once every 6 days during course of works.

Noise Monitoring

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

Water Quality Monitoring

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

3.5 MONITORING EQUIPMENT

Air Quality Monitoring

3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 *(Part 50), Appendix B.* If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve.

3.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

3.5.3 All equipment to be used for air quality monitoring is listed in ***Table 3-5***.

Table 3-5 Air Quality Monitoring Equipment

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

Wind Data Monitoring Equipment

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

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

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

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

Noise Monitoring

3.5.7 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m s^{-1}.

3.5.8 Noise monitoring equipment to be used for monitoring is listed in ***Table 3-6***.

Table 3-6 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	B&K Type 2238 and Rion NL-52
Calibrator	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 ºC 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 550A Multifunctional Meter//YSI PRO20 Handheld Dissolved Oxygen Instrument
pH meter	YSI Professional Plus / AZ8685 pH pen-style meter
Turbidimeter	Hach 2100Q
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-liter plastic cool box with Ice pad

3.6 MONITORING METHODOLOGY

1-hour TSP Monitoring

3.6.1 The 1-hour TSP monitor was a brand named "Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter" which is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90º light scattering. The 1-hour TSP monitor consists of the following:

(a.) A pump to draw sample aerosol through the optic chamber where TSP is measured;
(b.) A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
(c.) 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:

(a.) An anodized aluminum shelter;
(b.) A 8"x10" stainless steel filter holder;
(c.) A blower motor assembly;
(d.) A continuous flow/pressure recorder;
(e.) A motor speed-voltage control/elapsed time indicator;
(f.) A 7-day mechanical timer, and
(g.) 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}). $Leq_{(30min)}$ in six consecutive $Leq_{(5min)}$ measurements were used as the monitoring parameter for the time period between 0700-1900 hours on weekdays; and also $Leq_{(15min)}$ in three consecutive $Leq_{(5min)}$ 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 4^0C 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, YSI PRO20 Handheld Dissolved Oxygen Instrument or YSI 550A Multifunctional Meter is used for water in-situ measures, which automates the measurements and data logging of temperature, dissolved oxygen and dissolved oxygen saturation. Before each round of monitoring, the dissolved oxygen probe would be calibrated by the wet bulb method.

3.6.15 A portable AZ8685 pH pen-style meter or YSI Professional Plus is used for in-situ pH measurement. The pH meter is capable of measuring pH in the range of 0 – 14 and readable to 0.1.

3.6.16 A portable Hach 2100Q Turbidimeter is used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU. StablCal® Standards of known NTU are used for calibration of the instrument before and after measurement.

3.6.17 All in-situ measurement equipment are calibrated by HOKLAS accredited laboratory of three month interval.

Laboratory Analysis

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

3.7 EQUIPMENT CALIBRATION

3.7.1 Calibration of the HVS is performed upon installation and thereafter at bimonthly intervals in accordance with the manufacturer's instruction using the certified standard calibrator (TISCH Model TE-5025A). Moreover, the Calibration Kit would be calibrated annually. The calibration data are properly documented and the records are maintained by ET for future reference.

3.7.2 The 1-hour TSP meter was calibrated by the supplier prior to purchase. Zero response of the equipment would be checked before and after each monitoring event. Annually calibration with the High Volume Sampler (HVS) in same condition would be undertaken by the Laboratory.

3.7.3 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis.

3.7.4 All water quality monitoring equipment is calibrated by HOKLAS accredited laboratory of three month intervals.

3.7.5 The calibration certificates of all monitoring equipment used for the impact monitoring program in the Reporting Period and the HOKLAS accredited certificate of laboratory are presented in the relevant monthly EM&A reports.

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

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

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

Monitoring Station	Action Level (μg /m^3)		Limit Level (μg/m^3)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AM1b	265	143	500	260
AM2	268	149		
AM3	269	145		
AM4b	267	148		
AM5a	268	143		
AM6	269	148		
AM7b	275	156		

Monitoring Station	Action Level (μg /m³)		Limit Level (μg/m³)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AM8	269	144		
AM9b	271	151		

Table 3-9 Action and Limit Levels for Construction Noise

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

Note 1: Acceptable Noise Levels for school should be reduced to 70 dB(A) and 65 dB(A) during examination period
Note 2: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the NCA have to be followed.

Table 3-10 Action and Limit Levels for Water Quality

Parameter	Performance criteria	Monitoring Location				
		WM1	WM2A(a)	WM2B	WM3x	WM4
DO (mg/L)	Action Level	(*)4.23	(**)4.00	(*)4.74	(**)4.00	(*)4.14
	Limit Level	(#)4.19	(**)4.00	(#)4.60	(**)4.00	(#)4.08
Turbidity (NTU)	Action Level	51.3	24.9	11.4	13.4	35.2
		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, 4, 6, 7 and Contract SS C505 and air quality monitoring was performed at all designated locations.

4.2 SUMMARY OF MONITORING RESULTS

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

Table 4-1 Summary of Air Quality Monitoring Results

Monitoring Location	1-hour TSP (μg/m³)			24-hour TSP (μg/m³)		
	Max	Min	Mean	Max	Min	Mean
AM1c	166	53	87	136	35	81
Record Date	28-Jan-19	12-Dec-18	48 events	3-Jan-19	6-Nov-18	15 events
AM2	151	64	103	***232***	64	127
Record Date	28-Jan-19	12-Dec-18	48 events	12-Nov-18	15-Jan-19	15 events
AM3	158	55	97	142	18	89
Record Date	28-Jan-19	12-Dec-18	48 events	26-Jan-19	29-Nov-18	15 events
AM4b	160	33	80	139	31	80
Record Date	3-Jan-19 26-Jan-19	19-Nov-18	45 events	4-Jan-19	14-Nov-18	16 events
AM5a	145	54	88	140	31	90
Record Date	15-Jan-19	11-Dec-18	45 events	16-Jan-19	26-Nov-18	16 events
AM6	114	33	72	144	53	101
Record Date	21-Jan-19	17-Nov-18	45 events	8-Nov-18	10-Jan-19	16 events
AM7b	134	47	81	145	39	97
Record Date	21-Jan-19	3-Jan-19	45 events	22-Jan-19	26-Nov-18	16 events
AM8	71	24	50	95	22	59
Record Date	15-Jan-19	11-Dec-18	45 events	22-Jan-19	26-Nov-18	16 events
AM9b	140	27	65	143	20	57
Record Date	22-Jan-19	29-Dec-18	48 events	21-Jan-19	6-Nov-18	15 events

Remark: Bold and initial indicate action level exceedance.

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

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

Location	Exceedance	1-hour TSP	24- hour TSP	Total
AM1	Action Level	0	0	0
	Limit Level	0	0	0
AM2	Action Level	0	**1**	**1**
	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

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

4.2.3 In the Reporting Period, all the 1-hour TSP monitoring results were below the Action/Limit Levels. For 24-hour TSP monitoring, one (1) Action Level exceedances was recorded at AM2 on 12 November 2018. The Investigation Report revealed that the Contractor has implemented dust mitigation measures to control the dust generated under the Project. It was concluded that the exceedance was related to other dust source such as frequent road traffic apart from the project and work area owned by other project without proper maintenance site exit along Lin Ma Hang Road and unlikely due to the works under Contract works.

4.2.4 The summary of weather conditions during the Reporting Period is presented in ***Appendix G.***

5 CONSTRUCTION NOISE MONITORING

5.1 GENERAL

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

5.2 SUMMARY OF MONITORING RESULTS

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

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

Table 5-1 Summary of Construction Noise Monitoring Results

Monitoring Location	Leq, 30min (dB((A))	
	Max	Min
NM1	66	47
Record Date	16-Jan-19	18-Dec-18
NM2a(*)	74	65
Record Date	30-Nov-18	18-Dec-18
NM3	65	57
Record Date	6-Nov-18	21-Jan-19
NM4	65	61
Record Date	12-Nov-18	21-Jan-19
NM5	61	52
Record Date	3-Jan-19	18-Dec-18, 21-Jan-19
NM6	63	55
Record Date	12-Nov-18	11-Dec-18
NM7	66	54
Record Date	12-Nov-18	11-Dec-18
NM8	64	55
Record Date	10-Jan-19	7-Nov-18, 19-Nov-18
NM9	66	55
Record Date	1-Nov-18, 10-Jan-19	19-Nov-18
NM10(*)	68	56
Record Date	22-Jan-19	19-Nov-18

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

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

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

Station	Limit Level	Action Level	Received Date
NM1	0	0	N/A

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

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

6 WATER QUALITY MONITORING

6.1 GENERAL

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

6.2 SUMMARY OF MONITORING RESULTS

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

6.2.2 In accordance with "*Event and Action Plan*", the water quality monitoring frequency shall be increased to daily when exceedance recorded at the exceeded monitoring location. In the Reporting Period, thirty-nine (39) sampling days was scheduled to carry out for Locations WM1, WM2A(a), WM3x and WM4 with their control stations.. Moreover, 1, 5, 3 days of extra water sampling were conducted for WM1, WM2A and WM3 and all its control station.

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

Statistics	DO (mg/L)		Turbidity (NTU)		SS (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
Min	6.6	6.0	4.9	2.2	2.0	<2.0
Max	11.0	13.3	90.1	17.6	114.0	21.5
Average	8.4	8.8	18.3	7.2	17.0	5.1

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

Statistics	DO (mg/L)			Turbidity (NTU)			SS (mg/L)		
	WM4	WM4 - CA	WM4 - CB	WM4	WM4 - CA	WM4 - CB	WM4	WM4 - CA	WM4 - CB
Min	6.1	5.6	4.5	4.4	1.7	2.5	2.0	<2	<2.0
Max	21.6	10.5	9.0	34.1	18.1	14.6	38.0	16.0	14.0
Average	8.0	8.7	6.6	11.9	4.8	7.4	11.6	4.9	7.0

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

Statistics	DO (mg/L)				Turbidity (NTU)				SS (mg/L)			
	WM2A(a)	WM2A-C	WM2B	WM2B-C	WM2A(a)	WM2A-C	WM2B	WM2B-C	WM2A(a)	WM2A-C	WM2B	WM2B-C
Min	6.4	6.4	*	*	3.4	7.8	*	*	<2.0	2.0	*	*
Max	10.6	9.6	*	*	304.0	49.3	*	*	812.0	39.5	*	*
Average	8.7	8.1	*	*	21.5	18.2	*	*	35.1	9.2	*	*

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

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

Statistics	DO (mg/L)		Turbidity (NTU)		SS (mg/L)	
	WM3	WM3-Control	WM3	WM3-Control	WM3	WM3-Control
Min	6.4	6.4	2.9	2.2	2.5	<2
Max	9.6	9.2	99.1	142.5	3130	312.0
Average	8.1	7.9	16.0	21.7	87.7	36.1

6.2.3 Breaches of water quality A/L levels and statistical analysis of compliance for the water quality monitoring results are summarized in ***Tables 6-5.***

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

Reporting Period	No. of sampling day	Location	DO (mg/L)		Turbidity (NTU)		SS (mg/L)	
			Action	Limit	Action	Limit	Action	Limit
Nov-18	12	WM1	0	0	0	0	0	0
	17	WM2A(a)	0	0	0	**3**	0	**4**
	0	WM2B	0	0	0	0	0	0
	15	WM3x	0	0	0	**2**	0	**2**
	12	WM4	0	0	0	0	0	0
Dec-18	14	WM1	0	0	0	0	0	0
	14	WM2A(a)	0	0	0	0	0	0
	0	WM2B	0	0	0	0	0	0
	14	WM3x	0	0	0	0	0	0
	14	WM4	0	0	0	0	0	0
Jan-19	14	WM1	0	0	0	**1**	0	**1**
	13	WM2A(a)	0	0	0	0	0	0
	0	WM2B	0	0	0	0	0	0
	13	WM3x	0	0	0	0	0	0
	13	WM4	0	0	0	0	0	0
Total	40	WM1	0	0	0	**1**	0	**1**
	44	WM2A(a)	0	0	0	**3**	0	**4**
	0	WM2B	0	0	0	0	0	0
	42	WM3x	0	0	0	**2**	0	**2**
	39	WM4	0	0	0	0	0	0
Sum			0	0	0	**6**	0	**7**

6.2.4 In the Reporting Period, a total of 13 Limit Level (LL) exceedances, namely 6 LL exceedance of turbidity and 7 LL exceedances of Suspended Solids were recorded. NOEs were issued to relevant parties upon confirmation of the results.

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

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

Date of Exceedance	Location	Exceeded Parameter	Cause of Water Quality Exceedance In Brief
2 November 2018	WM2A(a)	Turbidity & SS	In our investigation, CCKJV had implemented water quality mitigation measures such as providing tarpaulin sheet for open slope and surface to minimize muddy runoff. Since improper discharge from another project was happened occasionally which affected the stream water quality and there was no adverse water quality impact observed during the site inspection at works area of Bridge D. It is concluded that the exceedances were unlikely caused by the works under the Project.

10 November 2018	WM3x	Turbidity & SS	In our investigation, the Contractor had implemented water quality mitigation measures and no adverse water quality impact was observed during site inspection. It is considered that the exceedances were caused to the isolated incident of burst water pipe which related to the works under Contract 6 and unlikely caused by the works under Contract 2.
17 November 2018	WM3x	Turbidity & SS	In our investigation, CCKJV had implemented water quality mitigation measures and no adverse water quality impact was observed during site inspection. It is considered that the exceedances were related to the ingress of muddy water from other party and unlikely caused by the works under Contract 6. In our investigation, DHK had implemented and well maintained the wastewater treatment facilities and no adverse water quality impact was identified at North Portal Site and Admin Building Site during site inspection. It is considered that the exceedances were related to the ingress of muddy water from other party and unlikely caused by the works under Contract 2.
26, 27 and 28 November 2018	WM2A(a)	Turbidity & SS	In our investigation, CCKJV had implemented water quality mitigation measures such as providing tarpaulin sheet for open slope and surface to minimize muddy runoff. The deficiency observed during site inspection was rectified immediately and the water quality impact was considered negligible. It is considered that the exceedances were related to the inflow of muddy water from upstream of the project and unlikely caused by the works under the Project.
9 January 2019	WM1	Turbidity & SS	In our investigation, no adverse water quality impact contributed to WM1 was observed. Since ingress of black water from upstream of the construction site was observed, it was considered that exceedances were unlikely due to the works under Contract 6 and Contract SS C505.

7 ECOLOGY MONITORING

7.1 GENERAL

7.1.1 Ecology monitoring for woodland compensation was shall be conducted at bi-monthly interval for the first year and the monitoring frequency would be reduced to quarterly from the second year.

7.1.2 The Ecology Monitoring for period of September to November 2018 was carried out on 20th and 23rd November 2018 by transects inspection and quadrat monitoring. The Quarterly Ecological Monitoring Report (September to November 2018) which verified by IEC has submitted to EPD as supplementary of the EM&A Report (November 2018) in December 2018.

8 WASTE MANAGEMENT

8.1 GENERAL WASTE MANAGEMENT

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

8.2 RECORDS OF WASTE QUANTITIES

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

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

8.2.2 Whenever possible, materials were reused on-site as far as practicable. The quantities of waste for disposal in the Reporting Period are summarized in ***Tables 8-1*** and ***8-2*** and the Waste Flow Table is presented in ***Appendix H***.

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

Type of Waste	Contract No	Quantity				Disposal Location
		Nov 2018	Dec 2018	Jan 2019	Total	
C&D Materials (Inert) (in '000m^3)	**2**	**1.9760**	**5.1965**	**8.1000**	**66.3035**	-
	3	**1.938**	**1.406**	**2.937**		
	4	0	0	0		-
	6	**0.310**	**12.477**	**16.511**		-
	7	0	0	**1.919**		
	SS C505	**4.702**	**4.016**	**4.815**		-
Reused in this Project (Inert) (in '000m^3)	**2**	0	0	0	**0.812**	-
	3	**0.296**	**0.060**	0		-
	4	0	0	0		-
	6	0	0	0		-
	7	0	0	0		
	SS C505	**0.186**	**0.110**	**0.160**		-
Reused in other Projects (Inert) (in '000m^3)	**2**	**0.1760**	**2.0925**	**1.5360**	**4.1995**	Recycling facility as approved alternative site
	3	0	0	0		
	4	0	0	0		
	6	0	**0.01**	**0.385**		NENT
	7	0	0	0		
	SS C505	0	0	0		
Disposal as Public Fill (Inert) (in '000m^3)	**2**	**1.8000**	**3.1040**	**6.5640**	**55.563**	Tuen Mun 38 TKO 137
	3	**1.281**	**1.044**	**2.010**		
	4	0	0	0		
	6	**0.310**	**12.467**	**16.126**		
	7	**0**	**0**	**1.919**		
	SS C505	**3.608**	**2.639**	**2.691**		

Remark:

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

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

Type of Waste	Contract No	Quantity				Disposal Location
		Nov 2018	Dec 2018	Jan 2019	Total	
Recycled Metal ('000kg) #	**2**	0	0	0	**757.98**	By licensed collector
	3	0	0	0		
	4	0	0	0		
	6	0	0	0		
	7	**0.3**	**0.2**	**6.7**		
	SS C505	**240.200**	**272.030**	**238.550**		
Recycled Paper / Cardboard Packing ('000kg) #	**2**	**0.1780**	0	0	**1.663**	By licensed collector
	3	0	0	0		
	4	0	0	0		
	6	**0.345**	0	0		
	7	**0.1**	**0.1**	**0.1**		
	SS C505	**0.340**	**0.210**	**0.290**		
Recycled Plastic ('000kg) #	**2**	**1.8200**	0	0	**3.073**	By licensed collector
	3	0	0	0		
	4	0	0	0		
	6	0	0	0		
	7	**0.001**	**0.001**	**0.001**		
	SS C505	**0.300**	0	**0.950**		
Chemical Wastes ('000kg) *	**2**	0	**28.4500**	**7.2760**	**35.726**	By licensed collector
	3	0	0	0		
	4	0	0	0		
	6	0	0	0		
	7	0	0	0		
	SS C505	0	0	0		
General Refuses ('000m^3)	**2**	**0.5690**	**0.3269**	**0.3000**	**8.4479**	NENT
	3	**0.160**	**0.085**	**0.145**		
	4	**0.018**	0	0		
	6	**0.929**	**0.800**	**0.521**		
	7	**0.2**	**0.27**	**0.1**		
	SS C505	**1.372**	**1.235**	**1.417**		

Remark:

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

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

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

9 SITE INSPECTIONS

9.1 REQUIREMENTS

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

Contract 2

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

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

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
November 2018	2, 9, 16, 23 and 30 November 2018	7	Completed
December 2018	7, 14, 21 and 28 December 2018	6	Completed
January 2019	4, 11, 18 and 25 January 2019	8	Completed

9.1.3 In the Reporting Period, no non-compliance was recorded; however, ***21*** observations/ reminders were recorded during the site inspections. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

Contract 3

9.1.4 During the Reporting Period, ***14*** events of the joint site inspections were undertaken at Contract 3 to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in ***Table 9-2*** and the details of site inspection can be found in relevant EM&A monthly report.

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

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
November 2018	1, 8, 15, 21 and 29 November 2018.	5	Completed
December 2018	5, 13, 19 and 27 December 2018	3	Completed
January 2019	2, 8, 16, 24 and 28 January 2019	3	Completed

9.1.5 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 4

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

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

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

November 2018	2, 9, 16, 19 and 30 November 2018	0	Completed
December 2018	7, 14, 17 and 28 December 2018	0	Completed
January 2019	4, 11, 18 and 21 January 2019	0	Completed

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

Contract 6

9.1.8 During the Reporting Period, ***14*** events of the joint site inspections were undertaken at Contract 6 to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in ***Table 9-4*** and the details of site inspection can be found in relevant EM&A monthly report.

Table 9-4 Summary of Reminders/Observations of Site Inspection – Contract 6

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
November 2018	1, 8, 15, 22 and 29 November 2018	5	Completed
December 2018	6, 13, 20 and 27 December 2018	1	Completed
January 2019	3, 10, 15, 24 and 31 January 2019	4	Completed

9.1.9 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 SS C505

9.1.10 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 9-5*** and the details of site inspection can be found in relevant EM&A monthly report.

Table 9-5 Summary of Reminders/Observations of Site Inspection – Contract SS C505

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
November 2018	7, 14, 21 and 28 November 2018	4	Completed
December 2018	5, 12, 19 and 24 December 2018	4	Completed
January 2019	2, 9, 16, 23 and 30 January 2019	7	Completed

9.1.11 In the Reporting Period, no non-compliance was recorded; however, ***15*** observations/ reminders were recorded during the site inspections. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

Contract 7

9.1.12 During the Reporting Period, ***13*** events of the joint site inspections were undertaken at Contract SS C505 to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in ***Table 9-6*** and the details of site inspection can be found in relevant EM&A monthly report.

Table 9-6 Summary of Reminders/Observations of Site Inspection – Contract 7

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
November 2018	2, 9, 16, 20 and 30 November 2018	1	Completed
December 2018	7, 14, 18 and 28 September 2018	4	Completed
January 2019	4, 11, 17 and 25 January 2019	1	Completed

9.1.13 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

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

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

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

10.1.1 In the Reporting Period, no summons and prosecution under the EM&A Programme was lodged for all Contracts. However, five (5) documented environmental complaints were received under the EM&A programme and the details are summary below. The status of the investigation report and finding and listed below.

Date of complaint	Complaint Detail	Investigation Status
19 November 2018	A public complaint was received from EPD on 19 November 2018 concerning about the dust impact generated from the demolition work for a temporary bridge near Kau Lung Hang under the project.(Dust Quality)	The IR revealed that DHK immediately provided additional measures to cover the stockpile of demolished materials with tarpaulin sheet and EPD was satisfied by the implementation of additional measure in their follow up inspection. There were no yellow/ pink inspection form issued by EPD and no non-compliance was observed during site inspection. However, DHK was reminded to fully implement the dust mitigation measures such as water spraying in particular during dusty activities.
29 November 2018	A public complaint was received by 1823 and referred to ArchSD Contract SS C505 on 29 November 2018 regarding the emission of dust and muddy road along the Lin Ma Hang Road in between Tsung Yuen Ha Village and Ta Kwu Ling police station.(Dust and Water Quality)	The Contractors has implemented dust control measures as such provide the wheel washing facilities at site exit and properly maintained cleanliness of site exit and adjoin roads. No cumulated muddy water and mud trails were observed at the site exit under Contract 6, Contract 7 and Contract SS C505 and adjoined LMH Road during our inspections. It is considered that the complaint was not related to the works under the Contract 6, Contract 7 and Contract SS C505.
13 December 2018	A public complaint was received by 1823 on 13 December 2018 regarding a road sweeper without water spraying and generated fugitive dust when travelling on Lin Ma Hang Road. (Dust Quality)	The IR indicated that the route of road sweeper extend to Ta Kwu Ling Police Station was an additional dust mitigation measures which voluntarily implemented by CCKJV apart from the project requirement. Water spraying by water tanker also deployed on the same route to suppress fugitive dust on road surface. There was no adverse dust impact observed during site inspection. It is considered that the dust problem concerned by the complainant was fully addressed by CCKJV.
4 January 2019	A public complaint was received via 1823 on 19 August 2018 and referred to CEDD on 4 January 2019 regarding large amount of slurry found on Lin Ma Hang Road near light post GD2344 and no wheel washing was performed. (Dust and Water Quality)	The IR indicated that wheel washing were properly provided by Leighton for all site exit Gates 1 to 3 during the concerned period of August 2018. There was no adverse impact observed at site exit and adjoined LMH Road during site inspection.
30 January 2019	A public complaint was received by EPD on 30 January 2019 about emission of construction dust from Chun Wo construction site near FEHD's RCP near Bridge Pier ID TP-60.(Dust Quality)	IR revealed that Chun Wo has implemented dust control measures such as providing adequate wheel washing at site exit, road cleaning by water tanker for entire site and covered stockpile when not in used. There were no Record of Inspection (yellow/ pink inspection form) issued

		by EPD and no non-compliance observed during site inspection. It is considered that the complaint was not related to the works under the Contract work.

10.1.2 The statistical summary table of environmental complaint, summons and prosecution are presented in **Tables 10-1, 10-2** and **10-3**.

Table 10-1 Statistical Summary of Environmental Complaints

Contract No	Reporting Period	Environmental Complaint Statistics			
		Frequency	Cumulative since commencement of project	Complaint Nature	Project related complaint
2	Nov 2018	**1**	**37**	• **(19)Water Quality** • **(10) Dust** • **(5) Noise** • **(1) dust & noise** • **(1) waste management** • **(1) Water quality and dust**	**(7) water quality** **(3) dust** **(1) noise**
	Dec 2018	0			
	Jan 2019	0			
3	Nov 2018	0	**7**	• **(3) Dust** • **(3) Water quality** • **(1) Noise**	**0**
	Dec 2018	0			
	Jan 2019	**1**			
4	Nov 2018	0	**0**	NA	**0**
	Dec 2018	0			
	Jan 2019	0			
6	Nov 2018	0	**45**	• **(24) Water Quality** • **(12) Dust** • **(3) Noise** • **(1) Nuisance** • **(1) Noise and dust** • **(3) Water quality and dust** • **(1) Water quality and noise**	**(8) water quality** **(3) dust** **(1) Nuisance** **(1) Water quality and dust** **(1) Water quality and noise**
	Dec 2018	**1**			
	Jan 2019	**2**			
7	Nov 2018	0	**4**	• **(1) Noise** • **(3) Water quality and dust**	**(1) water quality and dust**
	Dec 2018	0			
	Jan 2019	**1**			
SS C505	Nov 2018	0	**7**	• **(1) Noise** • **(2) dust** • **(3) Water quality and dust** • **(1) Water quality**	**(1) water quality and dust**
	Dec 2018	**1**			
	Jan 2019	**1**			

Table 10-2 Statistical Summary of Environmental Summons

Contract No	Reporting Period	Environmental Summons Statistics		
		Frequency	Cumulative since commencement of project	Complaint Nature
2	Nov 2018	0	**1**	contravening the Water Pollution Control (General) Regulations
	Dec 2018	0		
	Jan 2019	0		
3	Nov 2018	0	**0**	NA
	Dec 2018	0		

Contract No	Reporting Period	Environmental Summons Statistics		
		Frequency	Cumulative since commencement of project	Complaint Nature
	Jan 2019	0		
4	Nov 2018	0	**0**	NA
	Dec 2018	0		
	Jan 2019	0		
6	Nov 2018	0	**0**	NA
	Dec 2018	0		
	Jan 2019	0		
7	Nov 2018	0	**0**	NA
	Dec 2018	0		
	Jan 2019	0		
SS C505	Nov 2018	0	**0**	NA
	Dec 2018	0		
	Jan 2019	0		

Table 10-3 Statistical Summary of Environmental Prosecution

Contract No	Reporting Period	Environmental Prosecution Statistics		
		Frequency	Cumulative since commencement of project	Complaint Nature
2	Nov 2018	0	**1**	contravening the Water Pollution Control (General) Regulations
	Dec 2018	0		
	Jan 2019	0		
3	Nov 2018	0	**0**	NA
	Dec 2018	0		
	Jan 2019	0		
4	Nov 2018	0	**0**	NA
	Dec 2018	0		
	Jan 2019	0		
6	Nov 2018	0	**0**	NA
	Dec 2018	0		
	Jan 2019	0		
7	Nov 2018	0	**0**	NA
	Dec 2018	0		
	Jan 2019	0		
SS C505	Nov 2018	0	**0**	NA
	Dec 2018	0		
	Jan 2019	0		

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

11 IMPLEMENTATION STATUS OF MITIGATION MEASURES

11.1 GENERAL REQUIREMENTS

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

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

Table 11-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	• Wastewater to be treated by the filtration systems i.e. sedimentation tank or AquaSed before to discharge.
Air Quality	• Maintain damp / wet surface on access road • Low vehicular speed within the works areas. • All vehicles must use wheel washing facility before off site • Sprayed water during breaking works • A cleaning truck was regularly performed on the public road to prevent fugitive dust emission
Noise	• Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. • Keep good maintenance of plants • Place noisy plants away from residence or school • Provide noise barriers or hoarding to enclose the noisy plants or works • Shut down the plants when not in used.
Waste and Chemical Management	• On-site sorting prior to disposal • Follow requirements and procedures of the “Trip-ticket System” • Predict required quantity of concrete accurately • Collect the unused fresh concrete at designated locations in the sites for subsequent disposal
General	• The site was generally kept tidy and clean.

12 CONCLUSIONS AND RECOMMENDATIONS

12.1 CONCLUSIONS

12.1.1 This is the **22nd** Quarterly EM&A Summary Report presenting the monitoring results and inspection findings for the Reporting Period from **1 November 2018 to 31 January 2019**.

12.1.2 For air quality monitoring, no 1-hour TSP monitoring results triggered the Action /Limit Level, however, one (1) Action Level exceedances of 24-hour TSP were recorded.

12.1.3 In the Reporting Period, no construction noise exceedances were recorded and no complaints (which triggered the Action Level exceedance) were received.

12.1.4 For water quality monitoring, a total of 13 Limit Level (LL) exceedances, namely 6 LL exceedance of turbidity and 7 LL exceedances of Suspended Solids were recorded. Most of investigation results revealed that the Contractor had properly implemented water quality mitigation measures such as well-maintained the wastewater treatment facility and covered the expose area with impervious sheet and it was concluded that the exceedances were related to the unknown source of muddy water contributed from outside the project area and not caused by the works under the Project. However, one investigation result revealed that exceedances recorded at WM3x on 10 November 2018 concluded that the exceedances were caused to the isolated incident of burst water pipe which related to the works under Contract 6. Nevertheless, the Contractor was reminded to fully implement the water quality mitigation measure throughout the constriction phase as far as practicable.

12.1.5 In this Reporting Period, Quarterly Ecological Monitoring Report for woodland compensation (September to November 2018) was submitted to EPD in December 2018.

12.1.6 In this Reporting Period, five (5) documented environmental complaints were received under the EM&A programme with respective to the dust issues at Kau Lung Hang; the dust and water quality issues at Lin Ma Hang Road and dust issues at Chun Wo construction site near FEHD's RCP. The Investigation Reports for the complaints were completed by ET without further comments from IEC.

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

12.1.8 During the Reporting Period, weekly joint site inspection by the RE, IEC, ET with the relevant Main-contractor were carried out for Contracts 2, 3, 4, 6 and 7 in accordance with the EM&A Manual stipulation. For Contract SS C505, weekly joint site inspection was carried out by the RE, IEC, ET and main-contractor whereas IEC performed monthly site inspection. No non-compliance observed during the site inspection.

12.2 RECOMMENDATIONS

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

12.2.2 Preventive measures for muddy water or other water pollutants from site surface flow to local stream such as Kong Yiu Channel, Ma Wat Channel, Ping Yuen River, Kwan Tei River or public area should be properly maintained. The Contractors should paid special attention on water quality mitigation measures and fully implement according ISEMM of the EM&A Manual, in particular for working areas near Ma Wat Channel and Ping Yuen River.

12.2.3 In addition, all effluent discharge shall be ensure to fulfill Technical Memorandum of Effluent Discharged into Drainage and Sewerage Systems, inland and Coastal Waters criteria or discharge permits stipulation.

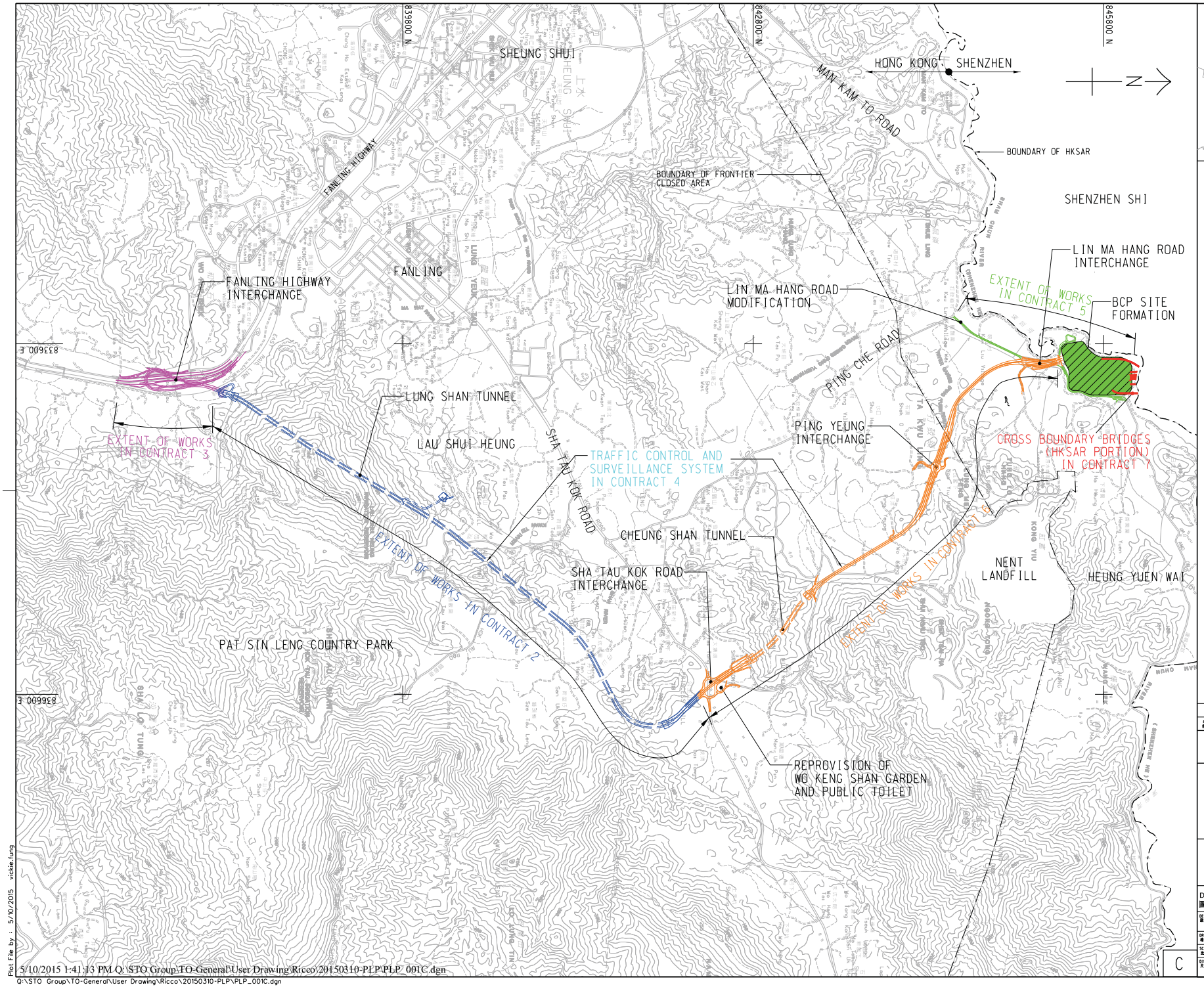
12.2.4 Construction noise would be a key environmental issue during construction work of the Project. Noise mitigation measures such as using quiet plants should be implemented in accordance with the EM&A requirement.

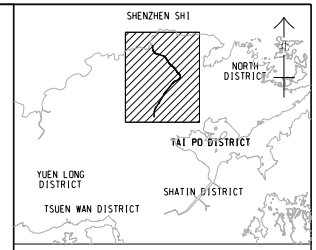
12.2.5 Since most of construction sites under the Project are located adjacent to villages, the Contractors should fully implement air quality mitigation measures to reduce construction dust emission.

12.2.6 Furthermore, daily cleaning and weekly tidiness shall be properly performed and maintained. In addition, mosquito control should be kept to prevent mosquito breeding on site.

Appendix A

Layout plan of the Project





LOCATION PLAN
SCALE 1 : 30000

LEGEND:

UNDERGROUND WORKS

REV. 修訂	DESCRIPTION 內容摘要	D.E.	P.E. CHECKED 審核	DATE 日期

CEDD 土木工程拓展署 Civil Engineering and Development Department

LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS (SITE FORMATION AND INFRASTRUCTURES) - DESIGN AND CONSTRUCTION

PROJECT LAYOUT PLAN

AECOM

DRG.NO. 圖紙編號 60212563/PLP/001

DESIGNED BY 設計	-	CONTRACT NO. 合約編號	-	P. DIV. APPROVED 批准人	-
DRAWN BY 繪圖	ZJ	STATUS 階段			
SCALE 比例	A1 1 : 15000 A3 1 : 30000				
DIMENSIONS ARE IN 尺寸單位	METRES	© COPYRIGHT RESERVED 版權所有			

C

Plot File by : 5/10/2015 vickie.fung

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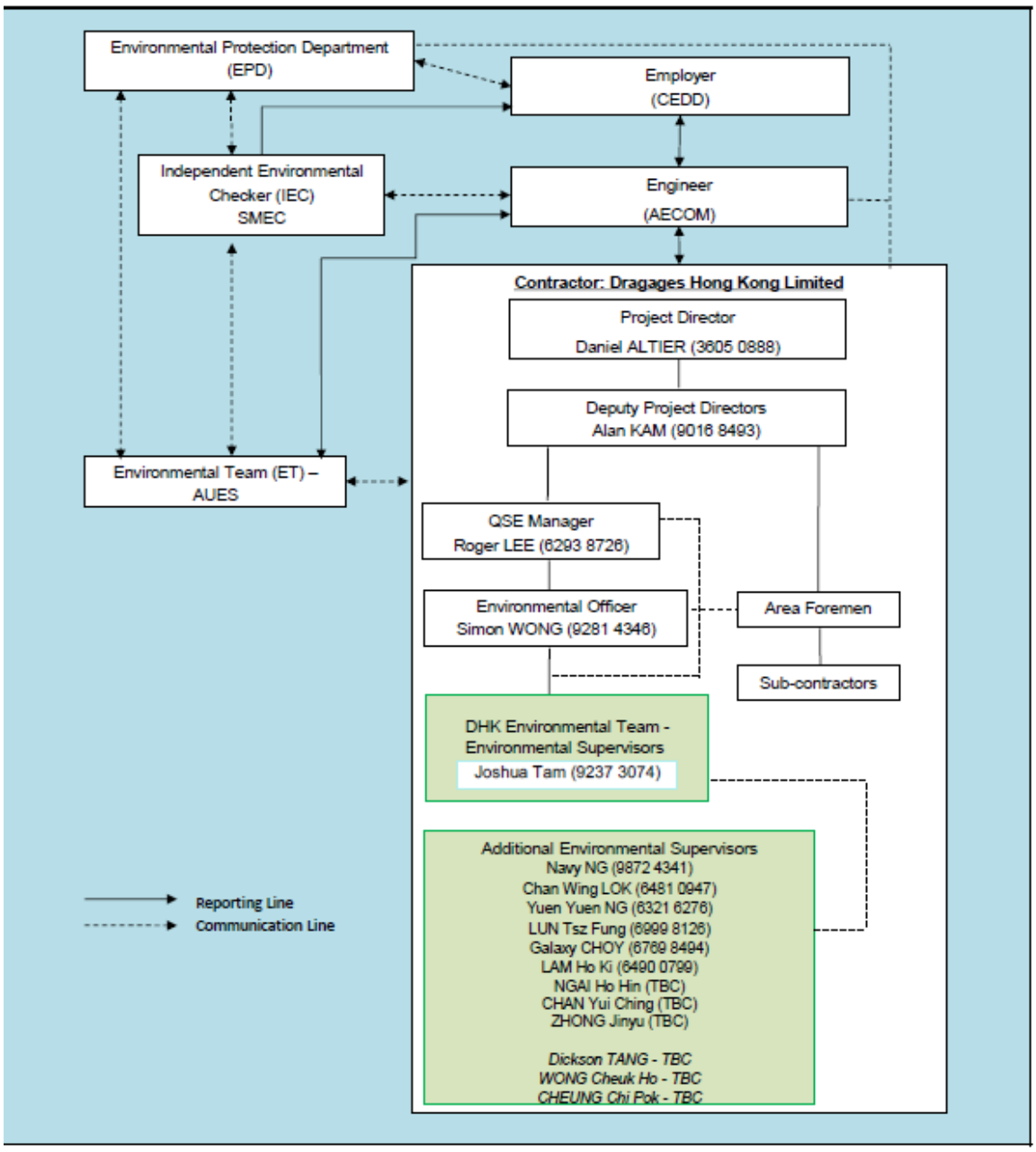
Appendix B

Environmental Management Organization Chart

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



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

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

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Edwin Ching	2171 3301	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
DHK	Project Director	Alan Kam	9016 8493	2171 3299
DHK	QSE Manager	Y. T So	9307 8728	2171 3299
DHK	Environmental Officer	Simon Wong	2171 3017	2171 3299
DHK	Environmental Supervisor	Joshua Tam	9237 3074	2171 3299
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

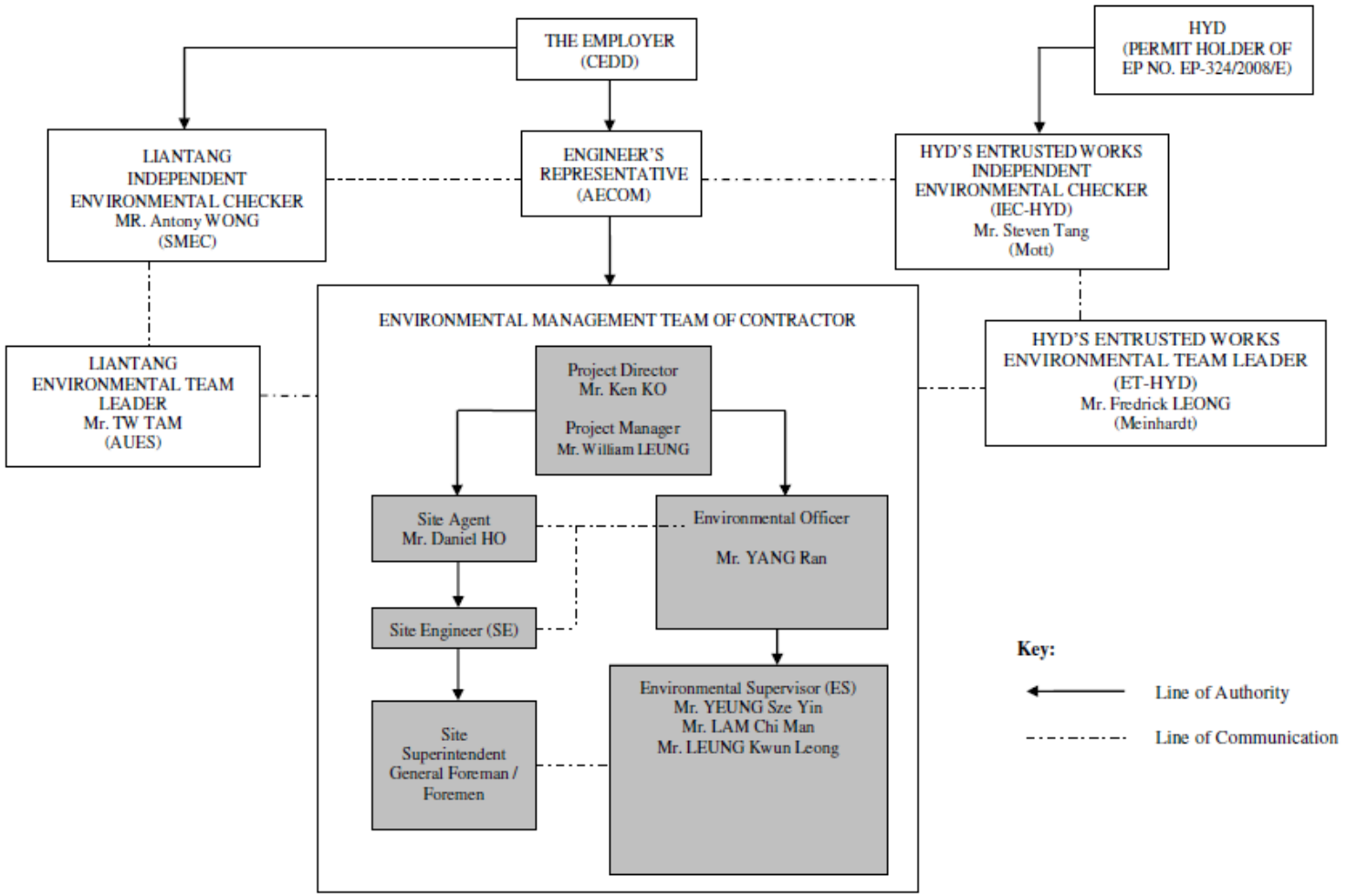
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

DHK (Main Contractor) –Dragages Hong Kong Ltd.

SMEC (IEC) – SMEC Asia Limited

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



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

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

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Alan Lee	2171 3303	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
Chun Wo	Project Director	Ken Ko	3758 8735	2638 7077
Chun Wo	Project Manager	William Leung	2638 6136	2638 7077
Chun Wo	Site Agent	Daniel Ho	2638 6144	2638 7077
Chun Wo	Environmental Officer	Mr. YANG Ran	2638 6151	2638 7077
Chun Wo	Environmental Supervisor	Frankie Leung	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

Remark: (#) The key staff for Environmental Officer has left her position on 10 July 2018 and her replacement will be included in next Reporting Month.

Legend:

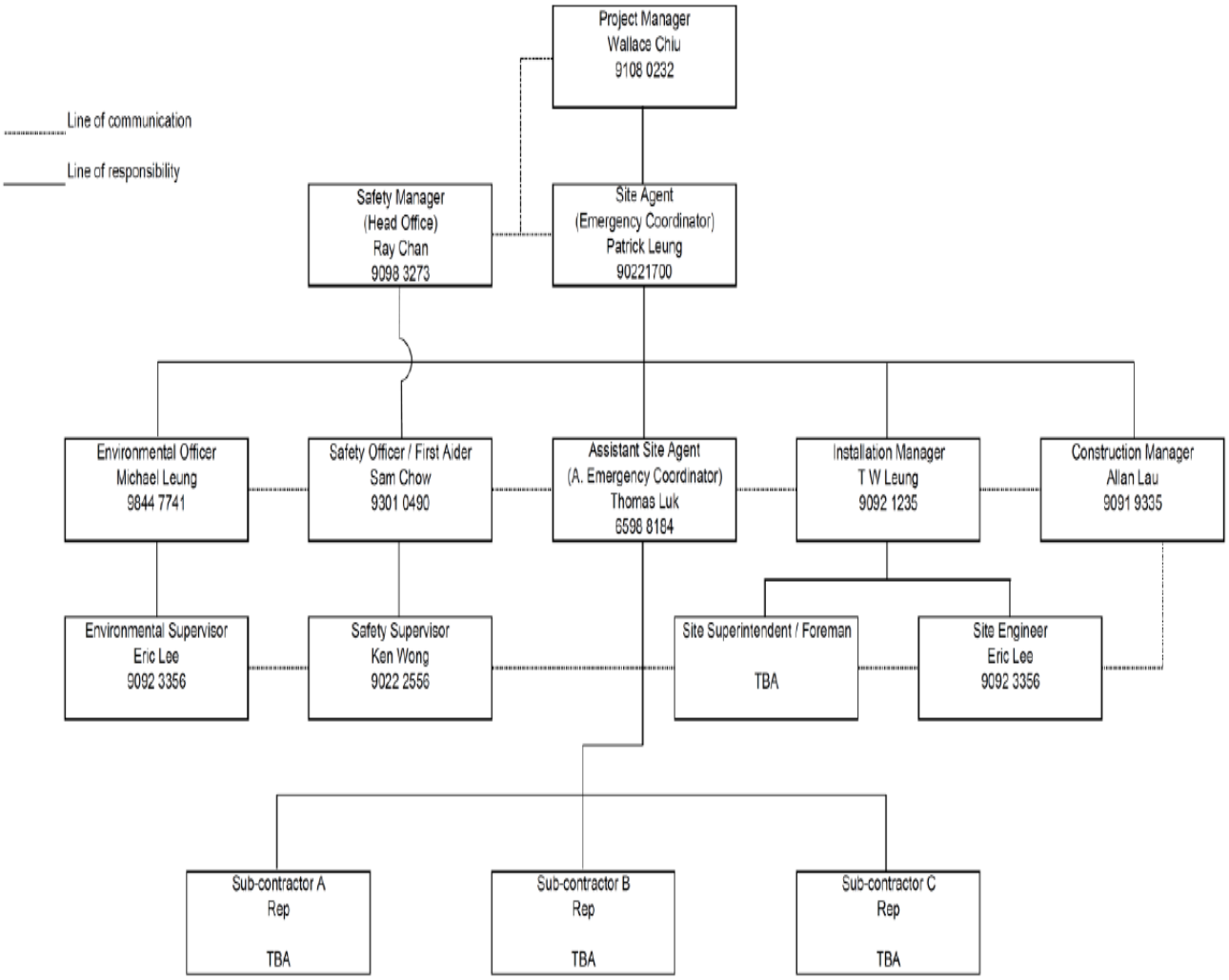
CEDD (Employer) – Civil Engineering and Development Department

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 4 - NE/2014/02

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

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Leo Lai	2171 3310	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
Siemens	Project Manager	Torsetn Jaretzke	9035 2709	--
Siemens	Site Agent	Francis Leung	9027 9565	--
Siemens	Environmental Officer	Michael Leung	9844 7741	--
Siemens	Environmental Supervisors	Eric Lee	9092 3356	--
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

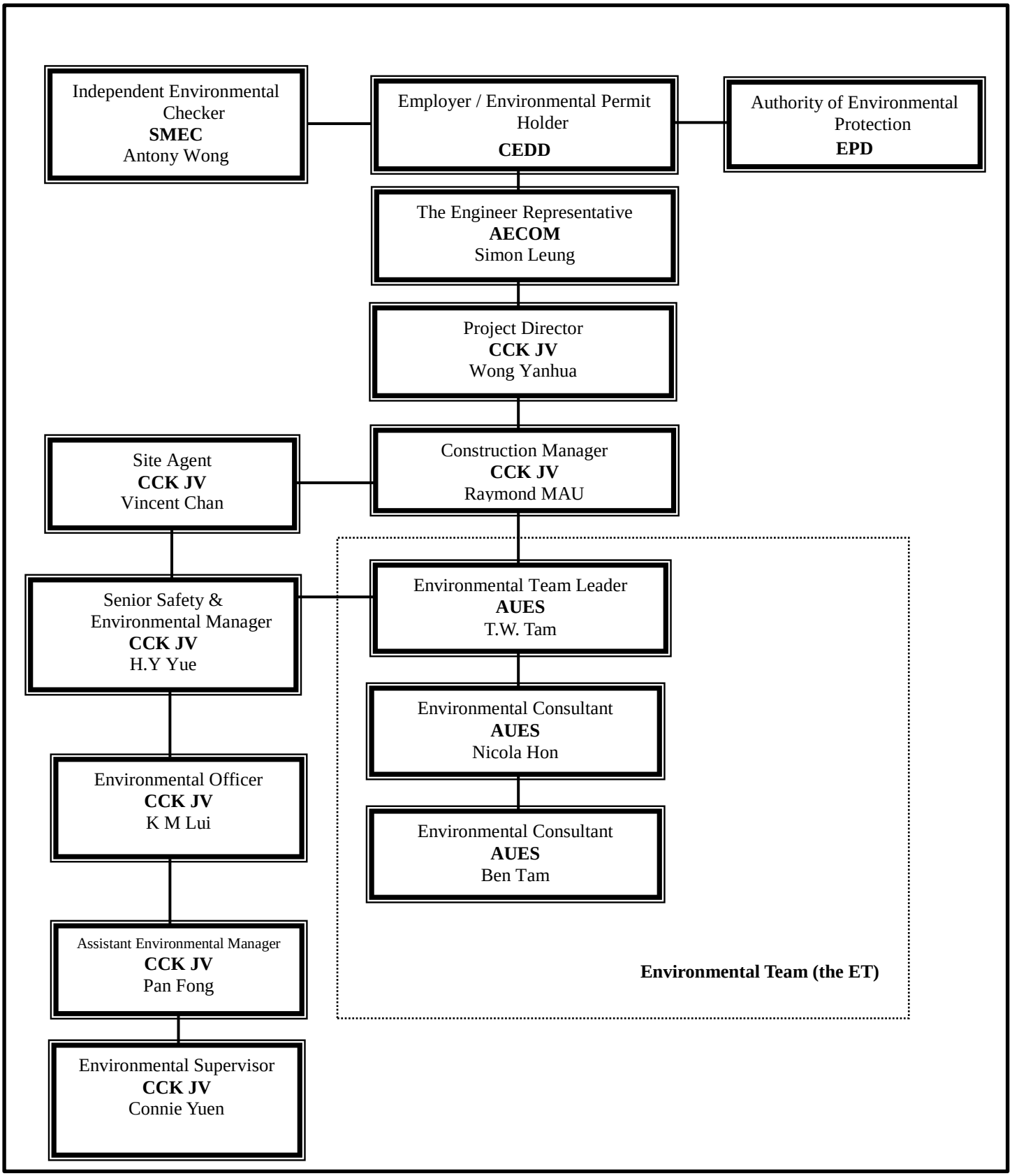
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

Siemens (Main Contractor) – Siemens Ltd.

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization – CV/2013/08

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

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
AECOM	Engineer's Representative	Simon Leung	2251 0688	2251 0698
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
CCK JV	Project Director	Wang Yanhua	6190 4212	--
CCK JV	Project Manager	Raymond Mau Sai-Wai	9011 5340	--
CCK JV	Site Agent	Vincent Chan	9655 9404	--
CCK JV	Senior Safety & Environmental Manager	H.Y. Yue	9185 8186	--
CCK JV	Environmental Manager	K M Lui	5113 8223	--
CCK JV	Environmental Supervisor	Connie Yuen	6316 6931	--
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
AECOM	Engineer's Representative	Simon Leung	2251 0688	2251 0698

Legend:

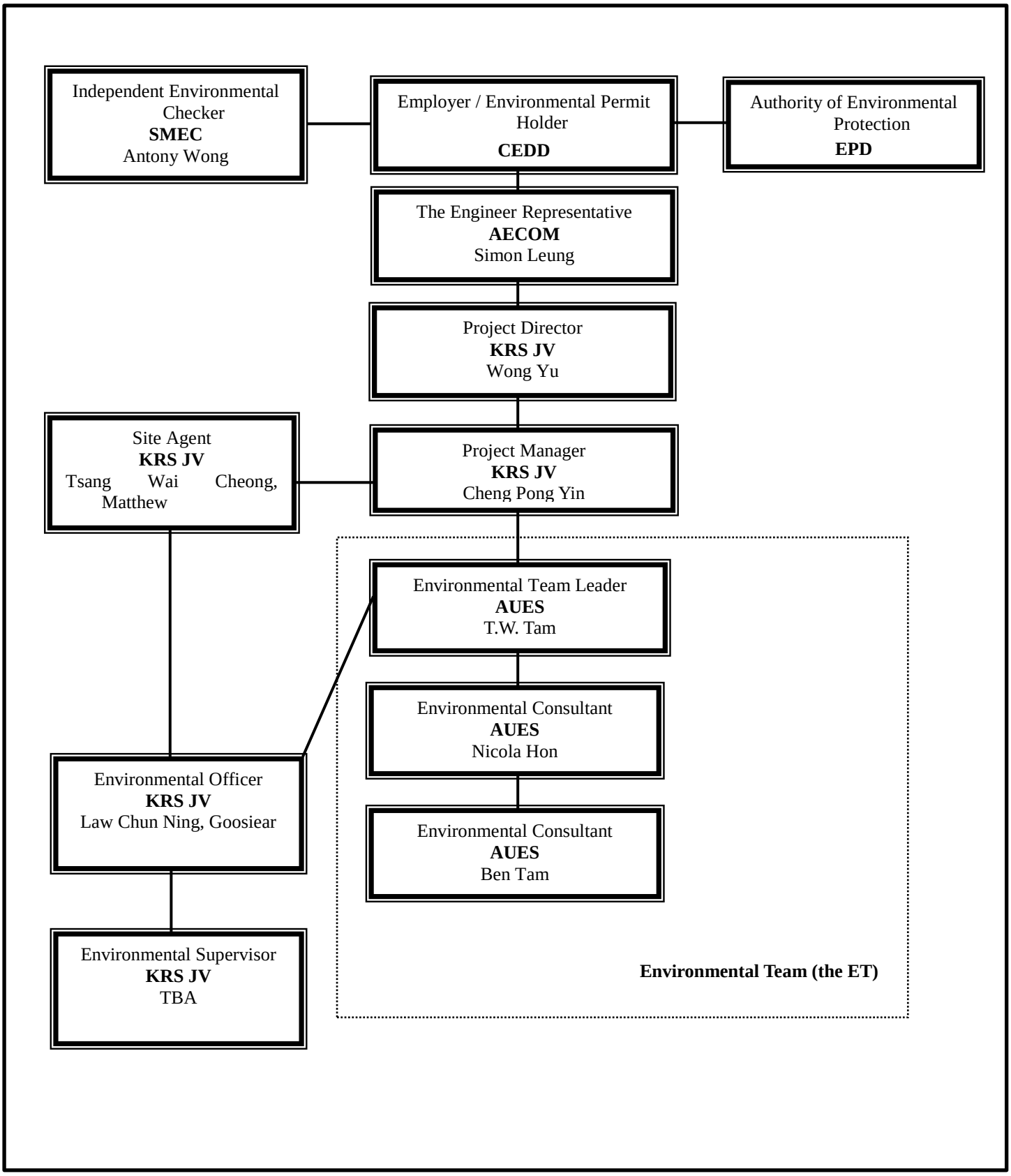
CEDD (Employer) – Civil Engineering and Development Department

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	Kelvin lee	2251 0609	2251 0698
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
KRSJV	Project Director	Wong Yu	2682 6691	2682 2783
KRSJV	Project Manager	Cheng Pong Yin	9023 4821	2682 2783
KRSJV	Site Agent	Tsang Wai Cheong, Matthew	9705 7536	2682 2783
KRSJV	Environmental Officer	Law Chun Ning, Goosiear	9625 2381	2682 2783
KRSJV	Environmental Supervisor	TBA	--	--
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:

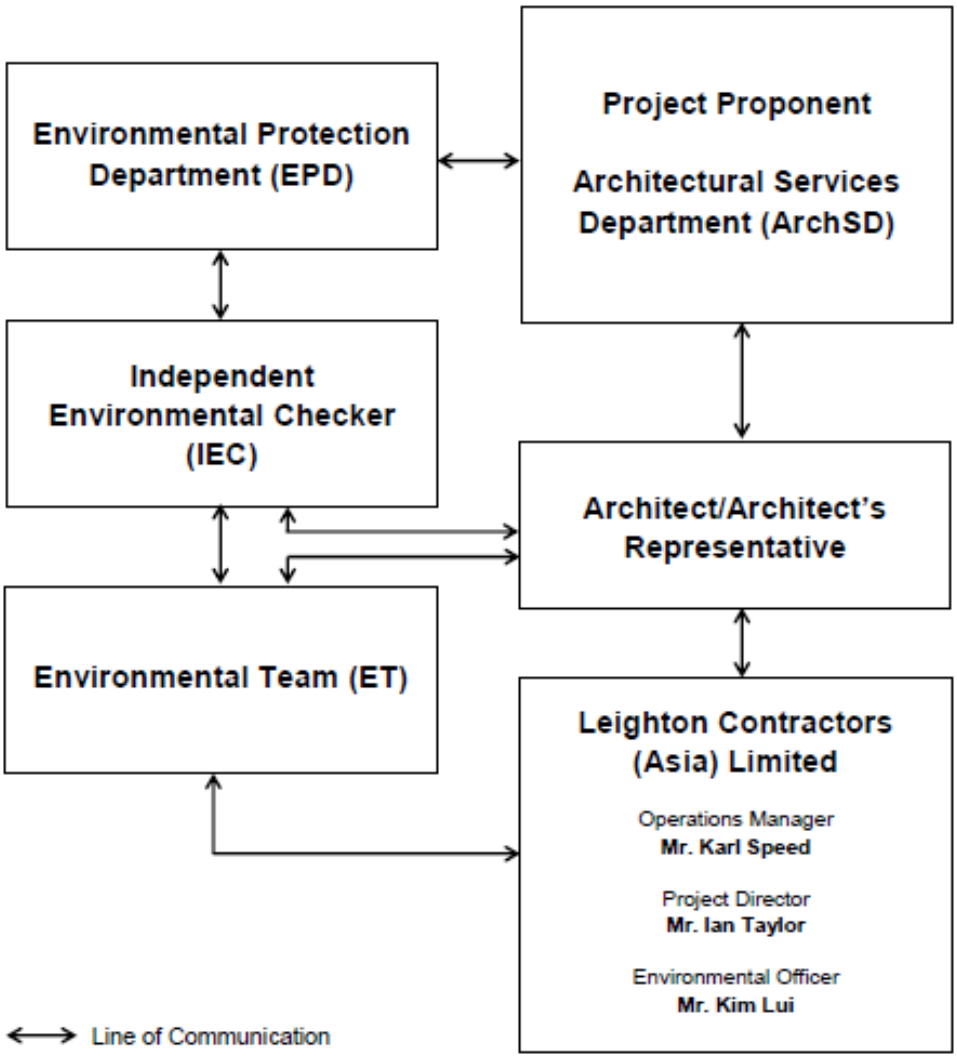
CEDD (Employer) – Civil Engineering and Development Department

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 Cheung	3189 9272	2834 5442
SMEC	Independent Environmental Checker	Mr. Antony Wong	3995 8120	3995 8101
Leighton	Operation Manager	Mr. Antony Zervaas	2823 1433	2529 8784
Leighton	Project Director	Mr. Steven Wong	2858 1519	2858 1899
Leighton	Site Agent	Mr. Ray Ho	2858 1519	2858 1899
Leighton	Environmental Officer	Mr. Legend Lam	3973 1003	-
Leighton	Assistant Environmental Officer	Mr. Alex Liu	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

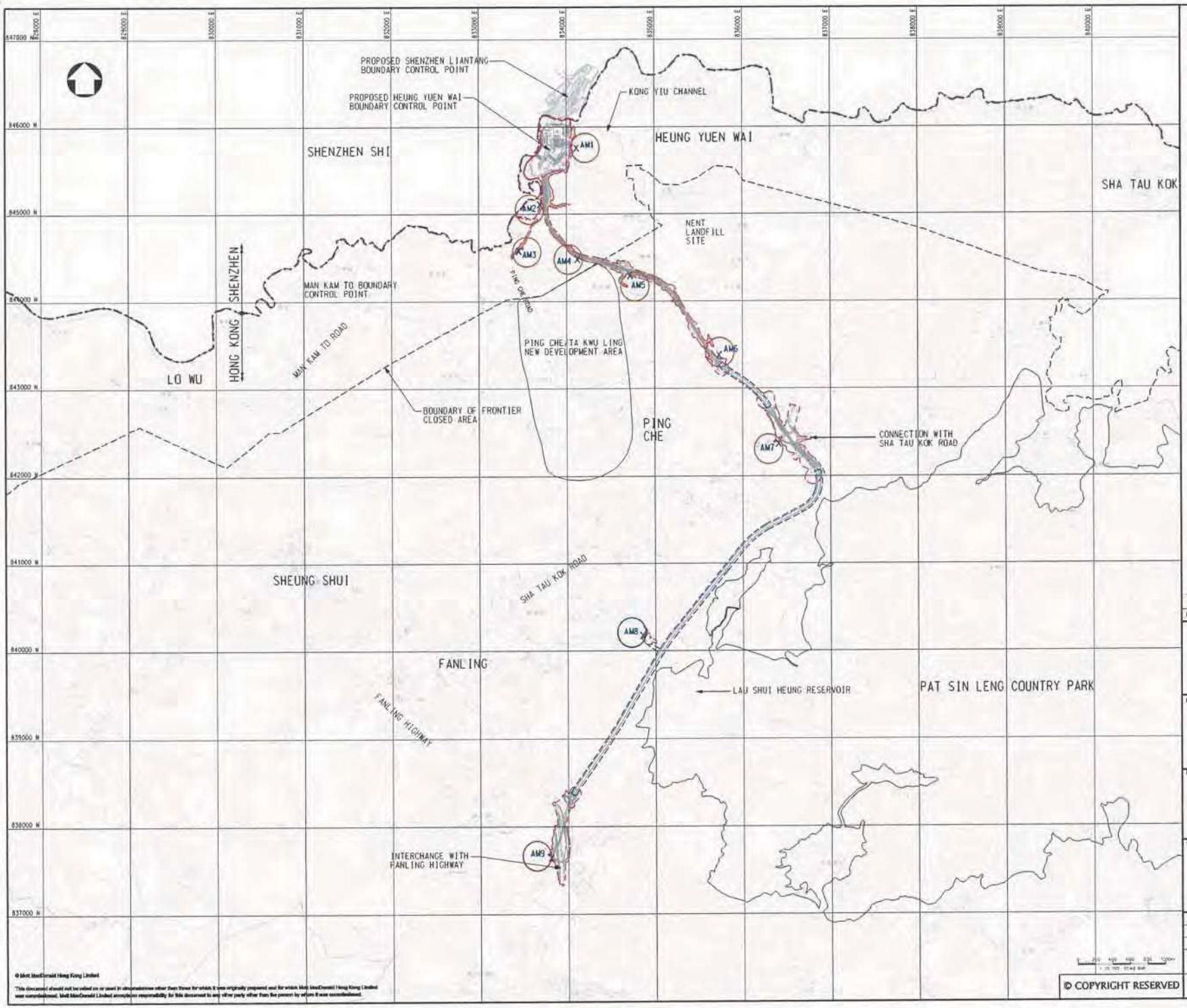
Leighton (Main Contractor) – Leighton Contractors (Asia) Limited

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



Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	AUG 10	MENG	FIRST ISSUE	DC	HT

Mott MacDonald

Client

CEDD

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

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

Title

PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

Designed	DC		Eng.Chk.	EC	
Drawn	MENG		Coordination	EC	
Eng.Chk.	DC		Approved	HT	

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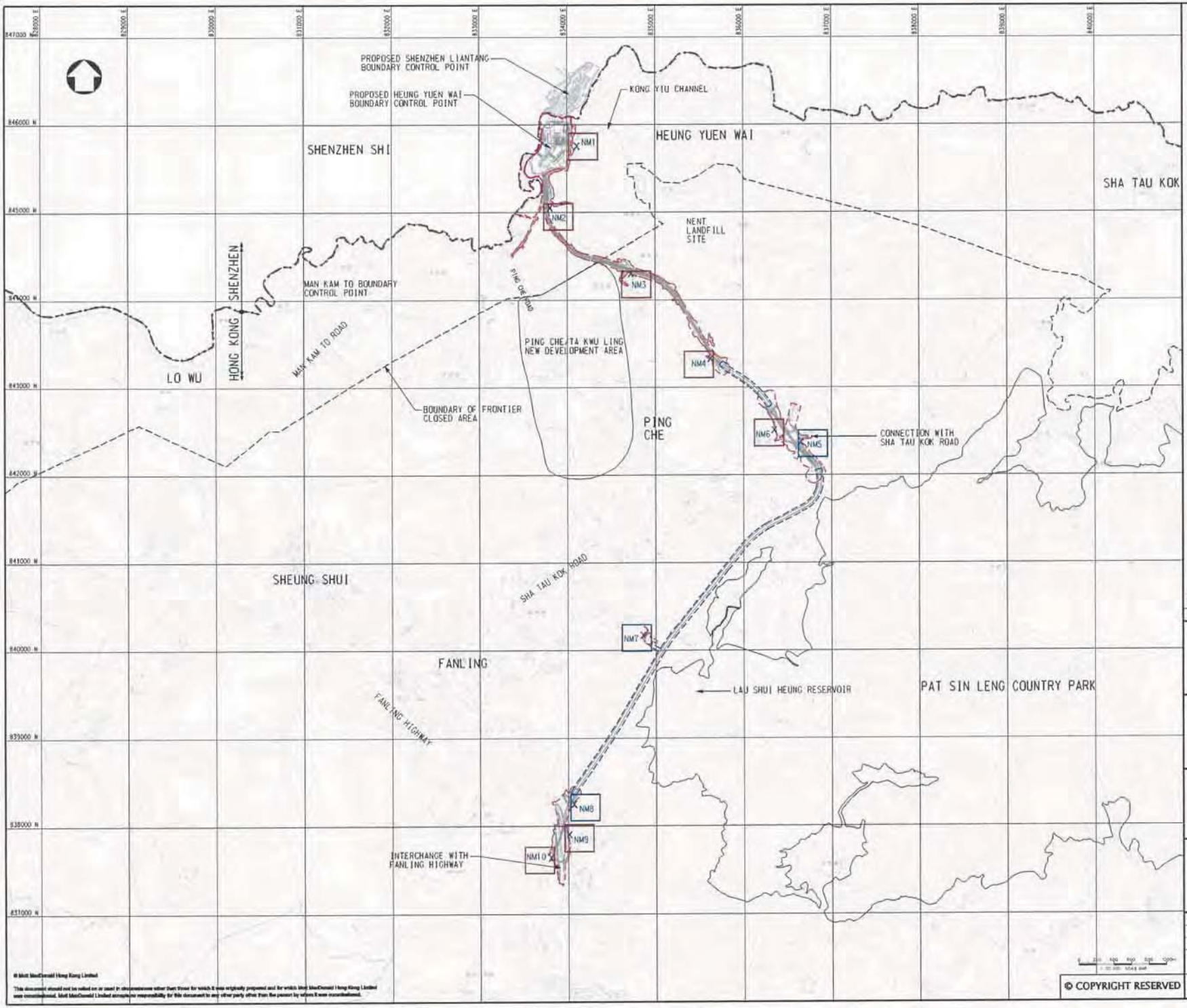
Status: PRE
Drawing No: FIGURE 2.1
Rev: P1



LEGEND:

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

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	AUG 10	WING	FIRST ISSUE	DC	HT

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

Title

PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	DC		Eng.Chk.	EC	
Drawn	WING		Coordination	EC	
Dwg.Chk.	DC		Approved	HT	

Scale at A1: 1:20000
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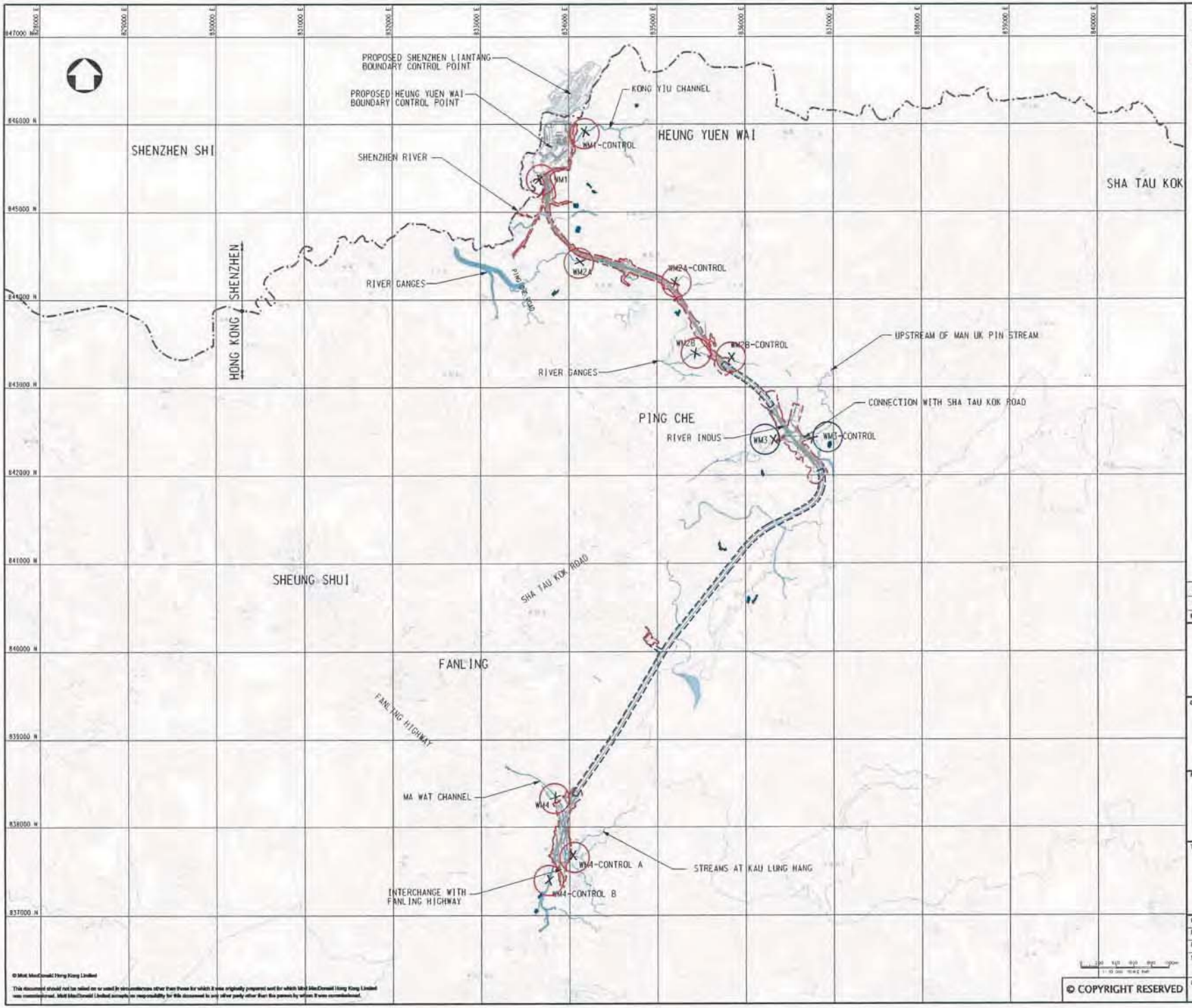
Status: PRE
Drawing No: FIGURE 3.1
Rev: P1



LEGEND:

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

MONITORING STATION	CO-ORDINATES	
	EASTING(m)	NORTHING(m)
WM1	833668.635	845371.097
WM1-CONTROL	834185.480	845916.662
WM2A	834132.193	844432.910
WM2A-CONTROL	835205.329	844200.151
WM2B	835434.744	843394.606
WM2B-CONTROL	835845.878	843343.625
WM3	836323.622	842404.977
WM3-CONTROL	836763.419	842425.507
WM4	833840.783	838344.842
WM4-CONTROL A	834038.937	837688.995
WM4-CONTROL B	833769.123	837406.936

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P2	NOV 10	WING	GENERAL REVISION	HC	HT
P1	OCT 10	WING	FIRST ISSUE	HC	HT

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

Title

LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

Designed	HC		Dwg.Chk.	EC	
Drawn	WING		Coordination	EC	
Dwg.Chk.	HC		Approved	HT	
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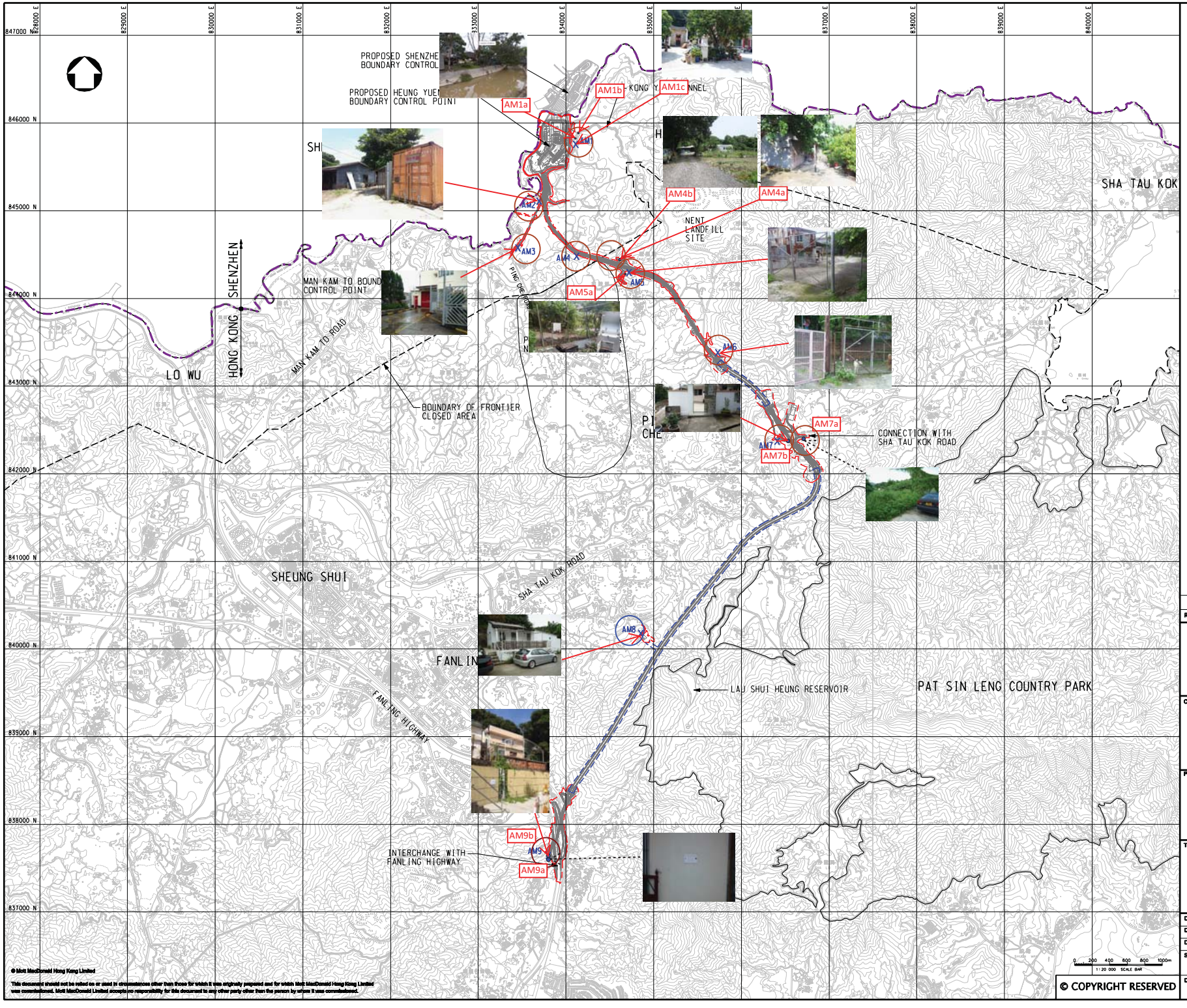
Drawing No	FIGURE 4.1	CAD file			Rev P2

Appendix D

Monitoring Locations for Impact Monitoring



LEGEND:

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

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

Mott MacDonald
20/F Two Landmark East
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T +852 2828 5757
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LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title

PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

Designed	DC		Eng.Chk.	EC	
Drawn	MING		Coordination	EC	
Dwg.Chk.	DC		Approved	HT	
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Drawing No	FIGURE 2.1			Rev	P1

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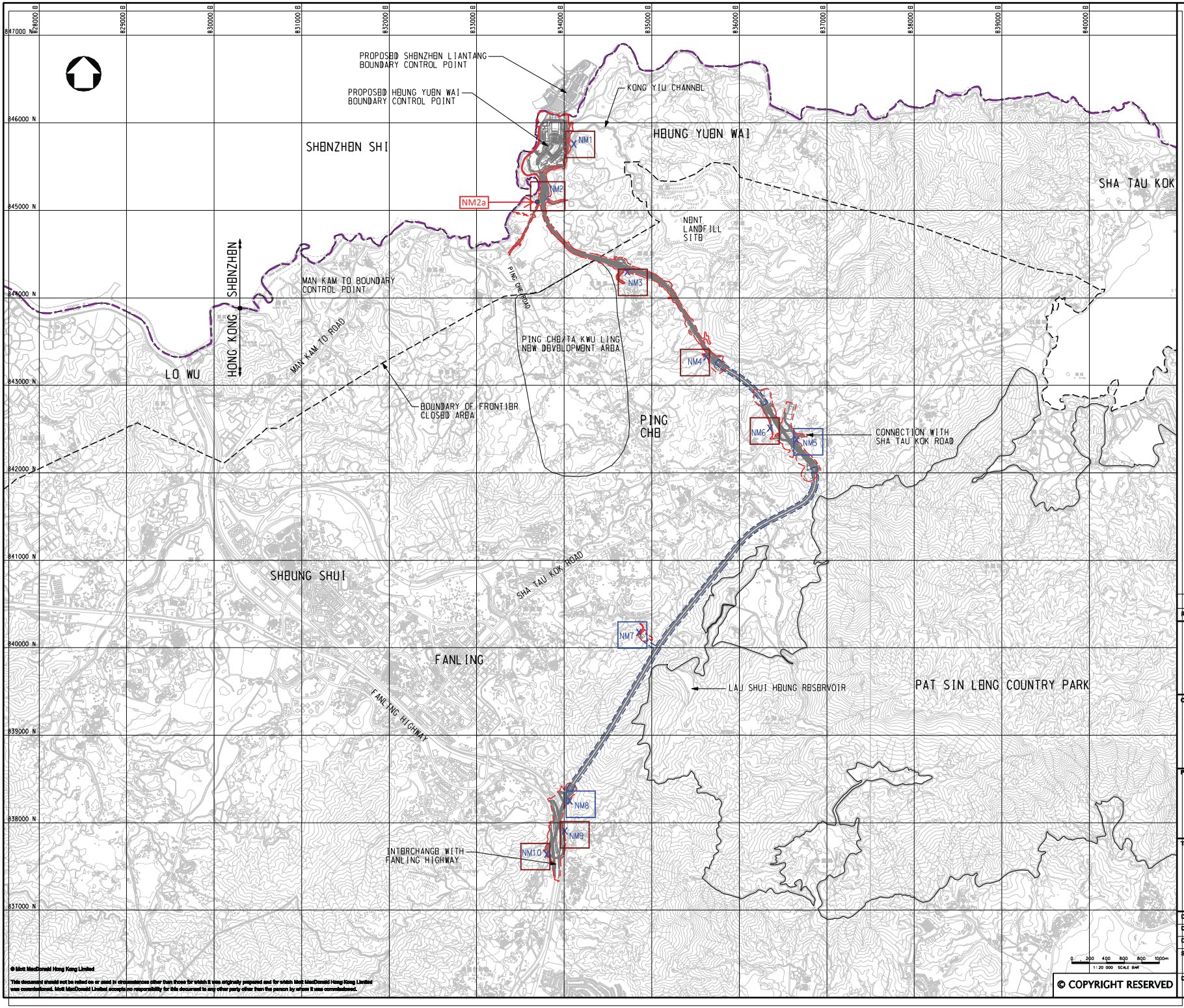

LEGEND:

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

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

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Project

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LIANTANG/HUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title

PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	DC		Eng.Chk.	BC	
Drawn	MING		Coordination	BC	
Dwg.Chk.	DC		Approved	HT	
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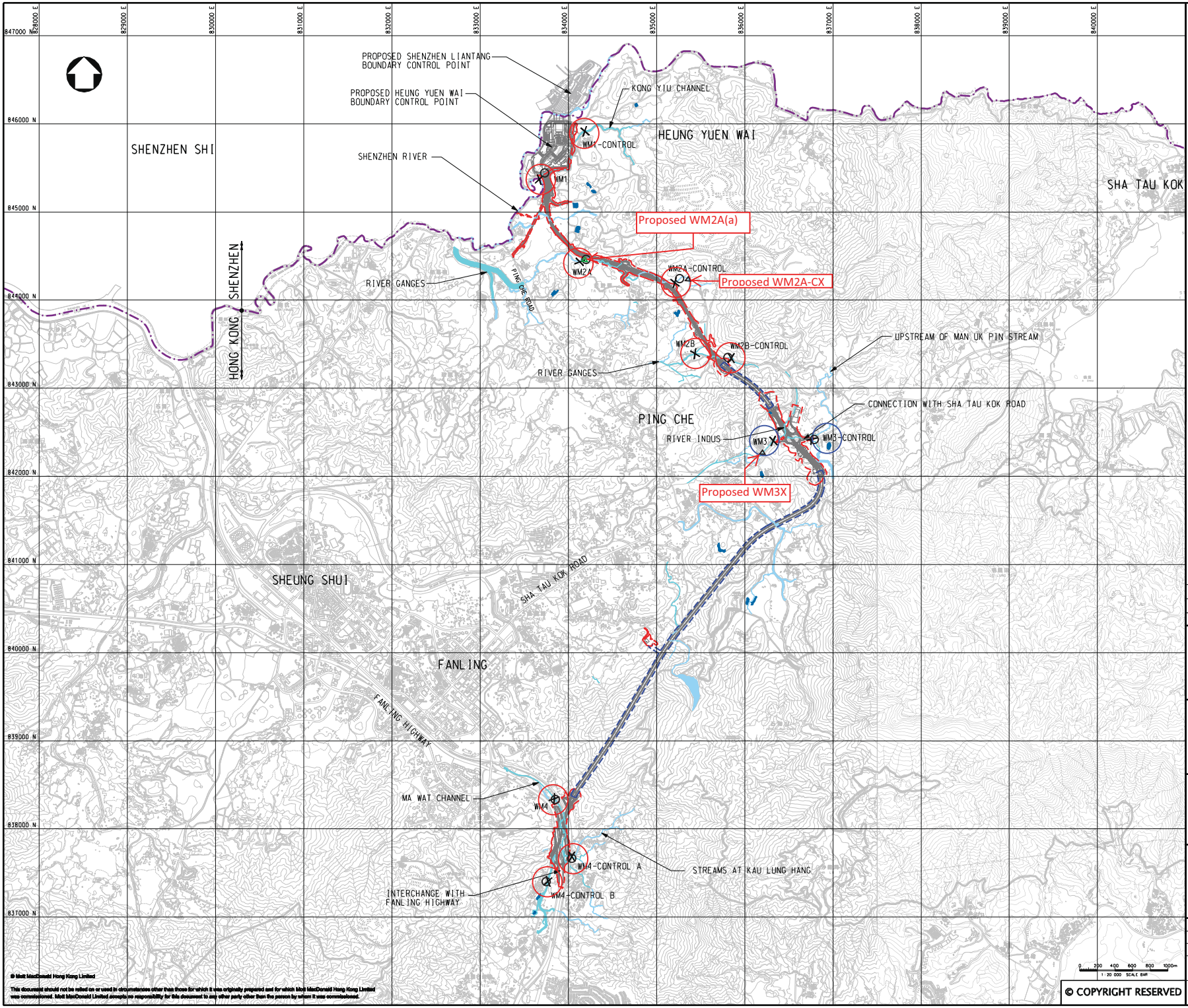
Drawing No	FIGURE 3.1			Rev	P1



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 Coordinates		Location found during site visit Coordinates	
	Easting	Northing	Easting	Northing
WM1	833668.655	845371.897	833679	845421
WM1 Control	834187.480	845916.662	834185	845917
WM2A	834132.193	844432.910	834204	844471
WM2A-Control	835205.329	844200.151	835270	844243
WM2B	835414.744	843304.606	835435	843397
WM2B-Control	835845.878	843343.625	835835	843351
WM3	836323.622	842404.377	836324	842407
WM3-Control	836763.419	842425.507	836763	842400
WM4	833840.784	838344.842	833850	838338
WM4-Control A	834038.937	837668.985	834028	837695
WM4-Control B	833769.123	837406.936	833760	837395

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 Wate Quality Monitoring Location in May 2016		
Location ID	Easting	Northing
WM2A (Original)	834204	844471
WM2A(a) (Proposed	834191	844474

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P1	OCT 10	MING	FIRST ISSUE	HC	HT

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CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

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

Title

LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

Designed	HC		Eng.Chk.	EC	
Drawn	MING		Coordination	EC	
Dwg.Chk.	HC		Approved	HT	
Scale at A1	1:20000	Project	255228		Status PRE
		CAD file	u:\255228\REPORT\ENV\EM&A\DWS\FIG 4-1.dgn		
Drawing No	Appendix C				Rev P2

Appendix E

Event and Action Plan

Event and Action Plan for Air Quality

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

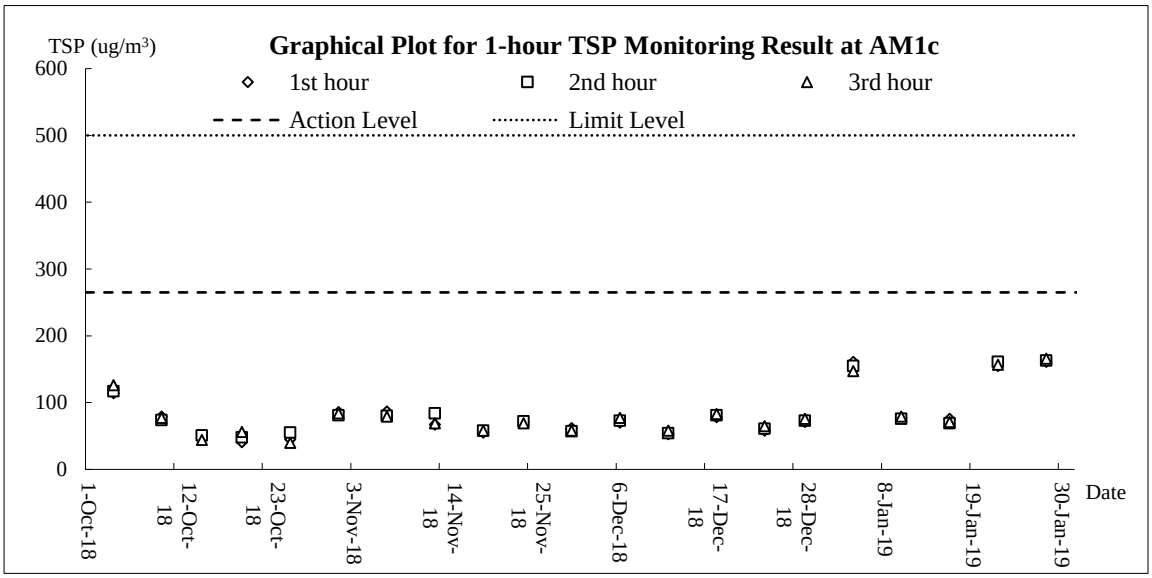
Event and Action Plan for Water Quality

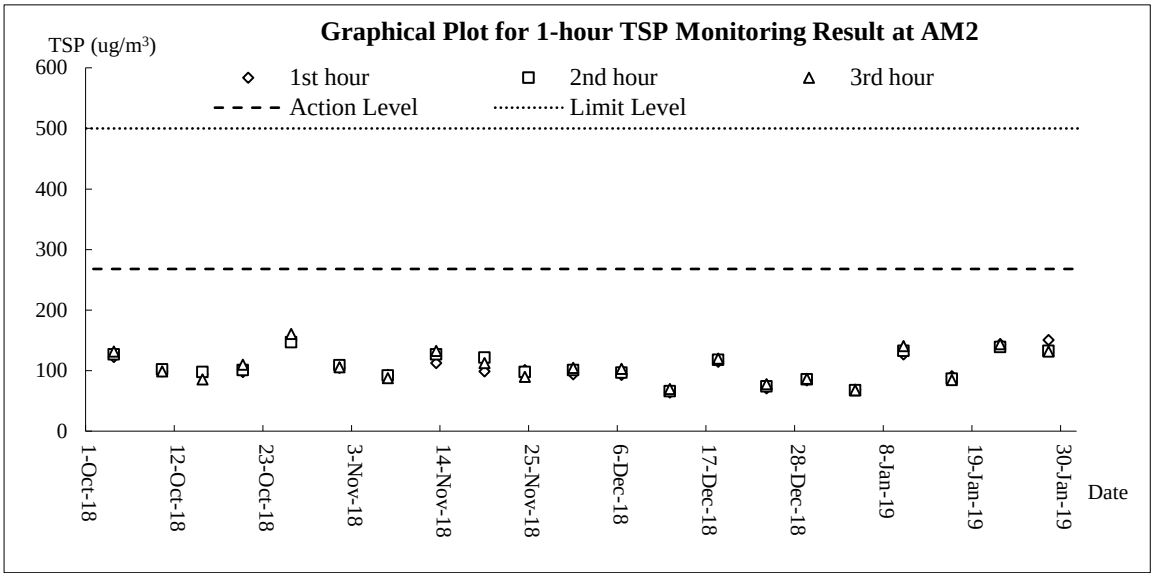
EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER; 6. Implement the agreed mitigation measures.
Action Level being exceeded by more than two consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; 8. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit Level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit level being exceeded by more than one consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit Level.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures; 7. As directed by the ER, to slow down or to stop all or part of the construction activities.

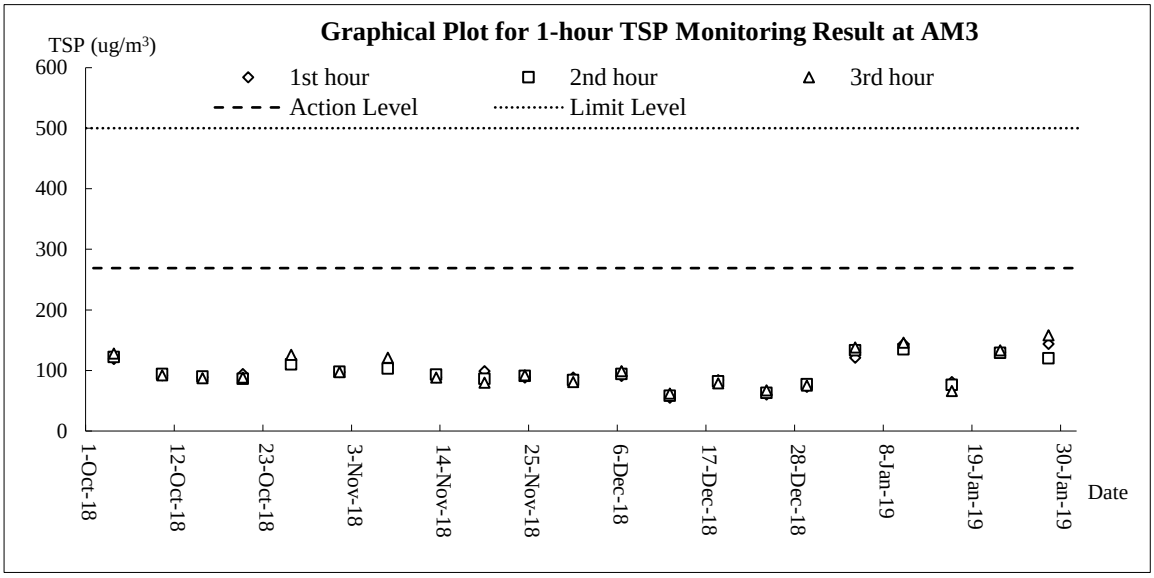
Appendix F

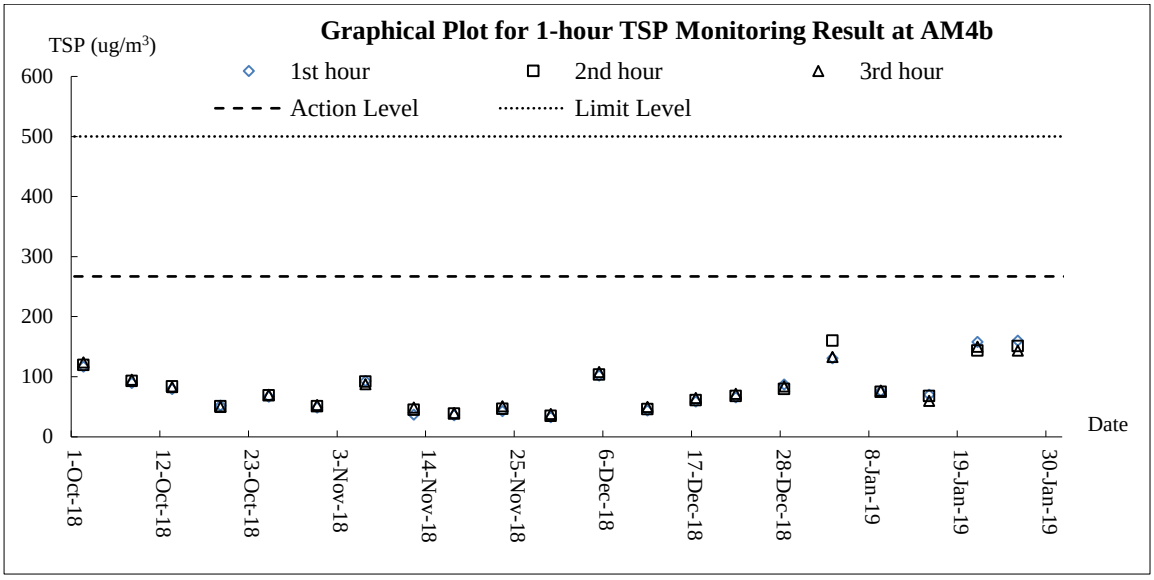
Graphical Plots for Monitoring Result

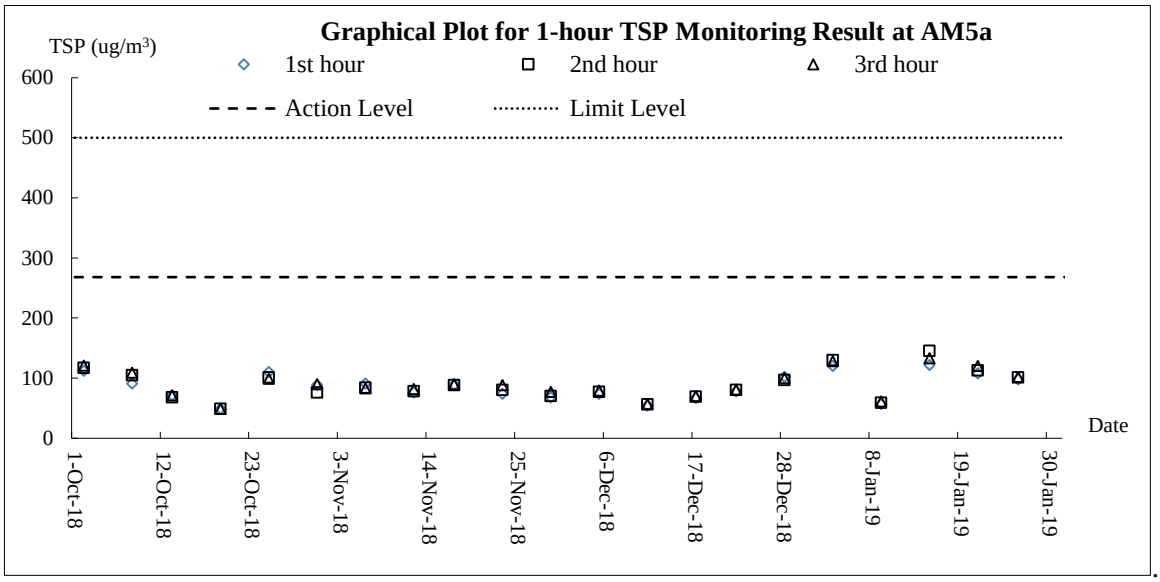
Air Quality – 1-hour TSP

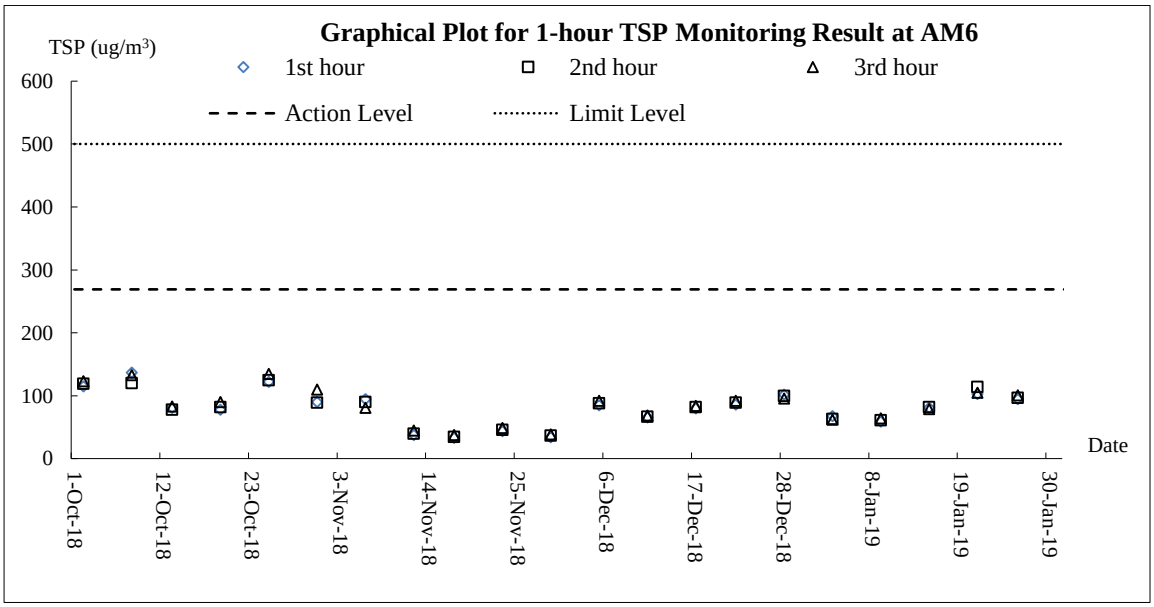







Graphical Plot for 1-hour TSP Monitoring Result at AM4b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19


Graphical Plot for 1-hour TSP Monitoring Result at AM5a
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19


Graphical Plot for 1-hour TSP Monitoring Result at AM6
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
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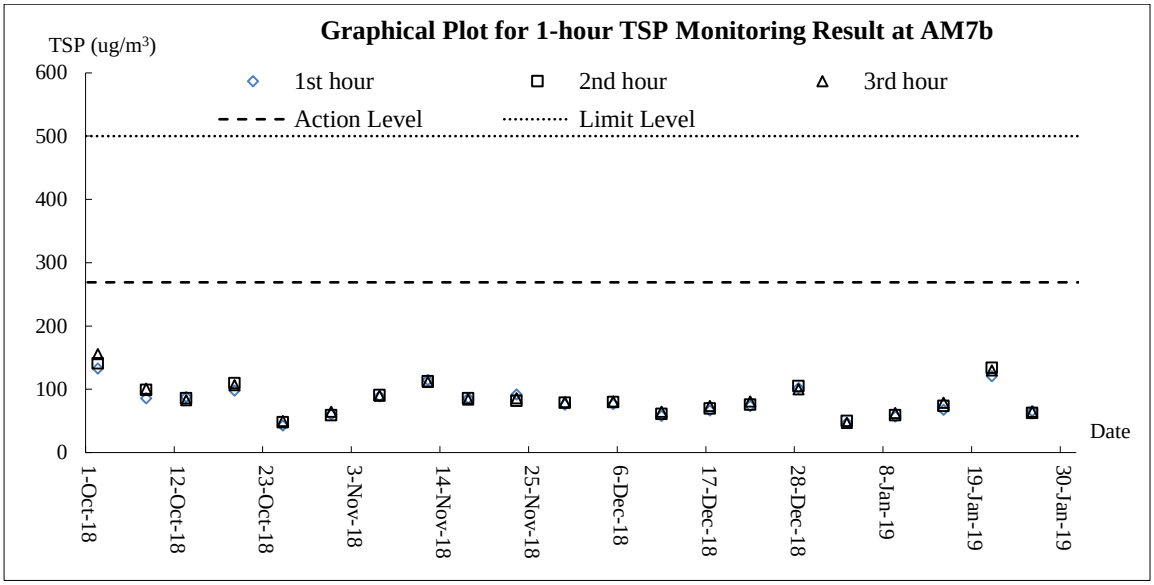
30-Jan-19


Graphical Plot for 1-hour TSP Monitoring Result at AM7b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
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300
200
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Date
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
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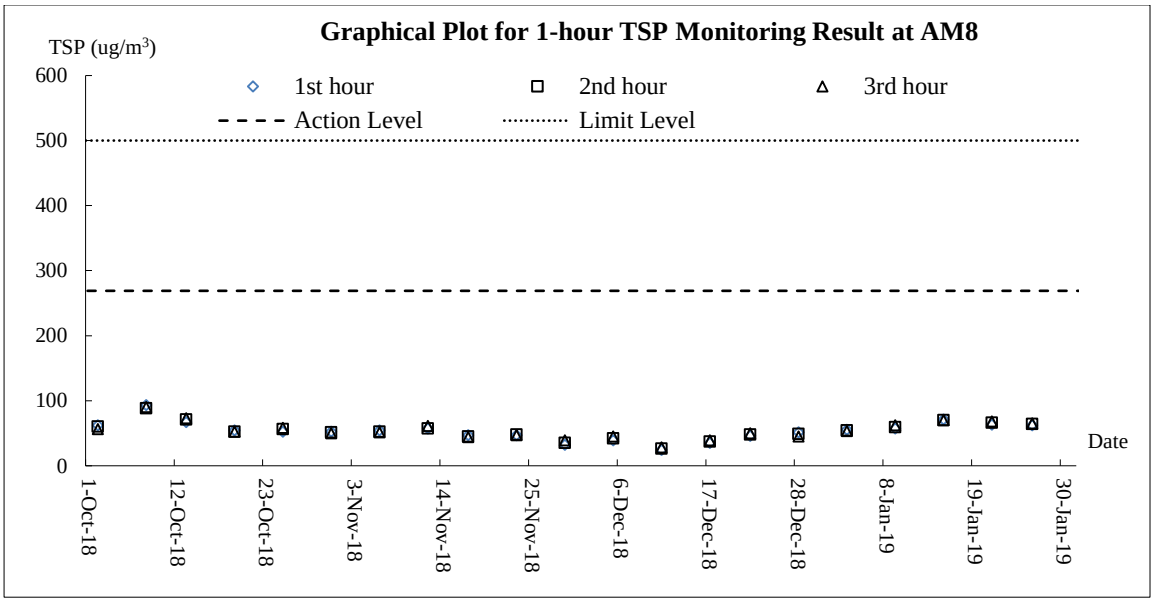
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19


Graphical Plot for 1-hour TSP Monitoring Result at AM8
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
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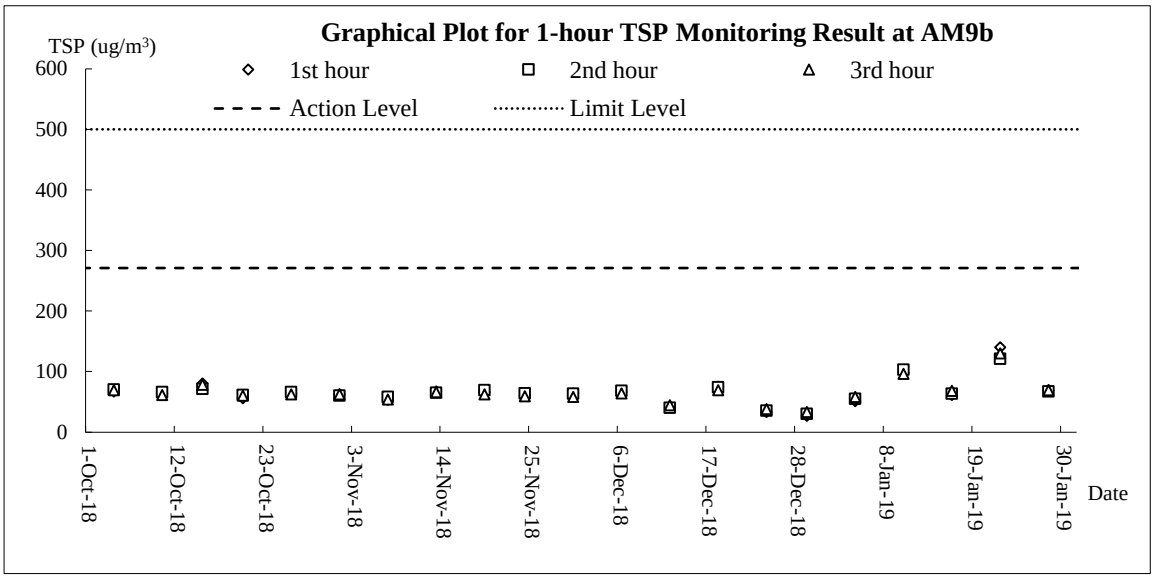
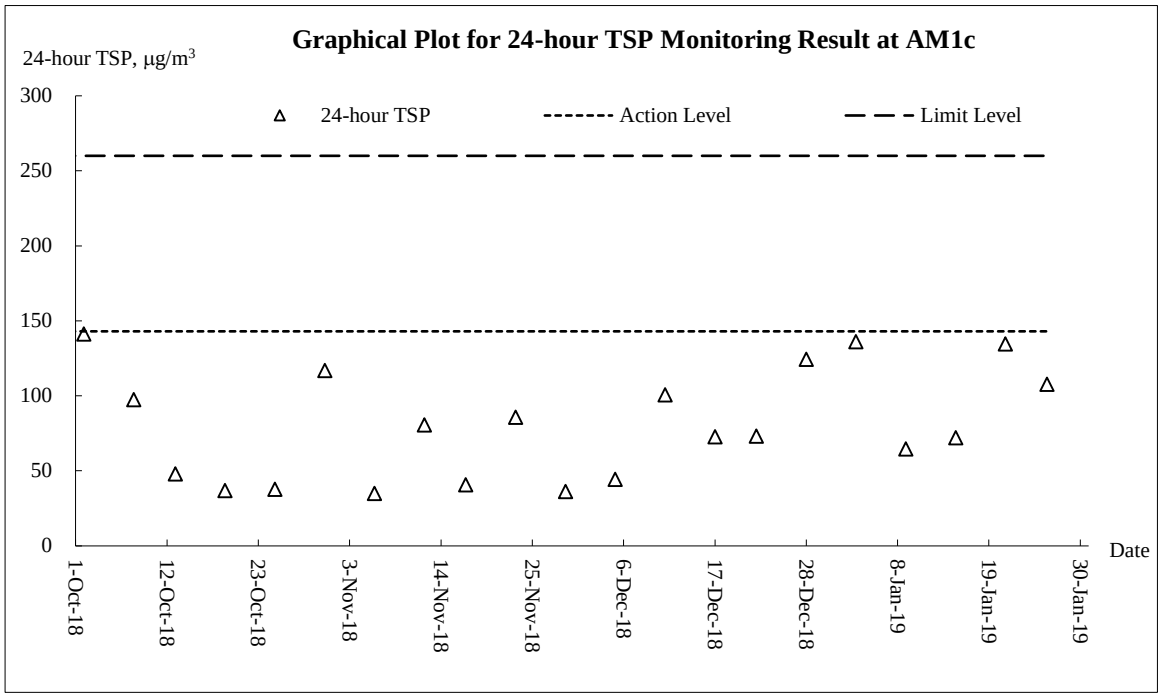
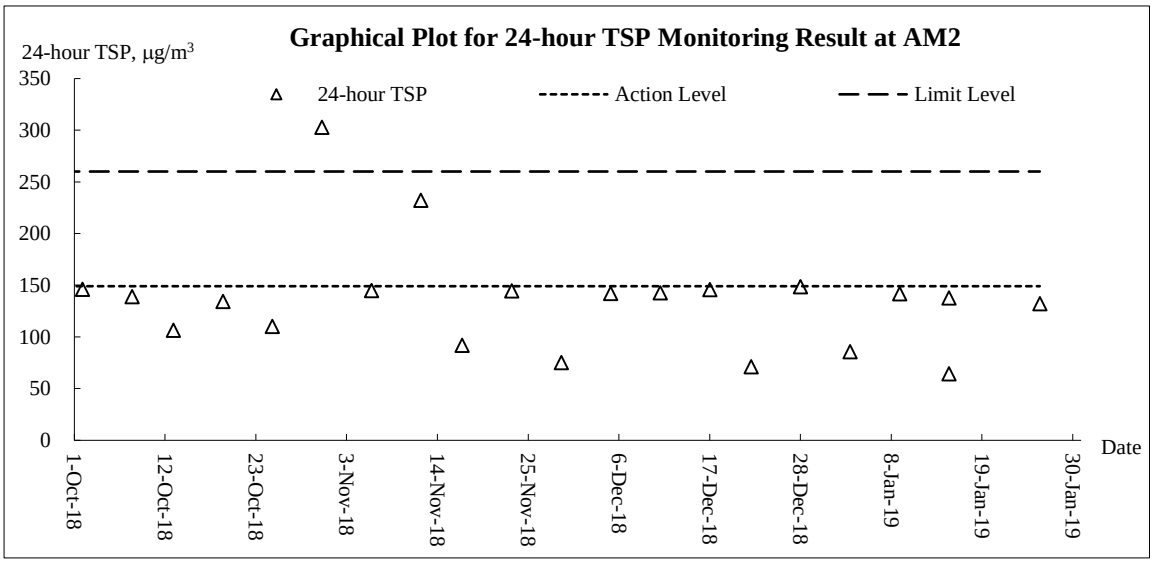
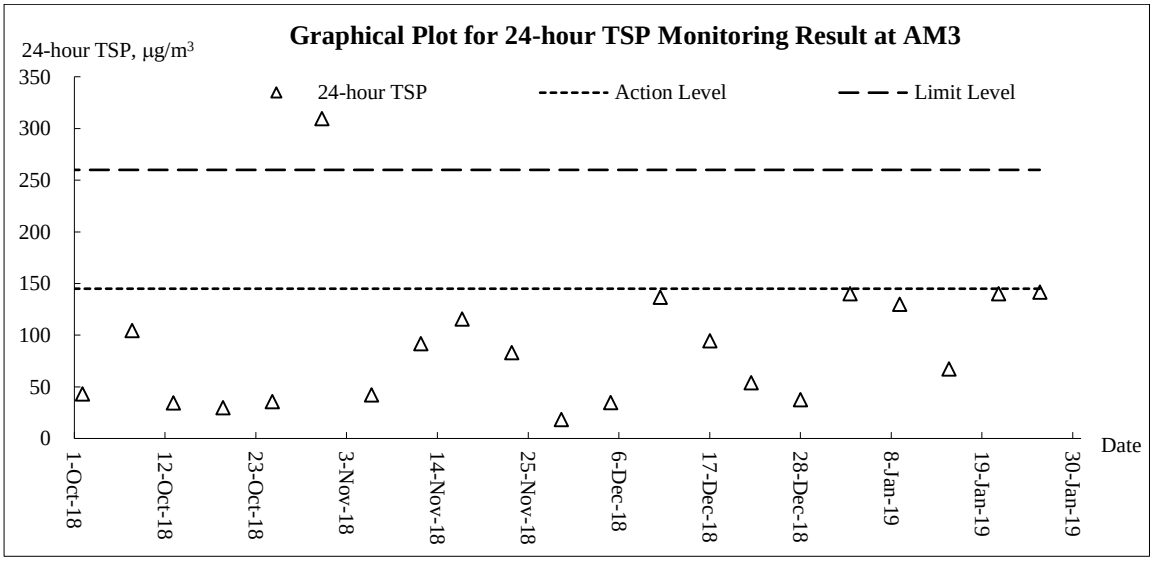
30-Jan-19

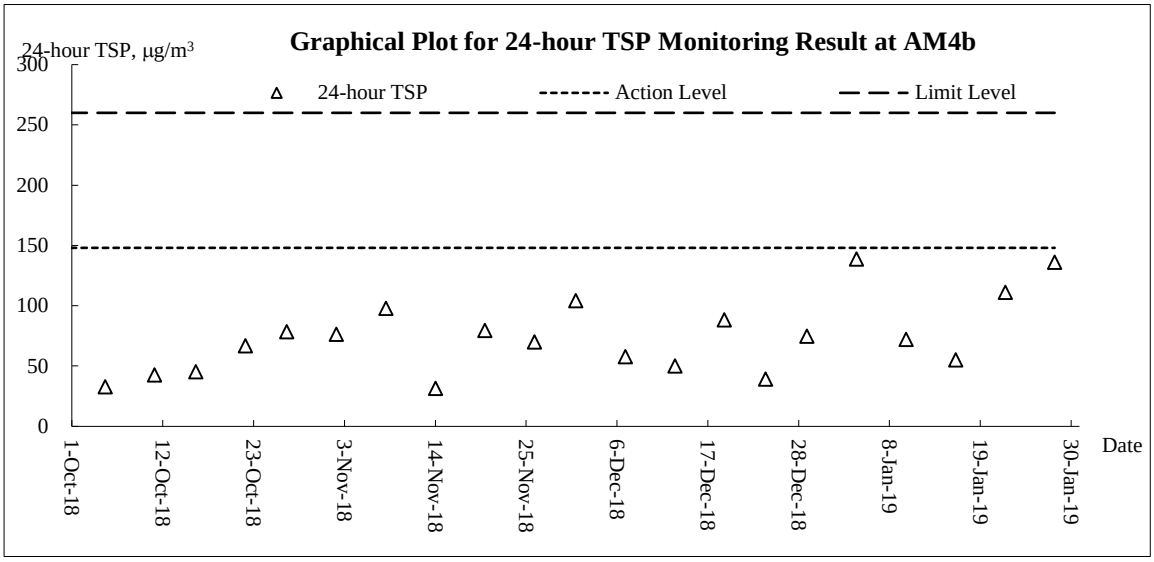

Graphical Plot for 1-hour TSP Monitoring Result at AM9b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19

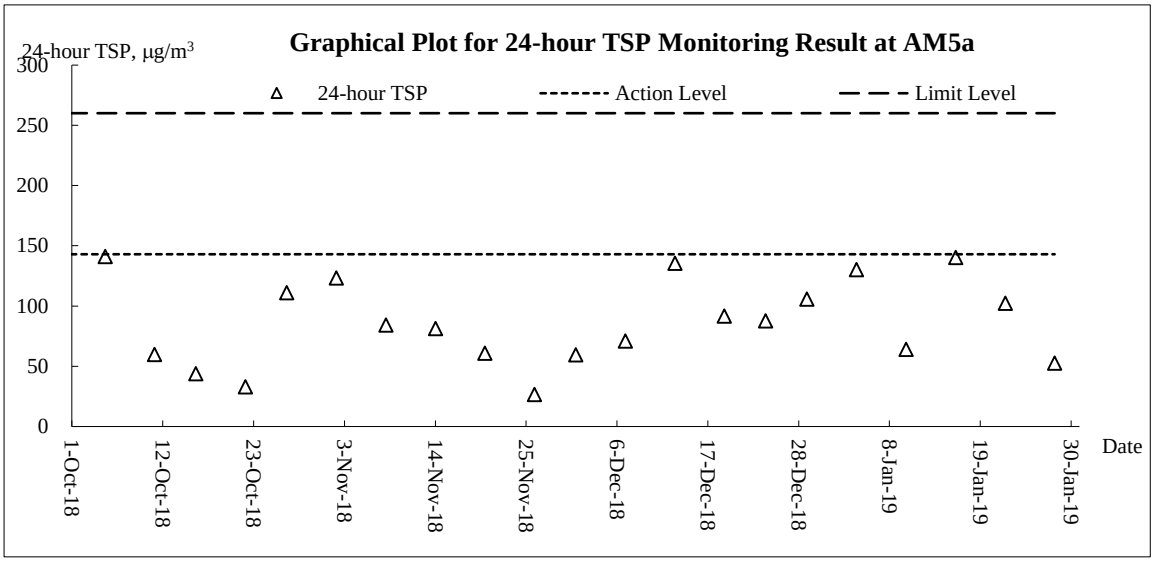
Air Quality – 24-hour TSP

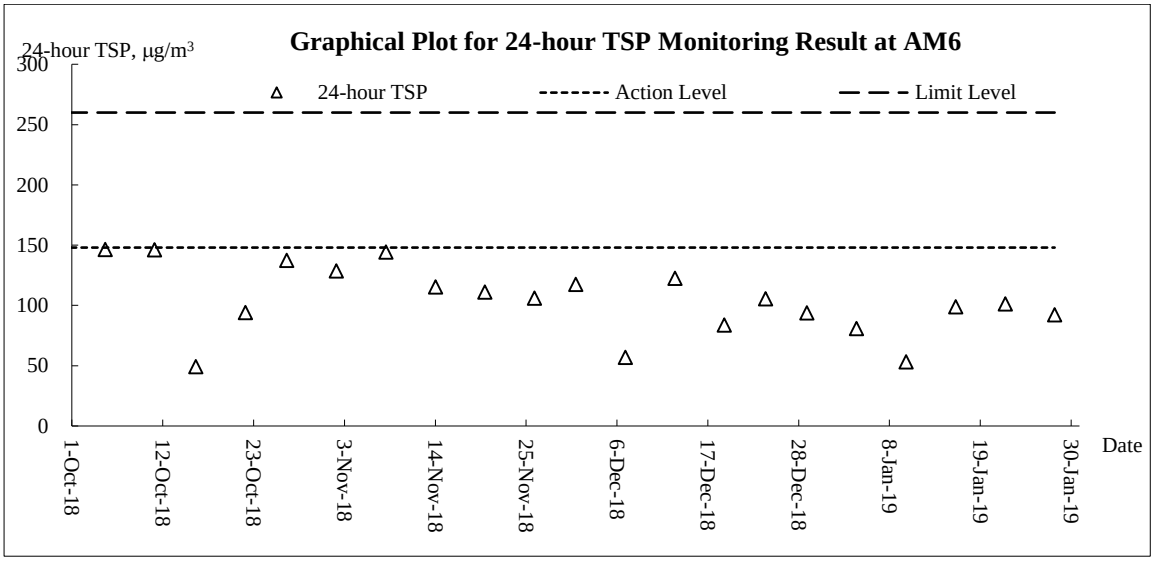


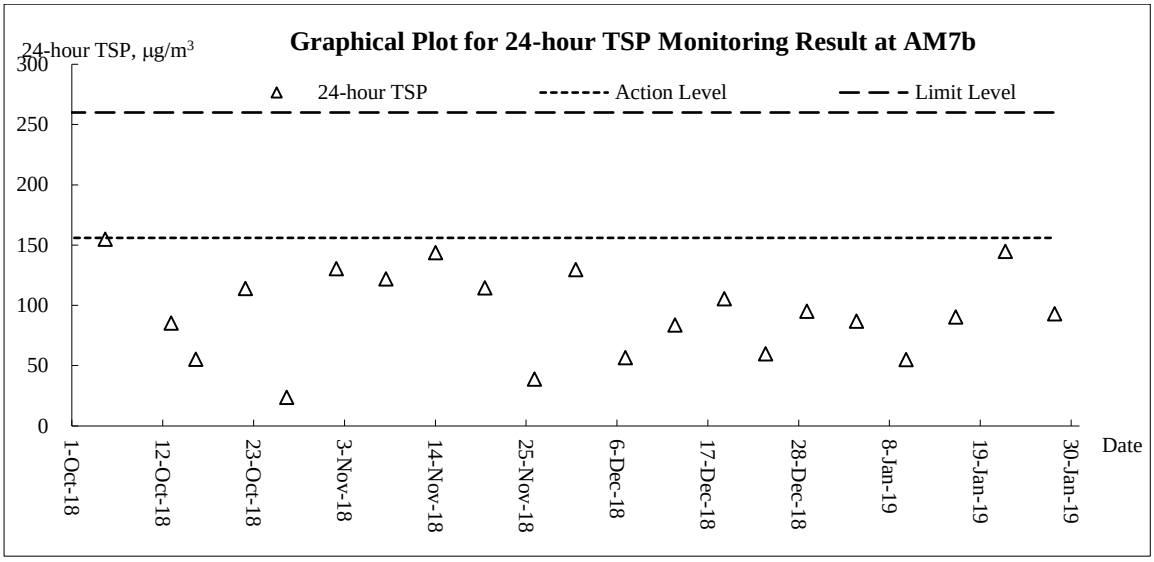


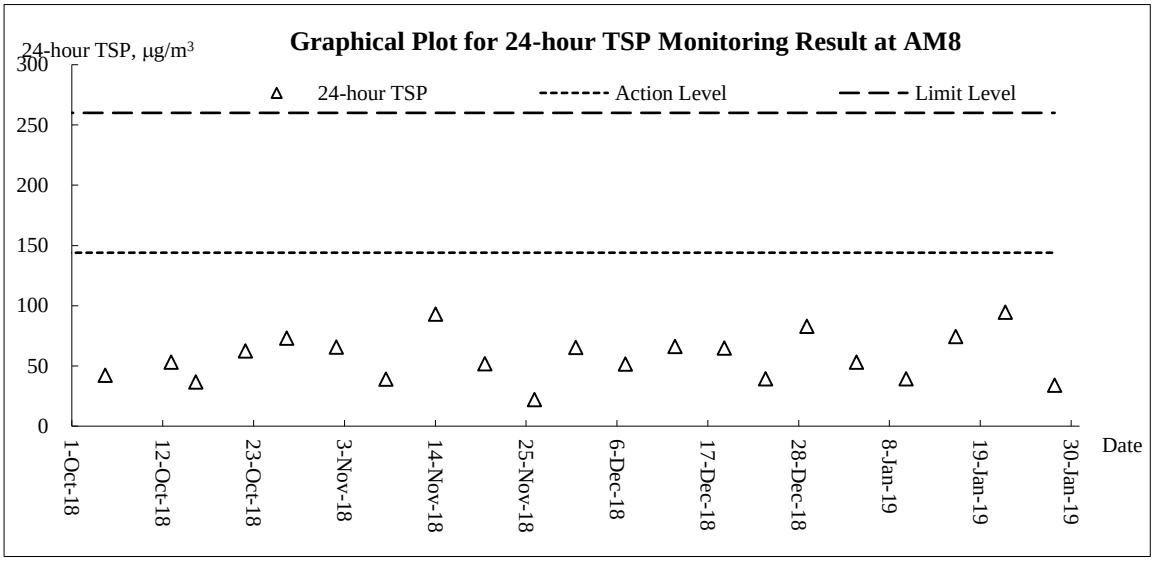


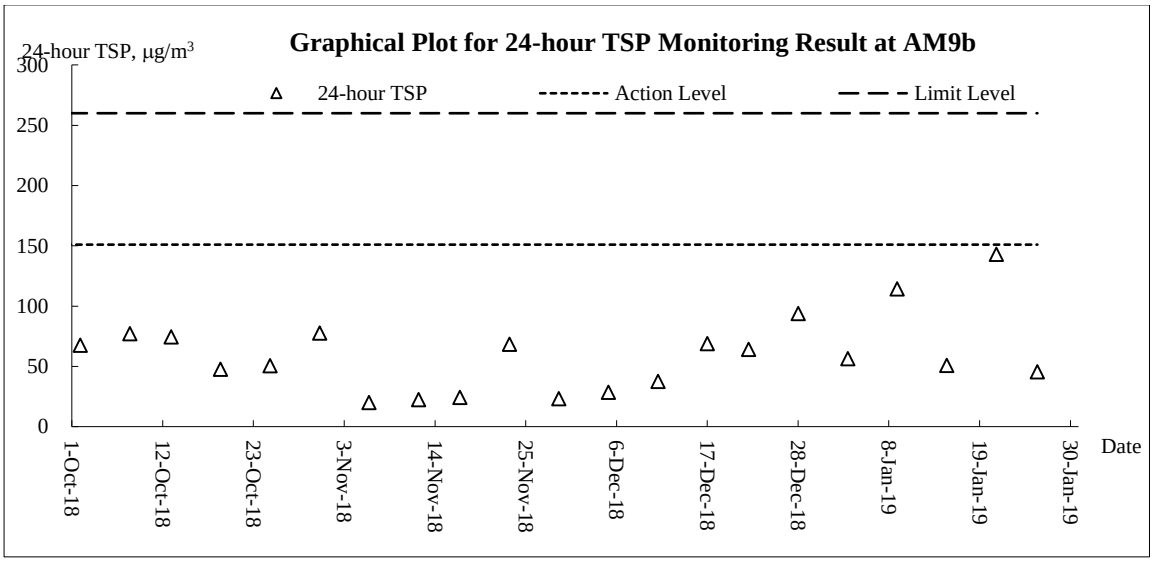

Graphical Plot for 24-hour TSP Monitoring Result at AM4b
24-hour TSP, µg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19
Date


Graphical Plot for 24-hour TSP Monitoring Result at AM5a
24-hour TSP, µg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19
Date

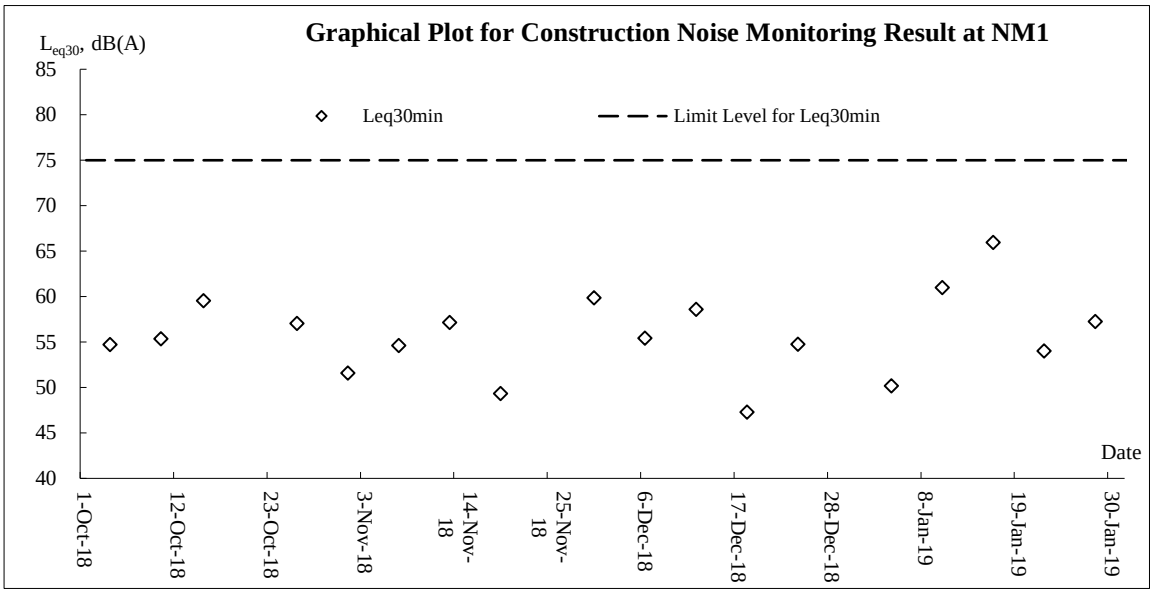

Graphical Plot for 24-hour TSP Monitoring Result at AM6
24-hour TSP, µg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19
Date

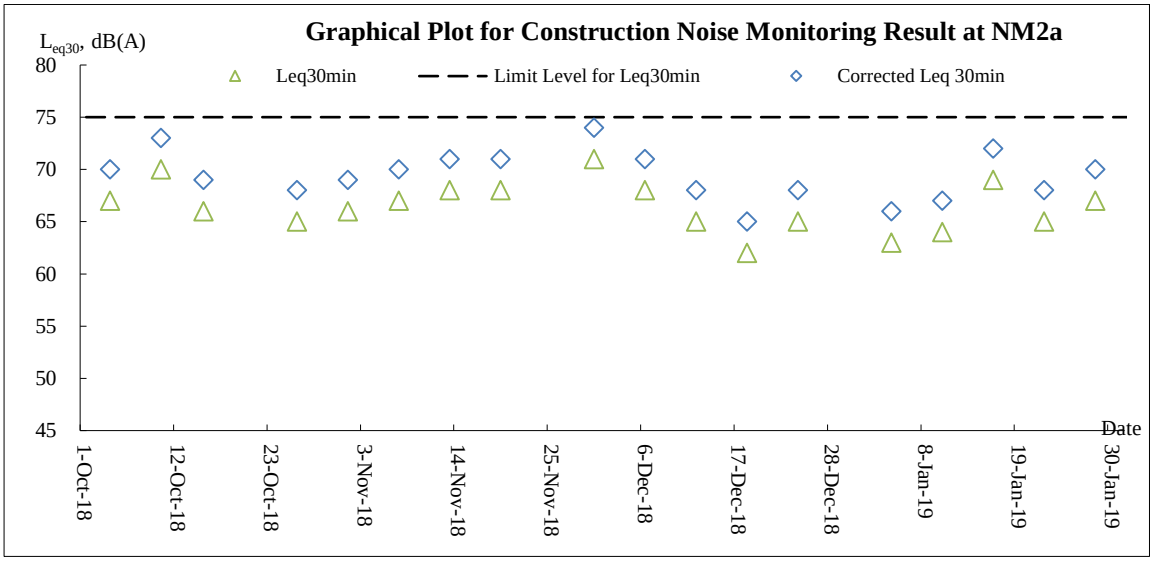

Graphical Plot for 24-hour TSP Monitoring Result at AM7b
24-hour TSP, µg/m3
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19
Date

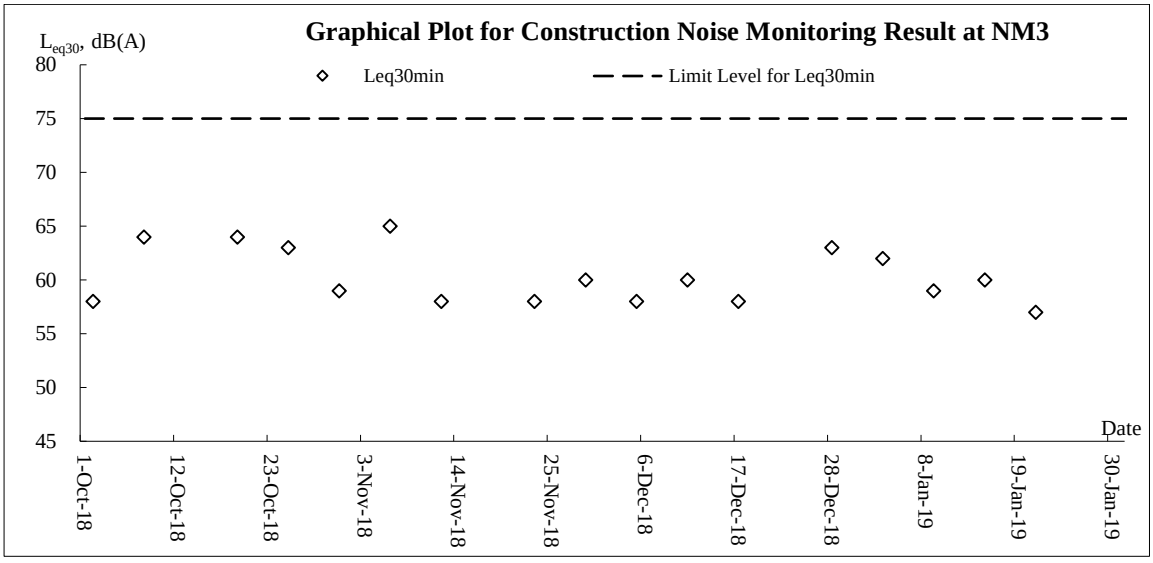

Graphical Plot for 24-hour TSP Monitoring Result at AM8
24-hour TSP, µg/m3
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19
Date


Graphical Plot for 24-hour TSP Monitoring Result at AM9b
24-hour TSP, µg/m3
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19
Date

Noise


Graphical Plot for Construction Noise Monitoring Result at NM1
Leq30, dB(A)
Leq30min
Limit Level for Leq30min
Date
85
80
75
70
65
60
55
50
45
40
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19


Graphical Plot for Construction Noise Monitoring Result at NM2a
Leq30, dB(A)
Leq30min
Limit Level for Leq30min
Corrected Leq 30min
Date
80
75
70
65
60
55
50
45
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19


Graphical Plot for Construction Noise Monitoring Result at NM3
Leq30, dB(A)
Leq30min
Limit Level for Leq30min
Date
80
75
70
65
60
55
50
45
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
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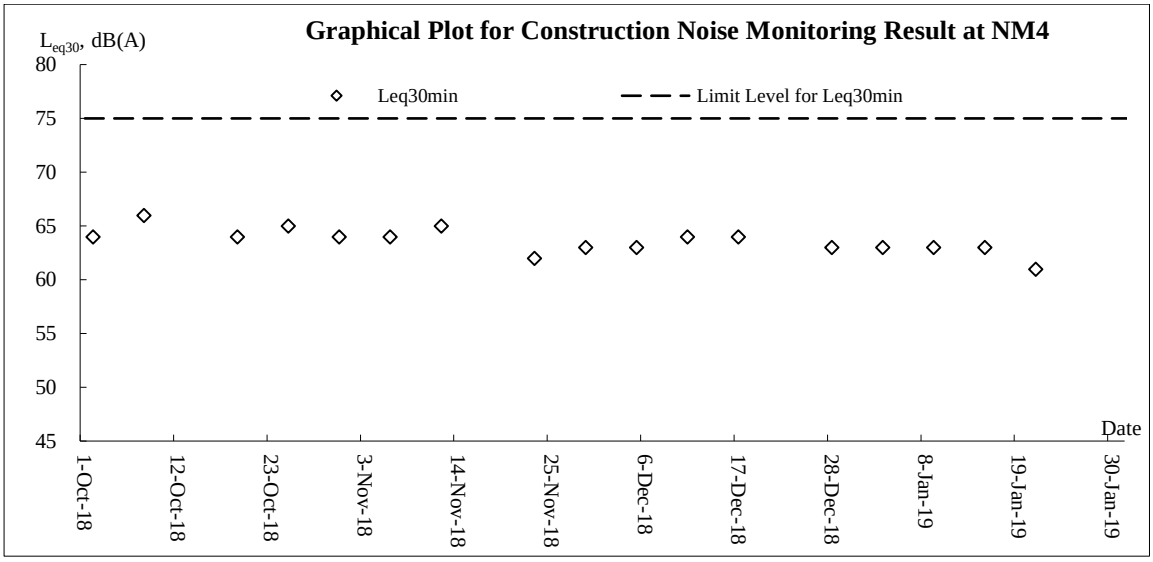
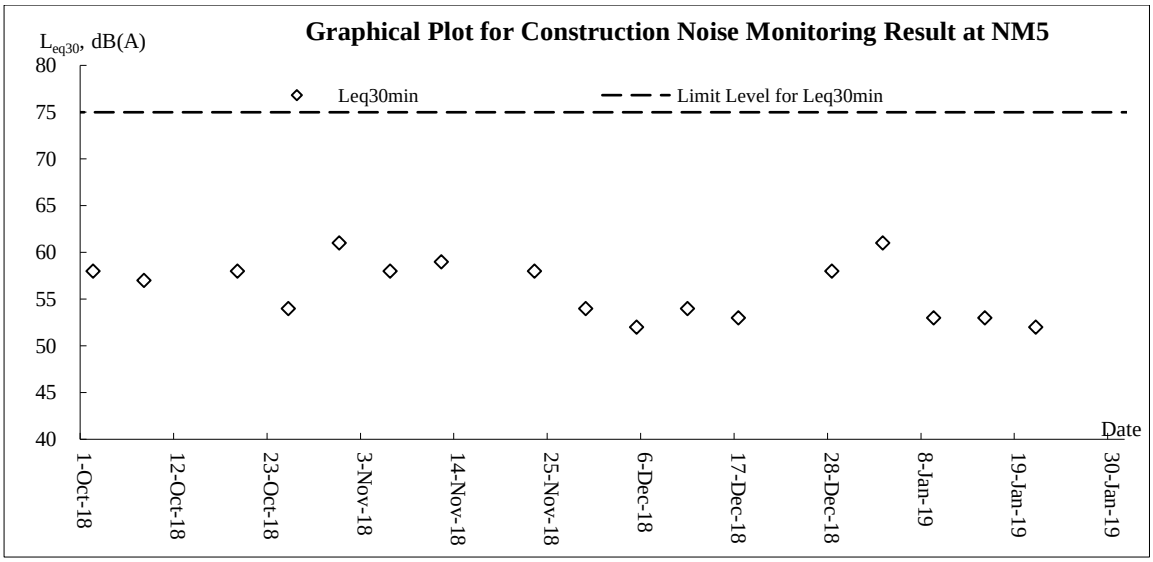
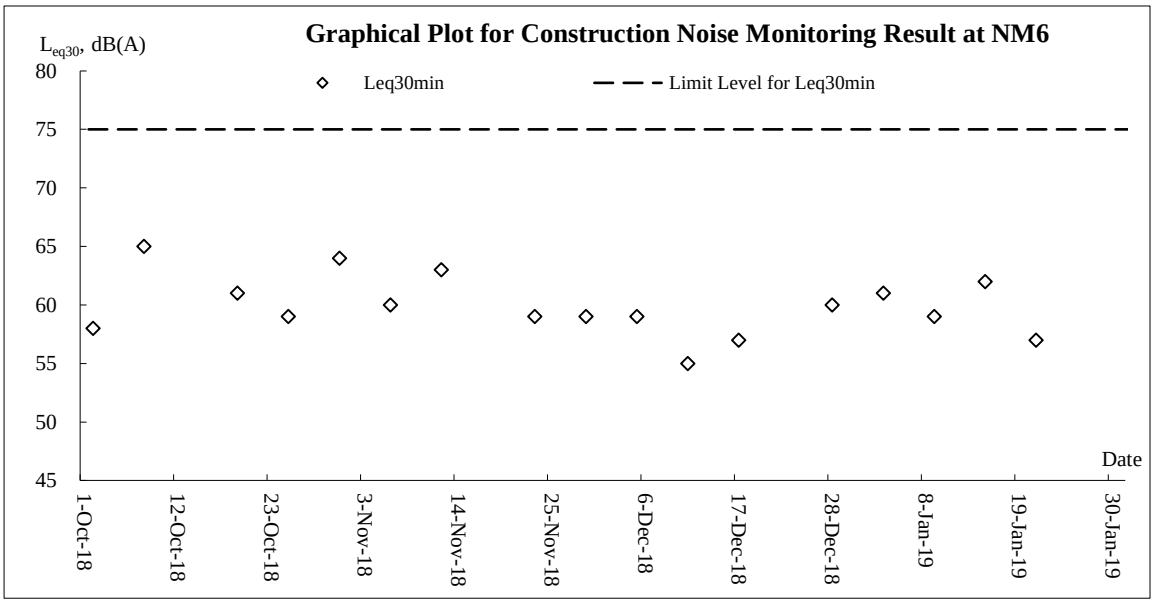
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19


Graphical Plot for Construction Noise Monitoring Result at NM4
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
Date
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19


Graphical Plot for Construction Noise Monitoring Result at NM5
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
40
Date
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19


Graphical Plot for Construction Noise Monitoring Result at NM6
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
Date
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
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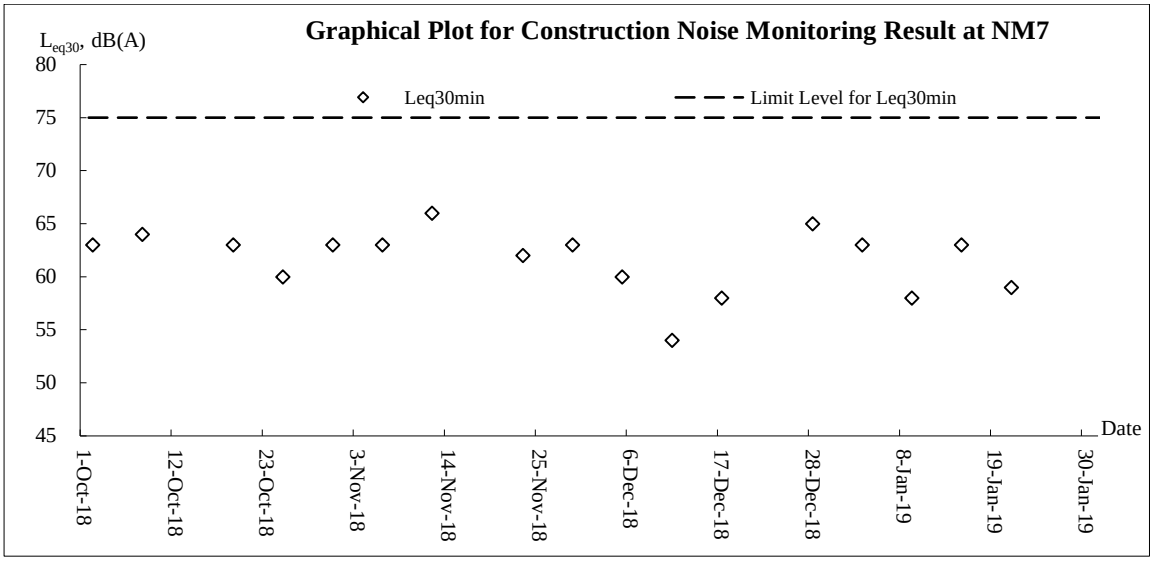
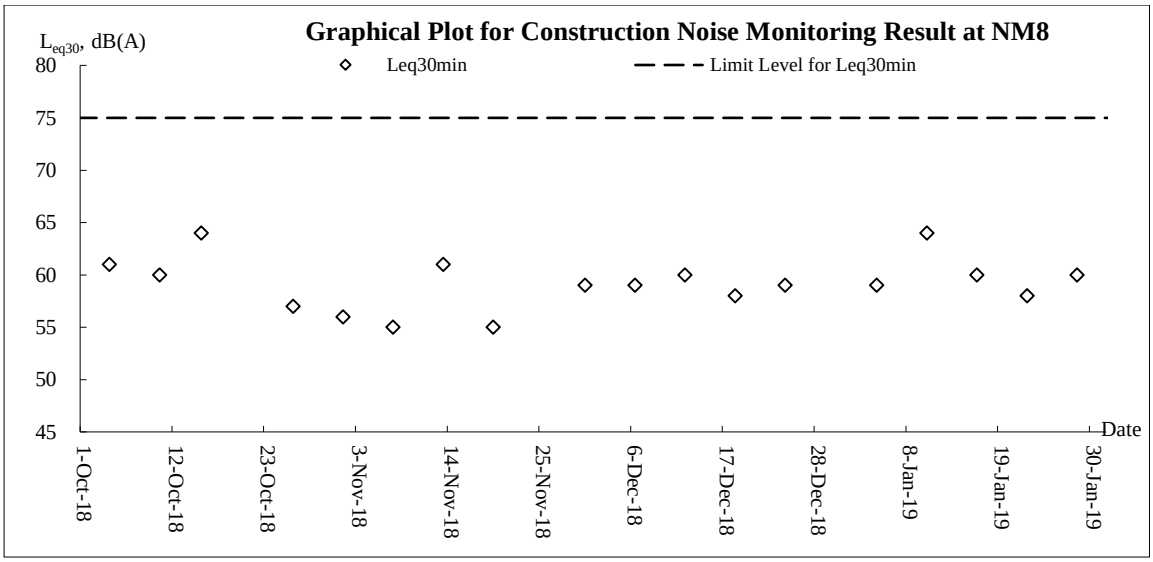
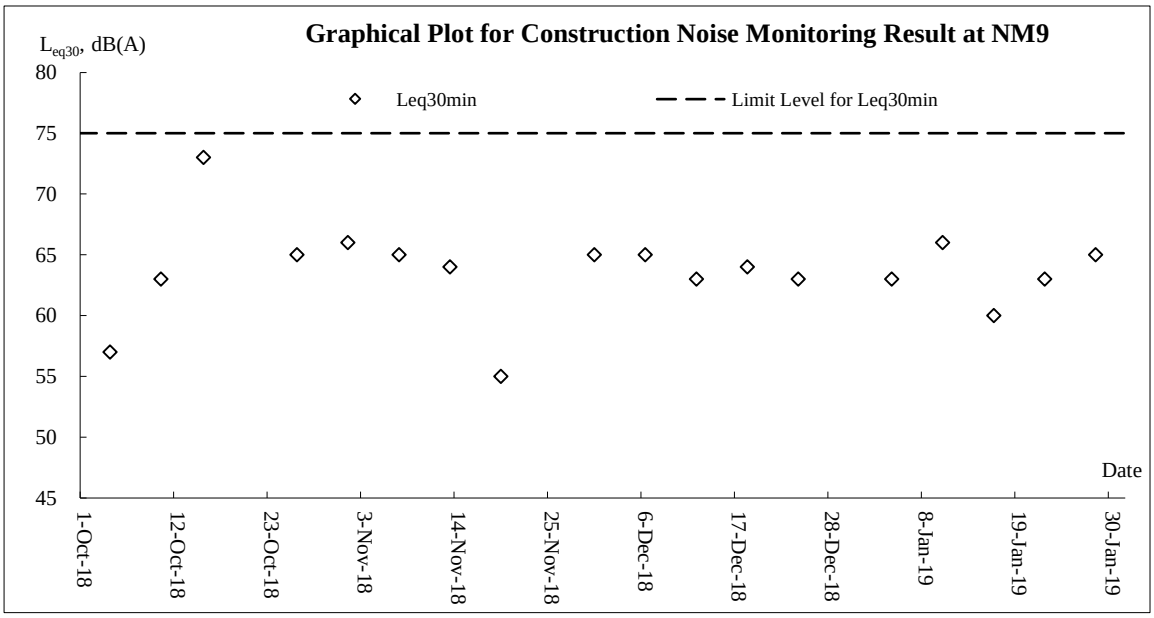
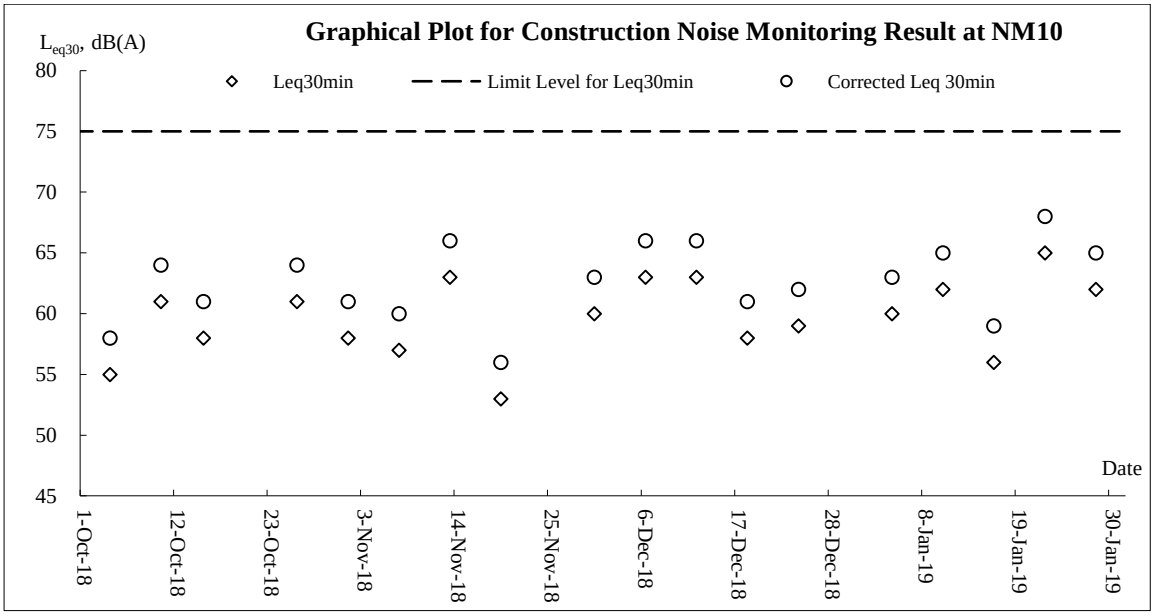
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19

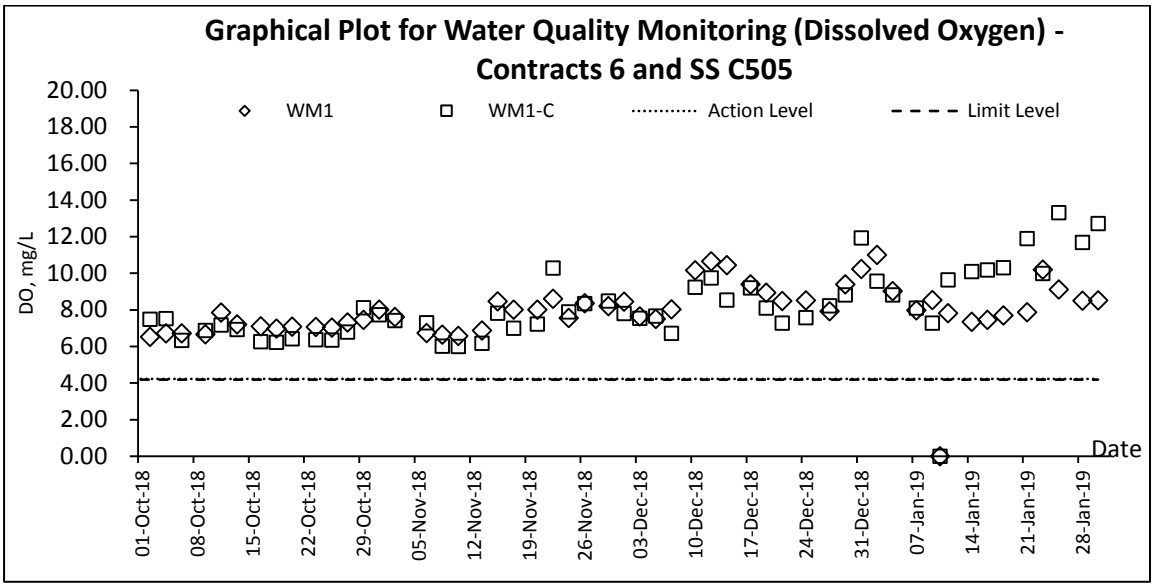

Graphical Plot for Construction Noise Monitoring Result at NM7
Leq30, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
Date
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19

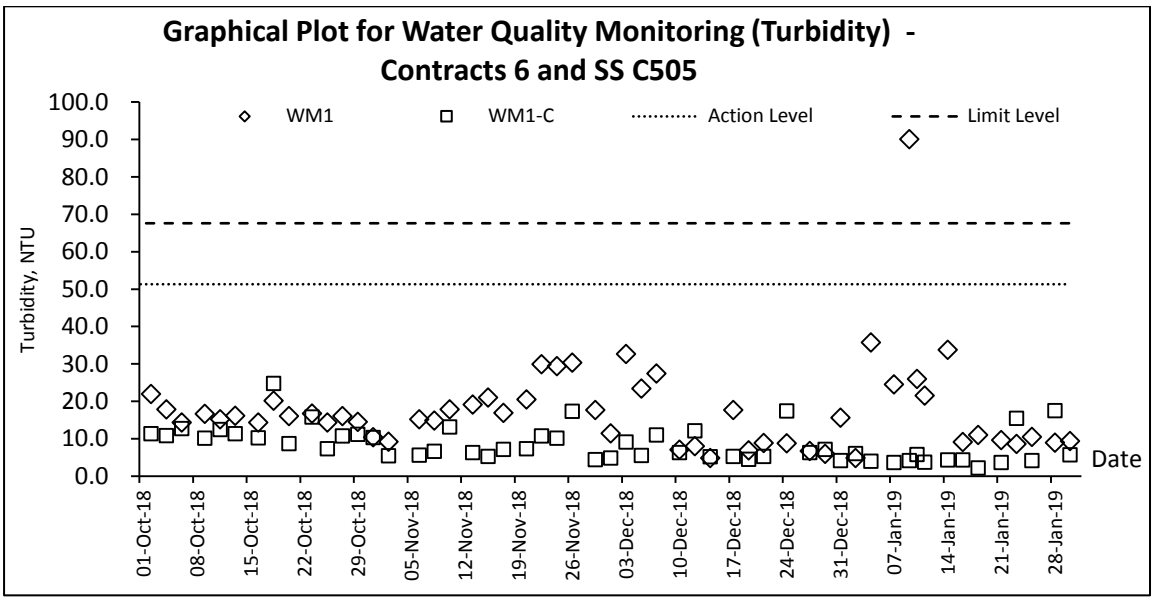

Graphical Plot for Construction Noise Monitoring Result at NM8
Leq30, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
Date
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19

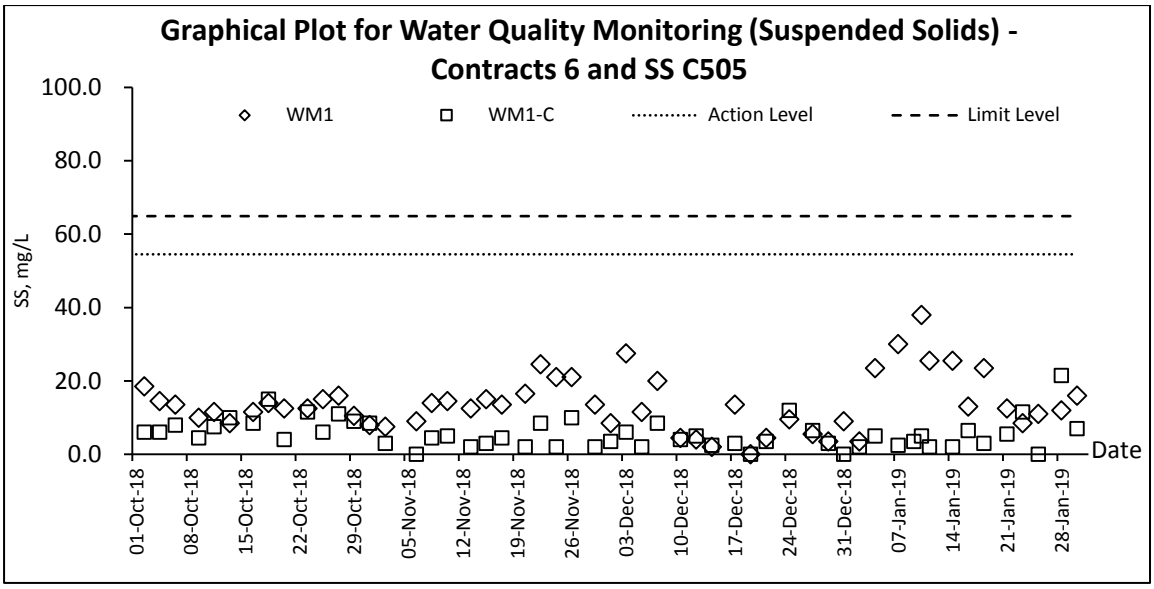

Graphical Plot for Construction Noise Monitoring Result at NM9
Leq30, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
Date
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19

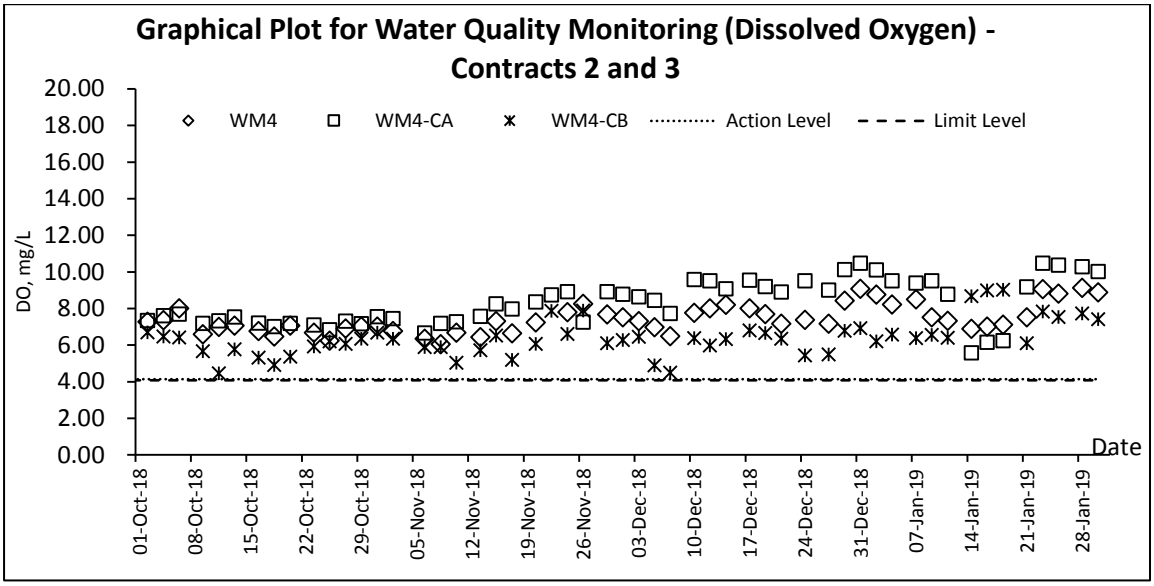

Graphical Plot for Construction Noise Monitoring Result at NM10
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
Corrected Leq 30min
80
75
70
65
60
55
50
45
Date
1-Oct-18
12-Oct-18
23-Oct-18
3-Nov-18
14-Nov-18
25-Nov-18
6-Dec-18
17-Dec-18
28-Dec-18
8-Jan-19
19-Jan-19
30-Jan-19

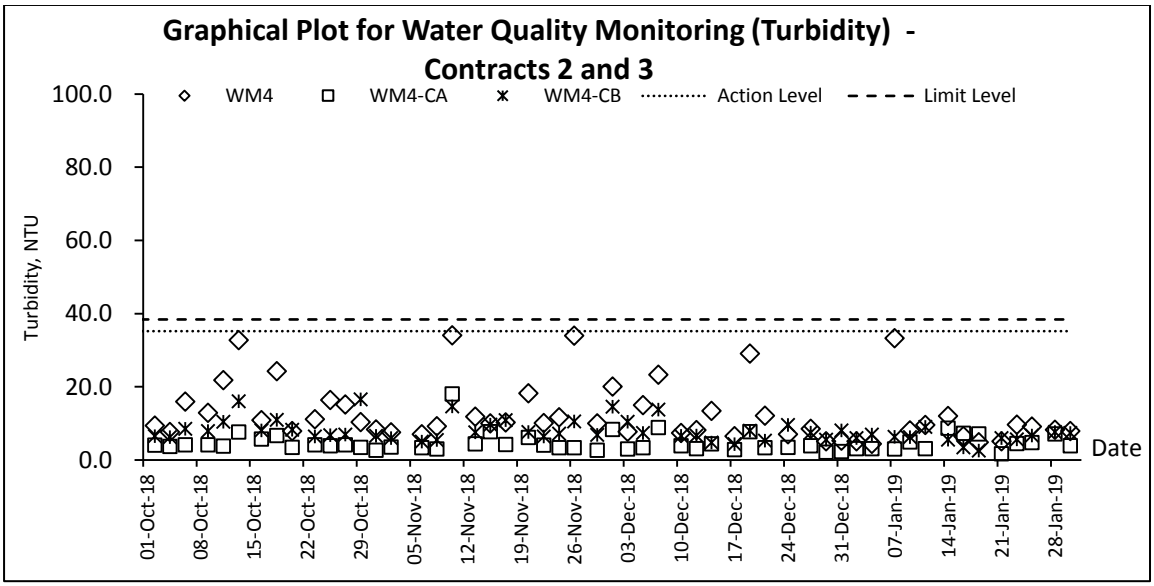
Water Quality

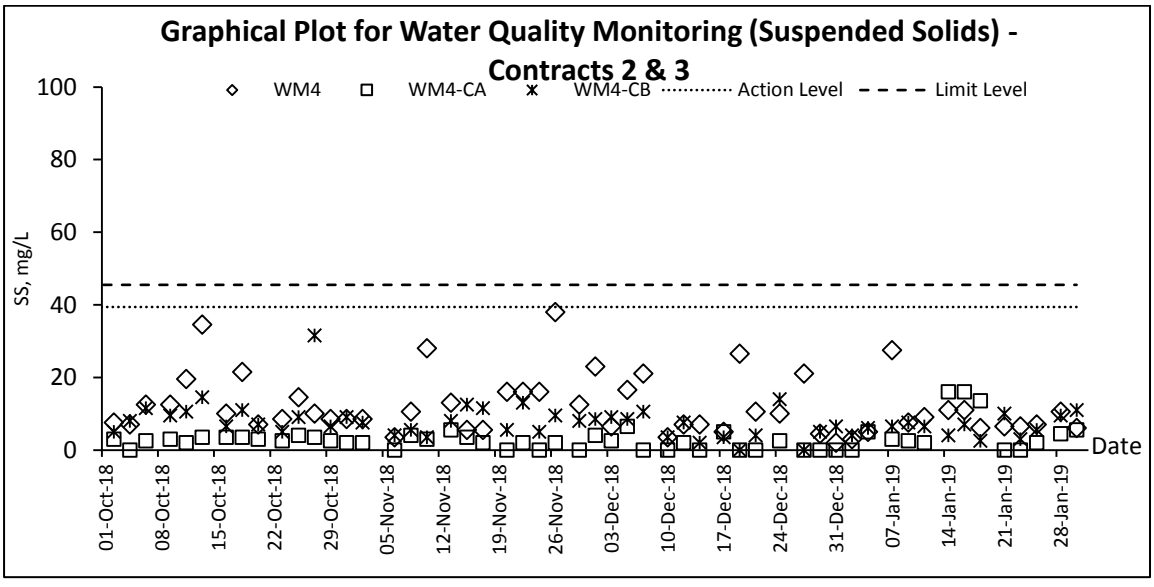


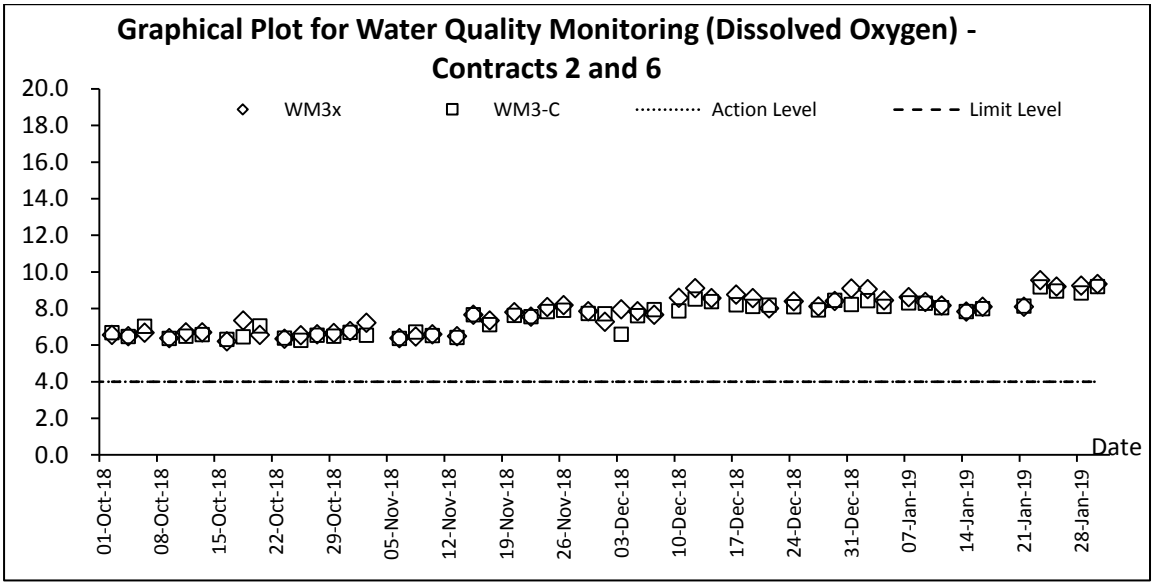





Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contracts 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
DO, mg/L
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Date
01-Oct-18
08-Oct-18
15-Oct-18
22-Oct-18
29-Oct-18
05-Nov-18
12-Nov-18
19-Nov-18
26-Nov-18
03-Dec-18
10-Dec-18
17-Dec-18
24-Dec-18
31-Dec-18
07-Jan-19
14-Jan-19
21-Jan-19
28-Jan-19


Graphical Plot for Water Quality Monitoring (Turbidity) - Contracts 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
Turbidity, NTU
100.0
80.0
60.0
40.0
20.0
0.0
Date
01-Oct-18
08-Oct-18
15-Oct-18
22-Oct-18
29-Oct-18
05-Nov-18
12-Nov-18
19-Nov-18
26-Nov-18
03-Dec-18
10-Dec-18
17-Dec-18
24-Dec-18
31-Dec-18
07-Jan-19
14-Jan-19
21-Jan-19
28-Jan-19


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contracts 2 & 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
SS, mg/L
100
80
60
40
20
0
Date
01-Oct-18
08-Oct-18
15-Oct-18
22-Oct-18
29-Oct-18
05-Nov-18
12-Nov-18
19-Nov-18
26-Nov-18
03-Dec-18
10-Dec-18
17-Dec-18
24-Dec-18
31-Dec-18
07-Jan-19
14-Jan-19
21-Jan-19
28-Jan-19


Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contracts 2 and 6
WM3x
WM3-C
Action Level
Limit Level
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Date
01-Oct-18
08-Oct-18
15-Oct-18
22-Oct-18
29-Oct-18
05-Nov-18
12-Nov-18
19-Nov-18
26-Nov-18
03-Dec-18
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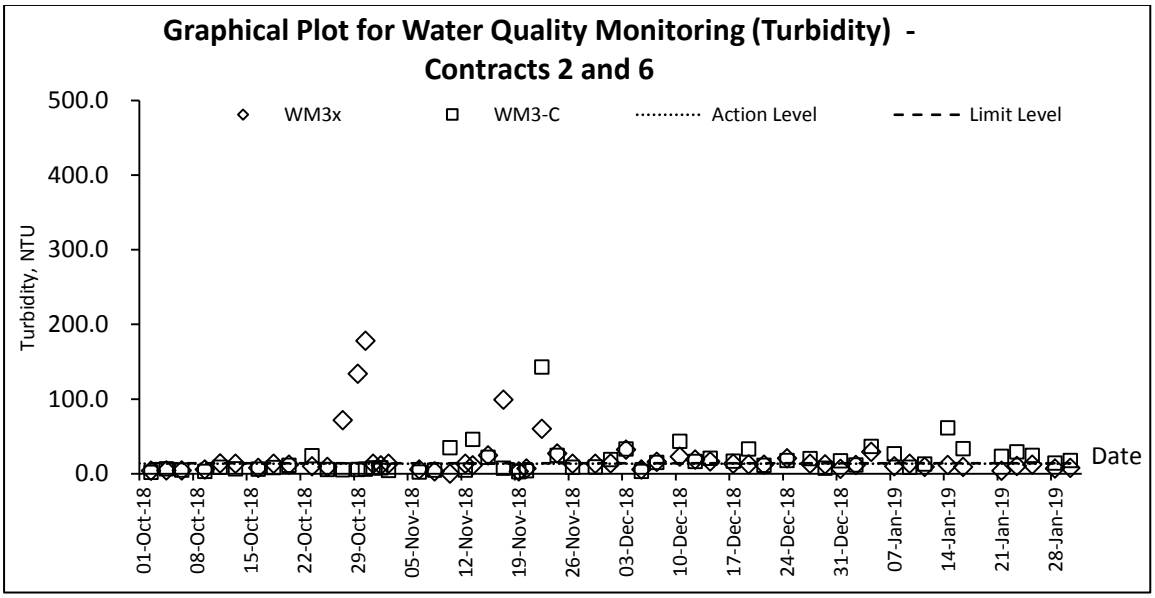
07-Jan-19
14-Jan-19
21-Jan-19
28-Jan-19


Graphical Plot for Water Quality Monitoring (Turbidity) - Contracts 2 and 6
WM3x
WM3-C
Action Level
Limit Level
Turbidity, NTU
500.0
400.0
300.0
200.0
100.0
0.0
Date
01-Oct-18
08-Oct-18
15-Oct-18
22-Oct-18
29-Oct-18
05-Nov-18
12-Nov-18
19-Nov-18
26-Nov-18
03-Dec-18
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24-Dec-18
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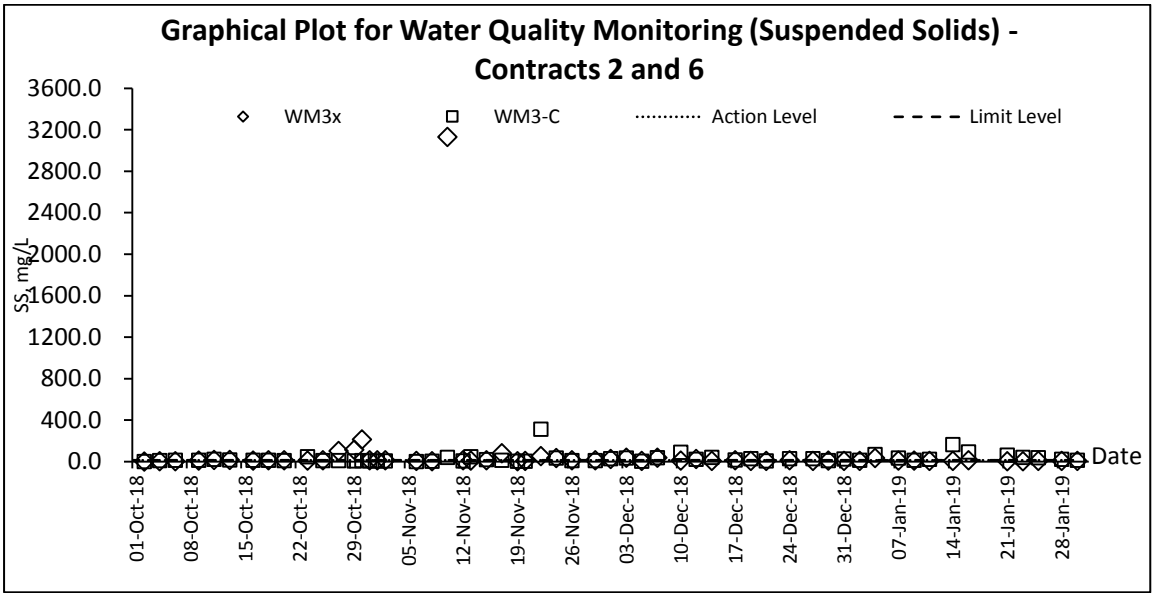
07-Jan-19
14-Jan-19
21-Jan-19
28-Jan-19


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contracts 2 and 6
WM3x
WM3-C
Action Level
Limit Level
SS, mg/L
3600.0
3200.0
2800.0
2400.0
2000.0
1600.0
1200.0
800.0
400.0
0.0
Date
01-Oct-18
08-Oct-18
15-Oct-18
22-Oct-18
29-Oct-18
05-Nov-18
12-Nov-18
19-Nov-18
26-Nov-18
03-Dec-18
10-Dec-18
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24-Dec-18
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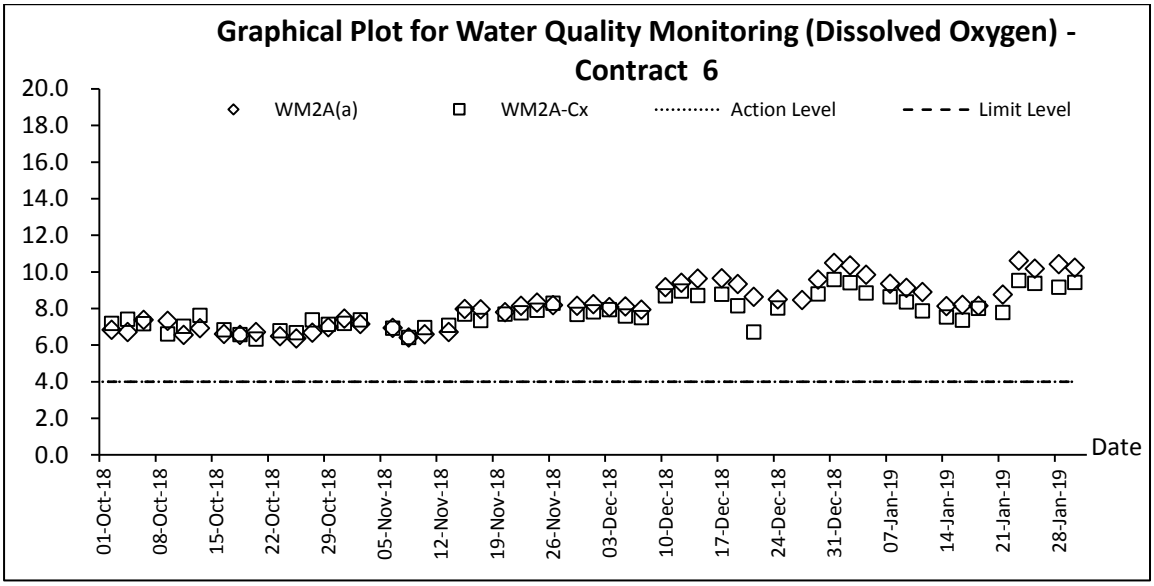
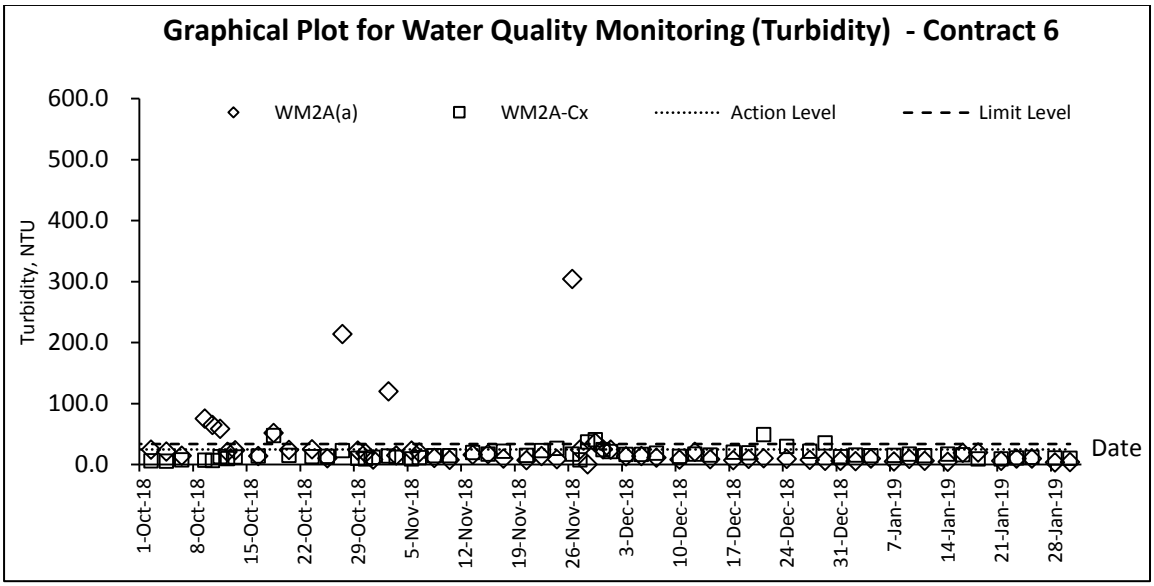
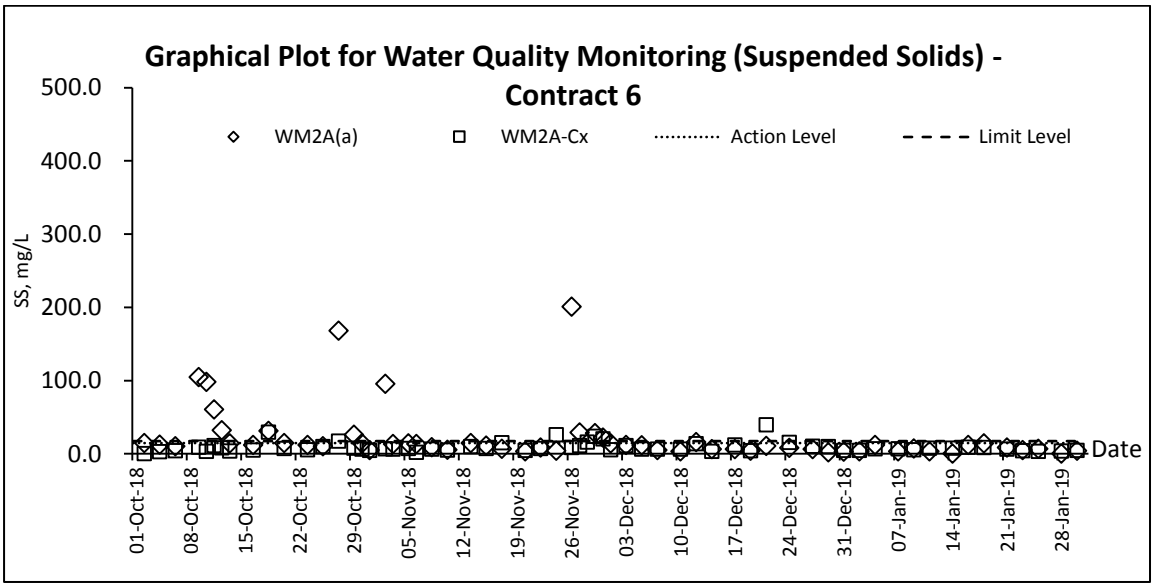
07-Jan-19
14-Jan-19
21-Jan-19
28-Jan-19


Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contract 6
WM2A(a)
WM2A-Cx
Action Level
Limit Level
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Date
01-Oct-18
08-Oct-18
15-Oct-18
22-Oct-18
29-Oct-18
05-Nov-18
12-Nov-18
19-Nov-18
26-Nov-18
03-Dec-18
10-Dec-18
17-Dec-18
24-Dec-18
31-Dec-18
07-Jan-19
14-Jan-19
21-Jan-19
28-Jan-19


Graphical Plot for Water Quality Monitoring (Turbidity) - Contract 6
WM2A(a)
WM2A-Cx
Action Level
Limit Level
Turbidity, NTU
600.0
500.0
400.0
300.0
200.0
100.0
0.0
Date
1-Oct-18
8-Oct-18
15-Oct-18
22-Oct-18
29-Oct-18
5-Nov-18
12-Nov-18
19-Nov-18
26-Nov-18
3-Dec-18
10-Dec-18
17-Dec-18
24-Dec-18
31-Dec-18
7-Jan-19
14-Jan-19
21-Jan-19
28-Jan-19


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contract 6
WM2A(a)
WM2A-Cx
Action Level
Limit Level
SS, mg/L
500.0
400.0
300.0
200.0
100.0
0.0
Date
01-Oct-18
08-Oct-18
15-Oct-18
22-Oct-18
29-Oct-18
05-Nov-18
12-Nov-18
19-Nov-18
26-Nov-18
03-Dec-18
10-Dec-18
17-Dec-18
24-Dec-18
31-Dec-18
07-Jan-19
14-Jan-19
21-Jan-19
28-Jan-19

Appendix G

Weather information

Weather Condition Extracted from HKO

The weather of November 2018

November 2018 was much gloomier than usual. As the northeast monsoon affecting the south China coast was relatively weak and southerlies were dominated in the lower atmosphere, more water vapour was built up and the weather in Hong Kong was cloudier than usual. The mean amount of cloud in the month was 79 percent, 25 percent above the normal of 54 percent and the highest on record for November. As a result, the duration of bright sunshine in the month was only 123.9 hours, about 31 percent lower than the normal figure of 180.1 hours and the eighth lowest on record for November. Despite the gloomy weather, the month was warmer than usual. The mean temperature of 22.9 degrees and mean minimum temperature of 21.4 degrees were 1.1 degrees and 1.6 degrees above the respective normals and were respectively the ninth and fourth highest for November on record. November 2018 was also wetter than usual with the monthly rainfall of 73.4 millimetres, about 95 percent above the normal of 37.6 millimetres. The accumulated rainfall up to November this year was 2151.0 millimetres, a deficit of about 9 percent compared to the normal of 2371.7 millimetres for the same period.

The weather of December 2018

With the northeast monsoon over southern China weaker than normal for most of the time in the month, December 2018 was much warmer than usual in Hong Kong. The monthly mean temperature was 19.2 degrees, 1.3 degrees above the normal of 17.9 degrees and among the sixth highest on record for December. The mean minimum temperature was 17.6 degrees, 1.7 degrees above normal of 15.9 degrees and among the fourth highest on record for December. The month was also drier than usual with a total rainfall of 11.9 millimetres, only about 44 percent of the normal of 26.8 millimetres. The annual total rainfall of 2162.9 millimetres in 2018 was about 10 percent below the annual normal of 2398.5 millimetres.

The weather of January 2019

With relatively less cold air outbreaks from the north arriving at the south China coast in the month, January 2019 was much warmer than usual in Hong Kong. The monthly mean temperature of 18.1 degrees and monthly mean minimum temperature of 16.4 degrees were 1.8 degrees and 1.9 degrees above their corresponding normals and both were the third highest on record for January. The mean maximum temperature of 20.4 degrees was 1.8 degrees above the normal and the fifth highest on record for January. The month was also drier than usual with only 4.7 millimetres of rainfall recorded in the month, about one fifth of the normal of 24.7 millimetres for January.

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

Appendix H

Waste Flow Table

香港寶嘉 Dragages HongKong
A member of the Bouygues Construction group

Contract No. CV/2012/08
Liantang / Heung Yuen Wai Boundary Control Point
Site Formation and Infrastructure Works – Contract 2

MONTHLY SUMMARY WASTE FLOW TABLE

FOR: 2018

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill*	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse#
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000m^3)
Jan	86.6400	0.0000	0.0000	5.2900	81.3500	1.6570	45.0000	0.3100	2.8000	4.5760	0.6575
Feb	33.2700	0.0000	0.0000	3.6700	29.6000	1.3470	32.0000	0.2500	2.4000	1.9500	0.2850
Mar	39.7600	0.0000	0.0000	3.4600	36.3000	1.3380	36.0000	0.3050	2.7000	9.8560	0.6290
Apr	55.5979	0.0000	0.0000	3.3680	52.2299	1.2470	33.7800	0.3240	2.5000	0.0000	0.5748
May	12.9815	0.0000	0.0000	4.6780	8.3035	1.1470	30.1400	0.3040	2.6000	44.9600	0.7056
June	9.0720	0.0000	0.0000	3.1910	5.8810	1.2200	31.7800	0.2870	2.3000	0.1760	0.7534
Sub-total	237.3214	0.0000	0.0000	23.6570	213.6644	7.9560	208.7000	1.7800	15.3000	61.5180	3.6053
July	6.0440	0.0000	0.0000	0.5840	5.4600	1.4570	30.7500	0.2750	2.1000	1.5840	0.8810
Aug	5.4100	0.0000	0.0000	0.7600	4.6500	1.3520	31.5900	0.2570	2.2000	3.0800	0.8400
Sep	8.2680	0.0000	0.0000	3.0430	5.2250	1.2300	30.7800	0.2200	1.8000	1.2300	0.4440
Oct	3.2564	0.0000	0.0000	1.1273	2.1291	1.2600	0.0000	0.1700	1.0125	9.5200	0.5969
Nov	1.9760	0.0000	0.0000	0.1760	1.8000	1.1000	0.0000	0.1780	1.8200	0.0000	0.5690
Dec	5.1965	0.0000	0.0000	2.0925	3.1040	1.3200	0.0000	0.0000	0.0000	28.4500	0.3269
Sub-total	30.1509	0.0000	0.0000	7.7828	22.3681	7.7190	93.1200	1.1000	8.9325	43.8640	3.6578
Total	267.4723	0.0000	0.0000	31.4398	236.0325	15.6750	301.8200	2.8800	24.2325	105.3820	7.2631

Notes:

(1) The performance targets are given in PS 1.100(14)(a)

(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials.

(5) Assumption: 1m^3 of inert material weight 2.2 tonne 1m3 of non-inert material weight 1.6 tonne 1m3 of chemical waste weight 0.88 tonne

MONTHLY SUMMARY WASTE FLOW TABLE

FOR: 2019

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill*	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse#
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000m^3)
Jan	8.1000	0.0000	0.0000	1.5360	6.5640	1.2000	0.0000	0.0000	0.0000	7.2760	0.3000
Feb											
Mar											
Apr											
May											
June											
Sub-total	8.1000	0.0000	0.0000	1.5360	6.5640	1.2000	0.0000	0.0000	0.0000	7.2760	0.3000
July											
Aug											
Sep											
Oct											
Nov											
Dec											
Sub-total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	8.1000	0.0000	0.0000	1.5360	6.5640	1.2000	0.0000	0.0000	0.0000	7.2760	0.3000

Notes:

(1) The performance targets are given in PS 1.100(14)(a)

(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials.

(5) Assumption: 1m^3 of inert material weight 2.2 tonne 1m3 of non-inert material weight 1.6 tonne 1m3 of chemical waste weight 0.88 tonne

Forecast of Total Quantities of C&D Materials to be Generated from the Project											
Forecast Made at the End of the Project	Total Quantity Generated	Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemicals Waste	Others, e.g. general refuse
Month-Year	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000m3)
Dec-13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	220.6270	0.0000	0.0000	0.0000	0.0000
Dec-14	425.4406	0.0000	2.7362	376.3945	46.3099	5.6245	3.2100	0.4390	0.0070	10.8800	2.2609
Dec-15	570.9459	0.0000	20.8159	543.2162	6.9138	4.5492	37.6310	3.9220	11.9700	16.1920	1.1696
Dec-16	905.0989	0.0000	7.4372	427.7834	469.8783	24.8350	430.5200	3.8500	18.7262	34.2936	1.9720
Dec-17	741.9482	0.0000	8.0385	175.6792	558.2305	78.3865	1681.8000	4.0700	30.5175	48.7906	5.9610
Dec-18	267.4723	0.0000	0.0000	31.4398	236.0325	15.6750	301.8200	2.8800	24.2325	105.3820	7.2631
Jan-19											
Total	2910.9059	0.0000	39.0278	1554.5132	1317.3650	129.0702	2675.6080	15.1610	85.4532	215.5382	18.6266

Name of Department: CEDD

Contract No.: CV/2012/09

Monthly Summary Waste Flow Table for 2018 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated (in '000m^3)	Hard Rock and Large Broken Concrete (in '000m^3)	Reused in the Contract (in '000m^3)	Reused in other Projects (in '000m^3)	Disposed as Public Fill (in '000m^3)	Imported Fill (in '000m^3)	Metals (in '000m^3)	Paper/ cardboard packaging (in '000m^3)	Plastics (in '000m^3)	Chemical Waste (in m^3)	Others, e.g. general refuse (in '000m^3)
Jan	3.089	0.304	0.060	0.000	2.725	0.923	0.000	0.000	0.000	0.000	0.150
Feb	2.697	0.256	0.150	0.000	2.292	1.144	0.000	0.000	0.000	0.000	0.095
Mar	1.524	0.141	0.120	0.000	1.263	0.211	0.000	0.000	0.000	0.000	0.085
Apr	2.880	0.786	0.360	0.000	1.734	0.788	0.000	0.000	0.000	0.000	0.125
May	1.164	0.290	0.101	0.000	0.773	0.185	0.000	0.000	0.000	0.000	0.150
Jun	0.862	0.082	0.515	0.000	0.265	0.000	0.000	0.000	0.000	0.000	0.110
Sub-total	12.216	1.859	1.306	0.000	9.051	3.251	0.000	0.000	0.000	0.000	0.715
Jul	1.520	0.261	0.476	0.000	0.783	0.039	0.000	0.000	0.000	0.000	0.135
Aug	2.372	0.478	0.613	0.000	1.281	0.193	0.000	0.000	0.000	0.000	0.095
Sep	1.709	0.361	0.381	0.000	0.967	0.272	0.000	0.000	0.000	0.000	0.150
Oct	1.198	0.316	0.000	0.000	0.882	0.000	0.000	0.000	0.000	0.000	0.115
Nov	1.938	0.361	0.296	0.000	1.281	0.000	0.000	0.000	0.000	0.000	0.160
Dec	1.406	0.302	0.060	0.000	1.044	0.000	0.000	0.000	0.000	0.000	0.085
Total	22.359	3.938	3.132	0.000	15.289	3.755	0.000	0.000	0.000	0.000	1.455

Note:

1. Assume the density of soil fill is 2 ton/m^3.
2. Assume the density of rock and broken concrete is 2.5 ton/m^3.
3. Assume each truck of C&D wastes is 5m^3.
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^3.
8. Assume the density of plastic is 941 kg/m^3.
9. Assume the density of paper is 800 kg/m^3.

Name of Department: CEDD

Contract No.: CV/2012/09

Monthly Summary Waste Flow Table for 2019 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in m^3)	(in '000m^3)
Jan	2.937	0.927	0.000	0.000	2.010	0.997	0.000	0.000	0.000	0.000	0.145
Feb											
Mar											
Apr											
May											
Jun											
Sub-total	2.937	0.927	0.000	0.000	2.010	0.997	0.000	0.000	0.000	0.000	0.145
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	2.937	0.927	0.000	0.000	2.010	0.997	0.000	0.000	0.000	0.000	0.145

Note:

1. Assume the density of soil fill is 2 ton/m^3.
2. Assume the density of rock and broken concrete is 2.5 ton/m^3.
3. Assume each truck of C&D wastes is 5m^3.
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^3.
8. Assume the density of plastic is 941 kg/m^3.
9. Assume the density of paper is 800 kg/m^3.

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

Notes:

(1) The performance targets are given in PS Clause 6(14).

(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works if equal to or exceed 50,000 m^3.

Appendix A

Name of Department: CEDD

Contract No.: NE/2014/02

Monthly Summary Waste Flow Table for 2018

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
一月-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
二月-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
三月-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
四月-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
五月-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
六月-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
七月-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
八月-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
九月-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
十月-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012
十一月-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018
十二月-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030

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

Notes :

(1) The performance targets are given in PS Clause 1.84(14).

(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Sites.

(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging materials.

(4) Estimate 6m3 capacity per dump truck

Appendix A

Name of Department: CEDD

Contract No.: NE/2014/02

Monthly Summary Waste Flow Table for 2016- 2019

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2018	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.049	0.000	0.000	0.030
Jan-19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Feb-19											
Mar-19											
Apr-19											
May-19											
Jun-19											
Jul-19											
Aug-19											
Sep-19											
Oct-19											
Nov-19											
Dec-19											
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.049	0.000	0.000	0.030

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

Notes :

(1) The performance targets are given in PS Clause 1.84(14).

(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Sites.

(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging materials.

(4) Estimate 6m3 capacity per dump truck

Monthly Summary Waste Flow Table for 2018 (year)

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

Project : Liangtang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 6 Contract No.: CV/2013/08

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m^3)
Jan	4.152	0	0.629	1.947	1.576	0	0	0.240	0	0	0.892
Feb	2.740	0	0.867	0.544	1.329	0	0	0.402	0	0	0.578
Mar	3.269	0	1.581	0.969	0.719	0	0	0.380	0	0	0.725
Apr	2.901	0	0.255	1.955	0.691	0	0	0.360	0	0	0.921
May	3.194	0	0.068	1.964	1.162	0	0	0.384	0	0	1.340
Jun	2.206	0	0	0.9775	1.228	0	0	0.270	0	0	0.714
Sub-total	18.462	0.000	3.400	8.357	6.705	0.000	0.000	2.036	0.000	0.000	5.170
Jul	1.512	0	0	0.816	0.696	0	0	1.608	0	0	0.846
Aug	2.562	0	0	1.989	0.573	0.886	0	0.360	0	0	0.866
Sep	0.997	0	0	0.552	0.445	3.070	0	0.225	0	0	0.633
Oct	1.896	0	0	1.386	0.510	13.192	0	0.188	0	0	0.855
Nov	0.310	0	0	0	0.310	15.028	0	0.345	0	0	0.929
Dec	12.477	0	0	0.010	12.467	9.197	0	0	0	0	0.800
Total	1036.609	0.000	166.627	283.753	586.231	95.312	0.000	11.141	0.007	34.045	18.850

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(2) Plastics refer to plastic bottles/containers, plastic sheets/ foam from packaging materials.

(3) Broken concrete for recycling into aggregates.

Monthly Summary Waste Flow Table for 2019 (year)

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

Project : Liangtang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 6 Contract No.: CV/2013/08

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m^3)
Jan	16.511	0	0	0.385	16.126	0	0	0	0	0	0.521
Feb	0	0	0	0	0	0	0	0	0	0	0
Mar	0	0	0	0	0	0	0	0	0	0	0
Apr	0	0	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0	0	0
Jun	0	0	0	0	0	0	0	0	0	0	0
Sub-total	16.511	0.000	0.000	0.385	16.126	0.000	0.000	0.000	0.000	0.000	0.521
Jul		0	0	0	0	0	0	0	0	0	0
Aug		0	0	0	0	0	0	0	0	0	0
Sep		0	0	0	0	0	0	0	0	0	0
Oct		0	0	0	0	0	0	0	0	0	0
Nov		0	0	0	0	0	0	0	0	0	0
Dec		0	0	0	0	0	0	0	0	0	0
Total	1053.120	0.000	166.627	284.138	602.357	95.312	0.000	11.141	0.007	34.045	19.371

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(2) Plastics refer to plastic bottles/containers, plastic sheets/ foam from packaging materials.

(3) Broken concrete for recycling into aggregates.

Appendix I

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 2018 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of Non-Inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/cardboard packaging	Plastic (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m3)
Jan	0.015	0	0	0	0.015	0	14.5	0.5	0.001	0	0.15
Feb	0	0	0	0	0	0	9	0.18	0.001	0	0.13
Mar	0.005	0	0	0	0.005	0	6	0.15	0.001	0	0.2
Apr	1.1	0	0	0	1.1	0	6.6	0.22	0.001	0	0.3
May	0.077	0	0	0	0.077	0	1.3	0.15	0.001	0	0.1
June	0	0	0	0	0	0	6	0.4	0.001	0	0.05
Sub-total	1.197	0	0	0	1.197	0	43.4	1.6	0.006	0	0.93
July	0.5	0	0	0	0.5	0	2.5	0.1	0.001	0	0.2
Aug	0.047	0	0	0	0.047	0	5.8	0.1	0.001	0	0.1
Sept	0.041	0	0	0	0.041	0	1.1	0.1	0.001	0	0.1
Oct	0.047	0	0	0	0.047	0	1.5	0.2	0.001	0	0.2
Nov	0	0	0	0	0	0	0.3	0.1	0.001	0	0.2
Dec	0	0	0	0	0	0	0.2	0.1	0.001	0	0.27
Total	1.832	0	0	0	1.832	0	54.8	2.3	0.012	0	2.000

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.

Appendix I

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 2019 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of Non-Inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/cardboard packaging	Plastic (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m3)
Jan	1.919	0.95	0	0	1.919	0	6.7	0.1	0.001	0	0.1
Feb											
Mar											
Apr											
May											
June											
Sub-total	2.869	0.95	0	0	1.919	0	6.7	0.1	0.001	0	0.1
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total	2.869	0.95	0	0	1.919	0	6.7	0.1	0.001	0	0.100

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.

Architectural Services Department	Form No. D/OI.03/09.002

Contract No. / Works Order No.: - SSC505

Monthly Summary Waste Flow Table for 2018 [year] [to be submitted not later than the 15th day of each month following reporting month]

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

Month	Actual Quantities of Inert Construction Waste Generated Monthly				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Broken Concrete (see Note 4)	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)
Jan	5.298	0.646	0.160	0.000	4.492
Feb	7.243	0.572	0.320	0.000	6.351
Mar	11.241	0.831	0.225	0.000	10.186
Apr	3.717	1.458	0.257	0.000	2.002
May	5.346	0.788	0.300	0.000	4.258
Jun	6.828	0.661	0.376	0.000	5.792
Sub-total	39.672	4.956	1.638	0.000	33.079
Jul	11.637	0.051	0.282	0.000	11.304
Aug	16.440	0.142	0.263	0.000	16.036
Sep	7.849	0.116	0.161	0.000	7.573
Oct	3.619	1.148	0.196	0.000	2.275
Nov	4.702	0.908	0.186	0.000	3.608
Dec	4.016	1.267	0.110	0.000	2.639
Total	87.934	8.587	2.836	0.000	76.512

Month	Actual Quantities of Non-inert Construction Waste Generated Monthly												
	Timber		Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Other Recyclable Materials (see Page 3)		General Refuse disposed of at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000m^3)
	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated
Jan	0.000	0.000	375.870	375.870	0.220	0.220	0.032	0.032	0.000	0.000	0.000	0.000	1.918
Feb	0.000	0.000	720.120	720.120	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.223
Mar	0.000	0.000	220.860	220.860	0.830	0.830	0.005	0.005	0.000	0.000	0.005	0.005	2.711
Apr	0.000	0.000	202.130	202.130	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.470
May	0.000	0.000	294.330	294.330	0.000	0.000	0.042	0.042	0.000	0.000	0.000	0.000	2.490
Jun	0.000	0.000	242.170	242.170	0.990	0.990	0.000	0.000	1.200	0.000	0.000	0.000	2.997
Sub-total	0.000	0.000	2,055.480	2,055.480	2.040	2.040	0.079	0.079	1.200	0.000	0.005	0.005	14.809
Jul	0.000	0.000	218.990	218.990	0.280	0.280	0.000	0.000	0.000	0.000	0.000	0.000	3.146
Aug	0.000	0.000	466.220	466.220	0.230	0.230	0.000	0.000	1.200	0.000	0.000	0.000	3.114
Sep	0.000	0.000	172.850	172.850	0.620	0.620	0.033	0.033	0.000	0.000	0.000	0.000	2.704
Oct	0.000	0.000	351.580	351.580	0.460	0.460	0.490	0.490	0.000	0.000	0.000	0.000	2.035
Nov	0.000	0.000	240.200	240.200	0.340	0.340	0.300	0.300	0.000	0.000	0.000	0.000	1.372
Dec	0.000	0.000	272.030	272.030	0.210	0.210	0.000	0.000	0.000	0.000	0.000	0.000	1.235
Total	0.000	0.000	3,777.350	3,777.350	4.180	4.180	0.902	0.902	2.400	0.000	0.005	0.005	28.415

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					
272.03 tons of scrap metals were sent to Global Metal Ltd. & Hing Lung Metal Ltd. for recycling	2,533.26 tons of broken concrete were sent to Tailor Recycled Aggregates Ltd. for recycling.	210.0 kg of paper were sent to Lau Choi Kee Papers Co. Ltd. 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^3 by volume.

Architectural Services Department	Form No. D/OI.03/09.002

Contract No. / Works Order No.: - SSC505

Monthly Summary Waste Flow Table for 2019 [year] [to be submitted not later than the 15th day of each month following reporting month]

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

Month	Actual Quantities of Inert Construction Waste Generated Monthly				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Broken Concrete (see Note 4)	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)
Jan	4.815	1.963	0.160	0.000	2.691
Feb					
Mar					
Apr					
May					
Jun					
Sub-total	4.815	1.963	0.160	0.000	2.691
Jul					
Aug					
Sep					
Oct					
Nov					
Dec					
Total	4.815	1.963	0.160	0.000	2.691

Month	Actual Quantities of Non-inert Construction Waste Generated Monthly												
	Timber		Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Other Recyclable Materials (see Page 3)		General Refuse disposed of at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000m^3)
	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated
Jan	0.000	0.000	238.550	238.550	0.290	0.290	0.950	0.950	0.000	0.000	0.000	0.000	1.417
Feb													
Mar													
Apr													
May													
Jun													
Sub-total	0.000	0.000	238.550	238.550	0.290	0.290	0.950	0.950	0.000	0.000	0.000	0.000	1.417
Jul													
Aug													
Sep													
Oct													
Nov													
Dec													
Total	0.000	0.000	238.550	238.550	0.290	0.290	0.950	0.950	0.000	0.000	0.000	0.000	1.417

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					
238.55 tons of scrap metals were sent to Global Metal Ltd., Prosperity Metal Ltd. & Hing Lung Metal Ltd. for recycling	3,926.59 tons of broken concrete were sent to Tailor Recycled Aggregates Ltd. for recycling.	290.0 kg of paper were sent to Lau Choi Kee Papers Co. Ltd. for recycling.	950.0 kg of plastic barrier were sent to Lau Choi Kee Papers Co. Ltd. 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^3 by volume.

Forecast of Total Quantities of C&D Materials to be Generated from the Contract										
Total Quantity Generated	Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill	Imported Fill	Metals	Paper/cardboard packaging	Plastics	Chemical Waste	General refuse
(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 m^3)
286.769	14.911	49.597	0.000	169.223	53.223	19,797.764	18.056	12.673	5.000	40.624

Appendix I

Implementation Schedule for Environmental Mitigation Measures

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
Air Quality Impact (Construction)							
3.6.1.1	2.1	**General Dust Control Measures** The following dust suppression measures should be implemented: ■ Frequent water spraying for active construction areas (4 times per day for active areas in Po Kak Tsai and 8 times per day for all other active areas), including areas with heavy construction and slope cutting activities ■ 80% of stockpile areas should be covered by impervious sheets ■ Speed of trucks within the site should be controlled to about 10 km/hr ■ All haul roads within the site should be paved to avoid dust emission due to vehicular movement	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation
3.6.1.2	2.1	**Best Practice for Dust Control** 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: *Good site management* ■ The Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. ■ Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimize the release of visible dust emission. ■ Any piles of materials accumulated on or around the work areas should be cleaned up regularly. ■ Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimizing generation of fugitive dust emissions. ■ The material should be handled properly to prevent fugitive dust emission before cleaning. *Disturbed Parts of the Roads* ■ Each and every main temporary access should be paved with	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or ■ Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. *Exposed Earth* ■ Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating 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. *Loading, Unloading or Transfer of Dusty Materials* ■ All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. *Debris Handling* ■ Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides. ■ Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. *Transport of Dusty Materials* ■ 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. *Wheel washing* ■ 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. *Use of vehicles* ■ Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. ■ Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.				

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		Site hoarding ■ 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. *Blasting* ■ The areas within 30m from the blasting area should be wetted with water prior to blasting.					
Air Quality Impact (Operation)							
3.5.2.2	2.2	The following odour containment and control measures will be provided for the proposed sewage treatment work at the BCP site: ■ The treatment work will be totally enclosed. Negative pressure ventilation will be provided within the enclosure to avoid any fugitive odorous emission from the treatment work. ■ Further odour containment will be achieved by covering or confining the sewage channels, sewage tanks, and equipment with potential odour emission. ■ Proper mixing will be provided at the equalization and sludge holding tanks to prevent sewage septicity. ■ Chemical or biological deodorisation facilities with a minimum odour removal efficiency of 90% will be provided to treat potential odorous emissions from the treatment plant including sewage channels / tanks, filter press and screening facilities so as to minimize any potential odour impact to the nearby ASRs.	To minimize potential odour impact from operation of the proposed sewage treatment work at BCP	DSD	BCP	Operation Phase	EIA recommendation
Noise Impact (Construction)							
4.4.1.4	3.1	**Adoption of Quieter PME** Use of the recommended quieter PME such as those given in the BS5228: Part 1:2009 and presented in **Table 4.14**, which can be found in Hong Kong.	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	**Use of Movable Noise Barrier** 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^2 is recommended to achieve the predicted screening effect.	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	**Use of Noise Enclosure/ Acoustic Shed** 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.	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	**Use of Noise Insulating Fabric** 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.	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	**Good Site Practice** The good site practices listed below should be followed during each phase of construction: • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction programme; • Mobile plant, if any, should be sited as far from NSRs as possible; • Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
Noise Impact (Operation)							
		Road Traffic Noise					
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
		Fixed Plant Noise					
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	The following noise reduction measures shall be considered as far as practicable during operation: • Choose quieter plant such as those which have been effectively silenced; • Include noise levels specification when ordering new plant (including chillier and E/M equipment); • Locate fixed plant/louver away from any NSRs as far as practicable; • Locate fixed plant in walled plant rooms or in specially designed enclosures; • Locate noisy machines in a basement or a completely separate building; • Install direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosure where necessary; and • Develop and implement a regularly scheduled plant maintenance programme so that equipment is properly operated and serviced in order to maintain a controlled level of noise.	To minimize the fixed plant noise impact	Managing Authority of the buildings / Contractor	BCP, Administration Building and all ventilation buildings	Before Operation	EIAO and NCO
Water Quality Impact (Construction)							
5.6.1.1	4.1	**Construction site runoff and drainage** 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: ▪ At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the Contractor prior to the commencement of construction. ▪ The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas.	To control site runoff and drainage; prevent high sediment loading from reaching the nearby watercourses	Contractor	Construction Works Sites	Construction Phase	Practice Note for Professional Persons on Construction Site Drainage (ProPECC Note PN 1/94)

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		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. ▪ Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the Contractor prior to the commencement of construction. ▪ All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. ▪ Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities. ▪ If surface excavation works cannot be avoided during the wet season (April to September), temporarily exposed slope/soil surfaces should be covered by tarpaulin or other means, as far as practicable, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Interception channels should be provided (e.g. along the crest/edge of the excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC Note PN 1/94. ▪ The overall slope of the site should be kept to a minimum to reduce					

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		the erosive potential of surface water flows. ▪ All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. ▪ Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. ▪ Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers. ▪ Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes. ▪ Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.					
5.6.1.1	4.1	**Good site practices for works within water gathering grounds** The following conditions should be complied, if there is any works to be carried out within the water gathering grounds:	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?
		▪ Adequate measures should be implemented to ensure no pollution or siltation occurs to the catchwaters and catchments. ▪ No earth, building materials, oil or fuel, soil, toxic materials or any materials that may possibly cause contamination to water gathering grounds are allowed to be stockpiled on site. ▪ All surplus spoil should be removed from water gathering grounds as soon as possible. ▪ Temporary drains with silt traps should be constructed at the site boundary before the commencement of any earthworks. ▪ Regular cleaning of silt traps should be carried out to ensure proper operation at all time. ▪ All excavated or filled surfaces which have the risk of erosion should always be protected form erosion. ▪ Facilities for washing the wheels of vehicles before leaving the site should be provided. ▪ Any construction plant which causes pollution to catchwaters or catchments due to the leakage of oil or fuel should be removed off site immediately. ▪ No maintenance activities which may generate chemical wastes should be undertaken in the water gathering grounds. Vehicle maintenance should be confined to designated paved areas only and any spillages should be cleared up immediately using absorbents and waste oils should be collected in designated tanks prior to disposal off site. All storm water run-off from these areas should be discharged via oil/petrol separators and sand/silt removal traps. ▪ Any soil contaminated with fuel leaked from plant should be removed off site and the voids arising from removal of contaminated soil should be replaced by suitable material approved by the Director of Water Supplies. ▪ Provision of temporary toilet facilities and use of chemicals or insecticide of any kind are subject to the approval of the Director of Water Supplies. ▪ Drainage plans should be submitted for approval by the Director of			grounds		

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		Water Supplies. ▪ An unimpeded access through the waterworks access road should always be maintained. ▪ Earthworks near catchwaters or streamcourses should only be carried out in dry season between October and March, ▪ Advance notice must be given before the commencement of works on site quoting WSD's approval letter reference.					
5.6.1.2	4.1	**Good site practices of general construction activities** 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. 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.	To minimize water quality impacts	Contractor	All construction works sites	Construction phase	EIA Recommendation
5.6.1.3	4.1	**Sewage effluent from construction workforce** 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.	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	**Hydrogeological Impact** 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.	To minimize water quality impacts	Contractor	Construction works sites of the drill and blast tunnel	Construction phase	EIA Recommendation and WPCO
Water Quality Impact (Operation)							
		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?
Sewage and Sewerage Treatment Impact (Construction)							
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
Sewage and Sewerage Treatment Impact (Operation)							
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
Waste Management Implication (Construction)							
7.6.1.1	6	**Good Site Practices** 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: ▪ Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site ▪ Training of site personnel in proper waste management and chemical handling procedures ▪ Provision of sufficient waste disposal points and regular collection of waste ▪ Dust suppression measures as required under the Air Pollution Control (Construction Dust) Regulation should be followed as far as practicable. Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by covering trucks or in enclosed containers ▪ General refuse shall be removed away immediately for disposal. As	To minimize adverse environmental impact	Contractor	Construction works sites (general)	Construction Phase	EIA recommendation; Waste Disposal Ordinance; Waste Disposal (Chemical Wastes) (General) Regulation; and ETWB TC(W) No. 19/2005, Environmental Management on Construction Site

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		such odour is not anticipated to be an issue to distant sensitive receivers ▪ Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction from public road ▪ Covers and water spraying system should be provided for the stockpiled C&D material to prevent dust impact or being washed away ▪ Designate different locations for storage of C&D material to enhance reuse ▪ Well planned programme for transportation of C&D material to lessen the off-site traffic impact. Well planned delivery programme for offsite disposal and imported filling material such that adverse noise impact from transporting of C&D material is not anticipated ▪ Site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" should be adopted as far as practicable, such as cleaning and maintenance of drainage systems regularly ▪ Provision of cover for the stockpile material, sand bag or earth bund as barrier to prevent material from washing away and entering the drains					
7.6.1.2	6	**Waste Reduction Measures** 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: ▪ Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal ▪ Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force ▪ Proper storage and site practices to minimise the potential for damage or contamination of construction materials ▪ Plan and stock construction materials carefully to minimise amount	To reduce the quantity of wastes	Contractor	Construction works sites (General)	Construction Phase	EIA recommendation and Waste Disposal Ordinance

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		of waste generated and avoid unnecessary generation of waste ▪ In addition to the above measures, specific mitigation measures are recommended below for the identified waste arising to minimise environmental impacts during handling, transportation and disposal of these wastes.					
7.6.1.3	6	**C&D Materials** In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the excavated materials should be reused on-site as backfilling material as far as practicable. The surplus rock and other inert C&D material would be disposed of at the Government's Public Fill Reception Facilities (PFRFs) at Tuen Mun Area 38 for beneficial use by other projects in the HKSAR as the last resort. C&D waste generated from general site clearance and tree felling works would require disposal to the designated landfill site. Other mitigation requirements are listed below: ▪ A Waste Management Plan should be prepared and implemented in accordance with ETWB TC(W) No. 19/2005 Environmental Management on Construction Site; and ▪ In order to monitor the disposal of C&D material and solid wastes at public filling facilities and landfills, and to control fly-tipping, a trip-ticket system (e.g. ETWB TCW No. 31/2004) should be included.	To minimize impacts resulting from C&D material	Contractor	Construction Works Sites (General)	Construction Phase	EIA recommendation; Waste Disposal Ordinance; and ETWB TCW No. 31/2004
7.6.1.4	6	**General refuse** General refuse should be stored in enclosed bins or compaction units separated from other C&D material. A reputable waste collector is to be employed by the Contractor to remove general refuse from the site separately. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' litter.	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	**Chemical waste** 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 *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*. 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	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