JOB NO.: TCS00694/13

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

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT REPORT (NO.87) – OCTOBER 2020

PREPARED FOR
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT (CEDD)

Date	Reference No.	Prepared By	Certified By
10 November 2020	TCS00694/13/600/R2543v2	Nicola Hon (Environmental Consultant)	Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	6 November 2020	First Submission
2	10 November 2020	Amended As Per IEC's comments

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Our ref: 7076192/L26644/AW/MCC/rw

11 November 2020

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

By Email & Post

Attention: Mr Owen NG

Dear Sir

Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary Control Point and Associated Works
Independent Environmental Checker – Investigation
Monthly EM&A Report (No. 87) – October 2020

With reference to the Monthly EM&A Report No. 87 for October 2020 (Version 2) certified by the ET Leader, please note that we have no adverse comment on the captioned submission. We herewith verify the captioned submission in accordance with Condition 5.4 of the Environmental Permit No. EP-404/2011/D.

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	-	Ms Becky WAN	by fax: 2804 6805
	AECOM	-	Mr Pat LAM / Mr Julian LING	by email
	Ronald Lu	-	Mr Peter YAM / Mr Justin CHEUNG	by email
	CW	-	Mr Ken LUN	by email
	DHK	-	Mr Alan KAM	by email
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EXECUTIVE SUMMARY

ES01 This is the **87th** monthly Environmental Monitoring & Audit (EM&A) report presenting the monitoring results and inspection findings for the reporting period from **1 to 31 October 2020** (hereinafter 'the Reporting Period').

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES02 To facilitate the project management and implementation, Liantang/Heung Yuen Wai Boundary Control Point and Associated Works of the Project is divided to six CEDD contracts including 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) and Contract 7 (NE/2014/03) and an ArshSD contract (Contract SS C505).

ES03 In the Reporting Period, environmental monitoring activities under the EM&A programme in the Reporting Period are summarized in the following table.

Environmental Aspect	Environmental Monitoring Parameters / Inspection	Reporting Period	
		Number of Monitoring Locations to undertake	Total Occasions
Air Quality	1-hour TSP	7 (#)	117
	24-hour TSP	7 (#)	39
Construction Noise	$L_{eq(30min)}$ Daytime	8 (~)	32
Water Quality	Water in-situ measurement and/or sampling	WM1 & WM1-C	13 Scheduled & 0 extra
		WM2A(a) & WM2A-Cx	13 Scheduled & 0 extra
		WM2B & WM2B-C	13 Scheduled & 0 extra (*)
		WM3x &WM3-C	13 Scheduled & 0 extra (*)
		WM4, WM4-CA &WM4-CB	13 Scheduled & 0 extra
Ecology	Woodland compensation i) General Health condition of planted species ii) Survival of planted species	9 Quadrats and transect	0
	Wetland compensation i) Site inspection	Contract 6	4
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	Contract 3	4
		Contract 6	4

Remark:
(*) Water sampling was unable to carry out at WM2B and WM2B-C in the Reporting Period due to shallow water. Besides, WM3-C was also unable to carry out in some of the monitoring days due to shallow water. (Water depth under 150mm).
(#) Number of air monitoring location changed to 7 since the partial termination proposal approved by EPD on 9 Jul 2020.
(~) Number of noise monitoring location changed to 8 since the partial termination proposal approved by EPD on 9 Jul 2020.

ACTION AND LIMIT (A/L) LEVELS EXCEEDANCE

ES04 In the Reporting Period, no exceedance was recorded for construction noise, air quality and water quality monitoring. The summary of exceedance in the Reporting Period is shown below.

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action			
				NOE Issued	Investigation Result	Project related exceedance	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--	--
	24-hour TSP	0	0	0	--	--	--

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action			
				NOE Issued	Investigation Result	Project related exceedance	Corrective Actions
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--	--
Water Quality	DO	0	0	0	--	--	--
	Turbidity	0	0	0	--		--
	SS	0	0	0			

ENVIRONMENTAL COMPLAINT

ES05 No environmental complaint was recorded in the Reporting Period.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES06 No environmental summons and prosecutions were recorded in the Reporting Period.

REPORTING CHANGE

ES07 No reporting change was recorded in the Reporting period.

SITE INSPECTION

ES08 In the Reporting Period, joint site inspection to evaluate the site environmental performance at ***Contract 3*** has been carried out by the RE, ET, IEC and the Contractor on **7, 14, 21 and 28 October 2020**. No non-compliance was noted during the site inspection.

ES09 In the Reporting Period, joint site inspection to evaluate the site environmental performance at ***Contract 6*** has been carried out by the RE, ET, IEC and the Contractor on **7, 14, 21 and 29 October 2020**. No non-compliance was noted during the site inspection.

FUTURE KEY ISSUES

ES10 In forthcoming dry season and in consideration of construction site under the Project are located adjacent to villages, the Contractors should fully implement air quality mitigation measures to reduce construction dust emission.

ES11 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.

ES12 Construction noise would be a key environmental issue during construction work of the Project. Noise mitigation measures such as using quiet plants should be implemented in accordance with the EM&A requirement.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Civil Engineering and Development Department is the Project Proponent and the Permit Holder of *Agreement No. CE 45/2008 (CE) Liantang / Heung Yuen Wai Boundary Control Point and Associated Works*, which is a Designated Project to be implemented under Environmental Permit number EP-404/2011/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. As part of the EM&A program, the baseline monitoring has carried out between **13 June 2013** and **12 July 2013** for all parameters including air quality, noise and water quality before construction work commencement. The Baseline Monitoring Report summarized the key findings and the rationale behind determining a set of Action and Limit Levels (A/L Levels) from the baseline data. Also, the Project baseline monitoring report which verified by the IEC has been submitted to EPD on **16 July 2013** for endorsement. The major construction works of the Project was commenced on **16 August 2013** in accordance with the EP Section 5.3 stipulation.

1.1.5 This is **87th** monthly EM&A report presenting the monitoring results and inspection findings for reporting period from **1** to **31 October 2020**.

1.2 REPORT STRUCTURE

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

Section 1 *Introduction*
Section 2 *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*

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 CONSTRUCTION CONTRACT PACKAGING

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

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

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

Contract 2 (CV/2012/08)

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

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

Contract 3 (CV/2012/09)

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

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

Contract 4 (NE/2014/02)

2.1.5 Contract 4 has awarded in mid-April 2016 and construction work was 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 has 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 has awarded in December 2015 and the construction works of Contract 7 was commenced on 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 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. Once the contractors are appointed, EPD, ET and IEC will be notified the details of the contractor.

2.2.8 The Contractor for Contracts under CEDD should report to the ER. For ArchSD Contract, the Contractor should report to the Architect or Architect's Representative (AR). 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)

2.2.9 Once the ET is appointed, the EPD, CEDD, ER, Architect and IEC will be notified the details of the ET.

2.2.10 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 Architect, the lEC and Contractor 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)

2.2.11 One IEC will be employed for this Project. Once the IEC is appointed, EPD, ER, the Architect and ET will be notified the details of the IEC.

2.2.12 The Independent Environmental Checker (IEC) should not be in any way an associated body of the Contractor 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 appointment of IEC should be subject to the approval of EPD. The IEC should:

- 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
- Verify the log-book(s) mentioned in Condition 2.2 of the EP, notify the Director by fax, within one working day of receipt of notification from the ET Leader of each and every occurrence, change of circumstances or non-compliance with the EIA Report and/or the EP, which might affect the monitoring or control of adverse environmental impacts from the Project
- 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, the Architect, ET, lEC and the Contractor 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 Following the partial commencement of the Project, apart from the construction work under Contract 3 and Contract 6, major construction work under Contract 2, Contract 4, Contract 7 and Contract SS C505 were substantially completed. The construction progresses of the project and remaining works are summarized in below. Moreover, 3-month rolling construction program for all the current contracts is enclosed in ***Appendix C***.

Contract 3 (CV/2012/09)

2.4.2 The Contract commenced in November 2013. In this Reporting Period, construction activities conducted are listed below:

- Road pavement works

Contract 6 (CV/2013/08)

2.4.3 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:

- Water Pipe Connection Work
- Road Construction
- Landscaping
- Implementation of Wetland

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 and 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 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 2013	Till Contract ends
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

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
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

3 SUMMARY OF IMPACT MONITORING REQUIREMENTS

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 D***. 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*** 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 E***.

3.3.2 Following the proposal for partial termination of the construction phase EM&A programme for Contract 2, 4, 7 and SSC505 approved by EPD on 9 July 2020. The corresponding air quality monitoring stations including AM1c and AM8 were ceased after last monitoring carried out on 7 July 2020 and 10 July 2020 respectively. Besides, the corresponding noise monitoring stations including NM1 and NM7 were ceased after last monitoring carried out on 7 July 2020 and 10 July 2020 respectively.

Table 3-2 Impact Monitoring Stations - Air Quality

Station ID	Description	Works Area	Related to the Work Contract
AM1c (*) ($)	Open area of Tsung Yuen Ha Village No. 63	BCP	SS C505 Contract 7
AM2	Village House near Lin Ma Hang Road	LMH to Frontier Closed Area	Contract 6
AM3	Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village.	LMH to Frontier Closed Area	Contract 6
AM4b^	House no. 10B1 Nga Yiu Ha Village	LMH to Frontier Closed Area	Contract 6
AM5a^	Ping Yeung Village House	Ping Yeung to Wo Keng Shan	Contract 6
AM6	Wo Keng Shan Village House	Ping Yeung to Wo Keng Shan	Contract 6
AM7b[@]	Loi Tung Village House	Sha Tau Kok Road	Contract 2 Contract 6
AM8 ($)	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).*
$ AM1c and AM8 were ceased after last monitoring carried out on 7 July 2020 and 10 July 2020 respectively according to Partial Termination Proposal approved by EPD on 9 July 2020.

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.
$ NM1 and NM7 were ceased after last monitoring carried out on 7 July 2020 and 10 July 2020

respectively according to Partial Termination Proposal approved by EPD on 9 July 2020.

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
		Easting	Northing		
WM1	Downstream of Kong Yiu Channel	833 679	845 421	Alternative location located at upstream 51m of the designated location	Contract 6
WM1-Control	Upstream of Kong Yiu Channel	834 185	845 917	NA	Contract 6
WM2A	Downstream of River Ganges	834 204	844 471	Alternative location located at upstream 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 6
WM3-Control	Upstream of River Indus	836 763	842 400	Alternative location located at downstream 26m of the designated location	Contract 6
WM4	Downstream of Ma Wat Channel	833 850	838 338	Alternative location located at upstream 11m of the designated location	Contract 3
WM4– Control A	Kau Lung Hang Stream	834 028	837 695	Alternative location located at downstream 28m of the designated location	Contract 3
WM4– Control B	Upstream of Ma Wat Channel	833760	837395	Alternative location located at upstream 15m of the designated location	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 (WM3x 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

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

3.4.1 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

3.4.2 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"), additional weekly impact monitoring for $L_{eq(5min)}$ measurement shall be employed during respective restricted hours periods.. Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.

Water Quality Monitoring

3.4.3 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-Hr 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*

** Instrument was used in the Reporting Period and the calibration certificate could be referred in Appendix F.*

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.

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	Rion NL-52*
Calibrator	Rion NC-73*
Portable Wind Speed Indicator	Testo Anemometer

** Instrument was used in the Reporting Period and the calibration certificate could be referred in Appendix F.*

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:

- a DO level in the range of 0-20 mg/l and 0-200% saturation; and
- a 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 PRO20 Handheld Dissolved Oxygen Instrument*/ YSI 550A Multifunctional Meter/ YSI Professional DSS
pH meter	YSI Professional Plus / AZ8685 pH pen-style meter*/ YSI 6820/ 650MDS/ YSI Professional DSS
Turbidimeter	Hach 2100Q*/ YSI 6820/ 650MDS/ YSI Professional DSS
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-liter plastic cool box with Ice pad

** Instrument was used in the Reporting Period and the calibration certificate could be referred in Appendix F.*

3.6 MONITORING METHODOLOGY

1-hour TSP Monitoring

3.6.1 The 1-hour TSP monitor was a brand named "Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter" which is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90^{o} 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 would be 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 will use as the monitoring parameter for the time period between 0700-1900 hours on weekdays; $Leq_{(5min)}$ measurements would be 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 is performed before and after the noise measurement.

Water Quality

3.6.9 Water quality monitoring is conducted at the designated or alternative locations. The sampling procedures 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 or tape measurement 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 If the water level of a monitoring station is too shallow when sampling, sediment would be disturbed which affecting the accuracy of water quality monitoring. In order to avoid disturbing sediment, depth limits should be set up for the water sampling for the ease of reference. When the measured water depth of the monitoring station (both control and impact stations) is lower than 150mm, water monitoring would not be to perform at that monitoring location. Instead, the monitoring location will be moved to a temporary alternative location monitoring location based on the criteria below:-

(a) the alternative location should be either upstream or downstream of the original location and at the same the river/drain channel
(b) the alternative location should be within 15m far from the original location
(c) 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.

3.6.12 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.

3.6.13 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.

3.6.14 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

3.6.15 YSI PRO20 Handheld Dissolved Oxygen Instrument is used for water in-situ measures, which automates the measurements and data logging of temperature, dissolved oxygen and dissolved oxygen saturation.

3.6.16 A portable AZ Model 8685 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.

3.6.17 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.

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

Laboratory Analysis

3.6.19 All water samples analyzed Suspended Solids (SS) will be carried out by a local HOKLAS-accredited testing laboratory (ALS Technichem (HK) Pty Ltd HOKLAS registration no. 66). SS determination using *APHA Standard Methods 2540D* as specified in the *EM&A Manual* will start 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 would be 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 attached in ***Appendix F***.

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 /m³)		Limit Level (μg/m³)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AM1c ($)	265	143	500	260
AM2	268	149		
AM3	269	145		
AM4b	267	148		
AM5a	268	143		
AM6	269	148		
AM7b	275	156		
AM8 ($)	269	144		
AM9b	271	151		

$ AM1c and AM8 were ceased after last monitoring carried out on 7 July 2020 and 10 July 2020 respectively according to Partial Termination Proposal approved by EPD on 9 July 2020.

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) and65 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.

$ NM1 and NM7 were ceased after last monitoring carried out on 7 July 2020 and 10 July 2020 respectively according to Partial Termination Proposal approved by EPD on 9 July 2020.

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 G.***

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 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 Proposal for partial termination of the construction phase EM&A programme for Contract 2, Contract 4, Contract 7 and Contract SS C505 was approved by EPD on 9 July 2020 (EPD's ref.: ( ) in Ax (3) to EP 2/N7/A/52 Pt.17). The corresponding air quality monitoring stations AM1c and AM8 ceased accordingly, while monitoring at other monitoring stations continued in the Reporting Period.

4.1.2 The air quality monitoring schedule is presented in ***Appendix H*** and the monitoring results are summarized in the following sub-sections.

4.2 AIR QUALITY MONITORING RESULTS

4.2.1 In the Reporting Period, a total of ***117*** events of 1-hour TSP and ***39*** events 24-hours TSP monitoring were carried out and the monitoring results are summarized in ***Tables 4-1 to 4-7***. The detailed 24-hour TSP monitoring data are presented in ***Appendix I*** and the relevant graphical plots are shown in ***Appendix J***.

Table 4-1 Summary of 24-hour and 1-hour TSP Monitoring Results – AM2

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
5-Oct-20	56	6-Oct-20	9:21	76	84	66
10-Oct-20	80	12-Oct-20	9:24	60	66	70
16-Oct-20	86	17-Oct-20	9:32	49	59	55
22-Oct-20	123	23-Oct-20	9:33	72	77	70
28-Oct-20	108	29-Oct-20	9:28	70	69	63
Average (Range)	**91 (56 – 123)**	Average (Range)		**67 (49 – 84)**		

Table 4-2 Summary of 24-hour and 1-hour TSP Monitoring Results – AM3

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
5-Oct-20	39	6-Oct-20	9:33	83	75	68
10-Oct-20	71	12-Oct-20	9:18	62	57	66
16-Oct-20	75	17-Oct-20	9:41	51	58	52
22-Oct-20	101	23-Oct-20	9:23	79	78	72
28-Oct-20	87	29-Oct-20	9:16	73	67	70
Average (Range)	**75 (39 – 101)**	Average (Range)		**67 (51 – 83)**		

Table 4-3 Summary of 24-hour and 1-hour TSP Monitoring Results – AM4b

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
3-Oct-20	69	5-Oct-20	11:00	58	55	52
8-Oct-20	25	9-Oct-20	9:24	57	60	52
13-Oct-20	119	14-Oct-20	9:23	65	67	66
19-Oct-20	136	20-Oct-20	9:14	68	73	62
23-Oct-20	118	24-Oct-20	9:13	69	63	67
29-Oct-20	117	30-Oct-20	9:41	61	65	58

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
Average (Range)	**97 (25 – 136)**	Average (Range)		**62 (52 – 73)**		

Table 4-4 Summary of 24-hour and 1-hour TSP Monitoring Results – AM5a

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
3-Oct-20	38	5-Oct-20	11:05	52	49	50
8-Oct-20	97	9-Oct-20	9:18	60	63	58
13-Oct-20	88	14-Oct-20	9:39	65	66	63
19-Oct-20	134	20-Oct-20	13:07	74	66	70
23-Oct-20	56	24-Oct-20	9:38	63	72	68
29-Oct-20	67	30-Oct-20	9::36	56	63	59
Average (Range)	**80 (38 – 134)**	Average (Range)		**62 (49 – 74)**		

Table 4-5 Summary of 24-hour and 1-hour TSP Monitoring Results – AM6

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
3-Oct-20	35	5-Oct-20	11:15	51	55	54
8-Oct-20	17	9-Oct-20	13:19	66	69	72
13-Oct-20	77	14-Oct-20	9:48	69	66	63
19-Oct-20	104	20-Oct-20	9:38	71	63	67
23-Oct-20	98	24-Oct-20	13:27	65	71	67
29-Oct-20	64	30-Oct-20	9:30	67	68	65
Average (Range)	**66 (17 – 104)**	Average (Range)		**65 (51 – 72)**		

Table 4-6 Summary of 24-hour and 1-hour TSP Monitoring Results – AM7b

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
3-Oct-20	34	5-Oct-20	11:28	59	58	65
8-Oct-20	44	9-Oct-20	13:49	69	76	79
13-Oct-20	24	14-Oct-20	13:38	66	67	68
19-Oct-20	56	20-Oct-20	14:08	60	65	58
23-Oct-20	45	24-Oct-20	12:52	66	68	72
29-Oct-20	66	30-Oct-20	9:24	61	64	60
Average (Range)	**45 (24 – 66)**	Average (Range)		**66 (58– 79)**		

Table 4-7 Summary of 24-hour and 1-hour TSP Monitoring Results – AM9b

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
5-Oct-20	10	6-Oct-20	13:04	71	67	60
10-Oct-20	56	12-Oct-20	13:36	53	58	50
16-Oct-20	81	17-Oct-20	14:07	67	71	75

22-Oct-20	60	23-Oct-20	14:14	69	72	67
28-Oct-20	79	28-Oct-20	14:30	69	67	65
Average (Range)	**57 (10 – 81)**	Average (Range)		**65 (50 – 75)**		

4.2.2 As shown in ***Tables 4-1 to 4-7***, all the 1-hour and 24-hour TSP monitoring results were below the Action/Limit Levels. No Notification of Exceedance (NOE) was issued in this Reporting Period.

4.2.3 The meteorological data during the impact monitoring days are summarized in ***Appendix K***.

5 CONSTRUCTION NOISE MONITORING

5.1 GENERAL

5.1.1 Proposal for partial termination of the construction phase EM&A programme for Contract 2, Contract 4, Contract 7 and Contract SS C505 was approved by EPD on 9 July 2020 (EPD's ref.: ( ) in Ax (3) to EP 2/N7/A/52 Pt.17). The corresponding noise quality monitoring stations NM1 and NM7 ceased accordingly, while monitoring at other monitoring stations in the Reporting Period.

5.1.2 The noise monitoring schedule is presented in ***Appendix H*** and the monitoring results are summarized in the following sub-sections.

5.2 NOISE MONITORING RESULTS

5.2.1 In the Reporting Period, a total of **32** events noise measurements were carried out at the designated locations. The sound level meter was set in 1m from the exterior of the building façade including noise monitoring locations NM3, NM4, NM5, NM6, NM8 and NM9. Therefore, no façade correction (+3 dB(A)) is added according to acoustical principles and EPD guidelines. However, free-field status were performed at NM2a and NM10 and façade correction (+3 dB(A)) has added according to the requirement in this month. The noise monitoring results at the designated locations are summarized in ***Tables 5-1 and 5-2.*** The detailed noise monitoring data are presented in ***Appendix I*** and the relevant graphical plots are shown in ***Appendix J***.

Table 5-1 Summary of Construction Noise Monitoring Results

Construction Noise Level ($L_{eq30min}$), dB(A)				
Date	**NM2a(*)**	**NM8**	**NM9**	**NM10(*)**
6-Oct-20	64	61	59	60
12-Oct-20	62	59	58	61
23-Oct-20	62	58	62	59
29-Oct-20	58	60	62	59
Limit Level	**75 dB(A)**			

Remarks

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

Table 5-2 Summary of Construction Noise Monitoring Results

Construction Noise Level ($L_{eq30min}$), dB(A)				
Date	**NM3**	**NM4**	**NM5**	**NM6**
5-Oct-20	55	63	55	57
14-Oct-20	55	61	56	59
20-Oct-20	56	58	53	57
30-Oct-20	59	66	55	58
Limit Level	**75 dB(A)**			

5.2.2 As shown in ***Tables 5-1 and 5-2***, no construction noise measurement results that exceeded the Limit Level were recorded. Moreover, no valid noise complaint (which triggered Action Level exceedance) was recorded in the Reporting Period.

6 WATER QUALITY MONITORING

6.1 GENERAL

6.1.1 In the Reporting Period, construction works under the project has been commenced in Contracts 3, and 6 and water quality monitoring was performed at all designated locations. The water quality monitoring schedule is presented in ***Appendix H***. The monitoring results are summarized in the following sub-sections.

6.2 RESULTS OF WATER QUALITY MONITORING

6.2.1 In the Reporting Period, a total of **thirteen (13)** sampling days were scheduled to carry out for all designated locations with their control stations.

6.2.2 The key monitoring parameters including Dissolved Oxygen, Turbidity and Suspended Solids are summarized in ***Tables 6-1 to 6-4***. Breaches of water quality monitoring criteria are shown in ***Table 6-5***. Detailed monitoring database including in-situ measurements and laboratory analysis data are shown in ***Appendix I*** and the relevant graphical plot are shown in ***Appendix J***.

Table 6-1 Water Quality Monitoring Results Associated Contracts 3

Date	Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
	WM4	WM4-CA	WM4-CB	WM4	WM4-CA	WM4-CB	WM4	WM4-CA	WM4-CB
3-Oct-20	6.9	6.2	8.1	17.6	5.9	15.1	15.5	5.0	14.0
5-Oct-20	6.9	6.1	8.1	18.5	5.6	15.2	14.0	5.5	13.5
7-Oct-20	6.9	4.9	8.5	3.7	0.8	5.8	4.0	<2	7.0
9-Oct-20	7.4	4.5	10.4	4.2	2.5	4.9	3.0	<2	4.5
12-Oct-20	5.9	6.7	7.1	2.0	0.6	2.1	3.0	<2	8.0
14-Oct-20	6.7	6.2	7.6	2.4	0.5	5.9	4.0	<2	6.0
16-Oct-20	6.6	6.6	6.7	2.6	0.6	3.9	4.0	<2	20.0
19-Oct-20	5.6	6.6	6.7	3.1	1.0	3.1	5.5	<2	6.0
21-Oct-20	6.1	4.5	8.2	4.1	1.1	5.0	4.0	<2	4.5
23-Oct-20	6.0	4.7	7.9	3.9	1.0	4.9	4.0	<2	7.5
27-Oct-20	5.5	5.0	7.2	3.9	1.2	6.6	3.5	<2	8.5
29-Oct-20	5.6	5.0	6.4	2.8	1.0	5.7	4.0	<2	8.0
31-Oct-20	5.7	5.1	7.9	3.6	1.7	6.3	3.5	3.5	6.0

Table 6-2 Water Quality Monitoring Results Associated Contracts 6

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-C	WM1	WM1-C	WM1	WM1-C
3-Oct-20	6.9	6.8	343.5	289.0	213.5	185.0
5-Oct-20	7.0	6.8	350.5	296.5	233.0	219.0
7-Oct-20	9.3	9.5	41.8	8.6	49.0	4.0
9-Oct-20	8.1	8.3	37.1	12.4	51.0	4.0
12-Oct-20	7.7	8.4	24.9	7.1	3.0	26.5
14-Oct-20	7.8	7.4	20.6	9.1	19.5	5.0
16-Oct-20	7.6	7.7	18.5	8.1	24.5	4.5
19-Oct-20	7.9	7.7	16.1	8.0	16.0	3.0
21-Oct-20	9.6	9.0	15.8	6.9	21.0	2.5
23-Oct-20	9.7	7.8	11.4	4.7	9.5	<2
27-Oct-20	8.6	7.4	16.3	6.3	21.0	3.5
29-Oct-20	9.3	8.7	14.0	3.7	15.5	<2
31-Oct-20	10.9	9.0	20.4	7.9	27.5	2.0

Table 6-3 Water Quality Monitoring Results Associated Contract 6

Date	Dissolved Oxygen (mg/L)				Turbidity (NTU)				Suspended Solids (mg/L)			
	WM2A(a)	WM2A- Cx	WM2B	WM2B- C	WM2A(a)	WM2A- Cx	WM2B	WM2B- C	WM2A(a)	WM2A- Cx	WM2B	WM2B-C
3-Oct-20	8.8	7.9	*	*	46.4	39.9	*	*	21.5	18.5	*	*
5-Oct-20	8.8	7.9	*	*	48.1	40.7	*	*	24.5	21.5	*	*
7-Oct-20	6.8	7.3	*	*	4.1	9.2	*	*	<2	4.0	*	*
9-Oct-20	7.2	8.5	*	*	5.3	3.9	*	*	<2	<2	*	*
12-Oct-20	7.0	7.8	*	*	5.0	4.2	*	*	2.0	<2	*	*
14-Oct-20	6.6	7.9	*	*	5.1	3.6	*	*	2.0	<2	*	*
16-Oct-20	6.9	8.0	*	*	4.1	3.9	*	*	2.0	<2	*	*
19-Oct-20	6.9	8.3	*	*	4.5	4.4	*	*	<2	<2	*	*
21-Oct-20	6.4	7.0	*	*	5.5	4.2	*	*	2.0	<2	*	*
23-Oct-20	6.1	6.8	*	*	4.2	4.0	*	*	<2	<2	*	*
27-Oct-20	31.2	6.1	*	*	4.3	4.5	*	*	<2	<2	*	*
29-Oct-20	5.6	6.3	*	*	17.3	5.3	*	*	10.5	<2	*	*
31-Oct-20	5.6	6.6	*	*	4.6	4.9	*	*	<2	<2	*	*

*Remarks: * water sampling was unable to carry out at WM2B and WM2B-C due to shallow water (water depth under 150mm)*

Table 6-4 Water Quality Monitoring Results Associated Contracts 6

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM3x	WM3-C	WM3x	WM3-C	WM3x	WM3-C
3-Oct-20	6.6	7.6	31.8	53.9	20.5	37.0
5-Oct-20	6.6	7.5	33.2	54.6	21.5	30.5
7-Oct-20	6.7	6.6	4.8	7.2	3.5	2.0
9-Oct-20	7.0	6.6	4.7	8.4	4.5	5.0
12-Oct-20	7.3	6.9	6.6	5.2	9.0	4.0
14-Oct-20	7.4	7.6	3.8	5.6	4.0	3.0
16-Oct-20	7.2	6.8	4.6	4.5	5.0	4.0
19-Oct-20	7.4	6.7	4.3	3.6	4.5	<2
21-Oct-20	6.4	5.5	7.3	3.2	11.5	2.0
23-Oct-20	6.5	*	4.0	*	6.0	*
27-Oct-20	6.1	*	4.8	*	5.5	*
29-Oct-20	6.0	*	9.8	*	9.5	*
31-Oct-20	6.2	*	3.4	*	3.0	*

*Remarks: * water sampling was unable to carry out at WM3-C due to shallow water (water depth under 150mm)*

Table 6-5 Action and Limit (A/L) Levels Exceedance Recorded

Location	Dissolved Oxygen		Turbidity		Suspended Solids		Total Exceedance		Project Related exceedance	
	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL
WM1	0	0	0	0	0	0	0	0	0	0
WM2A(a)	0	0	0	0	0	0	0	0	0	0
WM2B	0	0	0	0	0	0	0	0	0	0
WM3x	0	0	0	0	0	0	0	0	0	0
WM4	0	0	0	0	0	0	0	0	0	0
No of Exceedance	0	0	0	0	0	0	0	0	0	0

6.2.3 In this Reporting Period, no exceedance was recorded for water quality monitoring. No corrective measure was therefore required.

7 ECOLOGY MONITORING

7.1 MONITORING ON WOODLAND COMPENSATION

7.1.1 According to the approved Woodland Compensation Plan (WCP), ecological monitoring for woodland compensation shall be conducted at bi-monthly interval for the first year and the monitoring frequency would be reduced to quarterly from the second year.

7.1.2 As Stage 2 of the enhancement planting work was undertaken in August 2019 has covered all of the 9 monitoring quadrats, the monitoring frequency should have increased from quarterly to bi-monthly interval for the first year of enhancement planting.

7.1.3 The bi-monthly ecological monitoring for period of July 2020 to August 2020 had carried out on 24th and 31st August 2020 by transects inspection and quadrat monitoring. The bi-monthly Ecological Monitoring Report was verified by IEC on 17 September2020 and it has been submitted as a stand-alone copy to supplement the EM&A Report on 17 September 2020.

7.2 MONITORING ON WETLAND COMPENSATION

7.2.1 According to the approved Habitat Creation and Management Plan (HCMP), the proposed Wetland Compensation Area (WCA) near the Ping Yeung Interchange adjacent to the section of Ping Yuen River was adopted. Ecological monitoring at implementation and establishment periods of WCA will be conducted to cover the ecological attributes. Implementation of the wetland will commence within the construction phase after completion of the construction works at Ping Yeung Section. Monitoring on the WCA will be conducted in implementation and establishment stages.

7.2.2 As discussed among CEDD, AEOCM and Contractor of Contract 6 in the SSEMC in October 2020, establishment stage for the wetland was commenced on 1 October 2020 for one year after completion of construction of the wetland.

7.2.3 In the Reporting Period, wetland monitoring was conducted on 28 and 29 October 2020. The monthly monitoring report for the WCA will be submitted as a stand-alone copy to supplement the EM&A Report after verified by IEC.

8 WASTE MANAGEMENT

8.1 GENERAL WASTE MANAGEMENT

8.1.1 Waste management was carried out in accordance with the Waste Management Plan (WMP) for contract 3 and 6.

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; and
- Excavated Soil.

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

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

Type of Waste	Contract 3		Contract 6		Total Qty.
	Quantity	Disposal location	Quantity	Disposal location	
C&D Materials (Inert) (in '000m^3)	0	--	**0.321**	--	**0.321**
Reused in this Contract (Inert) (in '000 m^3)	0	--	0	--	0
Reused in other Contracts/ Projects (Inert) (in '000 m^3)	0	--	0	--	0
Disposal as Public Fill (Inert) (in '000 m^3)	0	--	**0.321**	**Tuen Mun 38**	**0.321**

Table 8-2 Summary of Quantities of C&D Wastes for the Project

Type of Waste	Contract 3		Contract 6		Total Qty.
	Quantity	Disposal location	Quantity	Disposal location	
Recycled Metal ('000kg) #	0	--	0	--	0
Recycled Paper / Cardboard Packing ('000kg) #	0	--	0	--	0
Recycled Plastic ('000kg) #	0	--	0	--	0
Chemical Wastes ('000kg) #	0	--	0	--	0
General Refuses ('000m^3)	0	--	**0.187**	**NENT**	**0.187**

Remark #: Unit of recycled metal, recycled paper/ cardboard packing and recycled plastic under Contract 3 was in ('000m^3) while the unit of chemical wastes for Contract 3 was in ('m^3).

9 SITE INSPECTION

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.

9.1.2 Proposal for partial termination of the construction phase EM&A programme for Contract 2, Contract 4, Contract 7 and Contract SS C505 was approved by EPD on 9 July 2020 (EPD's ref.: ( ) in Ax (3) to EP 2/N7/A/52 Pt.17). The ET's site inspection and audit for corresponding Contract 2, 4, 7 and SS C505 were ceased after last site inspection undertaken on 10 July 2020.

9.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

Contract 3

9.2.1 In the Reporting Period, joint site inspection for Contract 3 to evaluate the site environmental performance has been carried out by the RE, ET, IEC and the Contractor on **7, 14, 21 and 28 October 2020**. No non-compliance was noted.

9.2.2 The findings / deficiencies of ***Contract 3*** that observed during the weekly site inspection are listed in ***Table 9-1***.

Table 9-1 Site Observations for Contract 3

Date	Findings / Deficiencies	Follow-Up Status
7 October 2020	• No adverse environmental issue was observed.	• NA
14 October 2020	• No adverse environmental issue was observed.	• NA
21 October 2020	• No adverse environmental issue was observed.	• NA
28 October 2020	• No adverse environmental issue was observed.	• NA

Contract 6

9.2.3 In the Reporting Period, joint site inspection for Contract 6 to evaluate the site environmental performance has been carried out by the RE, ET, IEC and the Contractor on **7, 14, 21 and 29 October 2020**. No non-compliance was noted.

9.2.4 The findings / deficiencies of ***Contract 6*** that observed during the weekly site inspection are listed in ***Table 9-2***.

Table 9-2 Site Observations for Contract 6

Date	Findings / Deficiencies	Follow-Up Status
7 October 2020	• No adverse environmental issue was observed.	• NA
14 October 2020	• No adverse environmental issue was observed.	• NA
21 October 2020	• No adverse environmental issue was observed.	• NA
29 October 2020	• No adverse environmental issue was observed.	• NA

9.2.5 General housekeeping such as daily site tidiness and cleanliness should be maintained for all Contracts. Furthermore, the Contractors were reminded to implement Waste Management Plan of the Project.

10 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

10.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTIONS

10.1.1 In the Reporting Period, no environmental complaint was recorded.

10.1.2 No summons and prosecution under the EM&A Programme was lodged for all Contracts.

10.1.3 The statistical summary of environmental complaint is presented in ***Tables 10-1, 10-2*** and ***10-3***.

Table 10-1 Statistical Summary of Environmental Complaints

Reporting Period	Contract No	Environmental Complaint Statistics			Project related complaint
		Frequency	Cumulative	Complaint Nature	
19 May 2014 – 30 September 2020	Contract 2	0	**38**	• **(19)Water Quality** • **(10) Dust** • **(6) Noise** • **(1) dust & noise** • **(1) waste management** • **(1) Water quality and dust**	**(7) water quality** **(3) dust** **(1) noise**
06 Nov 2013 – 30 September 2020	Contract 3	0	**10**	• **(3) Dust** • **(3) Water quality** • **(2) Noise** • **(2) site cleanliness (dust & water quality)**	**(1) site cleanliness (dust & water quality)**
16 Aug 2013 – 30 September 2020	Contract 4	0	0	NA	NA
16 Aug 2013 – 30 September 20200	Contract 6	0	**46**	• **(24) Water Quality** • **(12) Dust** • **(3) Noise** • **(1) Nuisance** • **(2) 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**
15 Feb 2016 – 30 September 2020	Contract 7	0	**4**	• **(1) Noise** • **(3) Water quality and dust**	**(1) water quality and dust**
16 Aug 2013 – 30 September 2020	SS C505	0	**8**	• **(1) Noise** • **(2) dust** • **(3) Water quality and dust** • **(2) Water quality**	**(1) water quality and dust**
1 – 31 October 2020	Contract 3	0	**10**	• **(3) Dust** • **(3) Water quality** • **(2) Noise** • **(2) site cleanliness (dust & water quality)**	NA
	Contract 6	0	**46**	• **(24) Water Quality** • **(12) Dust** • **(3) Noise** • **(1) Nuisance** • **(2) Noise and dust** • **(3) Water quality and dust** • **(1) Water quality and noise**	NA

Table 10-2 Statistical Summary of Environmental Summons

Reporting Period	Contract No	Environmental Summons Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 – 30 September 2020	Contract 2	0	**1**	contravening the Water Pollution Control (General) Regulations
06 Nov 2013 – 30 September 2020	Contract 3	0	0	NA
16 Aug 2013 – 30 September 2020	Contract 5	0	0	NA
16 Aug 2013 – 30 September 20200	Contract 6	0	0	NA
15 Feb 2016 – 30 September 2020	Contract 7	0	0	NA
16 Aug 2013 – 30 September 2020	SS C505	0	0	NA
1 – 31 October 2020	Contract 3	0	0	NA
	Contract 6	0	0	NA

Table 10-3 Statistical Summary of Environmental Prosecutions

Reporting Period	Contract No	Environmental Prosecutions Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 – 30 September 2020	Contract 2	0	**1**	contravening the Water Pollution Control (General) Regulations
06 Nov 2013 – 30 September 2020	Contract 3	0	0	NA
16 Aug 2013 – 30 September 2020	Contract 5	0	0	NA
16 Aug 2013 – 30 September 20200	Contract 6	0	0	NA
15 Feb 2016 – 30 September 2020	Contract 7	0	0	NA
16 Aug 2013 – 30 September 2020	SS C505	0	0	NA
1 – 31 October 2020	Contract 3	0	0	NA
	Contract 6	0	0	NA

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 M.***

Implementation of Mitigation Measures during Construction Phase

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 3 and 6 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 wastewater treatment facilities i.e. sedimentation tank or similar facility before 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.

Implementation of Mitigation Measures during Operation Phase

11.1.3 The Heung Yuen Wai (HYW) Highway and connecting roads under the Project was opened on 26 May 2019. Since partial commencement of operation is the same as the commencement of operation for the entire project from EIAO perspective. All relevant requirements as stipulated in the EP and the approved EIA report (including the EM&A Manual) for the commencement of operation of the Project shall be strictly complied with.

11.1.4 In general, the recommended mitigation measures for operation stage of HYW Highway and connecting roads under the Project have been implemented. The implementation status of mitigation measures for operation phase in the Reporting Period are summarized in ***Appendix N***.

11.1.5 For more details about the implementation status of mitigation measures for operation phase with photo illustration, an Environmental Monitoring and Audit report on the implementation of the mitigation measures for operation stage of the Project will be disposed to EPD not later than three months after the commencement of operation of the Project under EP-404/2011/D condition 5.5. The abovementioned report was submitted to EPD on 23 August 2019.

11.1.6 As BCP was partially opened on 26 August 2020, a supplement operation phase EM&A report covering the operation of the BCP will be submitted to EPD in accordance with the

EP-404/2011/D condition 5.5 separately.

11.1.7 Pursuant to EM&A Manual Section 10.2, the implementation of landscape mitigation measures during establishment period shall be audited by a qualified landscape architect. Site inspection for establishment period was commenced in August 2019 and competed in July 2020 respectively. The relevant checklists were included in the corresponding EM&A Reports.

11.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

11.2.1 The construction works under Contract 2, 4, 5 7 and SS C505 was substantially completed. Construction activities for other Contracts in the coming month are listed below:

Contract 3

- Road pavement works

Contract 6

- Water Pipe Connection Work
- Road Construction
- Landscaping
- Landscaping works for the proposed Wetland

11.3 KEY ISSUES FOR THE COMING MONTH

11.3.1 Key issues to be considered in the coming month for Contracts 3 and 6 include:

- Implementation of control measures for rainstorm;
- Regular clearance of stagnant water during wet season;
- Implementation of dust suppression measures at all times;
- Potential wastewater quality impact due to surface runoff;
- Potential fugitive dust quality impact due from the dry/loose/exposure soil surface/dusty material;
- Disposal of empty engine oil containers within site area;
- Ensure dust suppression measures are implemented properly;
- Sediment catch-pits and silt removal facilities should be regularly maintained;
- Management of chemical wastes;
- Discharge of site effluent to the nearby wetland, stockpiling or disposal of materials, and any dredging or construction area at this area are prohibited;
- Follow-up of improvement on general waste management issues; and
- Implementation of construction noise preventative control measures

11.3.2 The Heung Yuen Wai (HYW) Highway and connecting roads under the Project was opened on 26 May 2019 and the BCP was partially opened on 26 August 2020. All relevant requirements as stipulated in the EP and the approved EIA report (including the EM&A Manual) for the commencement of operation of the Project shall be strictly complied with.

11.3.3 The contractors should pay special attention on water quality mitigation measures and fully implement according to the ISEMM of the EM&A Manual, in particular to prevent muddy water or other water pollutants from site surface overflow to public area should be properly maintained. The statuses of implemented water quality mitigation measures for the project are shown in ***Appendix O***.

12 CONCLUSIONS AND RECOMMENDATIONS

12.1 CONCLUSIONS

12.1.1 This is the **87th** monthly EM&A report presenting the monitoring results and inspection findings for the Reporting Period from **1** to **31 October 2020**.

12.1.2 For air quality monitoring, no 1-hour TSP and 24-hour TSP monitoring results triggered the Action /Limit Level was recorded in the Reporting Period.

12.1.3 In the Reporting Period, no construction noise measurement results that exceeded the Limit Level were recorded. Moreover, no valid noise complaint (which triggered an Action Level) exceedance was recorded.

12.1.4 In the Reporting Period, no exceedance was recorded for water quality monitoring.

12.1.5 Site inspection for the construction of WCA was conducted by ET as part of the weekly inspection of Contract 6 on **7, 14, 21 and 29 October 2020.** It was observed that landscaping was carried out in the WCA. There was no non-compliance observed during the site inspection. The forthcoming remaining activities would be landscaping in the WCA.

12.1.6 During the Reporting Period, weekly joint site inspection by the RE, ET and IEC with the relevant Main-contractor were carried out for Contracts 3 and 6 in accordance with the EM&A Manual stipulation. No non-compliance observed during the site inspection.

12.1.7 In this Reporting Period, no environmental complaints was received. Moreover, no summons and prosecution under the EM&A Programme was lodged in the Reporting Period.

12.2 RECOMMENDATIONS

12.2.1 In forthcoming dry season and in consideration of construction site under the Project are located adjacent to villages, the Contractors should fully implement air quality mitigation measures to reduce construction dust emission.

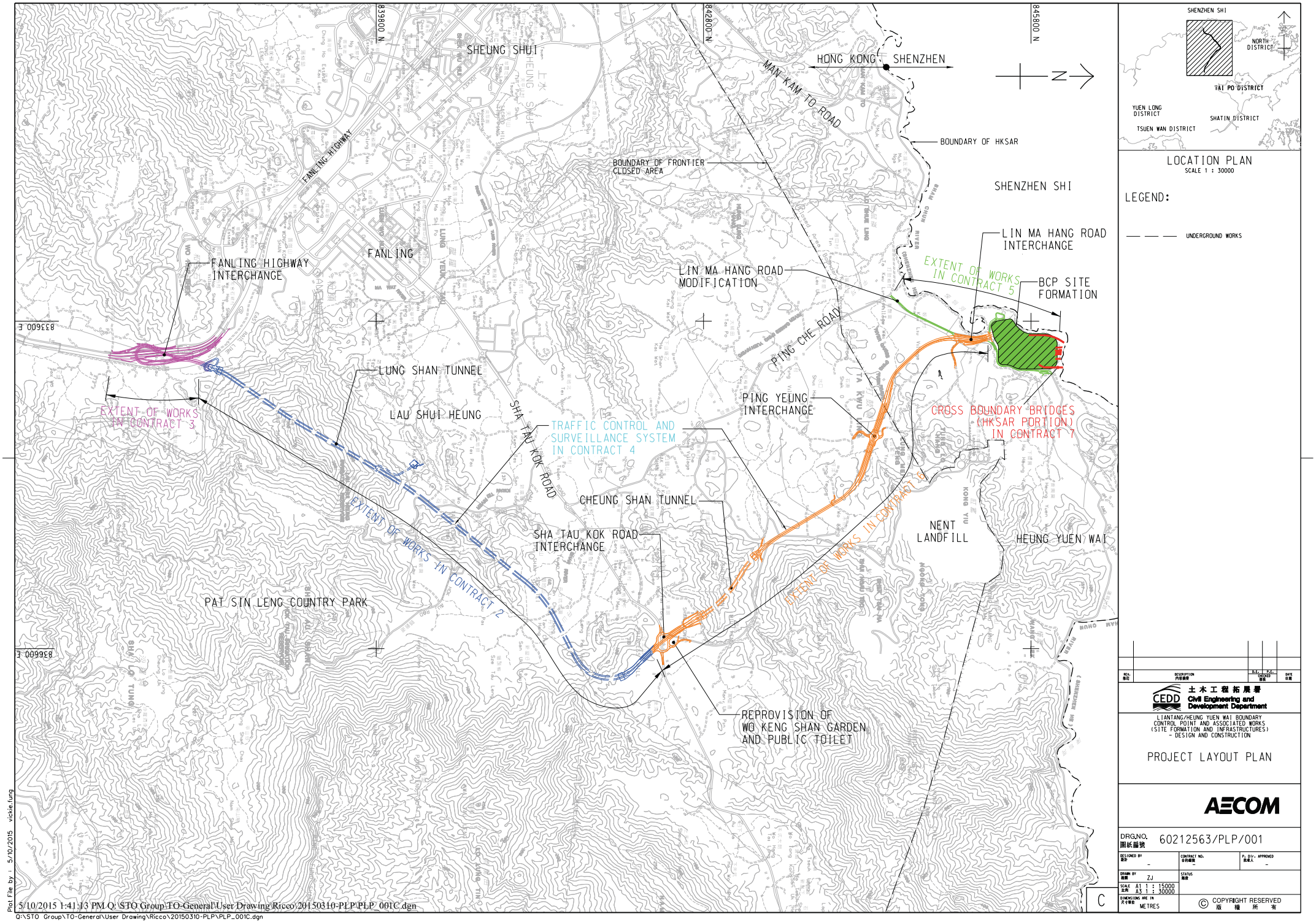
12.2.2 In addition, all effluent discharge shall be ensure to fulfill Technical Memorandum of Effluent Discharged into Drainage and Sewerage Systems, inland and Coastal Waters criteria or discharge permits stipulation.

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

12.2.4 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
C				

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	

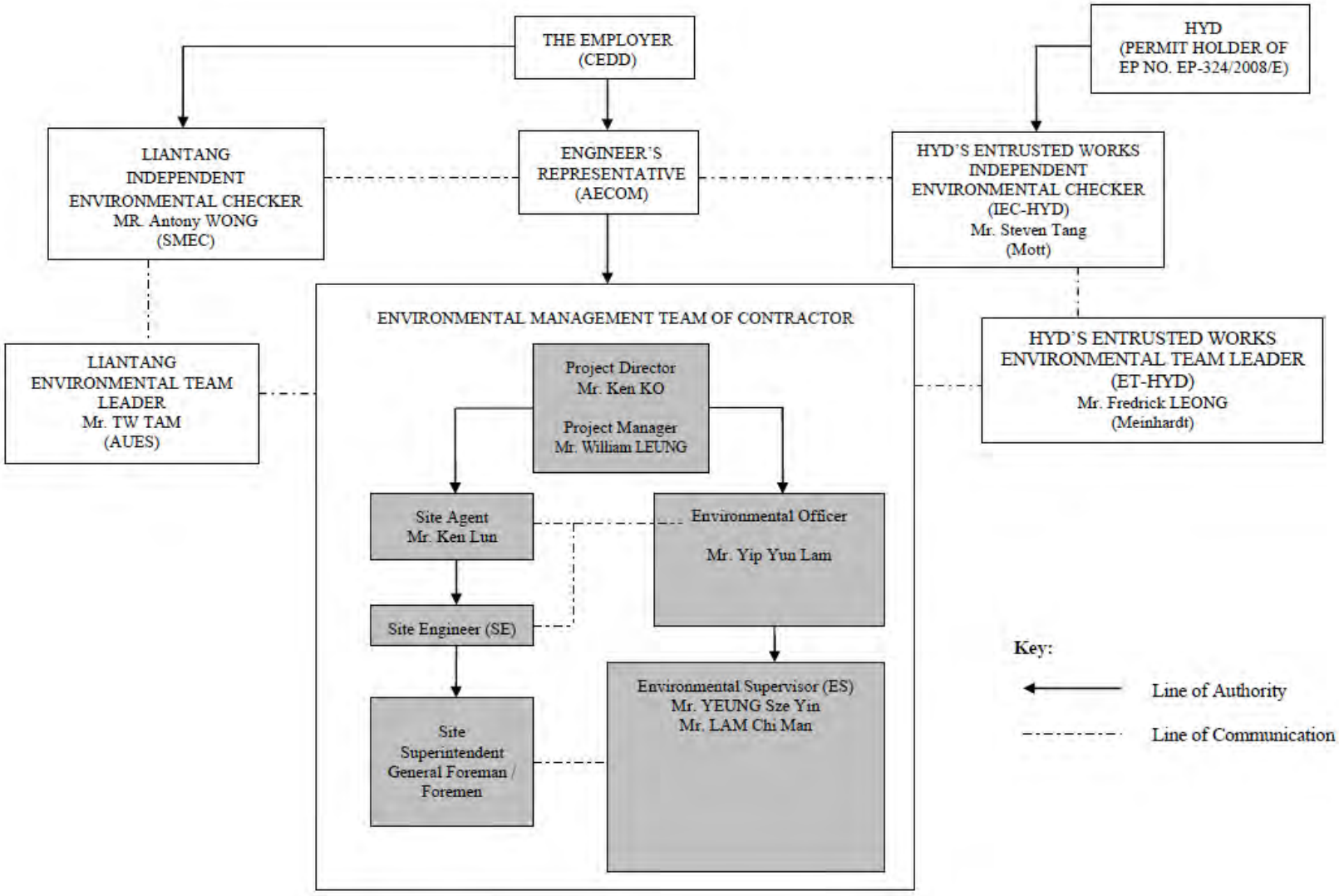
Plot File by : 5/10/2015 vickie.fung

5/10/2015 1:41:13 PM Q:\STO Group\TO-General\User Drawing\Ricco\20150310-PLP\PLP_001C.dgn

Q:\STO Group\TO-General\User Drawing\Ricco\20150310-PLP\PLP_001C.dgn

Appendix B

Organization Chart



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	Ken Lun	2638 6144	2638 7077
Chun Wo	Environmental Officer	Yip Yun Lam	2638 6151	2638 7077
Chun Wo	Environmental Supervisor	YEUNG Sze yin	2638 6125	2638 7077
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

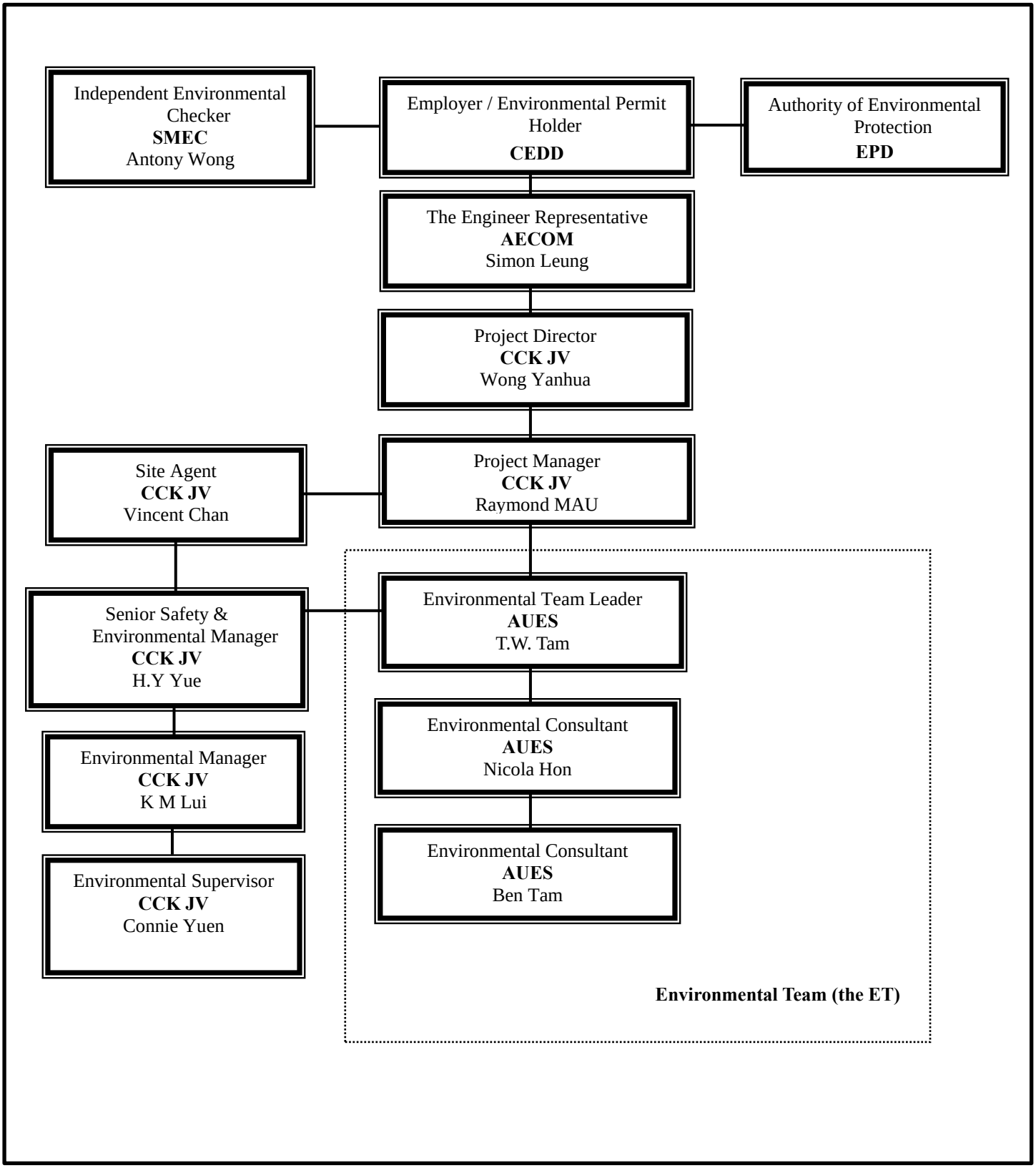
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

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

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization – 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	Owen Ng	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	--
AUES	Environmental Team Leader	TW Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079

Legend:

CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

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

SMEC (IEC) – SMEC Asia Limited

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

Appendix C

3-month rolling construction program

Contract 3

Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
CEDD Contract No: CV/2012/09
Main Contractor: Chun Wo Construction Ltd

俊和建築工程有限公司
CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.

Tentative Three Months (Oct, Nov and Dec 2020) Construction Rolling Programme

Item	Construction Activites
1	Road pavement works

Contract 6

Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
CEDD Contract No: CV/2013/08
Main Contractor: CRBE-CEC-Kaden Joint Venture

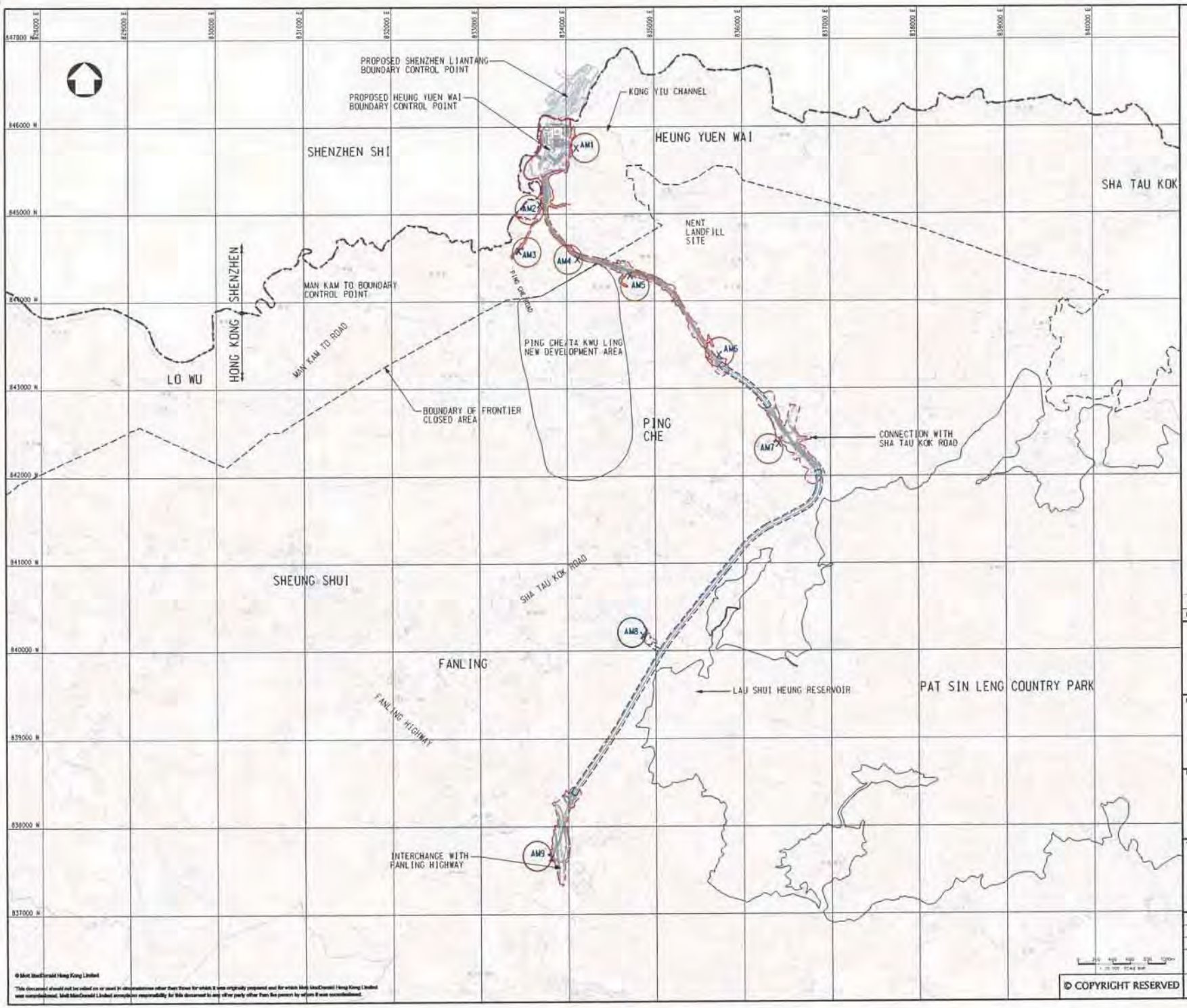
CRBC-CEC-KADEN Joint Venture

Tentative Three Months (Oct, Nov&Dec 2020) Construction Rolling Progam

Item	Construction Activites
1	Water Pipe Connection Work
2	Road Construction
3	Landscaping
4	Implementation of Wetland

Appendix D

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

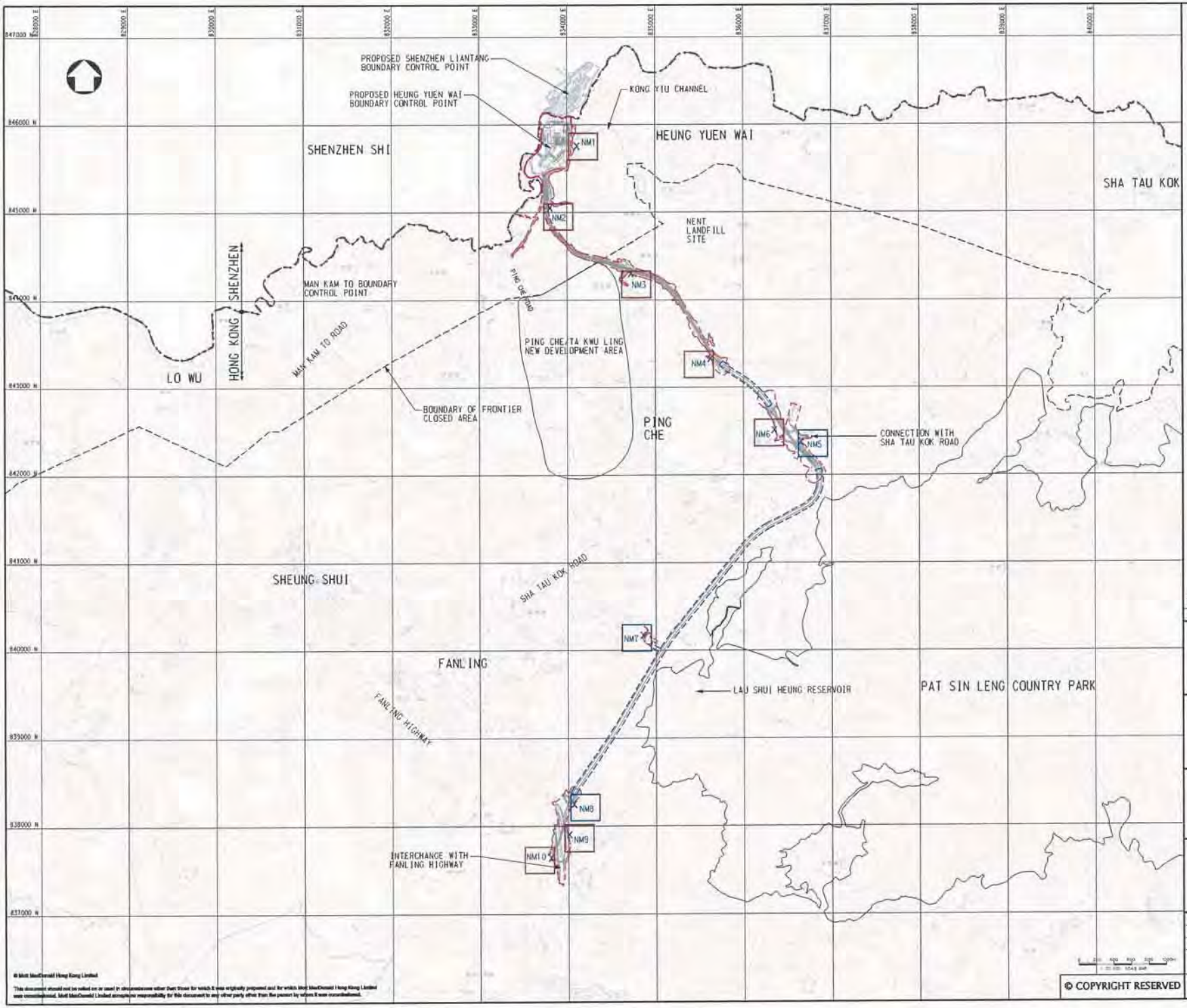
Project: AGREEMENT NO. CE45/2008(CE) LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title: PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

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

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

Drawing No: FIGURE 2.1 | Rev: P1



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

Mott MacDonald

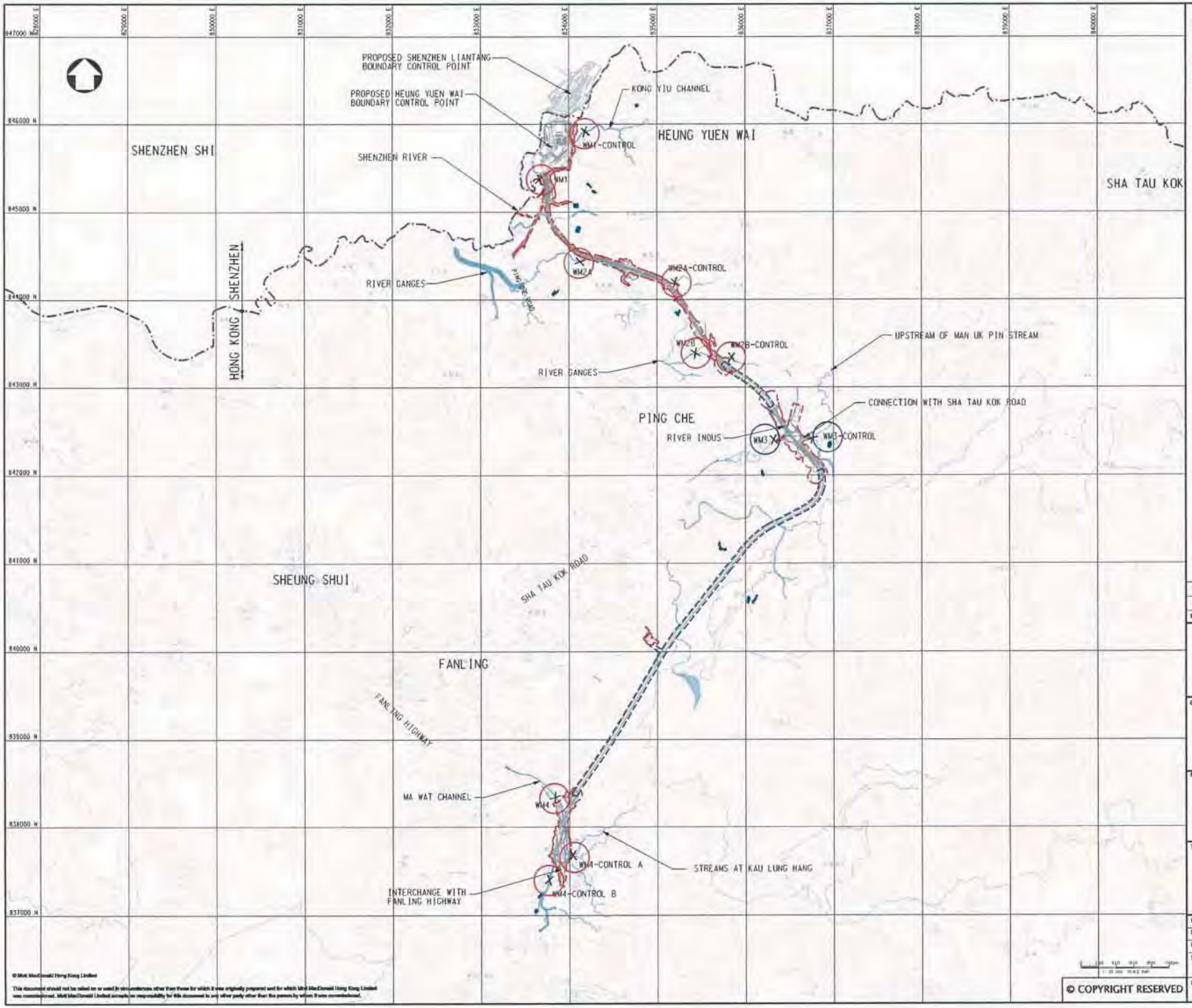
Client: CEDD — CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

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

Title: PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

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

Scale at A1: 1:20000 | Project: 255228 | 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

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	NOV 10	WING	GENERAL REVISION	HC	HT
P1	OCT 10	WING	FIRST ISSUE	HC	HT

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Client: CEDD — CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

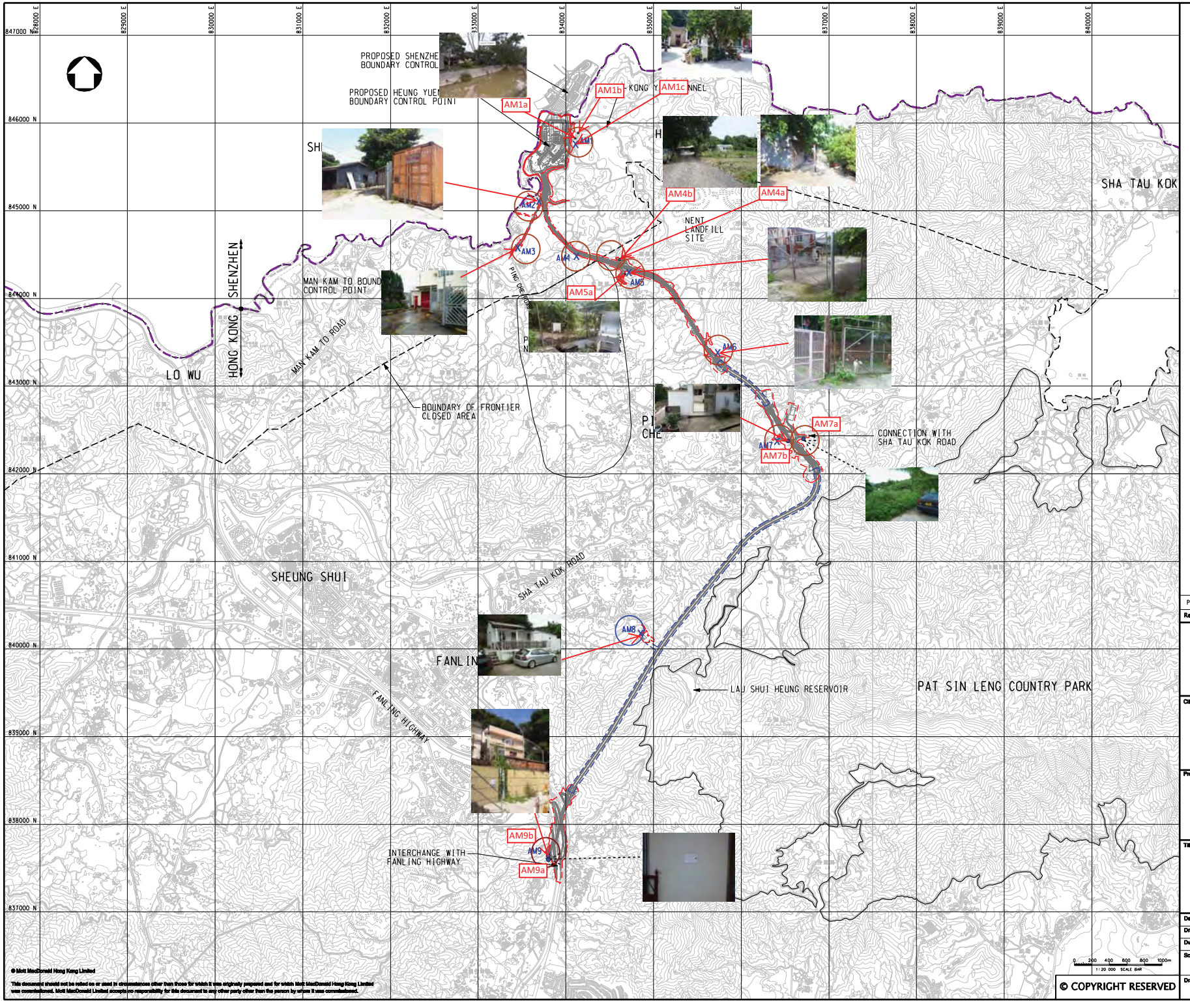
Project: AGREEMENT NO. CE45/2008(CE) LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title: LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

Designed	HC		Dwg.Chk.	EC	
Drawn	WING		Coordination	EC	
Dwg.Chk.	HC		Approved	HT	
Scale at A1	1:20000	Project	255228	Status	PRE
Drawing No	FIGURE 4.1			Rev	P2

Appendix E

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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Kwun Tong, Kowloon
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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	MING		Coordination	EC	
Dwg.Chk.	DC		Approved	HT	
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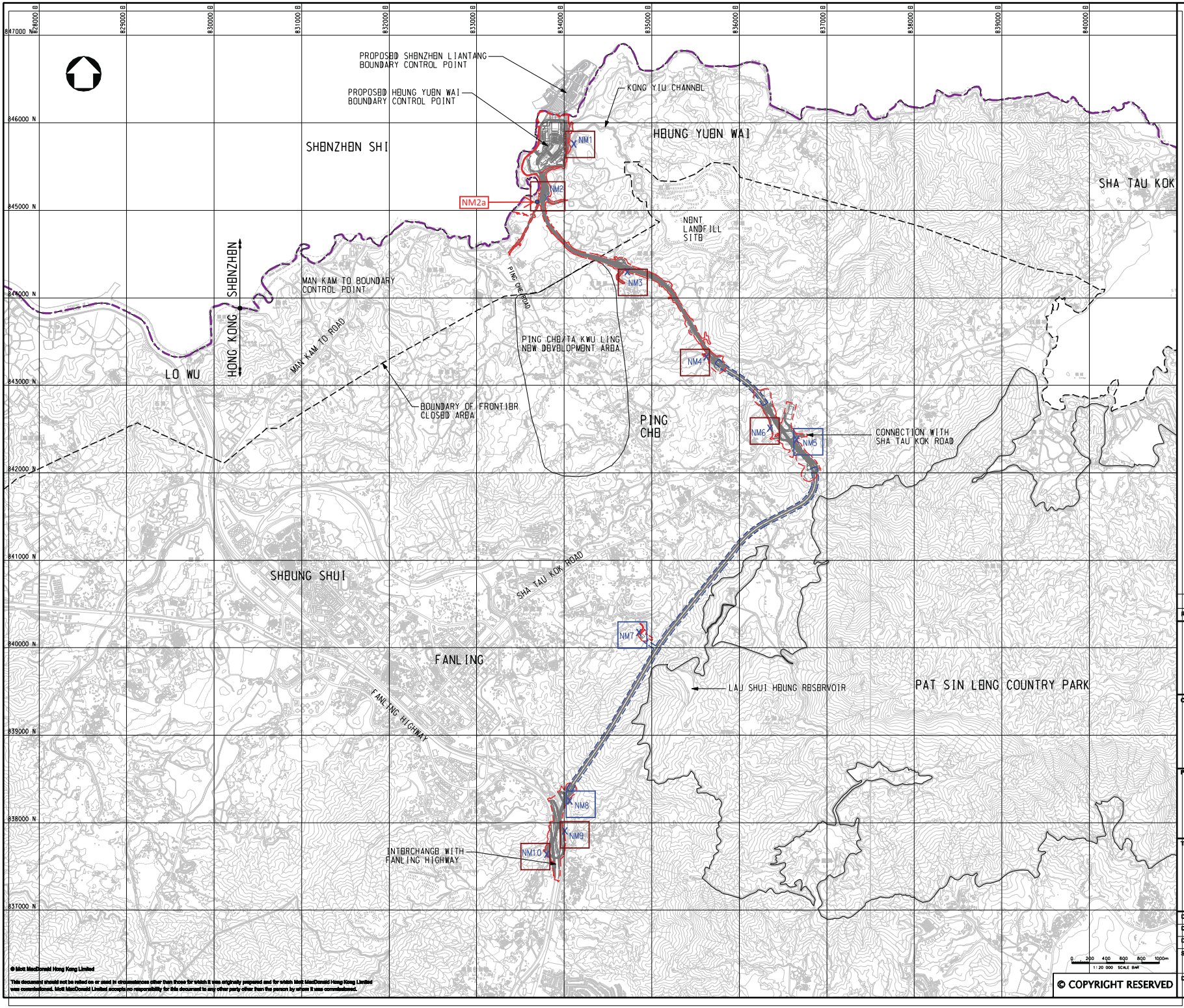
		CAD file	j:\255228\report\env\em&a\00B3\FIG 2-1.dgn		
Drawing No	FIGURE 2.1			Rev	P1

0 200 400 600 800 1000m
1:20 000 SCALE BAR



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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CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

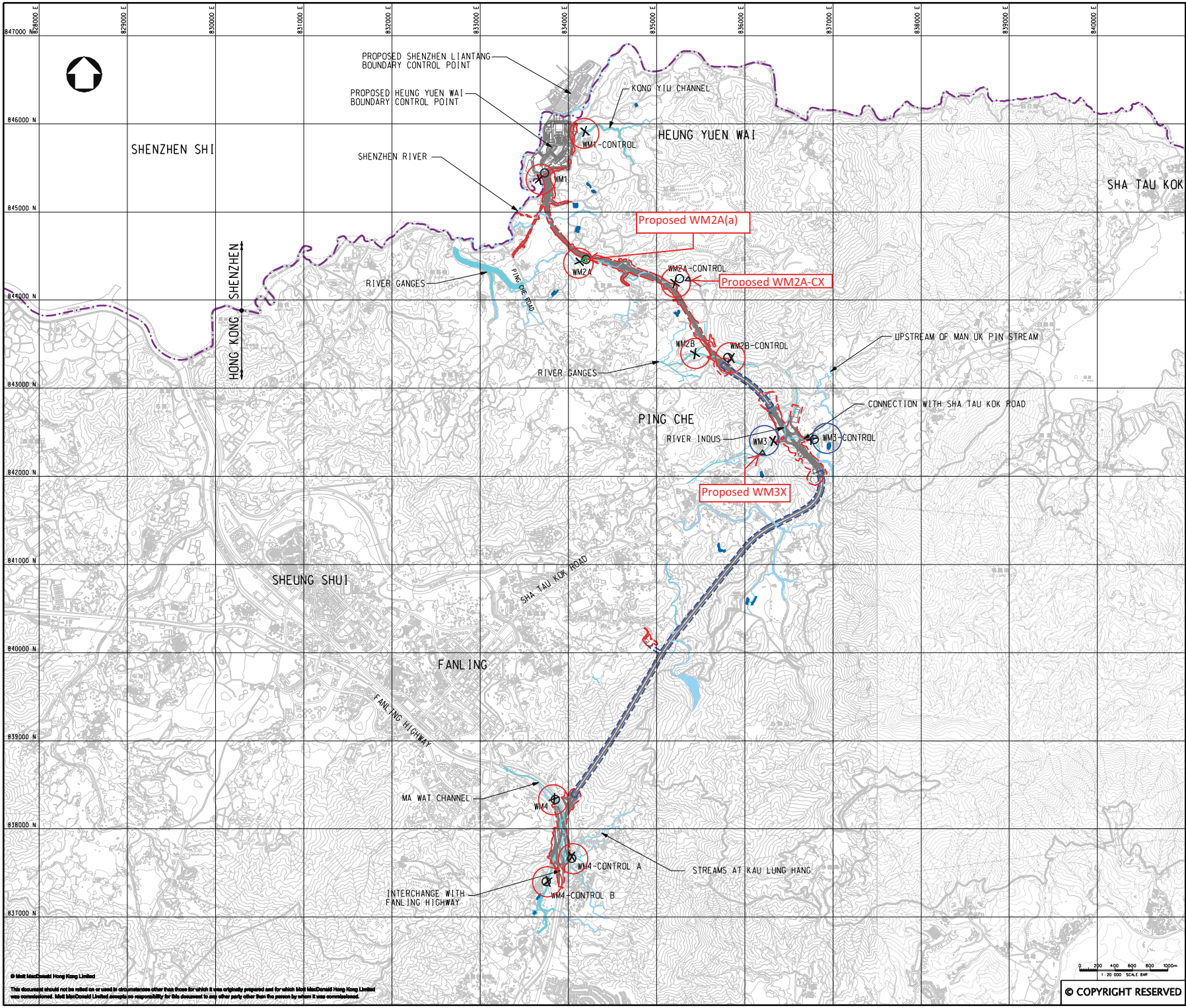
Project

AGREEMENT NO. CE45/2008(CE)
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	
Scale at A1	1:20000	Project	255228	Status	PRE
		CAD file	j:\255228\report\env\em&o\00B3\FIG 3-1.dgn		
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 Easting	Northing	Location found during site visit Coordinates 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	833840.783	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

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

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100 How Ming Street
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Hong Kong
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W www.mottmac.com.hk

Client

CEDD 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
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Drawing No	Appendix C				Rev P2

Appendix F

Calibration Certificate of Monitoring Equipment and HOKLAS-accreditation Certificate of the Testing Laboratory

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House near Lin Ma Hang Road		Date of Calibration:	30/9/2020
Location ID : AM2		Next Calibration Date:	30/11/2020
		Technician:	Eric

CONDITIONS

Sea Level Pressure (hPa)	1020.4	Corrected Pressure (mm Hg)	765.3
Temperature (°C)	20.4	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.03014
Model->	5025A	Qstd Intercept ->	-0.04616
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.1	5.1	10.2	1.614	54	54.61	Slope = 33.3003
13	4.2	4.2	8.4	1.467	48	48.54	Intercept = 0.5041
10	3.4	3.4	6.8	1.322	44	44.50	Corr. coeff. = 0.9970
7	2.1	2.1	4.2	1.044	36	36.41	
5	1.4	1.4	2.8	0.856	28	28.32	

Calculations :

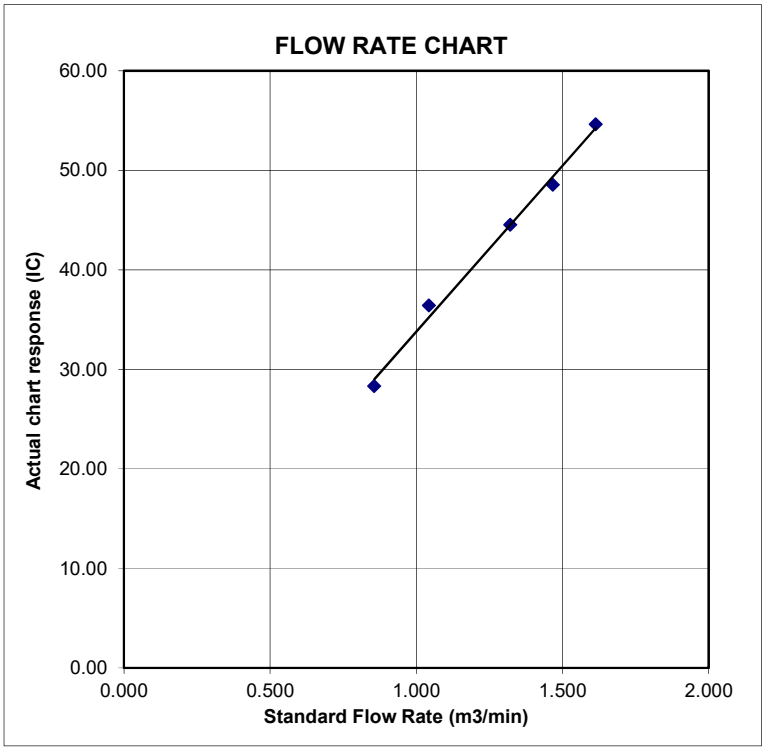
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Ta Kwu Ling Fire Service Station		Date of Calibration:	30/9/2020
Location ID : AM3		Next Calibration Date:	30/11/2020
		Technician:	Eric

CONDITIONS

Sea Level Pressure (hPa)	1020.4	Corrected Pressure (mm Hg)	765.3
Temperature (°C)	20.4	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.03014
Model->	5025A	Qstd Intercept ->	-0.04616
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.2	6.2	12.4	1.777	56	56.63	Slope = 36.4866
13	4.9	4.9	9.8	1.582	48	48.54	Intercept = -8.3972
10	3.9	3.9	7.8	1.414	44	44.50	Corr. coeff. = 0.9968
7	2.8	2.8	5.6	1.202	34	34.38	
5	1.7	1.7	3.4	0.941	26	26.29	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

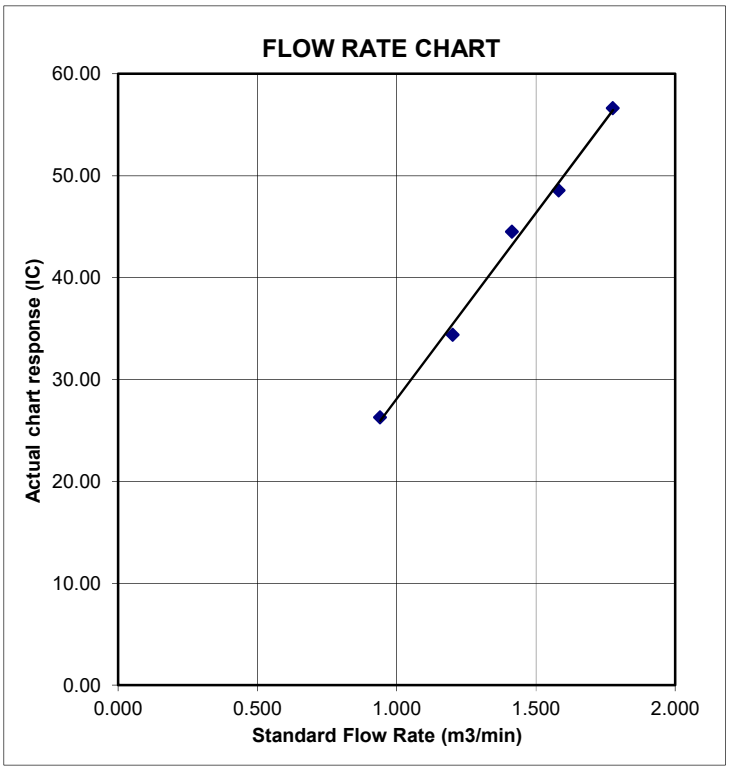
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Nga Yiu Ha Village		Date of Calibration:	30/9/2020
Location ID : AM4b		Next Calibration Date:	30/11/2020
		Technician:	Eric

CONDITIONS

Sea Level Pressure (hPa)	1020.4	Corrected Pressure (mm Hg)	765.3
Temperature (°C)	20.4	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.03014
Model->	5025A	Qstd Intercept ->	-0.04616
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6	6	12.0	1.748	56	56.63	Slope = 27.7731
13	5.2	5.2	10.4	1.629	50	50.57	Intercept = 6.7206
10	3.7	3.7	7.4	1.378	44	44.50	Corr. coeff. = 0.9949
7	2.1	2.1	4.2	1.044	36	36.41	
5	1.4	1.4	2.8	0.856	30	30.34	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

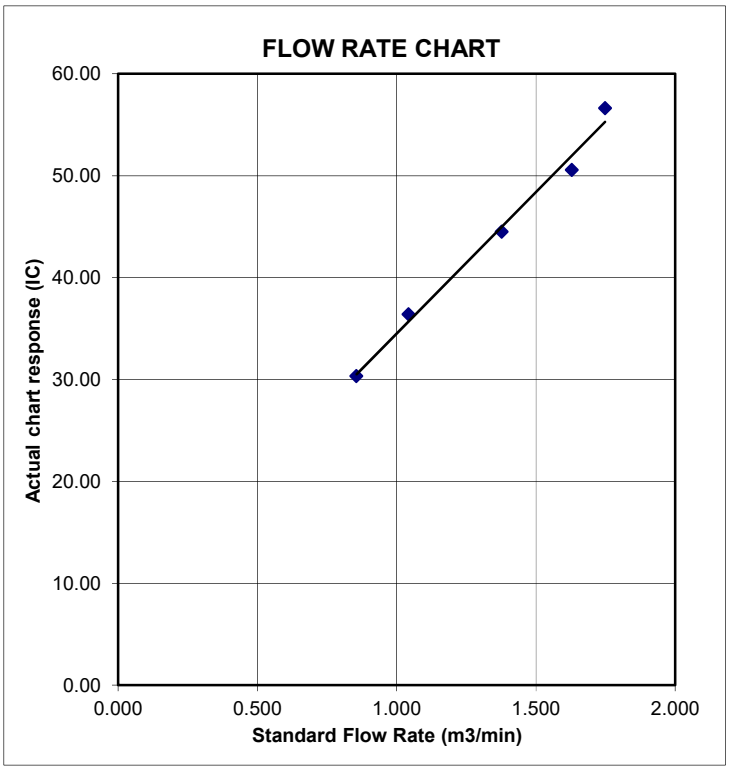
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Ping Yeung Village House		Date of Calibration:	30/9/2020
Location ID : AM5a		Next Calibration Date:	30/11/2020
		Technician:	Eric

CONDITIONS

Sea Level Pressure (hPa)	1020.4	Corrected Pressure (mm Hg)	765.3
Temperature (°C)	20.4	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.03014
Model->	5025A	Qstd Intercept ->	-0.04616
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.6	5.6	11.2	1.690	52	52.59	Slope = 33.7866
13	4.4	4.4	8.8	1.500	46	46.52	Intercept = -3.7264
10	3.1	3.1	6.2	1.263	40	40.45	Corr. coeff. = 0.9916
7	2	2	4.0	1.019	32	32.36	
5	1.3	1.3	2.6	0.826	22	22.25	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

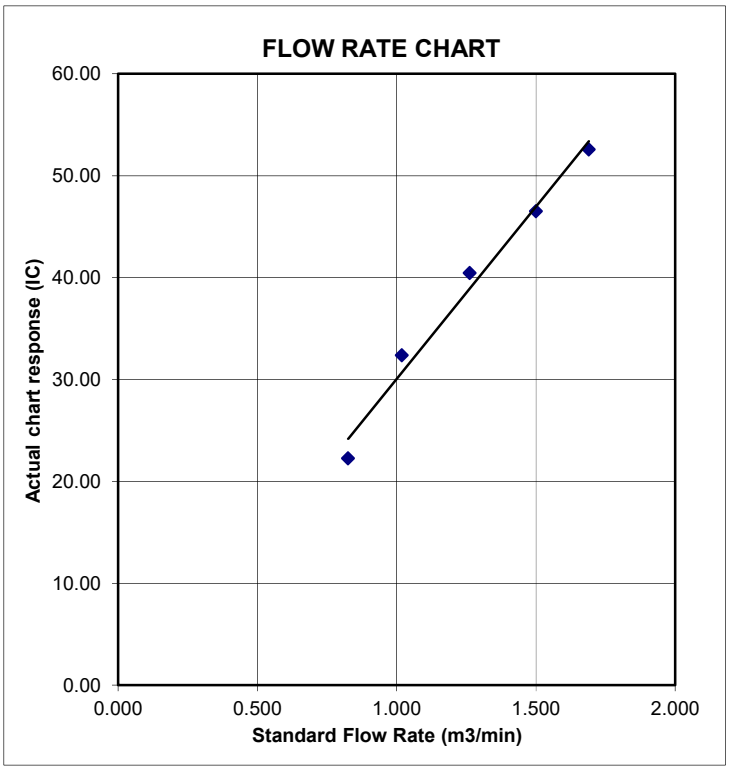
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Wo Keng Shan Village House		Date of Calibration:	30/9/2020
Location ID : AM6		Next Calibration Date:	30/11/2020
		Technician:	Eric

CONDITIONS

Sea Level Pressure (hPa)	1020.4	Corrected Pressure (mm Hg)	765.3
Temperature (°C)	20.4	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.03014
Model->	5025A	Qstd Intercept ->	-0.04616
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.2	5.2	10.4	1.629	53	53.60	Slope = 29.3959
13	4.6	4.6	9.2	1.534	48	48.54	Intercept = 4.4912
10	3.6	3.6	7.2	1.359	43	43.49	Corr. coeff. = 0.9934
7	2.1	2.1	4.2	1.044	36	36.41	
5	1.3	1.3	2.6	0.826	28	28.32	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

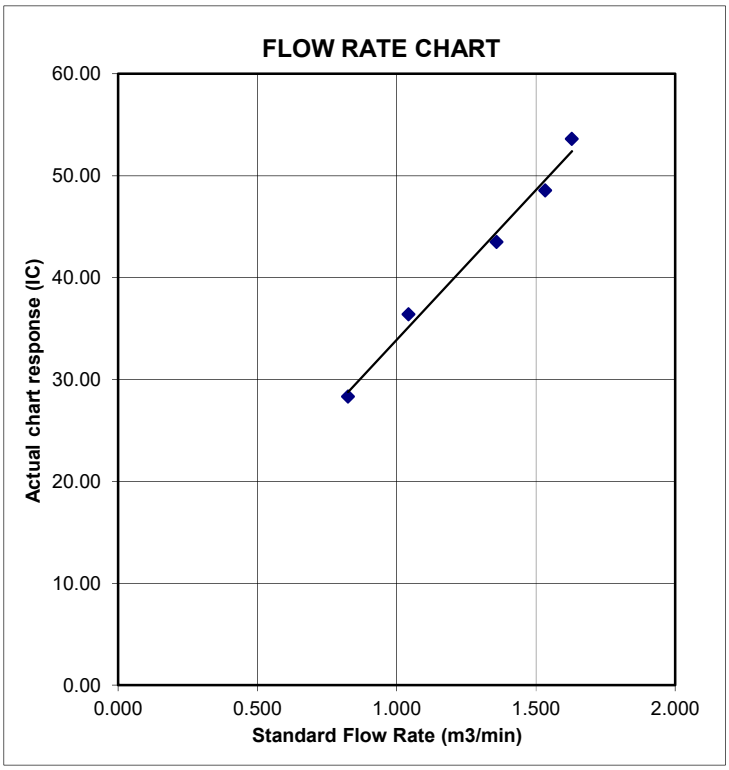
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House of Loi Tung Village
Location ID : AM7b

Date of Calibration: 30/9/2020
Next Calibration Date: 30/11/2020
Technician: Eric

CONDITIONS

Sea Level Pressure (hPa)	1020.4	Corrected Pressure (mm Hg)	765.3
Temperature (°C)	20.4	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.03014
Model->	5025A	Qstd Intercept ->	-0.04616
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.3	6.3	12.6	1.791	60	60.68	Slope = 35.8093
13	4.5	4.5	9.0	1.517	52	52.59	Intercept = -2.9289
10	3.9	3.9	7.8	1.414	46	46.52	Corr. coeff. = 0.9938
7	2.1	2.1	4.2	1.044	36	36.41	
5	1.4	1.4	2.8	0.856	26	26.29	

Calculations :

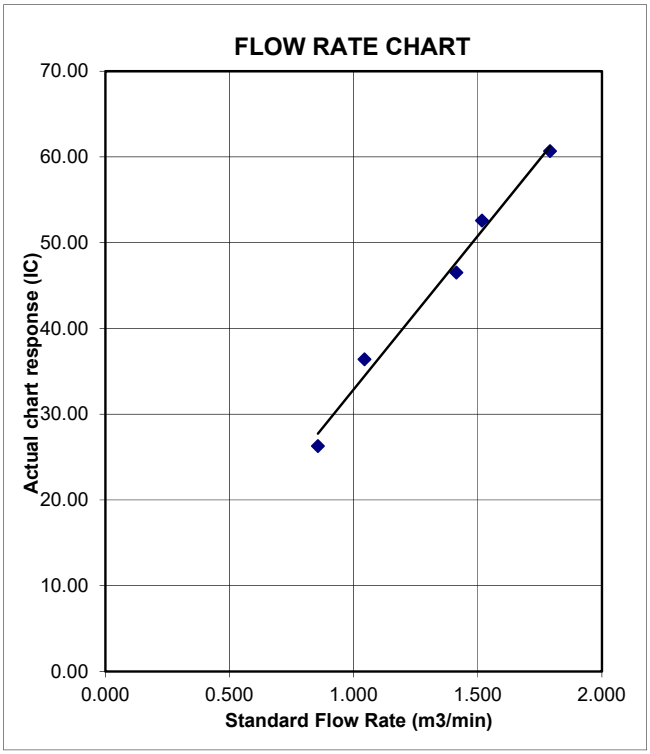
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Nam Wa Po Village House No. 80		Date of Calibration:	30/9/2020
Location ID : AM9b		Next Calibration Date:	30/11/2020
		Technician:	Eric

CONDITIONS

Sea Level Pressure (hPa)	1020.4	Corrected Pressure (mm Hg)	765.3
Temperature (°C)	20.4	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.03014
Model->	5025A	Qstd Intercept ->	-0.04616
Serial # ->	1612		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.5	6.5	13.0	1.819	54	54.61	Slope = 27.1953
13	4.9	4.9	9.8	1.582	49	49.55	Intercept = 5.8818
10	3.8	3.8	7.6	1.396	44	44.50	Corr. coeff. = 0.9982
7	2.2	2.2	4.4	1.068	34	34.38	
5	1.3	1.3	2.6	0.826	28	28.32	

Calculations :

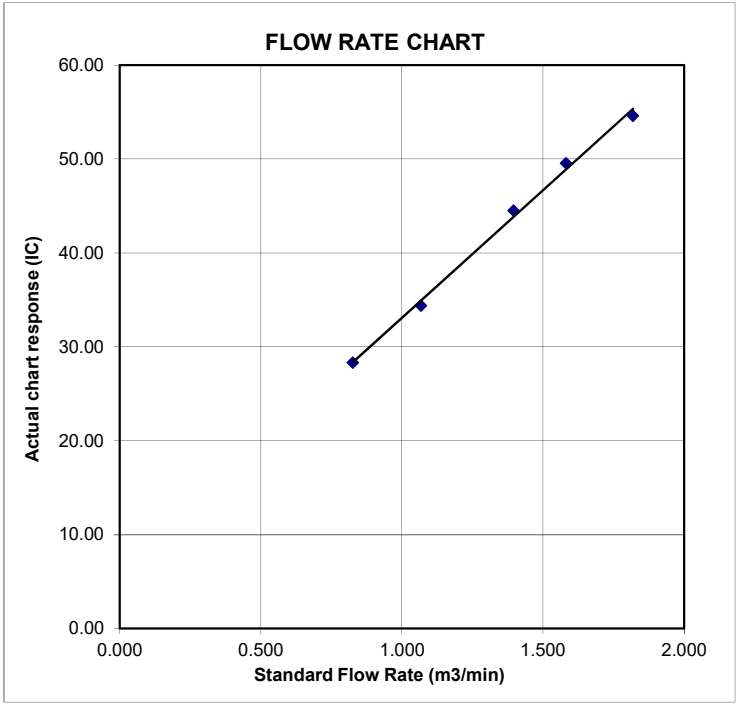
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TISCH Environmental

RECALIBRATION DUE DATE:
February 7, 2021

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 7, 2020	**Rootsmeter S/N:** 438320	**Ta:** 295	°K
Operator:	Jim Tisch		**Pa:** 745.5	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **1612**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3730	3.2	2.00
2	3	4	1	0.9820	6.4	4.00
3	5	6	1	0.8780	8.0	5.00
4	7	8	1	0.8340	8.8	5.50
5	9	10	1	0.6900	12.8	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9866	0.7186	1.4078	0.9957	0.7252	0.8896
0.9824	1.0004	1.9909	0.9914	1.0096	1.2581
0.9802	1.1165	2.2259	0.9893	1.1267	1.4066
0.9792	1.1741	2.3345	0.9882	1.1849	1.4753
0.9739	1.4114	2.8155	0.9828	1.4244	1.7792
QSTD	**m=**	**2.03014**	**QA**	**m=**	**1.27124**
	b=	**-0.04616**		**b=**	**-0.02917**
	r=	**0.99995**		**r=**	**0.99995**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

Qstd= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

Key
ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C201348
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC19-1098) Date of Receipt / 收件日期 : 27 February 2020

Description / 儀器名稱 : Sound Level Calibrator (EQ085)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NC-73
Serial No. / 編號 : 10655561
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 7 March 2020

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification & user's specified acceptance criteria.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong, Technical Officer

Certified By 核證 : K C Lee, Engineer

Date of Issue 簽發日期 : 10 March 2020

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
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c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

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Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C201348
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C193756
CL281	Multifunction Acoustic Calibrator	CDK1806821
TST150A	Measuring Amplifier	C201309

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.2	± 0.5	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	User's Spec.	Uncertainty of Measured Value (Hz)
1	0.958	1 kHz ± 6 %	± 1

Remarks : - The user's specified acceptance criteria (user's spec.) is a customer pre-defined operating tolerance of the UUT, suitable for one's own intended use.

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C204359
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC20-1324) Date of Receipt / 收件日期 : 30 July 2020

Description / 儀器名稱 : Sound Level Meter (EQ013)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 00921191
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 5 August 2020

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : K P Cheuk
Assistant Engineer

Certified By 核證 : K C Lee
Engineer

Date of Issue 簽發日期 : 11 August 2020

Sun Creation Engineering Limited - Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 - 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C204359
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C200258
CL281	Multifunction Acoustic Calibrator	CDK1806821

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	93.6	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L_A	A	Fast	94.00	1	93.6 (Ref.)
				104.00		103.6
				114.00		113.6

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	93.6	Ref.
			Slow			93.6	± 0.3

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
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Certificate of Calibration
校正證書

Certificate No. : C204359
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_A	A	Fast	94.00	63 Hz	67.3	-26.2 ± 1.5
					125 Hz	77.4	-16.1 ± 1.5
					250 Hz	84.9	-8.6 ± 1.4
					500 Hz	90.3	-3.2 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	94.8	+1.2 ± 1.6
					4 kHz	94.6	+1.0 ± 1.6
					8 kHz	92.5	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.1	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_C	C	Fast	94.00	63 Hz	92.8	-0.8 ± 1.5
					125 Hz	93.4	-0.2 ± 1.5
					250 Hz	93.6	0.0 ± 1.4
					500 Hz	93.6	0.0 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	93.4	-0.2 ± 1.6
					4 kHz	92.8	-0.8 ± 1.6
					8 kHz	90.6	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.2	-6.2 (+3.0 ; -6.0)

Sun Creation Engineering Limited - Calibration & Testing Laboratory
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c/o 香港新界屯門興安里一號四樓
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Certificate of Calibration
校正證書

Certificate No. : C204359
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 12910

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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輝創工程有限公司 – 校正及檢測實驗所
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Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C200488
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC19-1098) Date of Receipt / 收件日期 : 7 January 2020

Description / 儀器名稱 : Sound Level Meter (EQ011)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 01121362
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration

DATE OF TEST / 測試日期 : 22 January 2020

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification. (after adjustment)
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : Cheuk
K P Cheuk
Assistant Engineer

Certified By 核證 :
K C Lee
Engineer

Date of Issue 簽發日期 : 24 January 2020

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C200488
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using the internal standard (After Adjustment) was performed before the test 6.1.1.2 to 6.3.2.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C200258
CL281	Multifunction Acoustic Calibrator	CDK1806821

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Adjustment

UUT Setting				Applied Value		UUT	IEC 61672
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Class 1 Spec. (dB)
30 - 130	L_A	A	Fast	94.00	1	* 91.3	± 1.1

* Out of IEC 61672 Class 1 Spec.

6.1.1.2 After Adjustment

UUT Setting				Applied Value		UUT	IEC 61672
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Class 1 Spec. (dB)
30 - 130	L_A	A	Fast	94.00	1	94.0	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)
30 - 130	L_A	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

Sun Creation Engineering Limited - Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 - 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C200488
證書編號

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	94.0	Ref.
			Slow			94.0	± 0.3

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_A	A	Fast	94.00	63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.5
					250 Hz	85.3	-8.6 ± 1.4
					500 Hz	90.7	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.6
					4 kHz	95.0	+1.0 ± 1.6
					8 kHz	92.9	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.6	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_C	C	Fast	94.00	63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.5
					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.6
					4 kHz	93.2	-0.8 ± 1.6
					8 kHz	91.0	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.6	-6.2 (+3.0 ; -6.0)

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輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C200488
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 12912

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited - Calibration & Testing Laboratory
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ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	:	**HK2012986**
CLIENT	: **ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING**			
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH DATE RECEIVED DATE OF ISSUE	: 1 : 6-APR-2020 : 7-APR-2020	
PROJECT	: ----	NO. OF SAMPLES CLIENT ORDER	: 1 : ----	

General Comments

- **Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition. The result(s) related only to the item(s) tested.**
- **Sample information (Project name, Sample ID, Sampling date/time, etc., if any) is provided by client.**
- **Calibration was subcontracted to and analysed by Action United Enviro Services.**

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories	*Position*
Richard Fung	Managing Director

This is the Final Report and supersedes any preliminary report with this batch number.

All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the ALS Laboratory Group
11/F. Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 **www.alsglobal.com**

WORK ORDER	:	HK2012986
SUB-BATCH	:	1
CLIENT	:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT	:	----

ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2012986-001	S/N: 3Y6501	AIR	06-Apr-2020	S/N: 3Y6501

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	3Y6501
Equipment Ref:	EQ111
Job Order	HK2012986

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	9 March 2020

Equipment Verification Results:

Verification Date: 13 March 2020

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr	09:20 ~ 11:20	21.4	1015.7	0.044	2250	18.8
2hr01min	11:25 ~ 13:26	21.4	1015.7	0.045	2711	22.5
2hr01min	13:42 ~ 15:43	21.4	1015.7	0.046	2311	19.2

Sensitivity Adjustment Scale Setting (Before Calibration) 657 (CPM)

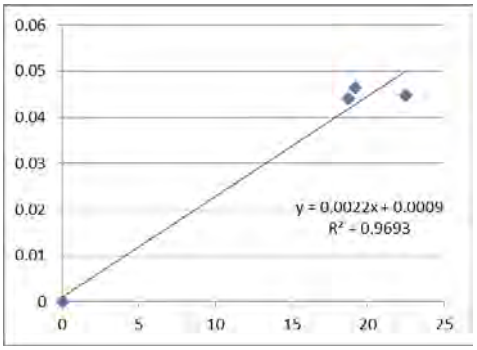
Sensitivity Adjustment Scale Setting (After Calibration) 656 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient (R) 0.9845

Date of Issue 16 March 2020



Remarks:

1. Strong Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Fai So Signature : Date : 16 March 2020

QC Reviewer : Ben Tam Signature : Date : 16 March 2020

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	9-Mar-20
Location ID :	Calibration Room	Next Calibration Date:	9-Jun-20

CONDITIONS

Sea Level Pressure (hPa)	1008.5	Corrected Pressure (mm Hg)	756.375
Temperature (°C)	23.4	Temperature (K)	296

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.03014
Model->	5025A	Qstd Intercept ->	-0.04616
Calibration Date->	7-Feb-20	Expiry Date->	7-Feb-21

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.1	6.1	12.2	1.744	55	55.02	Slope = 36.8508
13	4.9	4.9	9.8	1.565	49	49.01	Intercept = -8.9222
10	3.8	3.8	7.6	1.381	42	42.01	Corr. coeff. = 0.9997
8	2.4	2.4	4.8	1.102	32	32.01	
5	1.4	1.4	2.8	0.847	22	22.01	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

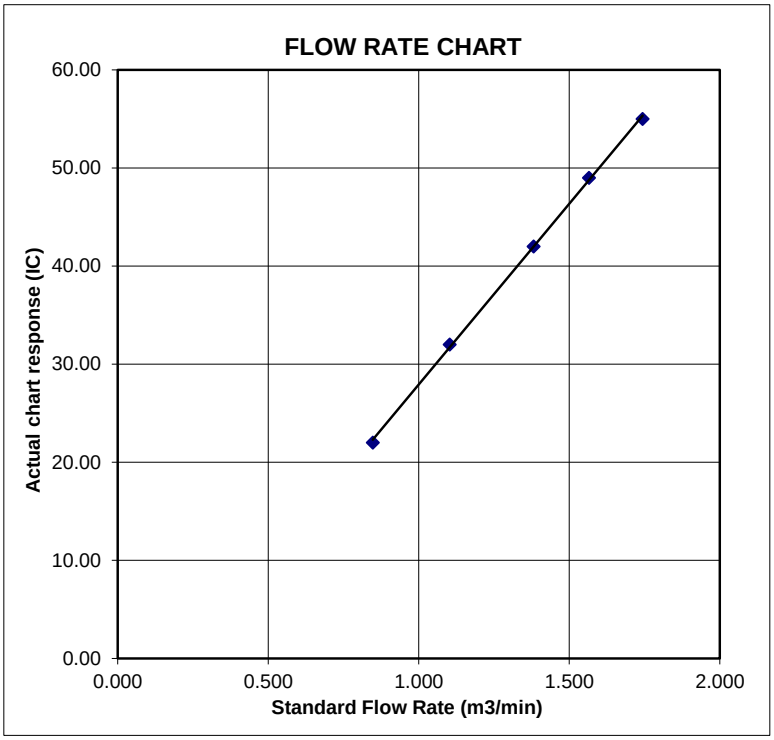
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TISCH Environmental

RECALIBRATION DUE DATE:
February 7, 2021

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 7, 2020	**Rootsmeter S/N:** 438320	**Ta:** 295	°K
Operator:	Jim Tisch		**Pa:** 745.5	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **1612**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3730	3.2	2.00
2	3	4	1	0.9820	6.4	4.00
3	5	6	1	0.8780	8.0	5.00
4	7	8	1	0.8340	8.8	5.50
5	9	10	1	0.6900	12.8	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9866	0.7186	1.4078	0.9957	0.7252	0.8896
0.9824	1.0004	1.9909	0.9914	1.0096	1.2581
0.9802	1.1165	2.2259	0.9893	1.1267	1.4066
0.9792	1.1741	2.3345	0.9882	1.1849	1.4753
0.9739	1.4114	2.8155	0.9828	1.4244	1.7792
QSTD	**m=**	**2.03014**	**QA**	**m=**	**1.27124**
	b=	**-0.04616**		**b=**	**-0.02917**
	r=	**0.99995**		**r=**	**0.99995**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

Qstd= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

Key
ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc.
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ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	:	**HK2012985**
CLIENT	: **ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING**			
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH DATE RECEIVED DATE OF ISSUE	: : :	1 6-APR-2020 7-APR-2020
PROJECT	: ----	NO. OF SAMPLES CLIENT ORDER	: :	1 ----

General Comments

- **Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition. The result(s) related only to the item(s) tested.**
- **Sample information (Project name, Sample ID, Sampling date/time, etc., if any) is provided by client.**
- **Calibration was subcontracted to and analysed by Action United Enviro Services.**

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories	*Position*
Richard Fung	Managing Director

This is the Final Report and supersedes any preliminary report with this batch number.

All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the ALS Laboratory Group
11/F. Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 **www.alsglobal.com**

WORK ORDER : HK2012985
SUB-BATCH : 1
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT : ----

ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2012985-001	S/N: 366418	AIR	06-Apr-2020	S/N: 366418

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	366418
Equipment Ref:	EQ108
Job Order	HK2012985

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	9 March 2020

Equipment Verification Results:

Verification Date: 13 March 2020

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr	09:20 ~ 11:20	21.4	1015.7	0.044	2297	19.1
2hr01min	11:25 ~ 13:26	21.4	1015.7	0.045	2498	20.7
2hr01min	13:42 ~ 15:43	21.4	1015.7	0.046	2647	21.9

Sensitivity Adjustment Scale Setting (Before Calibration) 685 (CPM)

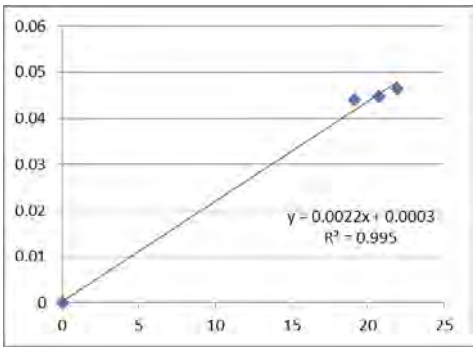
Sensitivity Adjustment Scale Setting (After Calibration) 685 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient (R) 0.9975

Date of Issue 16 March 2020



Remarks:

1. Strong Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Fai So Signature : Date : 16 March 2020

QC Reviewer : Ben Tam Signature : Date : 16 March 2020

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	9-Mar-20
Location ID :	Calibration Room	Next Calibration Date:	9-Jun-20

CONDITIONS

Sea Level Pressure (hPa)	1008.5	Corrected Pressure (mm Hg)	756.375
Temperature (°C)	23.4	Temperature (K)	296

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.03014
Model->	5025A	Qstd Intercept ->	-0.04616
Calibration Date->	7-Feb-20	Expiry Date->	7-Feb-21

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.1	6.1	12.2	1.744	55	55.02	Slope = 36.8508
13	4.9	4.9	9.8	1.565	49	49.01	Intercept = -8.9222
10	3.8	3.8	7.6	1.381	42	42.01	Corr. coeff. = 0.9997
8	2.4	2.4	4.8	1.102	32	32.01	
5	1.4	1.4	2.8	0.847	22	22.01	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

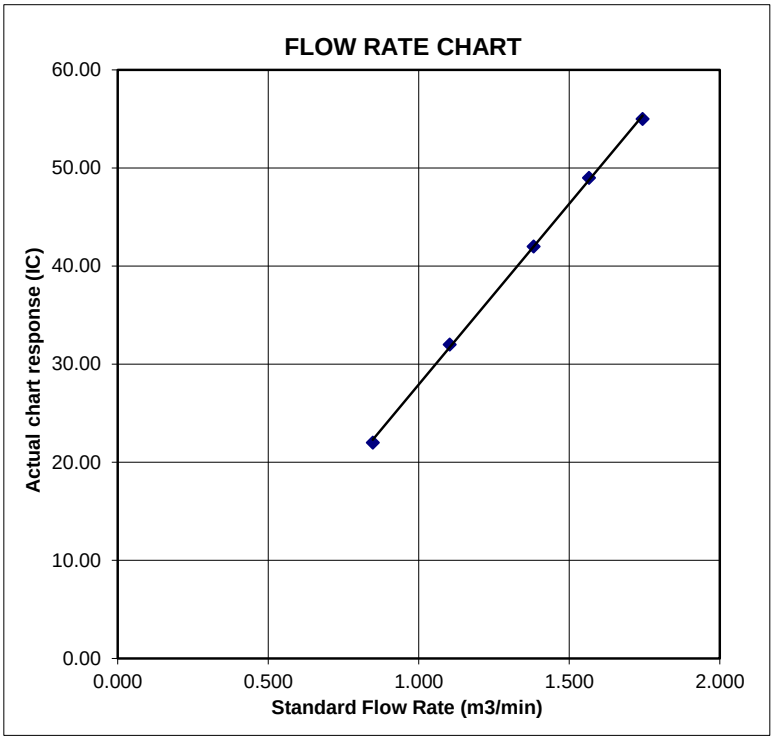
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TISCH Environmental

RECALIBRATION DUE DATE:
February 7, 2021

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 7, 2020	**Rootsmeter S/N:** 438320	**Ta:** 295	°K
Operator:	Jim Tisch		**Pa:** 745.5	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **1612**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3730	3.2	2.00
2	3	4	1	0.9820	6.4	4.00
3	5	6	1	0.8780	8.0	5.00
4	7	8	1	0.8340	8.8	5.50
5	9	10	1	0.6900	12.8	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9866	0.7186	1.4078	0.9957	0.7252	0.8896
0.9824	1.0004	1.9909	0.9914	1.0096	1.2581
0.9802	1.1165	2.2259	0.9893	1.1267	1.4066
0.9792	1.1741	2.3345	0.9882	1.1849	1.4753
0.9739	1.4114	2.8155	0.9828	1.4244	1.7792
QSTD	**m=**	**2.03014**	**QA**	**m=**	**1.27124**
	b=	**-0.04616**		**b=**	**-0.02917**
	r=	**0.99995**		**r=**	**0.99995**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

Qstd= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

Key
ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

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ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	:	**HK2012980**
CLIENT	: **ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING**			
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH DATE RECEIVED DATE OF ISSUE	: : :	1 6-APR-2020 7-APR-2020
PROJECT	: ----	NO. OF SAMPLES CLIENT ORDER	: :	1 ----

General Comments

- **Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition. The result(s) related only to the item(s) tested.**
- **Sample information (Project name, Sample ID, Sampling date/time, etc., if any) is provided by client.**
- **Calibration was subcontracted to and analysed by Action United Enviro Services.**

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories	*Position*
Richard Fung	Managing Director

This is the Final Report and supersedes any preliminary report with this batch number.

All pages of this report have been checked and approved for release.

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WORK ORDER : HK2012980
SUB-BATCH : 1
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT : ----

ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2012980-001	S/N: 366407	AIR	06-Apr-2020	S/N: 366407

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	366407
Equipment Ref:	EQ107
Job Order	HK2012980

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	9 March 2020

Equipment Verification Results:

Verification Date: 13 March 2020

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr	09:20 ~ 11:20	21.4	1015.7	0.044	2247	18.7
2hr01min	11:25 ~ 13:26	21.4	1015.7	0.045	2518	20.9
2hr01min	13:42 ~ 15:43	21.4	1015.7	0.046	2699	22.4

Sensitivity Adjustment Scale Setting (Before Calibration) 565 (CPM)

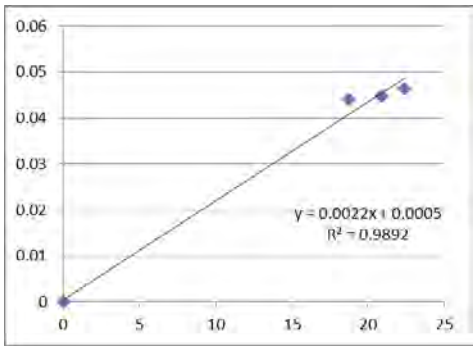
Sensitivity Adjustment Scale Setting (After Calibration) 566 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient (R) 0.9946

Date of Issue 16 March 2020



Remarks:

1. Strong Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Fai So Signature : Date : 16 March 2020

QC Reviewer : Ben Tam Signature : Date : 16 March 2020

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	9-Mar-20
Location ID :	Calibration Room	Next Calibration Date:	9-Jun-20

CONDITIONS

Sea Level Pressure (hPa)	1008.5	Corrected Pressure (mm Hg)	756.375
Temperature (°C)	23.4	Temperature (K)	296

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.03014
Model->	5025A	Qstd Intercept ->	-0.04616
Calibration Date->	7-Feb-20	Expiry Date->	7-Feb-21

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.1	6.1	12.2	1.744	55	55.02	Slope = 36.8508
13	4.9	4.9	9.8	1.565	49	49.01	Intercept = -8.9222
10	3.8	3.8	7.6	1.381	42	42.01	Corr. coeff. = 0.9997
8	2.4	2.4	4.8	1.102	32	32.01	
5	1.4	1.4	2.8	0.847	22	22.01	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

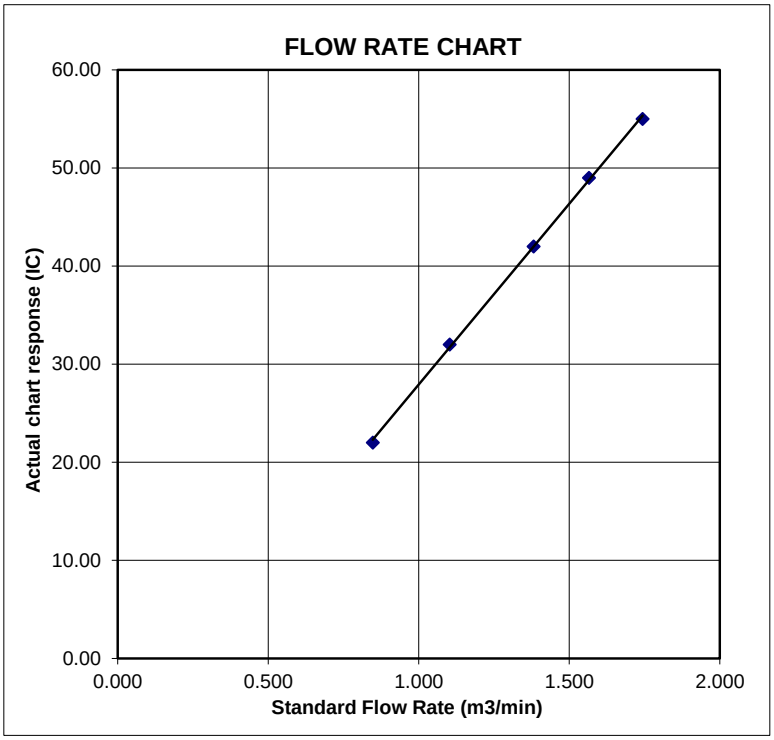
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TISCH Environmental

RECALIBRATION DUE DATE:
February 7, 2021

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 7, 2020	**Rootsmeter S/N:** 438320	**Ta:** 295	°K
Operator:	Jim Tisch		**Pa:** 745.5	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **1612**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3730	3.2	2.00
2	3	4	1	0.9820	6.4	4.00
3	5	6	1	0.8780	8.0	5.00
4	7	8	1	0.8340	8.8	5.50
5	9	10	1	0.6900	12.8	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9866	0.7186	1.4078	0.9957	0.7252	0.8896
0.9824	1.0004	1.9909	0.9914	1.0096	1.2581
0.9802	1.1165	2.2259	0.9893	1.1267	1.4066
0.9792	1.1741	2.3345	0.9882	1.1849	1.4753
0.9739	1.4114	2.8155	0.9828	1.4244	1.7792
QSTD	**m=**	**2.03014**	**QA**	**m=**	**1.27124**
	b=	**-0.04616**		**b=**	**-0.02917**
	r=	**0.99995**		**r=**	**0.99995**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

Qstd= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

Key
ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

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ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	:	**HK2001298**
CLIENT	: **ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING**			
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH DATE RECEIVED DATE OF ISSUE	: 1 : 6-JAN-2020 : 10-JAN-2020	
PROJECT	: ----	NO. OF SAMPLES CLIENT ORDER	: 1 : ---	

General Comments

- **Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition. The result(s) related only to the item(s) tested.**
- **Sample information (Project name, Sample ID, Sampling date/time, etc., if any) is provided by client.**
- **Calibration was subcontracted to and analysed by Action United Enviro Services.**

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories	*Position*
Richard Fung	Managing Director

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

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Part of the ALS Laboratory Group
11/F. Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 **www.alsglobal.com**

WORK ORDER	:	HK2001298
SUB-BATCH	:	1
CLIENT	:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT	:	----

ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2001298-001	S/N: 2X6145	AIR	06-Jan-2020	S/N: 2X6145

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	2X6145
Equipment Ref:	EQ105
Job Order	HK2001298

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	3 December 2019

Equipment Verification Results:

Testing Date: 27&31 December 2019

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr	09:08 ~ 11:10	18.0	1020.3	0.040	2254	18.8
2hr	11:15 ~ 13:16	19.2	1024.9	0.048	2561	21.3
2hr15min	13:22 ~ 15:23	19.2	1024.9	0.034	1841	13.6

Sensitivity Adjustment Scale Setting (Before Calibration) 586 (CPM)

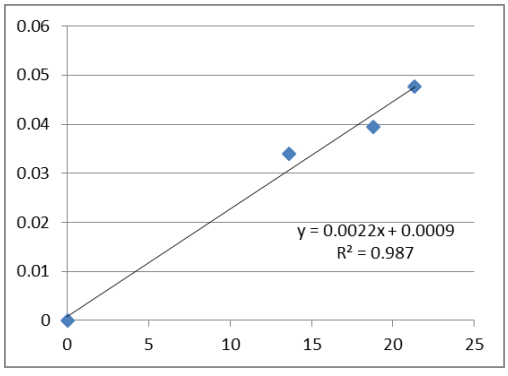
Sensitivity Adjustment Scale Setting (After Calibration) 586 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9935

Date of Issue 6 January 2020



Remarks:

1. Strong Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Fai So Signature : Date : 6 January 2020

QC Reviewer : Ben Tam Signature : Date : 6 January 2020

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	3-Dec-19
Location ID :	Calibration Room	Next Calibration Date:	3-Mar-20

CONDITIONS

Sea Level Pressure (hPa)	1023.1	Corrected Pressure (mm Hg)	767.325
Temperature (°C)	16.4	Temperature (K)	289

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.0968
Model->	5025A	Qstd Intercept ->	-0.00065
Calibration Date->	5-Feb-19	Expiry Date->	5-Feb-20

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.5	6.5	13.0	1.754	53	54.04	Slope = 36.7338
13	5.2	5.2	10.4	1.569	48	48.94	Intercept = -9.6198
10	4.1	4.1	8.2	1.393	41	41.80	Corr. coeff. = 0.9986
8	2.6	2.6	5.2	1.109	30	30.59	
5	1.6	1.6	3.2	0.870	22	22.43	

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

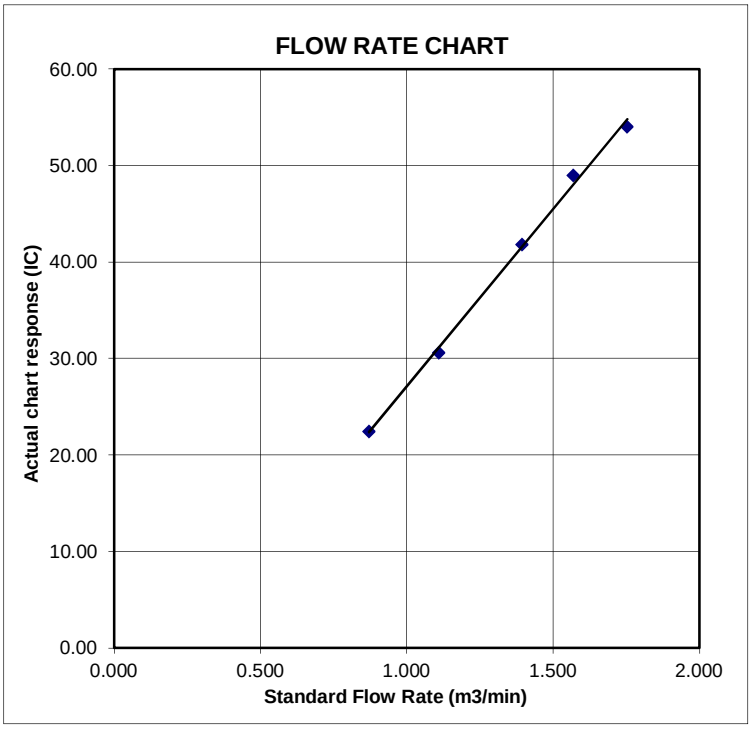
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
I = actual chart response
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TISCH Environmental

RECALIBRATION DUE DATE:
February 5, 2020

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 5, 2019	**Rootsmeter S/N:** 438320	**Ta:** 293	°K
Operator:	Jim Tisch		**Pa:** 753.1	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **1941**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4830	3.2	2.00
2	3	4	1	1.0430	6.4	4.00
3	5	6	1	0.9300	7.9	5.00
4	7	8	1	0.8870	8.7	5.50
5	9	10	1	0.7320	12.7	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0036	0.6767	1.4197	0.9958	0.6714	0.8821
0.9993	0.9581	2.0078	0.9915	0.9506	1.2475
0.9973	1.0723	2.2448	0.9895	1.0640	1.3947
0.9962	1.1231	2.3544	0.9884	1.1144	1.4628
0.9908	1.3536	2.8395	0.9831	1.3431	1.7642
QSTD	**m=**	**2.09680**	**QA**	**m=**	**1.31298**
	b=	**-0.00065**		**b=**	**-0.00040**
	r=	**0.99999**		**r=**	**0.99999**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

Qstd= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg
Key	
ΔH: calibrator manometer reading (in H2O)	
ΔP: rootsmeter manometer reading (mm Hg)	
Ta: actual absolute temperature (°K)	
Pa: actual barometric pressure (mm Hg)	
b: intercept	
m: slope	

RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	BEN TAM	WORK ORDER:	HK2034897
CLIENT:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH:	0
		LABORATORY:	HONG KONG
		DATE RECEIVED:	11-Sep-2020
		DATE OF ISSUE:	22-Sep-2020

SPECIFIC COMMENTS

Equipment information (Brand name, Model No., Serial No. and Equipment No.) is provided by client.
The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principle as practised by the laboratory or quoted from relevant international standards.
The validity of equipment/ meter performance only applies to the result(s) stated in the report.

Equipment Type:	Turbidimeter
Service Nature:	Performance Check
Scope:	Turbidity
Brand Name/ Model No.:	Hach 2100Q
Serial No./ Equipment No.:	12060C018266
Date of Calibration:	15-September-2020

GENERAL COMMENTS

This is the Final Report and supersedes any preliminary report with this batch number.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK2034897

SUB-BATCH: 0
DATE OF ISSUE: 22-Sep-2020
CLIENT: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Equipment Type: Turbidimeter
Brand Name/ Model No.: Hach 2100Q
Serial No./ Equipment No.: 12060C018266
Date of Calibration: 15-September-2020 Date of Next Calibration: 15-December-2020

PARAMETERS:

Turbidity Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.29	--
4	3.86	-3.5
40	38.3	-4.3
80	78.3	-2.1
400	393	-1.8
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	BEN TAM	WORK ORDER:	HK2034899
CLIENT:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH:	0
		LABORATORY:	HONG KONG
		DATE RECEIVED:	11-Sep-2020
		DATE OF ISSUE:	18-Sep-2020

SPECIFIC COMMENTS

Equipment information (Brand name, Model No., Serial No. and Equipment No.) is provided by client.
The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principle as practised by the laboratory or quoted from relevant international standards.
The validity of equipment/ meter performance only applies to the result(s) stated in the report.

Equipment Type:	pH meter
Service Nature:	Performance Check
Scope:	pH Value and Temperature
Brand Name/ Model No.:	AZ8685
Serial No./ Equipment No.:	1168272
Date of Calibration:	16-September-2020

GENERAL COMMENTS

This is the Final Report and supersedes any preliminary report with this batch number.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK2034899

SUB-BATCH: 0
DATE OF ISSUE: 18-Sep-2020
CLIENT: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Equipment Type: pH meter
Brand Name/ Model No.: AZ8685
Serial No./ Equipment No.: 1168272
Date of Calibration: 16-September-2020 Date of Next Calibration: 16-December-2020

PARAMETERS:

pH Value

Method Ref: APHA (21st edition), 4500H: B

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)
4.0	4.0	+0.00
7.0	7.0	+0.00
10.0	10.0	+0.00
	Tolerance Limit (pH unit)	±0.20

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (^{o}C)	Displayed Reading (^{o}C)	Tolerance (^{o}C)
9.5	9.5	+0.0
21.0	20.5	-0.5
39.0	38.0	-1.0
	Tolerance Limit (^{o}C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	BEN TAM	WORK ORDER:	HK2034895
CLIENT:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH:	0
		LABORATORY:	HONG KONG
		DATE RECEIVED:	11-Sep-2020
		DATE OF ISSUE:	18-Sep-2020

SPECIFIC COMMENTS

Equipment information (Brand name, Model No., Serial No. and Equipment No.) is provided by client.
The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the laboratory or quoted from relevant international standards.
The "Next Calibration Date" is recommended according to best practice principle as practised by the laboratory or quoted from relevant international standards.
The validity of equipment/ meter performance only applies to the result(s) stated in the report.

Equipment Type:	Dissolved Oxygen Meter
Service Nature:	Performance Check
Scope:	Dissolved Oxygen and Temperature
Brand Name/ Model No.:	YSI Pro 20
Serial No./ Equipment No.:	12C100570
Date of Calibration:	17-September-2020

GENERAL COMMENTS

This is the Final Report and supersedes any preliminary report with this batch number.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK2034895

SUB-BATCH: 0
DATE OF ISSUE: 18-Sep-2020
CLIENT: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Equipment Type: Dissolved Oxygen Meter
Brand Name/ Model No.: YSI Pro 20
Serial No./ Equipment No.: 12C100570
Date of Calibration: 17-September-2020 Date of Next Calibration: 17-December-2020

PARAMETERS:

Dissolved Oxygen

Method Ref: APHA (21st edition), 4500O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.77	2.86	+0.09
4.98	4.86	-0.12
7.70	7.68	-0.02
	Tolerance Limit (mg/L)	±0.20

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (^{o}C)	Displayed Reading (^{o}C)	Tolerance (^{o}C)
10.5	10.8	+0.3
23.5	23.2	-0.3
44.5	43.1	-1.4
	Tolerance Limit (^{o}C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganic

Appendix G

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 2 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 H

Impact Monitoring Schedule

Impact Monitoring Schedule for Reporting Period – October 2020

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
Thu	1-Oct-20				
Fri	2-Oct-20				
Sat	3-Oct-20		AM4b, AM5, AM6 & AM7b		All Water Quality Monitoring Locations
Sun	4-Oct-20				
Mon	5-Oct-20	AM4b, AM5, AM6 & AM7b	AM2, AM3 & AM9b	NM3, NM4, NM5 & NM6	All Water Quality Monitoring Locations
Tue	6-Oct-20	AM2, AM3 & AM9b		NM2a, NM8, NM9 & NM10	
Wed	7-Oct-20				All Water Quality Monitoring Locations
Thu	8-Oct-20		AM4b, AM5, AM6 & AM7b		
Fri	9-Oct-20	AM4b, AM5, AM6 & AM7b			All Water Quality Monitoring Locations
Sat	10-Oct-20		AM2, AM3 & AM9b		
Sun	11-Oct-20				
Mon	12-Oct-20	AM2, AM3 & AM9b		NM2a, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Tue	13-Oct-20		AM4b, AM5, AM6 & AM7b		
Wed	14-Oct-20	AM4b, AM5, AM6 & AM7b		NM3, NM4, NM5 & NM6	All Water Quality Monitoring Locations
Thu	15-Oct-20				
Fri	16-Oct-20		AM2, AM3 & AM9b		All Water Quality Monitoring Locations
Sat	17-Oct-20	AM2, AM3 & AM9b			
Sun	18-Oct-20				
Mon	19-Oct-20		AM4b, AM5, AM6 & AM7b		All Water Quality Monitoring Locations
Tue	20-Oct-20	AM4b, AM5, AM6 & AM7b		NM3, NM4, NM5 & NM6	
Wed	21-Oct-20				All Water Quality Monitoring Locations
Thu	22-Oct-20		AM2, AM3 & AM9b		
Fri	23-Oct-20	AM2, AM3 & AM9b	AM4b, AM5, AM6 & AM7b	NM2a, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Sat	24-Oct-20	AM4b, AM5, AM6 & AM7b			
Sun	25-Oct-20				
Mon	26-Oct-20				
Tue	27-Oct-20				All Water Quality Monitoring Locations
Wed	28-Oct-20		AM2, AM3 & AM9b		
Thu	29-Oct-20	AM2, AM3 & AM9b	AM4b, AM5, AM6 & AM7b	NM2a, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Fri	30-Oct-20	AM4b, AM5, AM6 & AM7b		NM3, NM4, NM5 & NM6	
Sat	31-Oct-20				All Water Quality Monitoring Locations

	Monitoring Day
	Sunday or Public Holiday

Impact Monitoring Schedule for next Reporting Period – November 2020

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
Sun	1-Nov-20				
Mon	2-Nov-20				All Water Quality Monitoring Locations
Tue	3-Nov-20		AM2, AM3 & AM9b		
Wed	4-Nov-20	AM2, AM3 & AM9b	AM4b, AM5, AM6 & AM7b	NM2a, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Thu	5-Nov-20	AM4b, AM5, AM6 & AM7b		NM3, NM4, NM5 & NM6	
Fri	6-Nov-20				All Water Quality Monitoring Locations
Sat	7-Nov-20				
Sun	8-Nov-20				
Mon	9-Nov-20		AM2, AM3 & AM9b		All Water Quality Monitoring Locations
Tue	10-Nov-20	AM2, AM3 & AM9b	AM4b, AM5, AM6 & AM7b	NM2a, NM8, NM9 & NM10	
Wed	11-Nov-20	AM4b, AM5, AM6 & AM7b		NM3, NM4, NM5 & NM6	All Water Quality Monitoring Locations
Thu	12-Nov-20				
Fri	13-Nov-20				All Water Quality Monitoring Locations
Sat	14-Nov-20		AM2, AM3 & AM9b		
Sun	15-Nov-20				
Mon	16-Nov-20	AM2, AM3 & AM9b	AM4b, AM5, AM6 & AM7b	NM2a, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Tue	17-Nov-20	AM4b, AM5, AM6 & AM7b		NM3, NM4, NM5 & NM6	
Wed	18-Nov-20				All Water Quality Monitoring Locations
Thu	19-Nov-20				
Fri	20-Nov-20		AM2, AM3 & AM9b		All Water Quality Monitoring Locations
Sat	21-Nov-20	AM2, AM3 & AM9b	AM4b, AM5, AM6 & AM7b		
Sun	22-Nov-20				
Mon	23-Nov-20	AM4b, AM5, AM6 & AM7b		NM3, NM4, NM5 & NM6	All Water Quality Monitoring Locations
Tue	24-Nov-20				
Wed	25-Nov-20				All Water Quality Monitoring Locations
Thu	26-Nov-20		AM2, AM3 & AM9b		
Fri	27-Nov-20	AM2, AM3 & AM9b	AM4b, AM5, AM6 & AM7b	NM2a, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Sat	28-Nov-20	AM4b, AM5, AM6 & AM7b			
Sun	29-Nov-20				
Mon	30-Nov-20				All Water Quality Monitoring Locations

	Monitoring Day
	Sunday or Public Holiday

Appendix I

Database of Monitoring Result

24-hour TSP Monitoring Data

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-HR TSP (μg/m³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m³/min)	(std m³)	INITIAL	FINAL	(g)	
AM2 - Village House near Lin Ma Hang Road															
5-Oct-20	26332	13758.53	13782.53	1440.00	32	32	32.0	28	1011.2	0.94	1354	2.6538	2.7295	0.0757	56
10-Oct-20	26338	13782.53	13806.53	1440.00	32	32	32.0	26.1	1012.8	0.94	1359	2.6513	2.7596	0.1083	80
16-Oct-20	26287	13806.53	13830.53	1440.00	32	32	32.0	25.7	1014	0.95	1361	2.6936	2.8110	0.1174	86
22-Oct-20	26353	13830.53	13854.53	1440.00	32	32	32.0	24.7	1009.4	0.94	1360	2.6313	2.7990	0.1677	123
28-Oct-20	26203	13854.53	13878.53	1440.00	32	32	32.0	24.4	1014.9	0.95	1364	2.6922	2.8400	0.1478	108
AM3 - Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village															
5-Oct-20	26331	17471.54	17495.54	1440.00	32	32	32	28	1011.2	1.10	1587	2.6477	2.7097	0.0620	39
10-Oct-20	26337	17495.54	17519.54	1440.00	32	32	32	26.1	1012.8	1.11	1592	2.6578	2.7711	0.1133	71
16-Oct-20	26288	17519.54	17543.54	1440.00	32	32	32	25.7	1014	1.11	1593	2.6807	2.7998	0.1191	75
22-Oct-20	26354	17543.54	17567.54	1440.00	32	32	32	24.7	1009.4	1.11	1593	2.6311	2.7912	0.1601	101
28-Oct-20	26205	17567.54	17591.54	1440.00	30	32	31	24.4	1014.9	1.08	1557	2.6954	2.831	0.1356	87
AM4b - House no. 10B1 Nga Yiu Ha Village															
3-Oct-20	26330	16887.94	16911.94	1440.00	36	36	36.0	28.3	1011.3	1.05	1506	2.6381	2.7415	0.1034	69
8-Oct-20	26335	16911.94	16935.95	1440.60	34	35	34.5	26.3	1013	1.00	1437	2.6628	2.6981	0.0353	25
13-Oct-20	26345	16935.95	16959.95	1440.00	34	34	34.0	24.9	1009.6	0.98	1411	2.6882	2.8559	0.1677	119
19-Oct-20	26289	16959.95	16983.95	1440.00	40	40	40.0	25.3	1014.4	1.20	1726	2.6970	2.9318	0.2348	136
23-Oct-20	26385	16983.95	17007.95	1440.00	38	38	38.0	23.5	1011.4	1.13	1625	2.6627	2.8552	0.1925	118
AM5a - Ping Yeung Village House															
3-Oct-20	26329	15701.60	15725.60	1440.00	34	34	34.0	28.3	1011.3	1.11	1599	2.6397	2.7000	0.0603	38
8-Oct-20	26338	15725.60	15749.13	1411.80	33	34	33.5	26.3	1013	1.10	1552	2.6565	2.8072	0.1507	97
13-Oct-20	26349	15749.13	15772.89	1425.60	32	34	33.0	24.9	1009.6	1.09	1547	2.6859	2.8224	0.1365	88
19-Oct-20	26290	15772.89	15796.89	1440.00	40	40	40.0	25.3	1014.4	1.29	1864	2.6824	2.9315	0.2491	134
23-Oct-20	26386	15796.89	15820.46	1414.20	34	34	34.0	23.5	1011.4	1.12	1581	2.6835	2.7724	0.0889	56
AM6 - Wo Keng Shan Village House															
3-Oct-20	26326	13333.22	13357.22	1440.00	34	34	34.0	28.3	1011.3	1.00	1435	2.7094	2.7600	0.0506	35
8-Oct-20	26334	13357.22	13381.22	1440.00	33	34	33.5	26.3	1013.0	0.98	1417	2.6580	2.6816	0.0236	17
13-Oct-20	26286	13381.22	13405.81	1475.40	32	34	33.0	24.9	1009.6	0.97	1428	2.6944	2.8046	0.1102	77
19-Oct-20	26291	13405.81	13429.81	1440.00	30	30	30.0	25.3	1014.4	0.87	1250	2.6904	2.8208	0.1304	104
23-Oct-20	26387	13429.81	13453.31	1410.00	32	32	32.0	23.5	1011.4	0.94	1322	2.6792	2.8086	0.1294	98
AM7b - Loi Tung Village House															
3-Oct-20	26325	22378.24	22402.24	1440.00	32	32	32	28.3	1011.3	0.97	1396	2.7007	2.7487	0.0480	34
8-Oct-20	26333	22402.24	22426.25	1440.60	32	33	32.5	26.3	1013	0.99	1422	2.6373	2.7	0.0627	44
13-Oct-20	26350	22426.25	22450.25	1440.00	30	32	31	24.9	1009.6	0.95	1362	2.6751	2.7073	0.0322	24

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-HR TSP ($\mu g/m^3$)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m^3/min)	(std m^3)	INITIAL	FINAL	(g)	
19-Oct-20	26255	22450.25	22474.25	1440.00	32	32	32	25.3	1014.4	0.98	1405	2.6921	2.7709	0.0788	56
23-Oct-20	26401	22474.25	22498.25	1440.00	30	30	30	23.5	1011.4	0.92	1326	2.7048	2.7643	0.0595	45
AM9b - Nam Wa Po Village House No. 80															
5-Oct-20	26007	23623.51	23647.71	1452.00	28	28	28	28	1011.2	0.81	1172	2.8422	2.8535	0.0113	10
10-Oct-20	26266	23647.71	23671.51	1428.00	31	32	31.5	26.1	1012.8	0.94	1342	2.6957	2.7708	0.0751	56
16-Oct-20	25972	23671.51	23695.51	1440.00	31	32	31.5	25.7	1013.05	0.94	1354	2.7634	2.8733	0.1099	81
22-Oct-20	26355	23695.51	23719.51	1440.00	32	32	32	24.7	1009.4	0.96	1381	2.651	2.7335	0.0825	60
28-Oct-20	26356	23719.51	23743.51	1440.00	32	32	32	24.4	1014.9	0.96	1386	2.6521	2.761	0.1089	79

Construction Noise Monitoring Results, dB(A)

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3nd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30	façade correction
NM2a - Village House near Lin Ma Hang Road																					
6-Oct-20	10:11	62.1	65.9	54.8	61.7	65.5	55	60.1	64.3	52.6	61	64.4	52.7	60.1	64	52.7	62.7	65.4	52.8	61	64
12-Oct-20	9:22	63.5	65.5	50.5	58.8	60.5	52.5	55.2	57.5	51.5	56.7	59.5	51	57.5	60.5	53.5	59.3	61.5	53	59	62
23-Oct-20	9:35	56.8	60.3	48.9	57.4	59.6	50.5	58.6	60.9	51.2	59.1	62.3	52.6	60.4	61.4	58.9	59.9	60.6	57.6	59	62
29-Oct-20	9:28	54.4	56.7	50.5	56.5	59.2	51.2	55.3	57.8	50.8	53.9	56.1	50.1	57.2	59.5	52.2	54.5	57.6	50.7	55	58
NM3 - Ping Yeung Village House																					
5-Oct-20	11:15	57.7	60.9	49.7	55.1	53.7	48.0	53.5	52.6	47.5	54.4	55.2	50.2	53.1	54.6	47.5	53.7	55.0	47.9	55	NA
14-Oct-20	10:49	53.8	56.7	48.2	57.8	59.2	51.0	55.5	56.1	50.8	54.5	59.7	48.8	53.5	57.8	50.6	52.1	54.8	47.6	55	NA
20-Oct-20	9:18	54.2	56.5	48.5	54.6	56.5	49.5	57.8	59.5	49.5	52.7	53.5	48.5	56.1	58.5	49.0	56.2	57.5	49.0	56	NA
30-Oct-20	9:36	61.4	62.1	51.3	57.2	60.5	51.4	59.4	60.6	51.0	56.5	58.9	50.6	58.7	59.5	51.0	61.2	61.2	51.4	59	NA
NM4 - Wo Keng Shan Village House																					
5-Oct-20	12:00	63.2	65.4	51.9	64.5	63.5	54.2	65.6	65.1	55.5	60.9	63.2	52.1	62.0	64.3	50.8	52.7	61.0	49.8	63	NA
14-Oct-20	9:50	63.2	58.9	46.3	61.1	62.3	48.2	59.1	60.5	50.2	56.7	59.8	50.6	61.8	61.7	49.5	60.5	61.2	48.7	61	NA
20-Oct-20	10:01	59.4	61.5	53.5	58.9	63.5	53.5	58.2	59.5	53.5	56.7	58.5	52.0	58.4	60.5	51.5	57.7	59.5	52.0	58	NA
30-Oct-20	10:43	64.8	67.6	56.7	64.8	66.0	55.5	65.8	65.1	54.1	69.7	71.2	53.7	59.0	62.6	54.7	61.5	64.5	51.7	66	NA
NM5– Ping Yeung Village House																					
5-Oct-20	13:30	52.1	55.8	45.7	52.5	55	46.8	54.2	56.2	48.9	54.8	58.1	49.1	57.3	59.8	52	55.5	57.8	48.5	55	NA
14-Oct-20	13:51	53.8	56.5	50.6	54.7	54.5	48.9	56.2	57.3	49.6	55.5	57.6	49.2	58.7	60.6	55.5	54.1	56.5	47.3	56	NA
20-Oct-20	13:26	53.2	56.5	47.5	52.9	55.5	47.0	54.2	55.5	48.5	51.4	54.5	47.5	52.3	54.0	47.5	55.2	57.5	48.0	53	NA
30-Oct-20	13:24	51.7	55.6	47.1	51.5	54.3	46.5	57.6	57.8	46.7	54.5	56.9	47.2	55.6	57.4	47.3	54	56.4	45.5	55	NA
NM6 – Tai Tong Wu Village House 2																					
5-Oct-20	14:10	58.6	61.4	51.6	56.9	60.5	50.2	57.2	59.4	50.8	56.5	60.4	50.8	55.2	57	49.8	57.5	60.3	51.4	57	NA
14-Oct-20	14:51	57.5	59.6	50.8	56.4	59.2	50.2	58.5	60.5	51.2	59.9	61.4	53.8	61.8	62.9	54.6	58.3	61.1	52.6	59	NA
20-Oct-20	14:16	57.4	60	52.5	57.2	60.5	51	55.4	58	51.5	57	59.5	51.5	58.3	60.5	52.5	55.9	59.5	53	57	NA
30-Oct-20	14:05	57	60	52.9	58.6	61.6	51.9	60.3	62.1	52.1	57.2	59.8	50.1	57.1	60	49.8	58.1	60.9	52.7	58	NA
NM8 - Village House, Tong Hang																					
6-Oct-20	14:32	59.9	67.9	44.3	62.8	68.9	46.1	60.8	66.6	45.5	60.7	65.9	44.8	59	64.3	44.9	62.5	66.1	45.9	61	NA
12-Oct-20	14:26	58.3	61.5	50	60.8	66.5	50	58.9	64	50.5	58.1	65.5	50.5	57.3	64	49.5	60	65.5	50.5	59	NA
23-Oct-20	15:55	56.4	59.1	52.6	57.5	60.4	53	55.8	57.6	51.8	56.5	58.6	53.4	59.3	64.6	55.2	59.7	62.7	56.2	58	NA
29-Oct-20	16:31	65.5	58.2	54.8	58.3	59	55.3	55.2	60.1	54.3	57.1	61.8	54.5	56	58	54.6	56.6	55.7	53.2	60	NA
NM9 - Village House, Kiu Tau Village																					
6-Oct-20	13:46	59.1	58.9	53.1	58	57.8	52.4	58.1	58	52.4	59.2	58.6	53.4	59.1	59	53.2	59.3	58.6	53.1	59	NA
12-Oct-20	13:34	57.4	59	54.5	57.7	60.5	53.5	58.6	60.5	56	59.4	60.5	58	58.7	61	54.5	57.6	59	52.5	58	NA
23-Oct-20	15:01	62.3	65.5	60.6	61.7	64.5	59.5	60.6	63.7	59.1	60.7	63.4	59.3	59.6	60.7	54.5	63.8	65.6	62.9	62	NA
29-Oct-20	15:21	61.8	62.2	58.6	60.5	61.4	58.1	62.4	63.6	59	62.7	63.9	59.5	60.6	61.7	58	62.8	64	60	62	NA
NM10 - Nam Wa Po Village House No. 80																					
6-Oct-20	13:05	58.5	59.5	54.5	57.4	59	53	56.5	58.5	52.5	55.9	59	52.5	53.5	58.5	52.5	55.9	57.5	51.5	57	60
12-Oct-20	11:02	57.5	61	56.5	58.9	60.5	56	60.1	61.5	59	57.1	60.5	56.5	58.7	60.5	56.5	57.5	61.5	56	58	61
23-Oct-20	14:10	55.5	58.9	54.3	57.7	59	56.2	56.6	58	54.5	56.1	57.6	54.8	55.2	58.1	53.1	54.3	57	52.5	56	59
29-Oct-20	14:30	56.2	57.8	54.2	56.7	58.5	54.6	55.8	57.1	53.9	55.5	56.9	53.7	56.6	58.3	54.4	55.1	56.5	53.2	56	59

Water Quality Monitoring Data for Contract 6 and SS C505

Date	3-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	13:15	0.28	26.6	26.6	6.75	6.8	84.0	84.1	288.0	289.0	7.81	7.8	188	185.0
			26.6		6.76		84.1		290.0		7.81		182	
WM1	13:00	0.26	26.4	26.4	6.92	6.9	86.0	86.1	342.0	343.5	8.34	8.3	210	213.5
			26.4		6.93		86.1		345.0		8.34		217	

Date	5-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:20	0.30	26.4	26.4	6.78	6.8	84.2	84.3	295.0	296.5	7.84	7.8	221	219.0
			26.4		6.79		84.4		298.0		7.84		217	
WM1	11:00	0.35	26.1	26.1	6.96	7.0	86.3	86.4	350.0	350.5	8.37	8.4	229	233.0
			26.1		6.97		86.4		351.0		8.37		237	

Date	7-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:50	0.25	23.7	23.7	9.53	9.5	112.6	112.7	8.9	8.6	8.4	8.4	4	4.0
			23.7		9.55		112.8		8.3		8.4		4	
WM1	11:30	0.28	23.3	23.3	9.33	9.3	110.1	110.2	42.2	41.8	7.9	7.9	49	49.0
			23.3		9.34		110.3		41.3		7.9		49	

Date	9-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:35	0.25	23.4	23.4	8.34	8.3	97.9	98.0	12.3	12.4	7.33	7.3	4	4.0
			23.4		8.35		98.1		12.4		7.33		4	
WM1	10:15	0.30	23.8	23.8	8.07	8.1	95.7	96.0	36.1	37.1	7.9	7.9	50	51.0
			23.8		8.12		96.3		38.0		7.9		52	

Date	12-Oct-20													
Location	Time	Depth	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	

		(m)											
WM1-C	10:20	0.25	25.3 25.3	25.3	8.37 8.39	8.4	101.9 102.2	102.1	7.4 6.9	7.1	7.42 7.42	7.4	26 27	26.5
WM1	9:55	0.25	25.8 25.8	25.8	7.65 7.66	7.7	94.0 94.1	94.1	25.3 24.5	24.9	7.46 7.46	7.5	3 3	3.0

Date	14-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:15	0.26	24.3 24.3	24.3	7.3 7.45	7.4	87.3 89.2	88.3	8.8 9.4	9.1	7.29 7.29	7.3	5 5	5.0
WM1	9:55	0.28	24.6 24.6	24.6	7.78 7.76	7.8	93.7 93.5	93.6	21.1 20.0	20.6	7.64 7.64	7.6	20 19	19.5

Date	16-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:30	0.25	24.9 24.9	24.9	7.68 7.71	7.7	92.9 93.2	93.1	8.3 8.0	8.1	7.56 7.56	7.6	5 4	4.5
WM1	11:10	0.30	25.2 25.2	25.2	7.57 7.59	7.6	92.2 92.4	92.3	18.2 18.7	18.5	7.95 7.95	8.0	25 24	24.5

Date	19-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:50	0.28	22.1 22.1	22.1	7.69 7.7	7.7	88.1 88.3	88.2	8.0 8.1	8.0	7.74 7.79	7.8	3 3	3.0
WM1	11:30	0.30	23.1 23.1	23.1	7.85 7.89	7.9	92.0 92.2	92.1	16.2 16.0	16.1	7.7 7.7	7.7	16 16	16.0

Date	21-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:45	0.28	21.8 21.8	21.8	9 9.01	9.0	101.6 101.7	101.7	6.7 7.2	6.9	9.9 9.9	9.9	2 3	2.5
WM1	11:25	0.30	23.1	23.1	9.66	9.6	112.6	112.1	15.0	15.8	10.1	10.1	22	21.0

			23.1		9.62		111.6		16.5		10.1		20	

Date	23-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:50	0.27	20.2	20.2	7.8	7.8	85.8	81.2	4.9	4.7	9.8	9.8	<2	<2
			20.2		7.88		76.6		4.6		9.8		<2	
WM1	11:30	0.28	21.6	21.6	9.67	9.7	108.9	109.0	10.9	11.4	10	10.0	10	9.5
			21.6		9.69		109.1		11.8		10		9	

Date	27-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:40	0.25	23.1	23.1	7.45	7.4	86.3	85.7	6.5	6.3	10.2	10.2	3	3.5
			23.1		7.25		85.0		6.2		10.2		4	
WM1	10:20	0.25	24.1	24.1	8.71	8.6	103.3	102.8	15.9	16.3	10	10.0	22	21.0
			24.1		8.53		102.2		16.7		10		20	

Date	29-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:10	0.26	23.3	23.3	8.57	8.7	100.0	101.5	3.8	3.7	9.8	9.8	<2	<2
			23.3		8.76		102.9		3.6		9.8		<2	
WM1	9:45	0.30	24	24.0	9.26	9.3	110.0	111.3	14.7	14.0	9.1	9.1	16	15.5
			24		9.37		112.6		13.3		9.1		15	

Date	31-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	14:20	0.25	22.1	22.1	9	9.0	102.1	102.5	8.0	7.9	9.7	9.7	2	2.0
			22.1		9.07		102.8		7.9		9.7		2	
WM1	14:00	0.28	24.1	24.1	10.88	10.9	129.7	129.8	20.5	20.4	9.5	9.5	28	27.5
			24.1		10.89		129.8		20.3		9.5		27	

Water Quality Monitoring Data for Contract 2 and 3

Date	3-Oct-20															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	15:00	0.13	28.8	28.8	6.25	6.2	81.0	80.9	5.9	5.9	7.23	7.2	5	5.0
			28.8		6.22		80.8		6.0		7.23		5	
WM4-CB	15:15	0.25	28.4	28.4	8.13	8.1	104.2	104.3	15.0	15.1	7.44	7.4	13	14.0
			28.4		8.14		104.3		15.1		7.44		15	
WM4	14:45	0.20	27.6	27.6	6.85	6.9	86.1	86.3	17.2	17.6	7.49	7.5	16	15.5
			27.6		6.9		86.5		17.9		7.49		15	

Date	5-Oct-20															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:20	0.14	28.7	28.7	6.27	6.1	81.1	79.4	6.1	5.6	7.25	7.3	6	5.5
			28.7		6.01		77.7		5.2		7.25		5	
WM4-CB	14:40	0.25	28.1	28.1	8.15	8.1	104.4	104.4	15.3	15.2	7.45	7.5	14	13.5
			28.1		8.14		104.3		15.1		7.45		13	
WM4	14:00	0.22	27	27.0	6.88	6.9	86.4	87.0	17.3	18.5	7.5	7.5	14	14.0
			27		6.97		87.6		19.7		7.5		14	

Date	7-Oct-20															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	15:00	0.13	28.2	28.2	4.79	4.9	60.8	62.1	0.8	0.8	9.4	9.4	<2	<2
			28.2		4.94		63.4		0.7		9.4		<2	
WM4-CB	15:20	0.25	24.9	24.9	8.43	8.5	103.9	104.6	5.9	5.8	9.4	9.4	7	7.0
			24.9		8.5		105.2		5.8		9.4		7	
WM4	14:40	0.20	24.9	24.9	6.84	6.9	82.5	82.8	4.0	3.7	9.7	9.7	4	4.0
			24.9		6.87		83.1		3.4		9.7		4	

Date	9-Oct-20															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	15:10	0.13	27.9	27.9	4.45	4.5	58.2	58.6	2.4	2.5	7.25	7.3	<2	<2
			27.9		4.63		59.0		2.5		7.25		<2	
WM4-CB	15:30	0.25	27.4	27.4	10.58	10.4	133.9	131.6	5.0	4.9	7.51	7.5	4	4.5
			27.4		10.25		129.3		4.8		7.51		5	
WM4	14:50	0.20	25	25.0	7.38	7.4	89.4	89.2	4.3	4.2	7.46	7.5	3	3.0
			25		7.34		88.9		4.1		7.46		3	

Date	12-Oct-20															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	15:00	0.13	27.8	27.8	6.72	6.7	85.7	85.9	0.5	0.6	7.16	7.2	<2	<2
			27.8		6.75		86.1		0.6		7.16		<2	
WM4-CB	15:20	0.25	28	28.0	7.07	7.1	90.5	90.9	2.2	2.1	7.25	7.3	8	8.0
			28		7.13		91.2		2.0		7.25		8	
WM4	14:40	0.20	26.1	26.1	5.85	5.9	74.8	75.0	2.0	2.0	7.13	7.1	3	3.0
			26.1		5.87		75.1		2.1		7.13		3	

Date	14-Oct-20															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:45	0.14	24.8	24.8	6.19	6.2	79.8	80.1	0.5	0.5	7.26	7.3	<2	<2
			24.8		6.23		80.4		0.5		7.26		<2	
WM4-CB	15:00	0.26	24.5	24.5	7.62	7.6	98.2	98.2	6.0	5.9	7.42	7.4	6	6.0
			24.5		7.62		98.1		5.9		7.42		6	
WM4	14:30	0.20	24.1	24.1	6.73	6.7	86.5	86.6	2.3	2.4	7.31	7.3	4	4.0
			24.1		6.75		86.7		2.6		7.31		4	

Date	16-Oct-20															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:30	0.13	25.7	25.7	6.54	6.6	83.4	83.7	0.7	0.6	7.23	7.2	<2	<2
			25.7		6.57		83.9		0.5		7.23		<2	
WM4-CB	14:50	0.25	25.2	25.2	6.71	6.7	85.9	91.2	3.6	3.9	7.25	7.3	20	20.0
			25.2		6.76		96.4		4.2		7.25		20	
WM4	14:15	0.20	25	25.0	6.63	6.6	84.4	84.6	2.7	2.6	7.41	7.4	4	4.0
			25		6.65		84.8		2.6		7.41		4	

Date	19-Oct-20															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	15:00	0.13	24.5	24.5	6.57	6.6	82.2	82.3	1.0	1.0	7.55	7.6	<2	<2
			24.5		6.58		82.3		0.9		7.55		<2	
WM4-CB	15:25	0.25	24.6	24.6	6.68	6.7	84.4	84.6	3.1	3.1	7.45	7.5	6	6.0
			24.6		6.71		84.8		3.1		7.45		6	
WM4	14:45	0.21	24.1	24.1	5.6	5.6	70.4	70.6	3.0	3.1	7.27	7.3	6	5.5
			24.1		5.63		70.7		3.2		7.27		5	

Date	21-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	15:00	0.13	26.5	26.5	4.44	4.5	54.9	55.1	1.1	1.1	9	9.0	<2	<2
			26.5		4.47		55.2		1.0		9		<2	
WM4-CB	15:25	0.25	26.6	26.6	8.15	8.2	100.5	100.6	5.0	5.0	9.4	9.4	4	4.5
			26.6		8.16		100.6		5.0		9.4		5	
WM4	14:40	0.20	25.2	25.2	6.04	6.1	73.6	73.7	4.0	4.1	9.8	9.8	4	4.0
			25.2		6.06		73.7		4.2		9.8		4	

Date	23-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:50	0.13	25.8	25.8	4.71	4.7	57.6	57.7	1.0	1.0	8.8	8.8	<2	<2
			25.8		4.72		57.7		1.0		8.8		<2	
WM4-CB	15:15	0.25	23.6	23.6	7.89	7.9	92.0	92.1	4.8	4.9	9.4	9.4	8	7.5
			23.6		7.9		92.1		5.1		9.4		7	
WM4	14:30	0.20	23.1	23.1	6.02	6.0	70.2	70.3	3.6	3.9	9.7	9.7	4	4.0
			23.1		6.04		70.4		4.1		9.7		4	

Date	27-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	13:50	0.13	25.3	25.3	5.02	5.0	61.0	61.3	1.1	1.2	9.6	9.6	<2	<2
			25.3		5.06		61.6		1.3		9.6		<2	
WM4-CB	14:15	0.25	24.9	24.9	7.22	7.2	87.2	87.5	6.0	6.6	9	9.0	9	8.5
			24.9		7.26		87.7		7.1		9		8	
WM4	13:30	0.20	24.2	24.2	5.45	5.5	65.1	65.7	4.0	3.9	9.8	9.8	3	3.5
			24.2		5.54		66.3		3.9		9.8		4	

Date	29-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	13:50	0.13	25.5	25.5	4.93	5.0	60.1	60.6	0.9	1.0	8.6	8.6	<2	<2
			25.5		4.99		61.0		1.0		8.6		<2	
WM4-CB	14:10	0.25	25	25.0	6.36	6.4	76.4	77.4	6.1	5.7	8.7	8.7	8	8.0
			25		6.47		78.4		5.3		8.7		8	
WM4	13:30	0.20	24.6	24.6	5.62	5.6	67.6	67.5	3.1	2.8	9.4	9.4	4	4.0
			24.6		5.61		67.4		2.6		9.4		4	

Date	31-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	16:00	0.13	24.6	24.6	5.05	5.1	60.8	61.0	1.8	1.7	9	9.0	4	3.5
			24.6		5.08		61.1		1.7		9		3	
WM4-CB	16:15	0.25	25.9	25.9	7.84	7.9	98.1	98.3	6.8	6.3	8.9	8.9	6	6.0
			25.9		7.88		98.5		5.9		8.9		6	
WM4	15:50	0.20	24.7	24.7	5.69	5.7	68.1	68.3	3.3	3.6	9	9.0	3	3.5
			24.7		5.72		68.4		3.9		9		4	

Water Quality Monitoring Data for Contract 6

Date	3-Oct-20															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	13:55	0.25	25.8	25.8	7.85	7.9	95.8	96.0	39.8	39.9	7.43	7.4	18	18.5
			25.8		8.01		96.1		40.0		7.43		19	
WM2A	13:35	0.15	26.6	26.6	8.78	8.8	108.0	108.1	46.3	46.4	7.30	7.3	22	21.5
			26.6		8.79		108.1		46.5		7.30		21	

Date	5-Oct-20															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	12:05	0.26	25.6	25.6	7.86	7.9	96.0	97.1	40.1	40.7	7.46	7.5	22	21.5
			25.6		8.03		98.1		41.2		7.46		21	
WM2A	11:45	0.20	26.4	26.4	8.79	8.8	108.3	108.4	48.0	48.1	7.31	7.3	25	24.5
			26.4		8.8		108.4		48.2		7.31		24	

Date	7-Oct-20															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	12:30	0.25	23.3	23.3	7.2	7.3	83.9	85.7	9.2	9.2	7.20	7.2	4	4.0
			23.3		7.4		87.5		9.2		7.20		4	
WM2A	12:10	0.15	23.8	23.8	6.75	6.8	79.7	80.4	4.1	4.1	7.10	7.1	<2	<2
			23.8		6.83		81.0		4.0		7.10		<2	

Date	9-Oct-20															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	11:10	0.25	22.9	22.9	8.46	8.5	98.6	98.7	4.0	3.9	7.31	7.3	<2	<2
			22.9		8.48		98.8		3.9		7.31		<2	
WM2A	10:55	0.15	23.8	23.8	7.21	7.2	84.5	84.5	5.2	5.3	7.30	7.3	<2	<2
			23.8		7.15		84.4		5.4		7.30		<2	

Date	12-Oct-20															
Location	Time	Depth	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	

		(m)											
WM2A-C	11:00	0.23	24.1 24.1	24.1	7.65 7.99	7.8	91.1 95.2	93.2	4.1 4.2	4.2	7.37 7.37	7.4	<2 <2	<2
WM2A	10:40	0.15	25.3 25.3	25.3	7.02 7.06	7.0	85.6 86.1	85.9	5.1 4.9	5.0	7.50 7.50	7.5	2 2	2.0

Date	14-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:55	0.25	23.7 23.7	23.7	7.93 7.94	7.9	93.7 93.8	93.8	3.4 3.7	3.6	7.36 7.36	7.4	<2 <2	<2
WM2A	10:40	0.16	24.1 24.1	24.1	6.57 6.59	6.6	78.2 78.4	78.3	5.2 5.0	5.1	7.61 7.61	7.6	2 2	2.0

Date	16-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	12:10	0.25	24.1 24.1	24.1	7.95 7.96	8.0	94.6 94.7	94.7	3.8 3.9	3.9	7.27 7.27	7.3	<2 <2	<2
WM2A	11:50	0.15	25.1 25.1	25.1	6.84 6.87	6.9	83.2 83.5	83.4	4.1 4.1	4.1	7.17 7.17	7.2	2 2	2.0

Date	19-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	12:30	0.25	22.4 22.4	22.4	8.33 8.31	8.3	96.2 95.8	96.0	4.3 4.5	4.4	7.36 7.36	7.4	<2 <2	<2
WM2A	12:10	0.15	23.1 23.1	23.1	6.9 6.93	6.9	80.7 81.3	81.0	4.4 4.5	4.5	7.24 7.24	7.2	<2 <2	<2

Date	21-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	13:05	0.23	21.9 21.9	21.9	6.88 7.04	7.0	78.2 80.4	79.3	4.2 4.3	4.2	10.90 10.90	10.9	<2 <2	<2
WM2A	12:45	0.15	23.5	23.5	6.42	6.4	75.5	75.6	5.5	5.5	8.80	8.8	2	2.0

			23.5		6.44		75.7		5.6		8.80		2	

Date	23-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	12:35	0.24	21.2	21.2	6.8	6.8	76.2	76.5	3.8	4.0	9.40	9.4	<2	<2
			21.2		6.85		76.7		4.1		9.40		<2	
WM2A	12:15	0.15	21.9	21.9	6.06	6.1	68.7	68.8	4.3	4.2	9.10	9.1	<2	<2
			21.9		6.07		68.8		4.1		9.10		<2	

Date	27-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	11:20	0.25	22.9	22.9	5.96	6.1	67.7	69.7	4.6	4.5	9.70	9.7	<2	<2
			22.9		6.2		71.6		4.4		9.70		<2	
WM2A	11:00	0.15	23.1	23.1	5.63	31.2	65.7	66.0	4.2	4.3	9.50	9.5	<2	<2
			23.1		56.7		66.3		4.4		9.50		<2	

Date	29-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	11:05	0.25	23.1	23.1	6.29	6.3	73.3	73.9	5.3	5.3	9.90	9.9	<2	<2
			23.1		6.36		74.5		5.4		9.90		<2	
WM2A	10:40	0.15	23.8	23.8	5.55	5.6	65.6	65.7	17.3	17.3	9.50	9.5	10	10.5
			23.8		5.57		65.8		17.2		9.50		11	

Date	31-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	14:50	0.25	22.3	22.3	6.56	6.6	74.5	74.6	5.0	4.9	9.60	9.6	<2	<2
			22.3		6.57		74.6		4.9		9.60		<2	
WM2A	14:35	0.15	23.3	23.3	5.61	5.6	64.9	65.1	4.7	4.6	9.00	9.0	<2	<2
			23.3		5.65		65.2		4.5		9.00		<2	

Water Quality Monitoring Data for Contract 2 and 6

Date	3-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-c	14:05	0.14	27	27.0	7.61	7.6	94.6	94.7	52.6	53.9	7.22	7.2	36	37.0
			27		7.65		94.7		55.1		7.22		38	
WM3	14:15	0.15	26	26.0	6.62	6.6	81.4	81.5	31.3	31.8	7.55	7.6	21	20.5
			26		6.64		81.6		32.2		7.55		20	

Date	5-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-c	12:25	0.15	26.8	26.8	7.61	7.5	94.9	94.0	53.7	54.6	7.26	7.3	31	30.5
			26.8		7.46		93.1		55.4		7.26		30	
WM3	12:40	0.20	25.9	25.9	6.62	6.6	81.5	81.6	32.4	33.2	7.59	7.6	22	21.5
			25.9		6.63		81.6		34.0		7.59		21	

Date	7-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-c	14:00	0.14	24.4	24.4	6.51	6.6	77.6	78.3	7.1	7.2	9.7	9.7	2	2.0
			24.4		6.59		79.0		7.2		9.7		2	
WM3	14:15	0.16	24.6	24.6	6.65	6.7	79.3	80.7	4.7	4.8	9.7	9.7	3	3.5
			24.6		6.8		82.1		4.8		9.7		4	

Date	9-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-c	11:30	0.14	24.3	24.3	6.75	6.6	80.6	79.2	8.6	8.4	7.25	7.3	5	5.0
			24.3		6.51		77.8		8.2		7.25		5	
WM3	11:45	0.16	24.6	24.6	6.58	7.0	82.4	85.9	5.0	4.7	7.57	7.6	5	4.5
			24.6		7.39		89.3		4.4		7.57		4	

Date	12-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	

WM3-c	11:20	0.15	25	25.0	6.91	6.9	83.8	84.1	5.3	5.2	7.37	7.4	4	4.0
			25		6.96		84.3		5.2		7.37		4	
WM3	11:35	0.17	25.2	25.2	7.31	7.3	89.0	87.8	6.6	6.6	7.53	7.5	9	9.0
			25.2		7.36		86.6		6.6		7.53		9	

Date	14-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-c	11:20	0.14	23.9	23.9	7.67	7.6	91.0	90.1	5.7	5.6	7.3	7.3	3	3.0
			23.9		7.52		89.2		5.6		7.3		3	
WM3	11:35	0.15	24.2	24.2	7.33	7.4	87.4	87.7	4.0	3.8	7.66	7.7	4	4.0
			24.2		7.38		88.0		3.7		7.66		4	

Date	16-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-c	12:25	0.15	24.8	24.8	6.81	6.8	82.1	82.5	4.6	4.5	7.46	7.5	4	4.0
			24.8		6.87		82.9		4.4		7.46		4	
WM3	12:35	0.17	25.4	25.4	7.22	7.2	88.1	88.4	4.6	4.6	7.52	7.5	5	5.0
			25.4		7.25		88.6		4.6		7.52		5	

Date	19-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-c	14:00	0.15	23.3	23.3	6.63	6.7	77.8	78.3	3.4	3.6	7.55	7.6	<2	<2
			23.3		6.69		78.7		3.8		7.55		<2	
WM3	14:15	0.16	23.9	23.9	7.33	7.4	87.5	88.0	4.8	4.3	7.66	7.7	4	4.5
			23.9		7.44		88.5		3.9		7.66		5	

Date	21-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-c	13:30	0.13	23.2	23.2	5.44	5.5	63.6	64.3	3.0	3.2	10.2	10.2	2	2.0
			23.2		5.53		65.0		3.3		10.2		2	
WM3	13:45	0.16	24.2	24.2	6.42	6.4	76.5	76.6	7.2	7.3	10.2	10.2	11	11.5
			24.2		6.44		76.7		7.4		10.2		12	

Date	23-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-c	12:55	0.00												
WM3	13:10	0.15	23.7 23.7	23.7	6.44 6.46	6.5	76.2 76.4	76.3	3.9 4.2	4.0	9.6 9.6	9.6	6 6	6.0

Date	27-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-c	11:45	0.00												
WM3	12:00	0.15	23.6 23.6	23.6	6.02 6.08	6.1	71.0 71.6	71.3	5.1 4.5	4.8	9.9 9.9	9.9	6 5	5.5

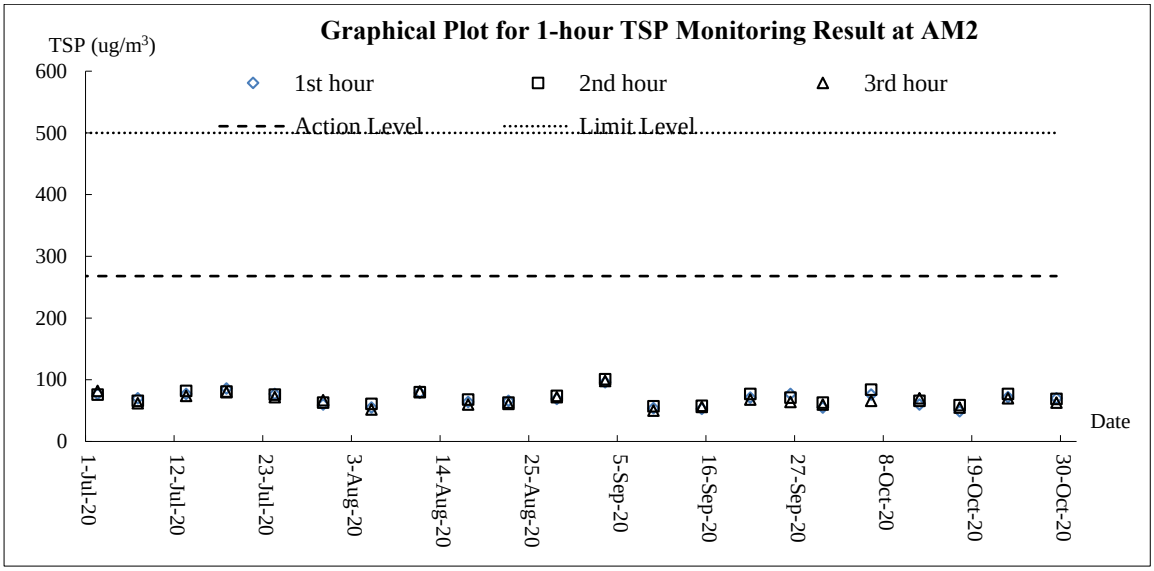
Date	29-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-c	11:30	0.00												
WM3	11:50	0.15	24.7 24.7	24.7	5.97 6.03	6.0	71.6 72.3	72.0	8.9 10.6	9.8	9.6 9.6	9.6	9 10	9.5

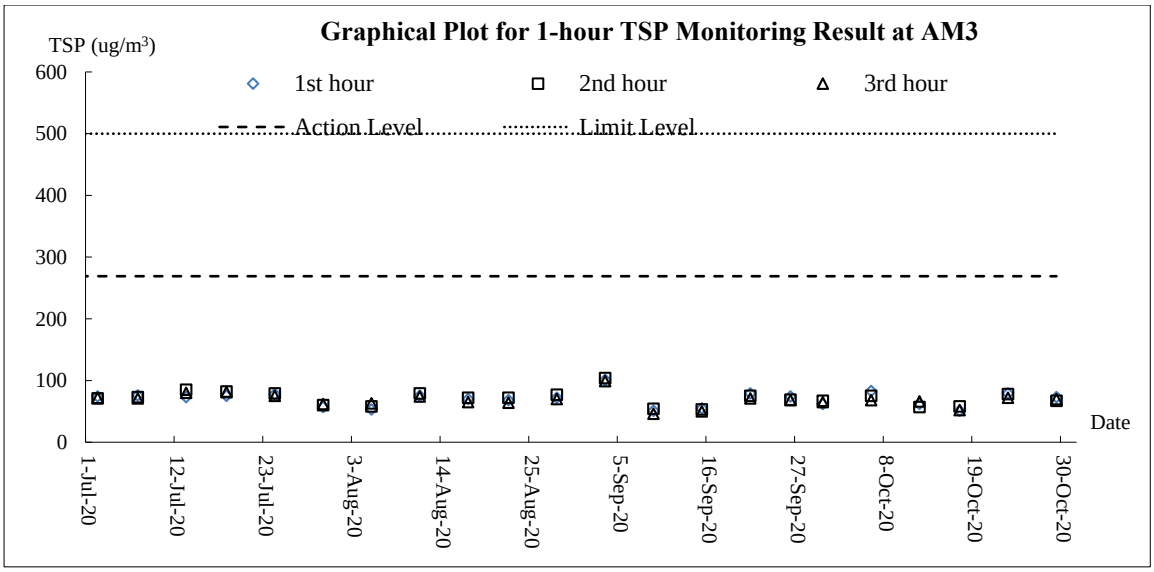
Date	31-Oct-20													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-c	15:00	0.00												
WM3	15:15	0.15	23.5 23.5	23.5	6.17 6.18	6.2	72.8 72.9	72.9	3.5 3.2	3.4	9.2 9.2	9.2	3 3	3.0

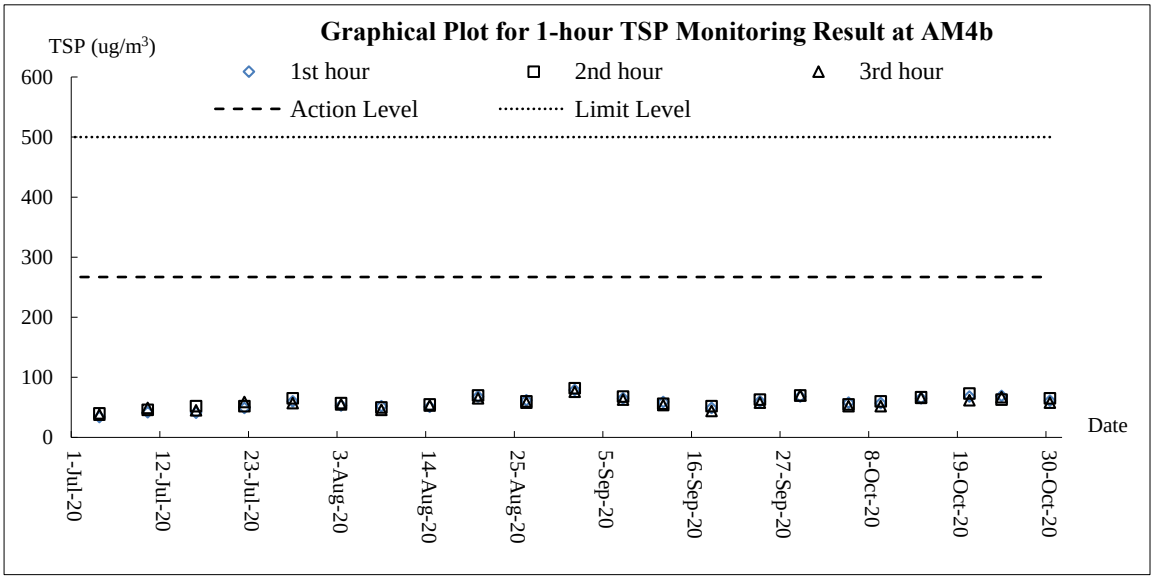
Appendix J

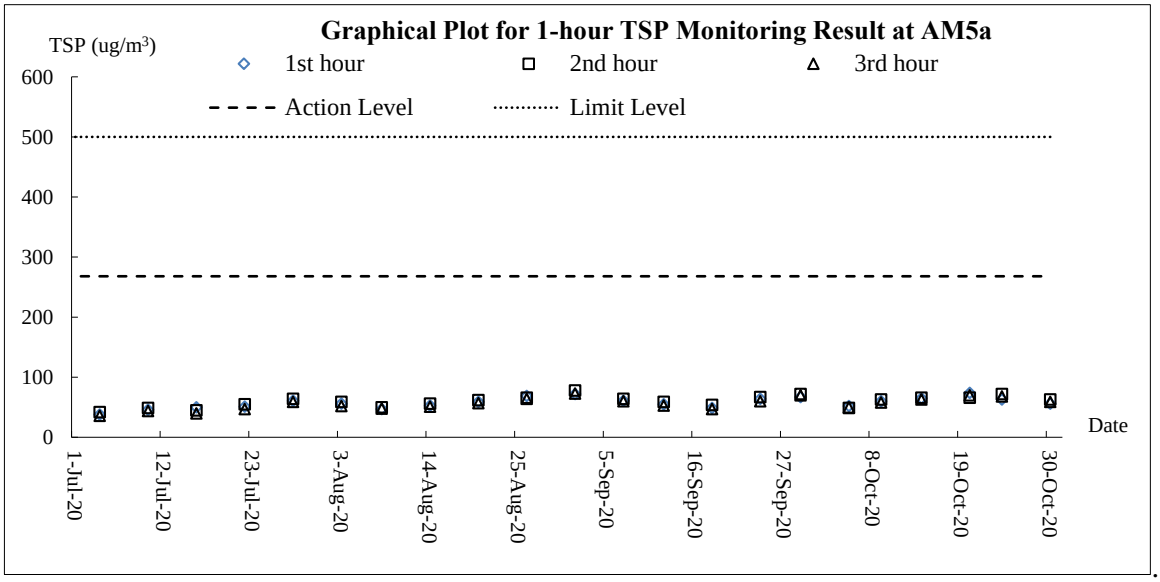
Graphical Plots for Monitoring Result

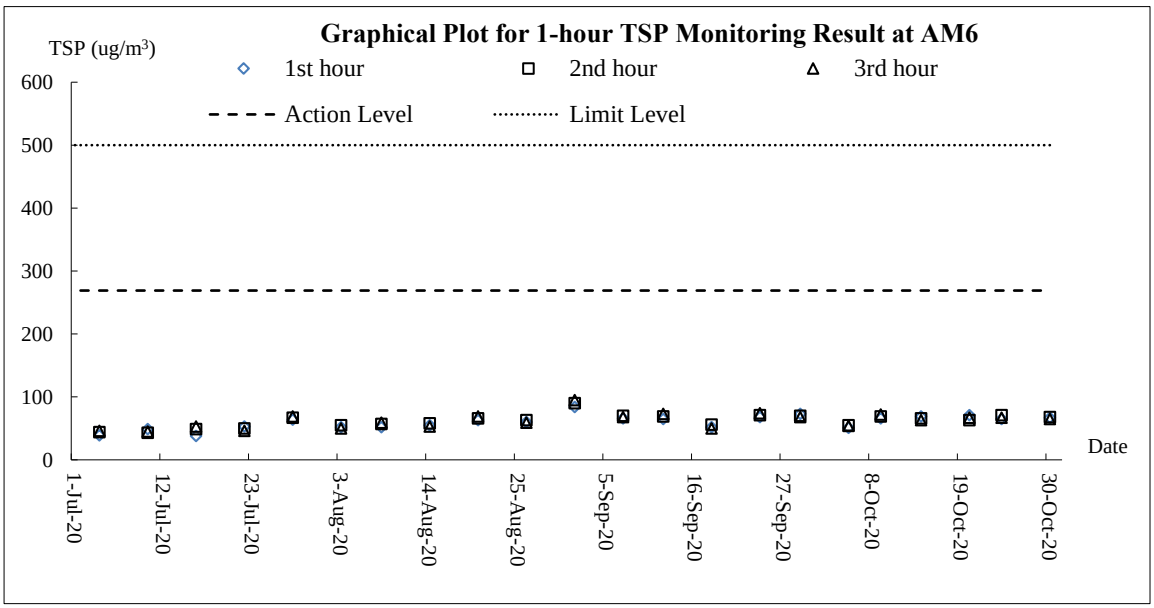
Air Quality – 1-hour TSP

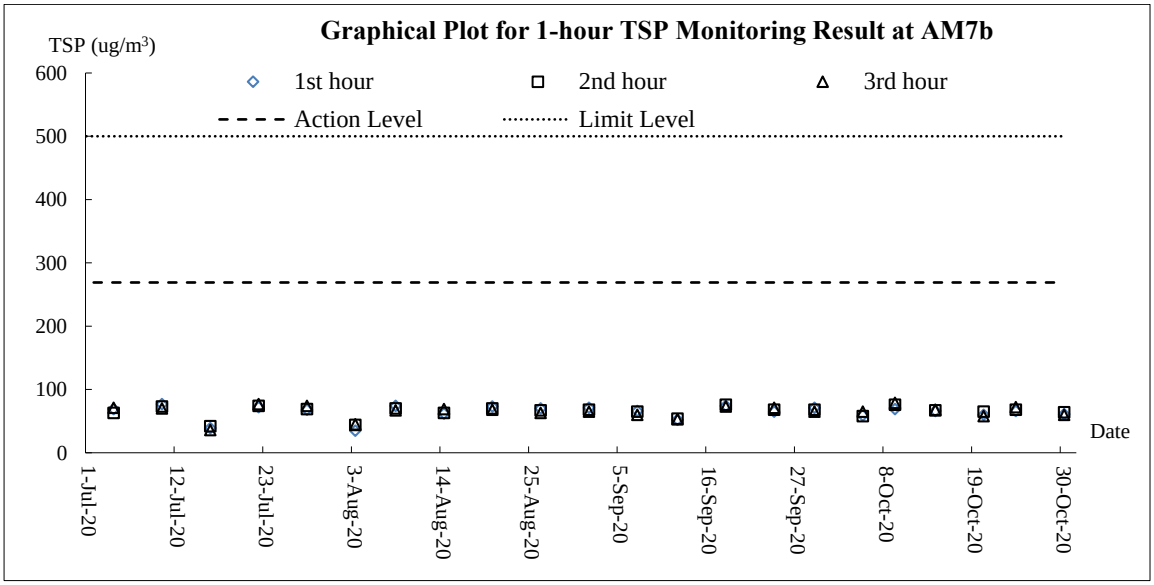


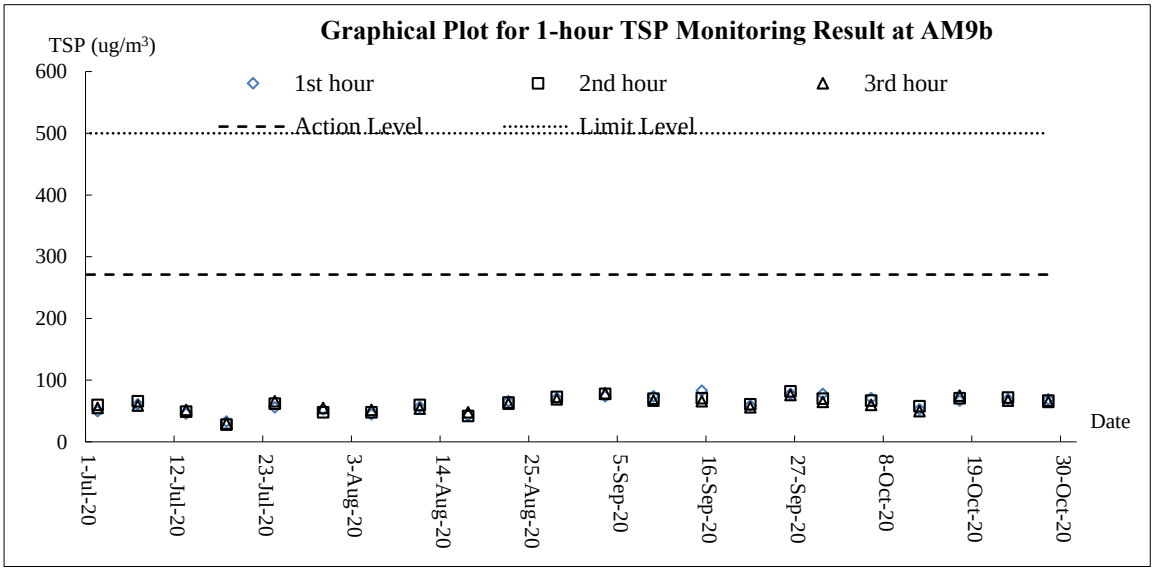




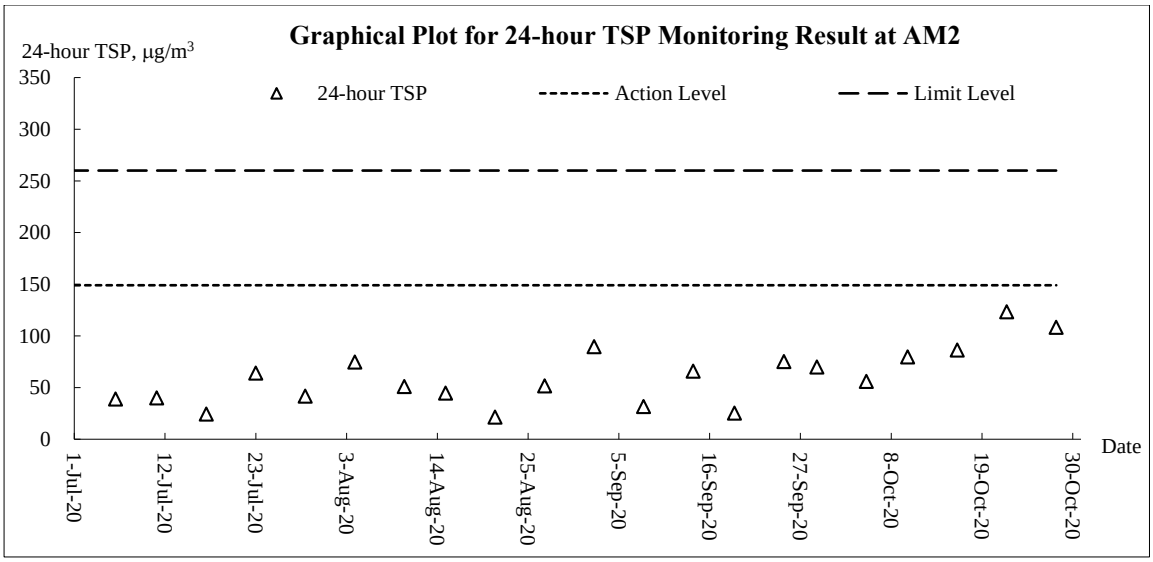

Graphical Plot for 1-hour TSP Monitoring Result at AM5a
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
1-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20
Date

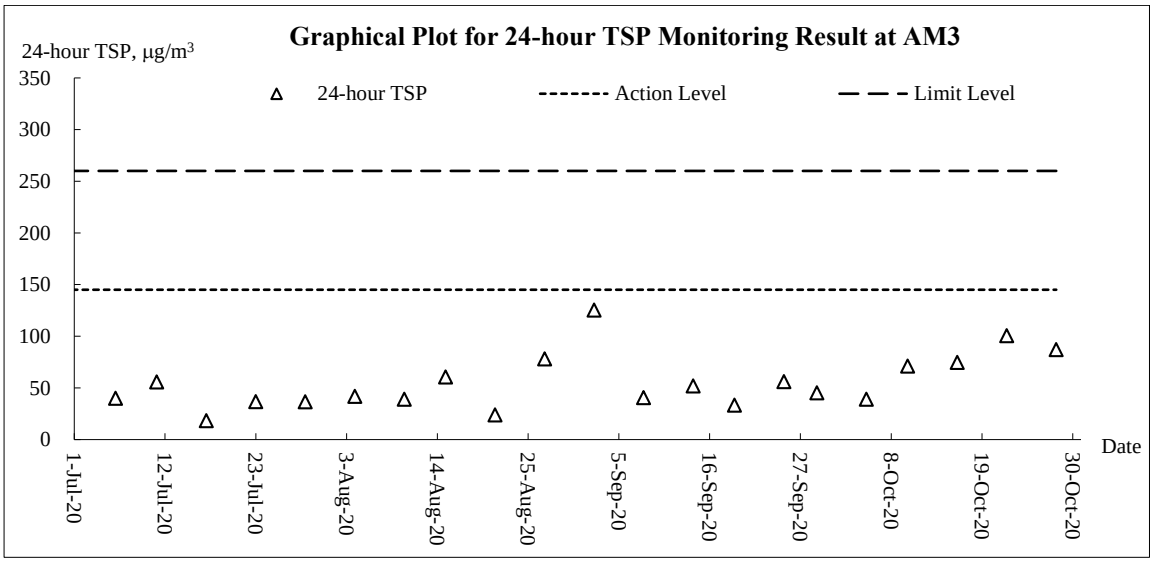

Graphical Plot for 1-hour TSP Monitoring Result at AM6
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
1-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20
Date

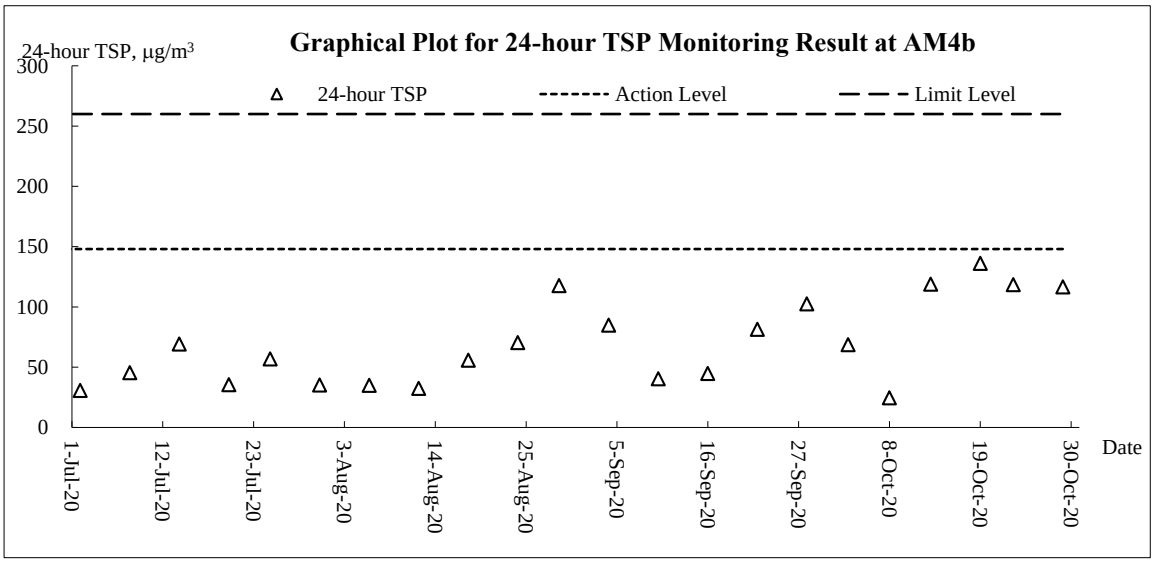

Graphical Plot for 1-hour TSP Monitoring Result at AM7b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
1-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20
Date

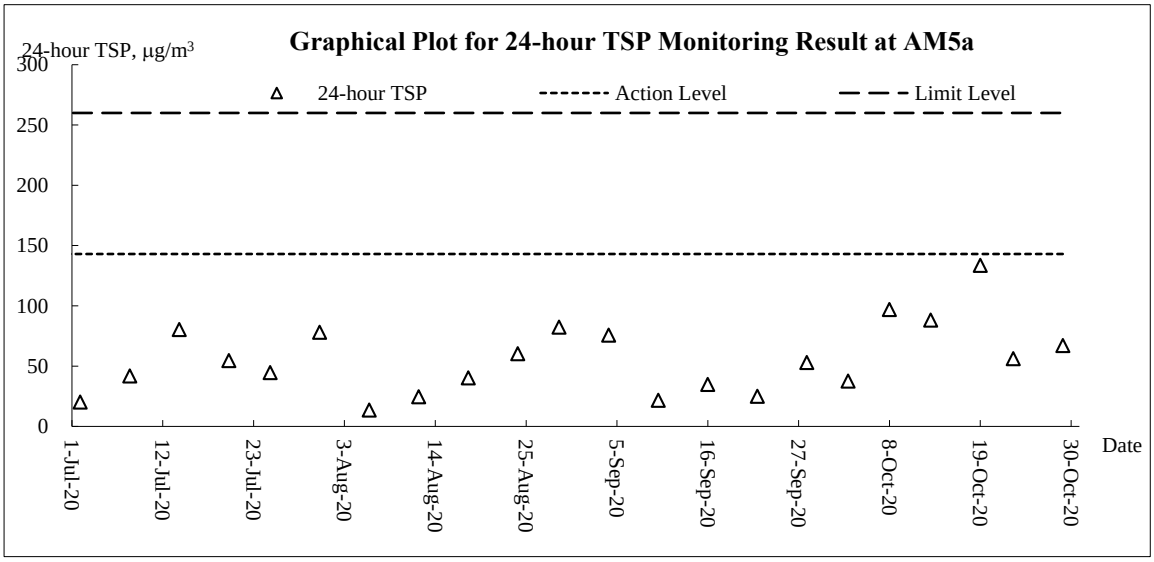

Graphical Plot for 1-hour TSP Monitoring Result at AM9b
TSP (ug/m3)
600
500
400
300
200
100
0
1st hour
2nd hour
3rd hour
Action Level
Limit Level
Date
1-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20

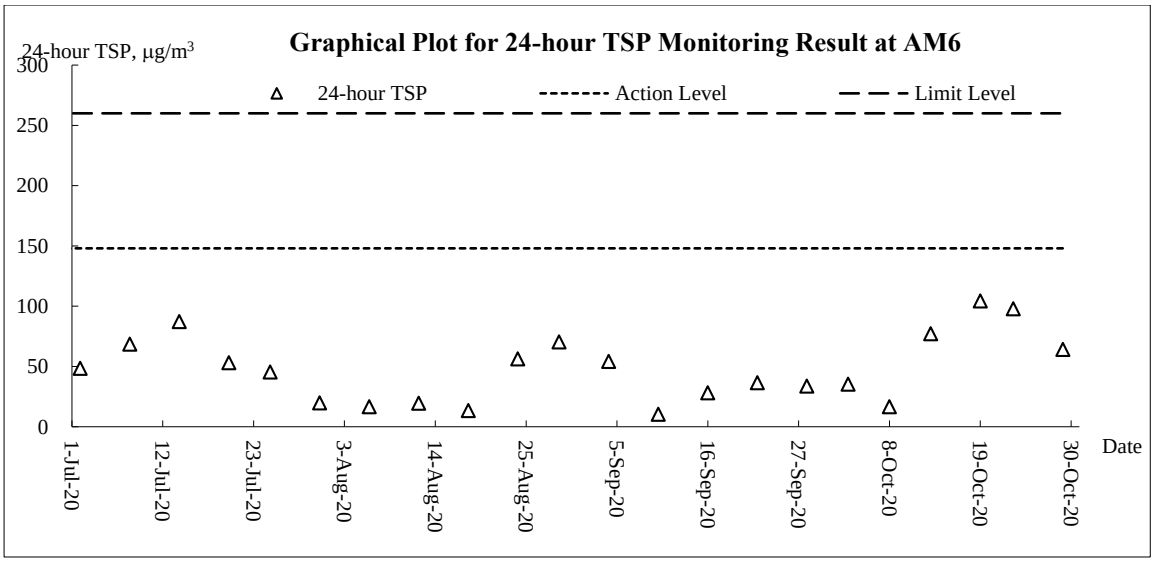
Air Quality – 24-hour TSP

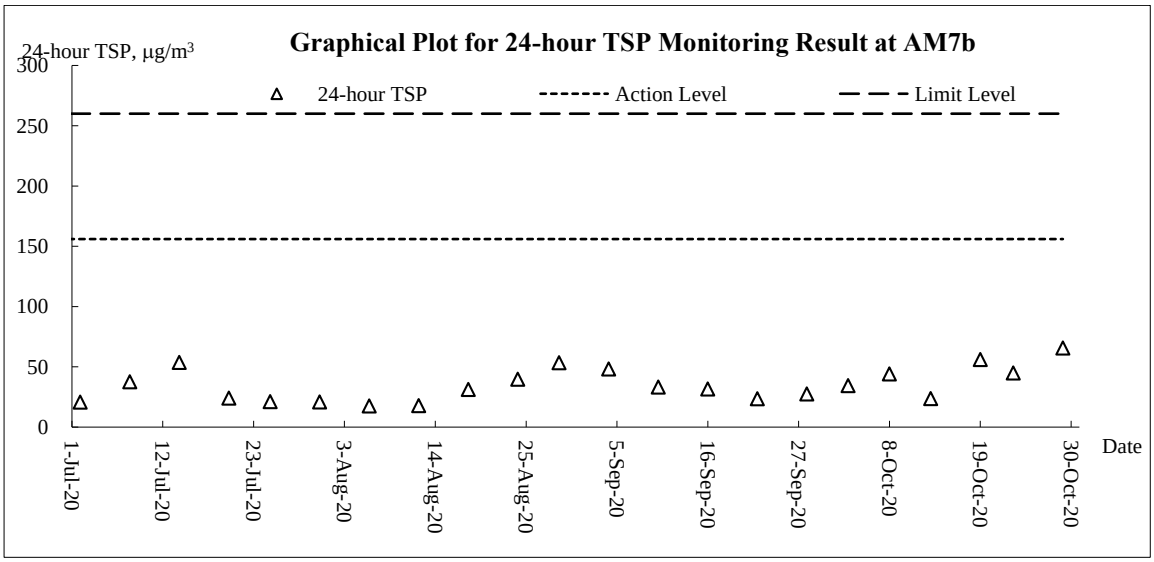







Graphical Plot for 24-hour TSP Monitoring Result at AM5a
24-hour TSP, μg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20
Date


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-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20
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-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
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5-Sep-20
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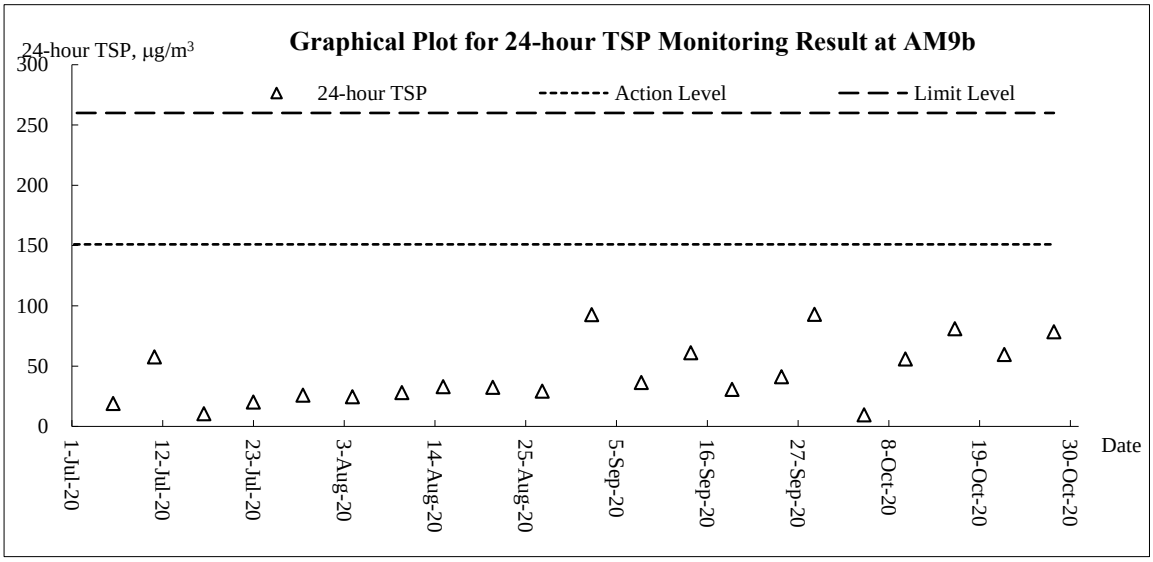
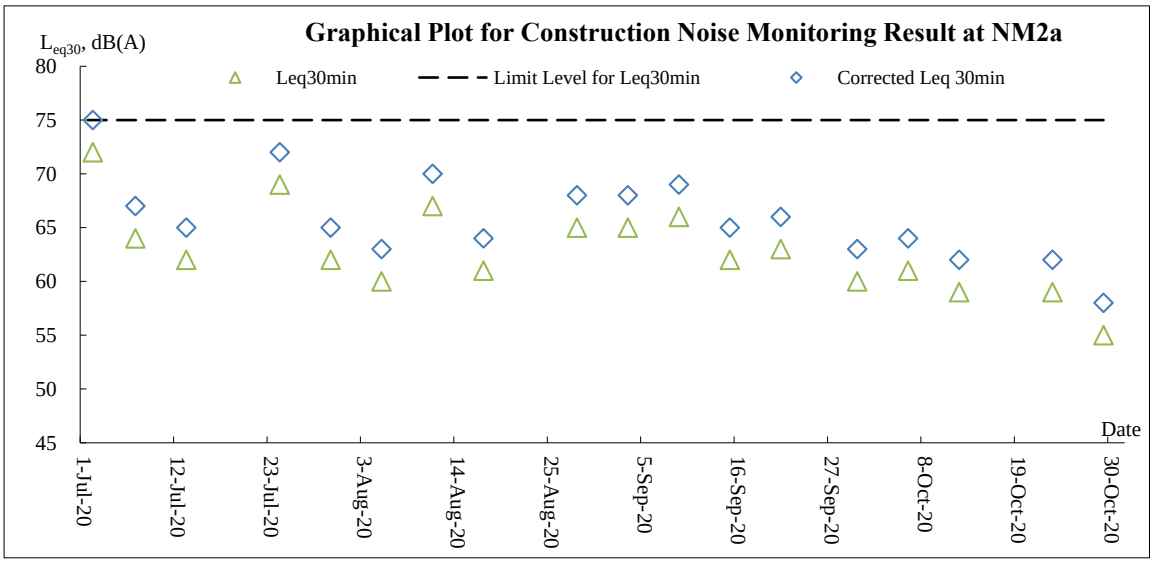
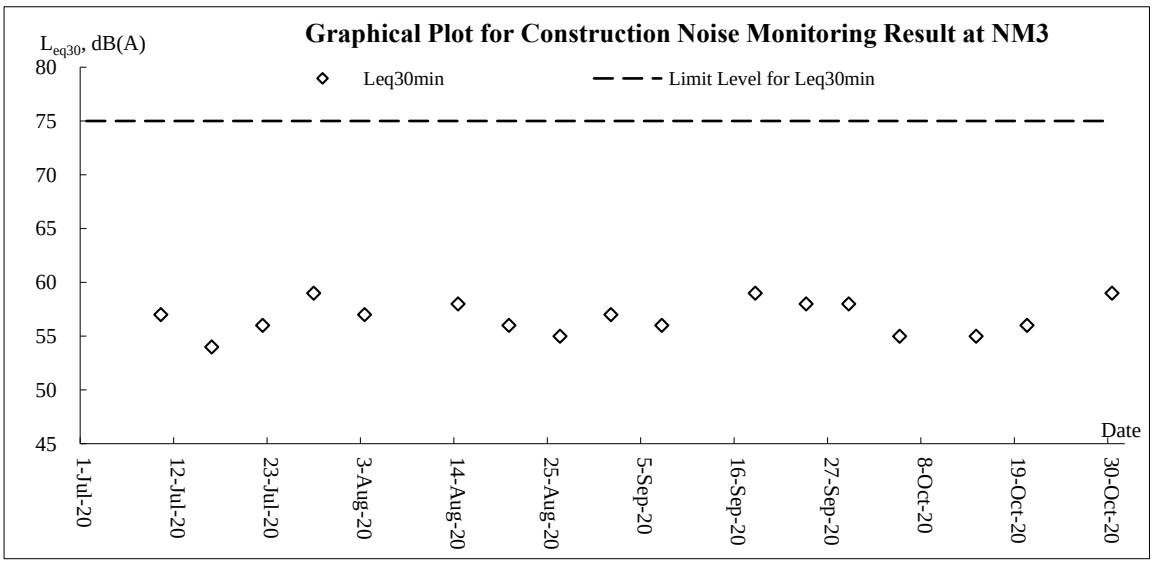
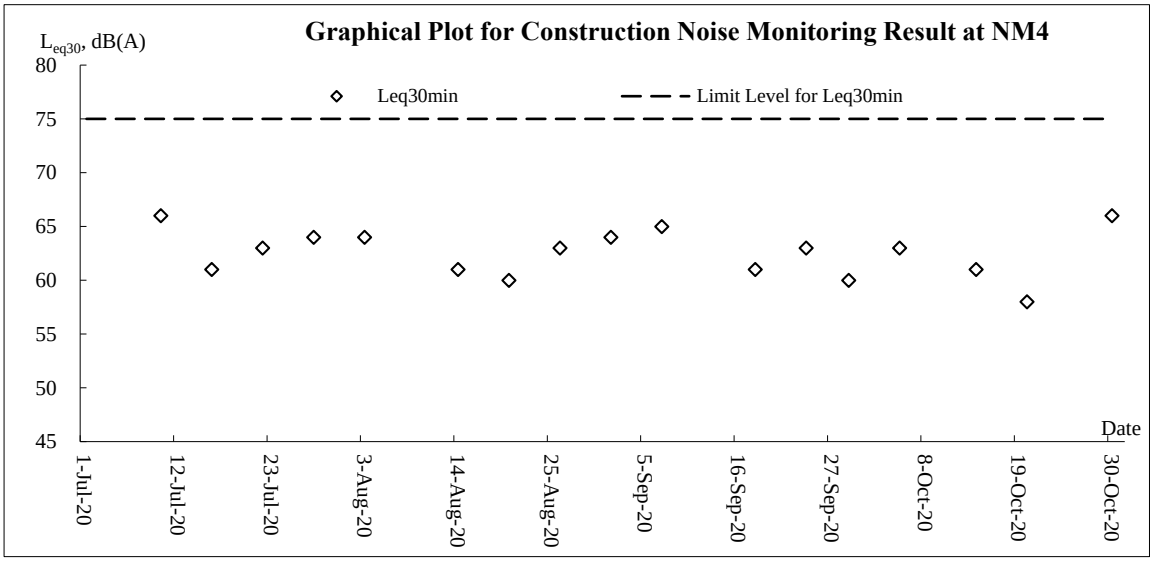
8-Oct-20
19-Oct-20
30-Oct-20
Date

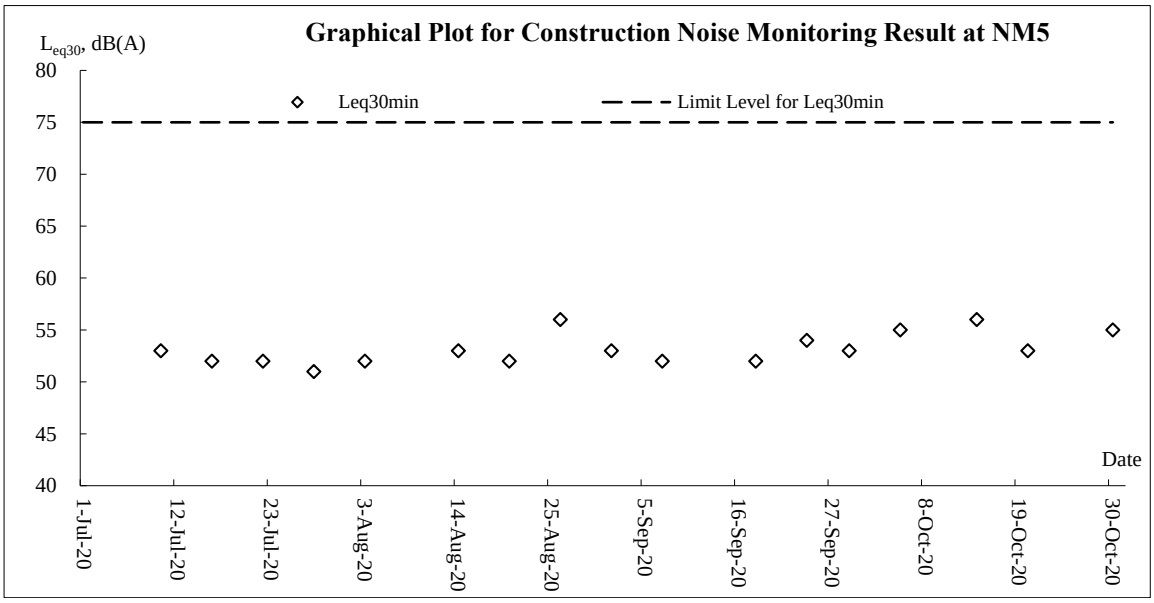

Graphical Plot for 24-hour TSP Monitoring Result at AM9b
24-hour TSP, µg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20
Date

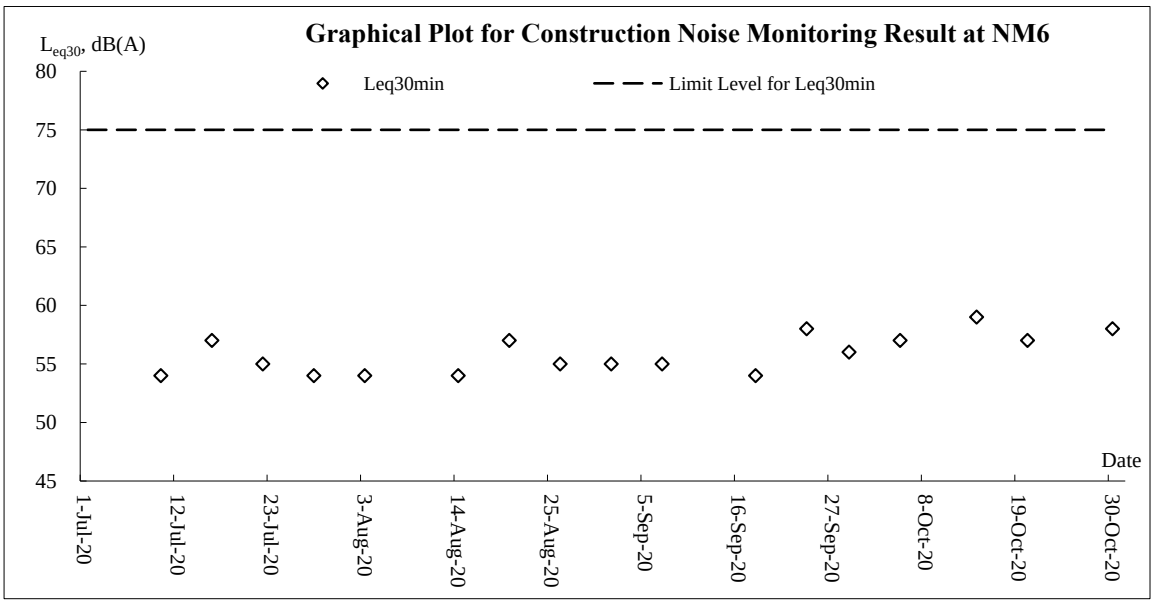
Noise

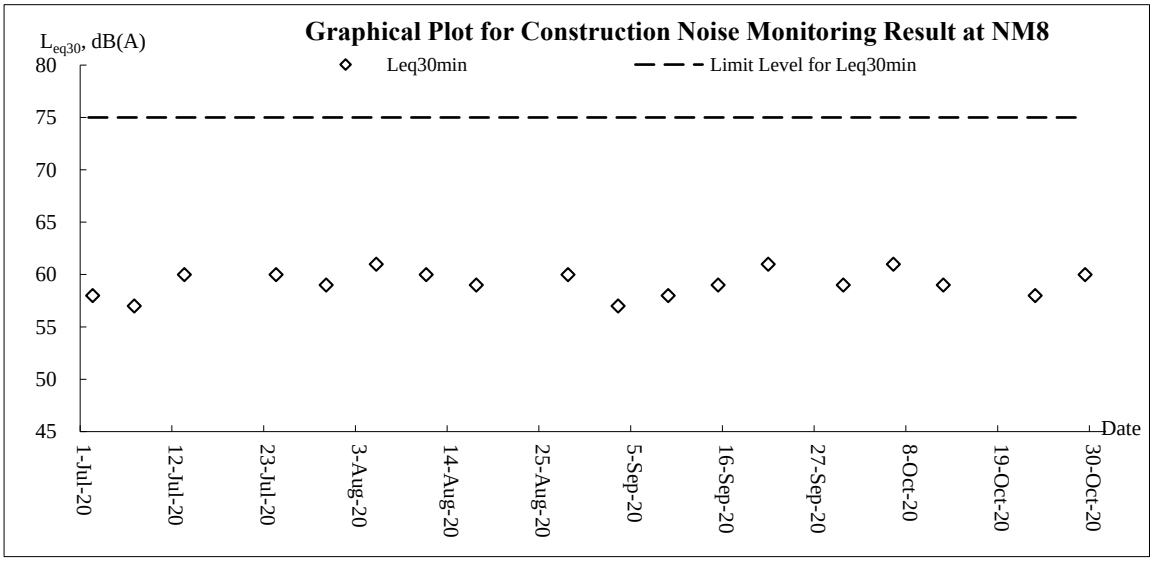

Graphical Plot for Construction Noise Monitoring Result at NM2a
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
Corrected Leq 30min
80
75
70
65
60
55
50
45
1-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20
Date

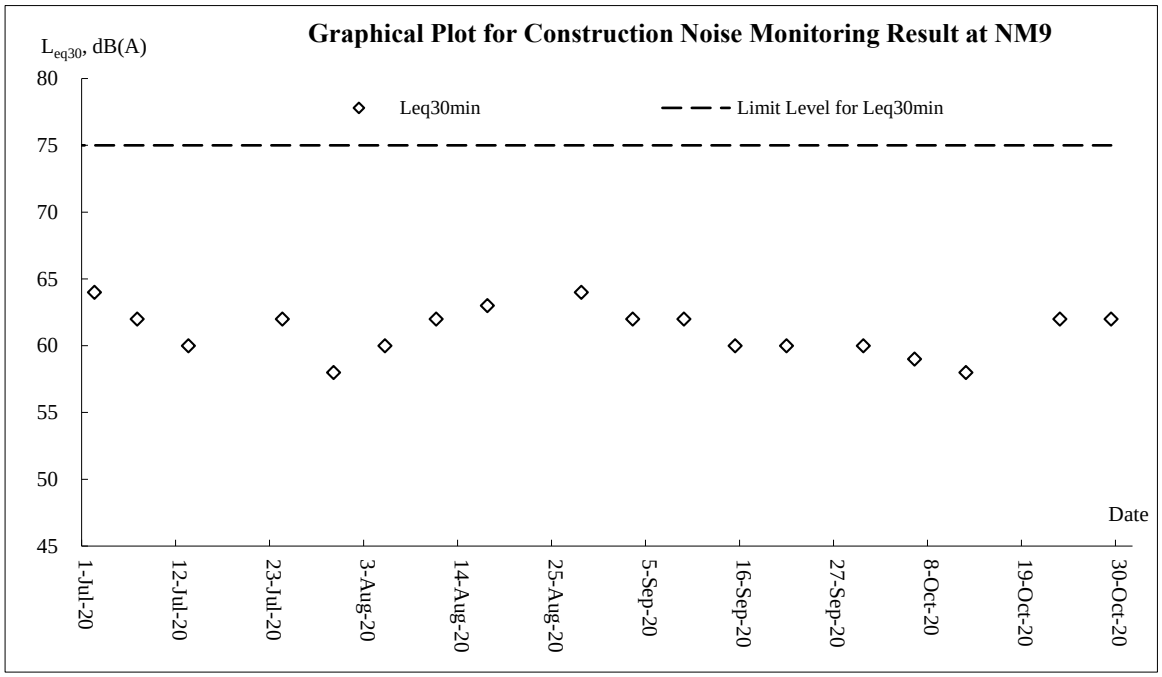

Graphical Plot for Construction Noise Monitoring Result at NM3
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
1-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20
Date

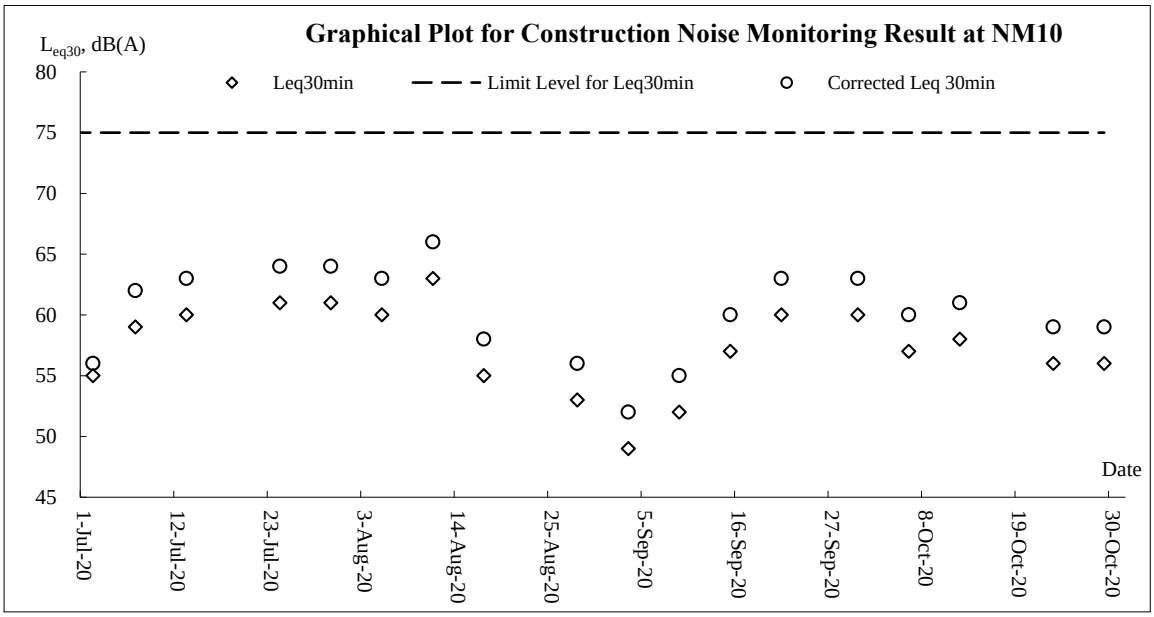

Graphical Plot for Construction Noise Monitoring Result at NM4
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
Date
1-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20


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-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20

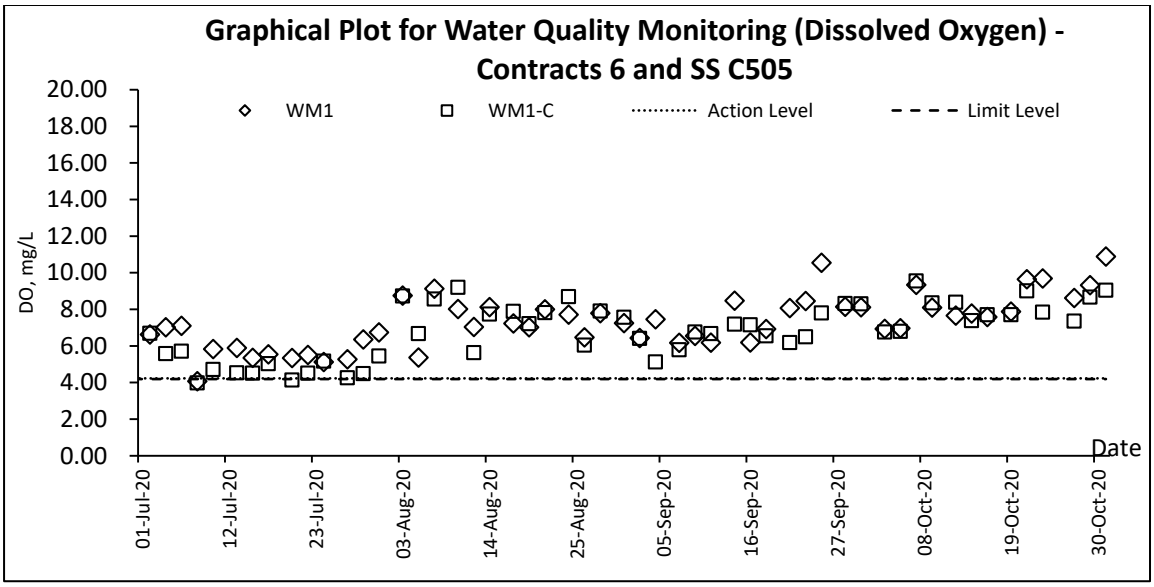

Graphical Plot for Construction Noise Monitoring Result at NM6
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
Date
1-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20

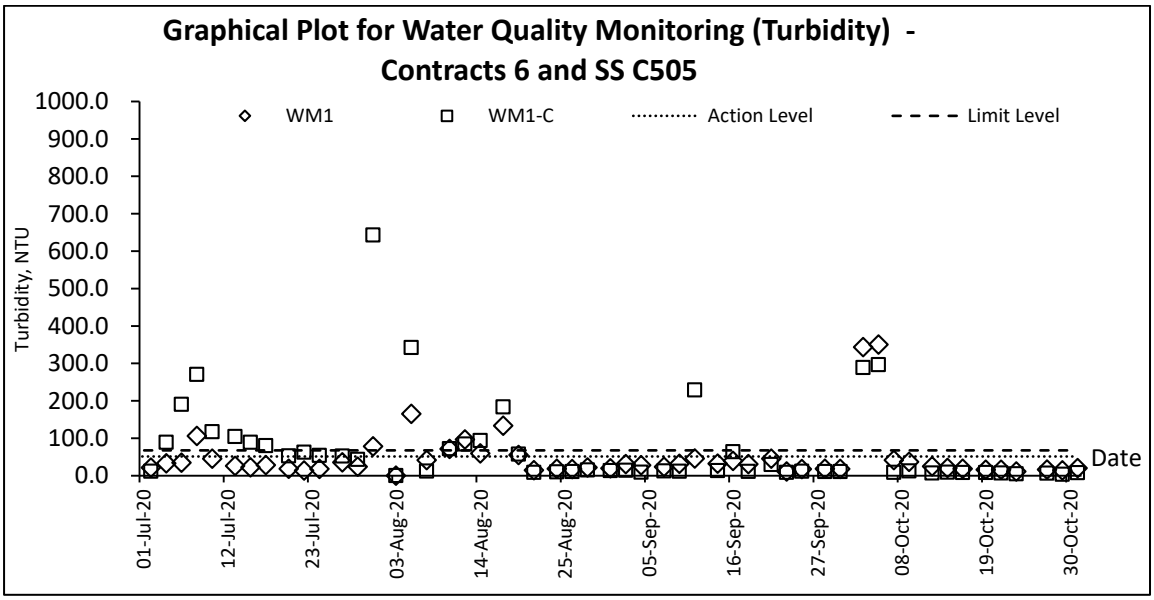

Graphical Plot for Construction Noise Monitoring Result at NM8
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
Date
1-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20

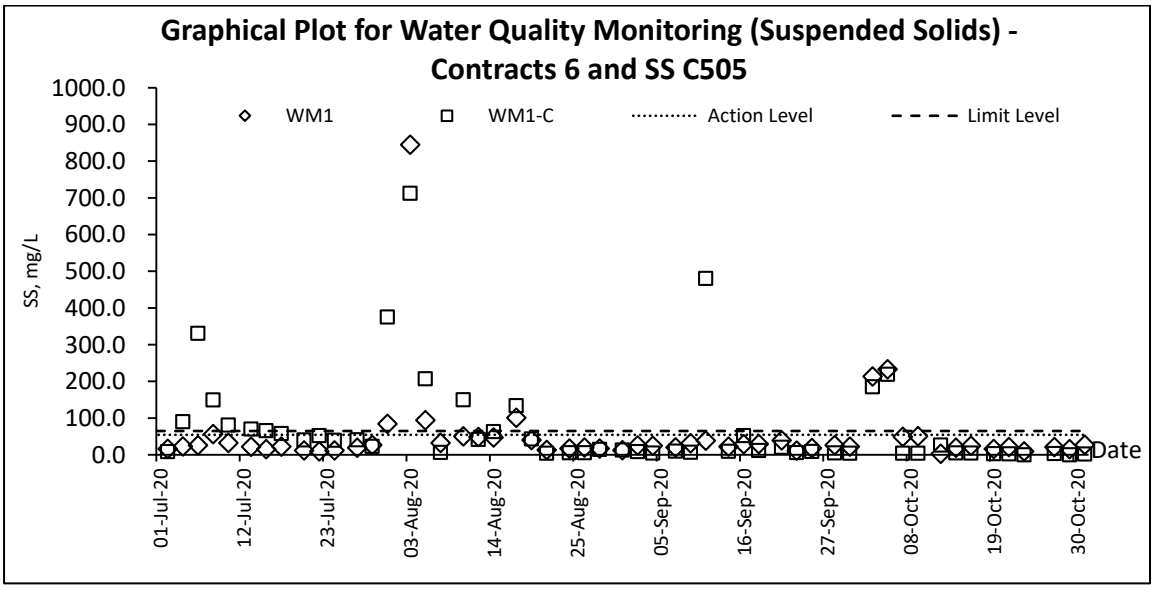

Graphical Plot for Construction Noise Monitoring Result at NM9
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
Date
1-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20

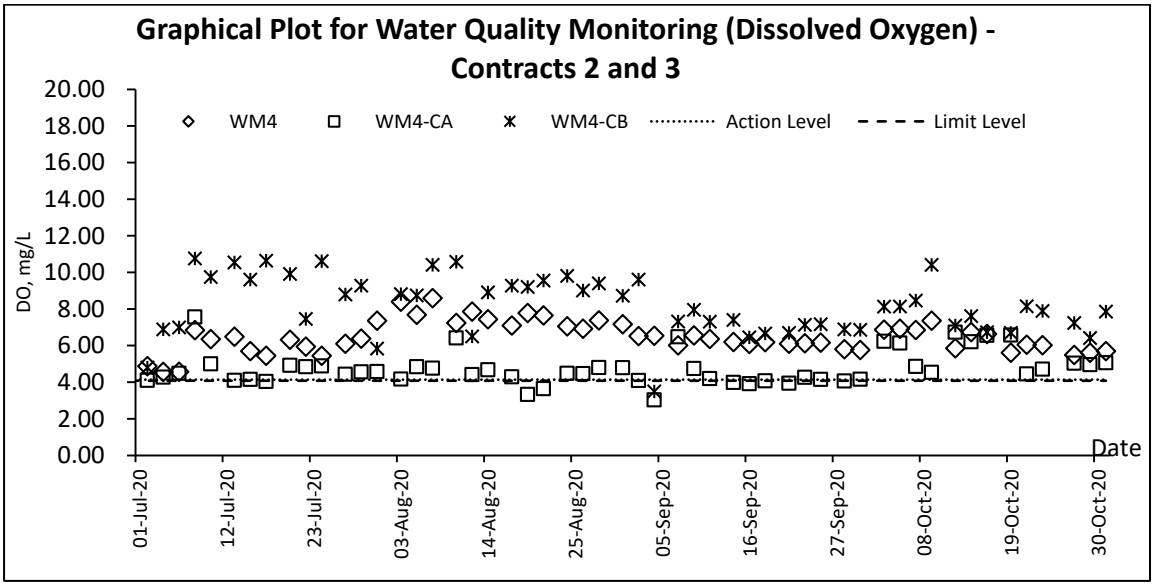

Graphical Plot for Construction Noise Monitoring Result at NM10
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
Corrected Leq 30min
80
75
70
65
60
55
50
45
Date
1-Jul-20
12-Jul-20
23-Jul-20
3-Aug-20
14-Aug-20
25-Aug-20
5-Sep-20
16-Sep-20
27-Sep-20
8-Oct-20
19-Oct-20
30-Oct-20

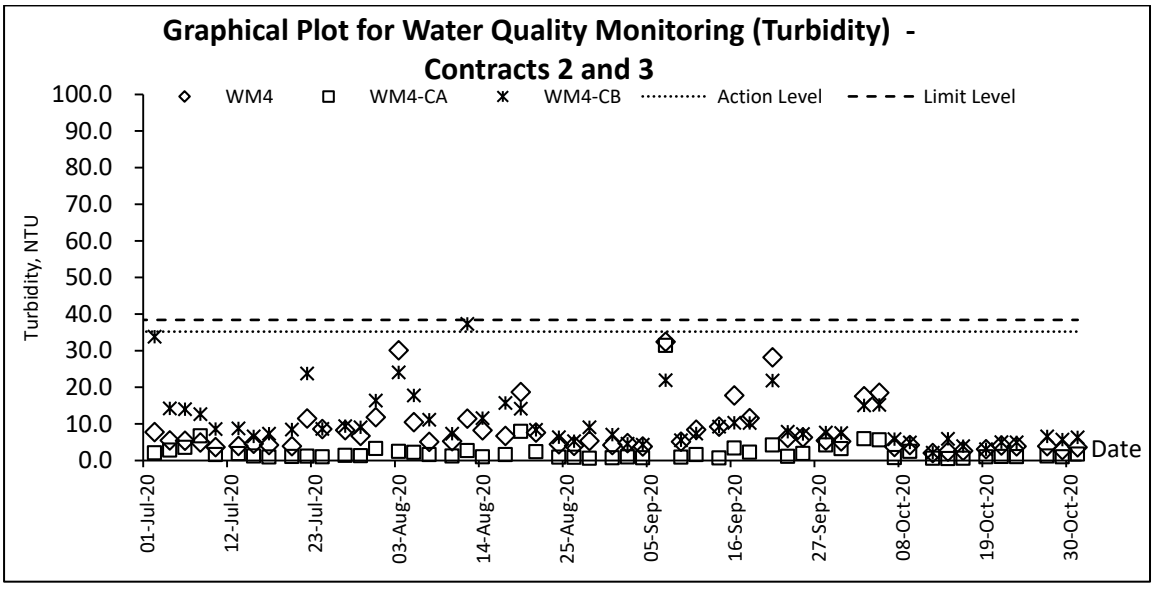
Water Quality

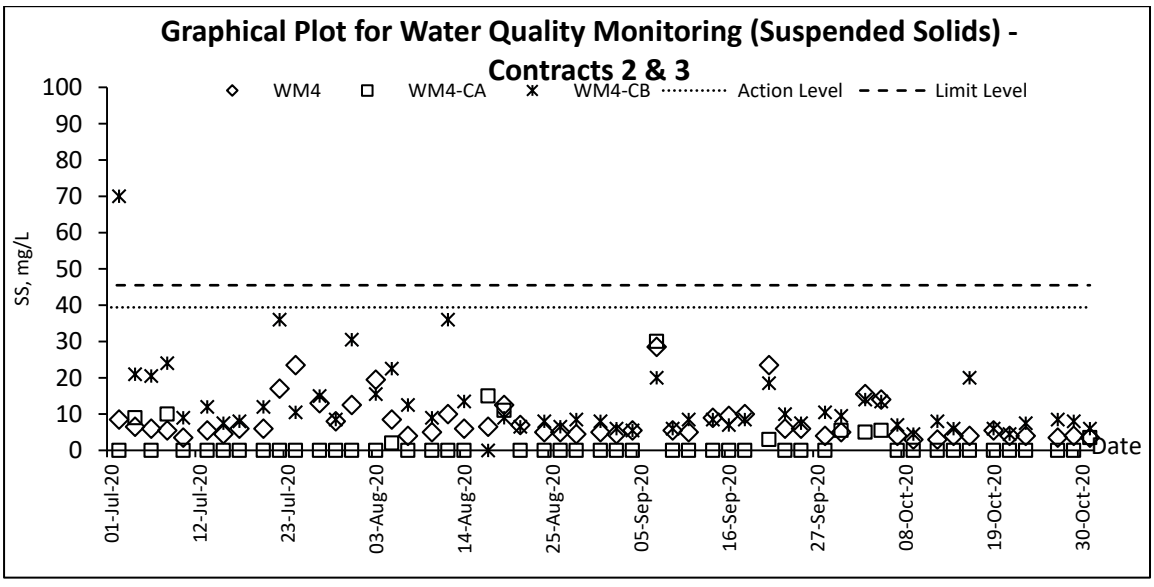


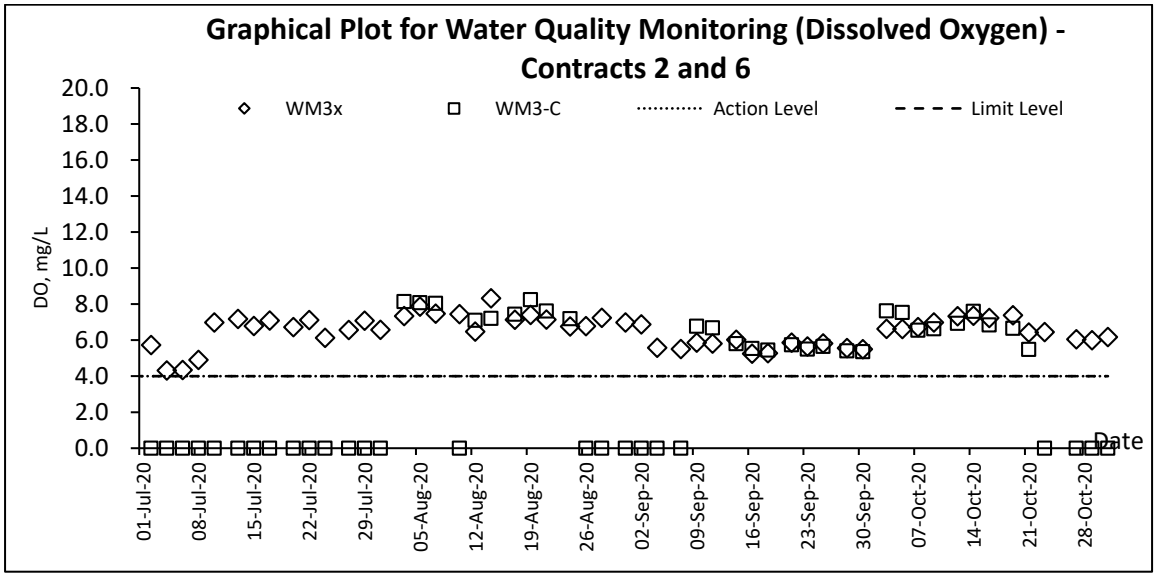





Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contracts 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
DO, mg/L
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Date
01-Jul-20
12-Jul-20
23-Jul-20
03-Aug-20
14-Aug-20
25-Aug-20
05-Sep-20
16-Sep-20
27-Sep-20
08-Oct-20
19-Oct-20
30-Oct-20


Graphical Plot for Water Quality Monitoring (Turbidity) - Contracts 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
Turbidity, NTU
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Date
01-Jul-20
12-Jul-20
23-Jul-20
03-Aug-20
14-Aug-20
25-Aug-20
05-Sep-20
16-Sep-20
27-Sep-20
08-Oct-20
19-Oct-20
30-Oct-20


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contracts 2 & 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
SS, mg/L
100
90
80
70
60
50
40
30
20
10
0
Date
01-Jul-20
12-Jul-20
23-Jul-20
03-Aug-20
14-Aug-20
25-Aug-20
05-Sep-20
16-Sep-20
27-Sep-20
08-Oct-20
19-Oct-20
30-Oct-20


Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contracts 2 and 6
WM3x
WM3-C
Action Level
Limit Level
DO, mg/L
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Date
01-Jul-20
08-Jul-20
15-Jul-20
22-Jul-20
29-Jul-20
05-Aug-20
12-Aug-20
19-Aug-20
26-Aug-20
02-Sep-20
09-Sep-20
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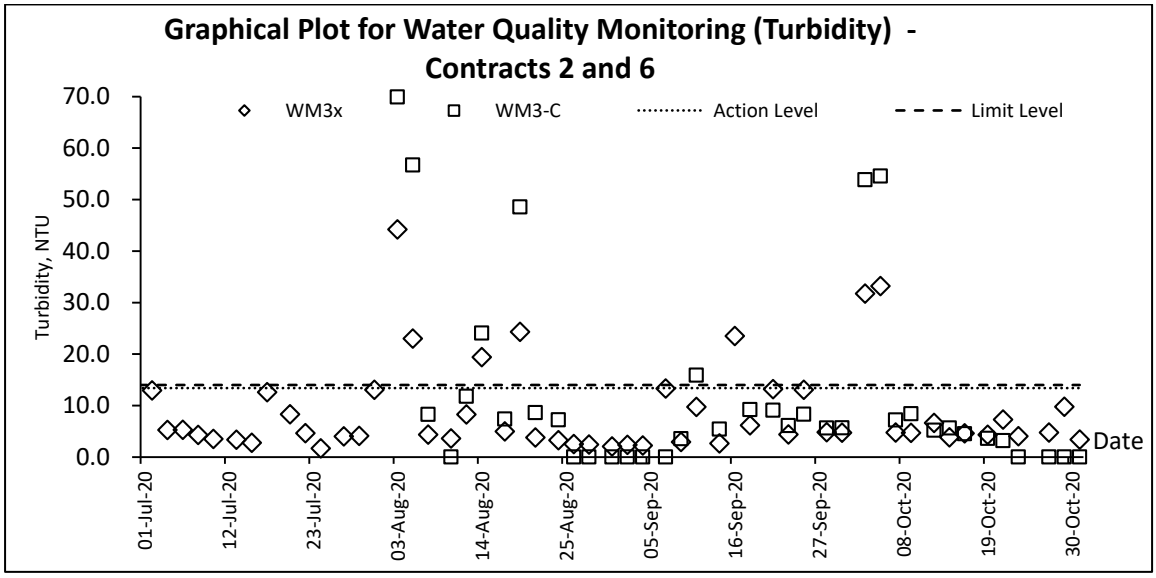
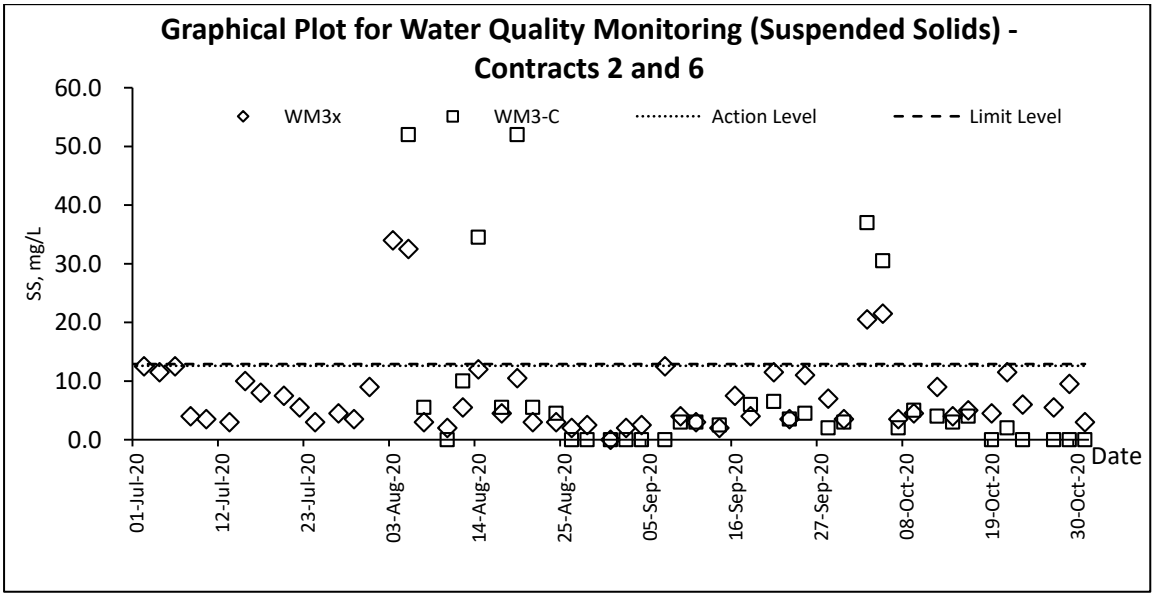
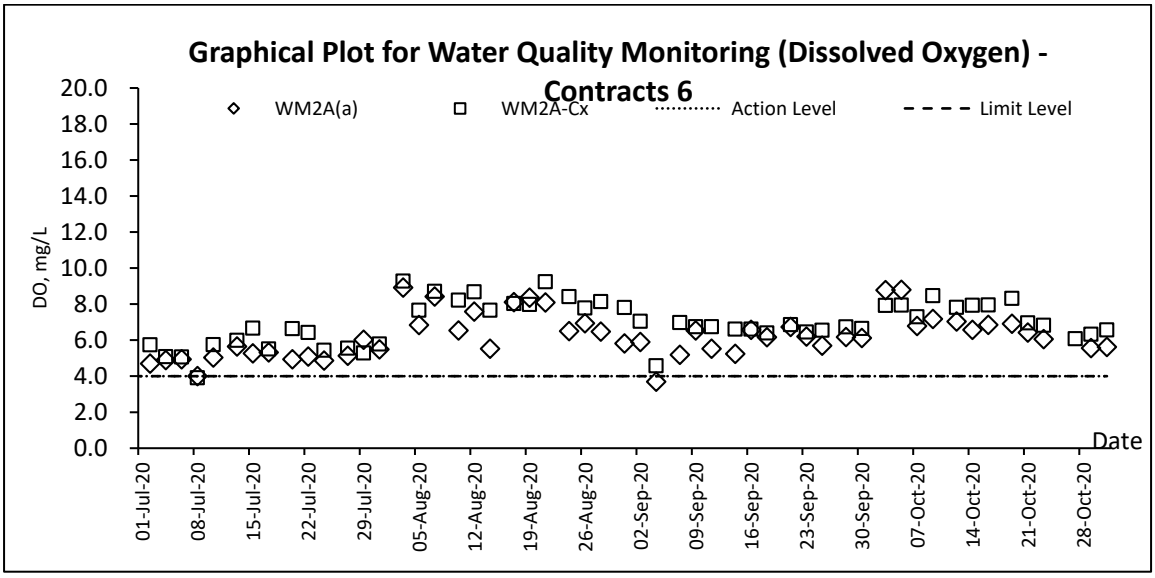
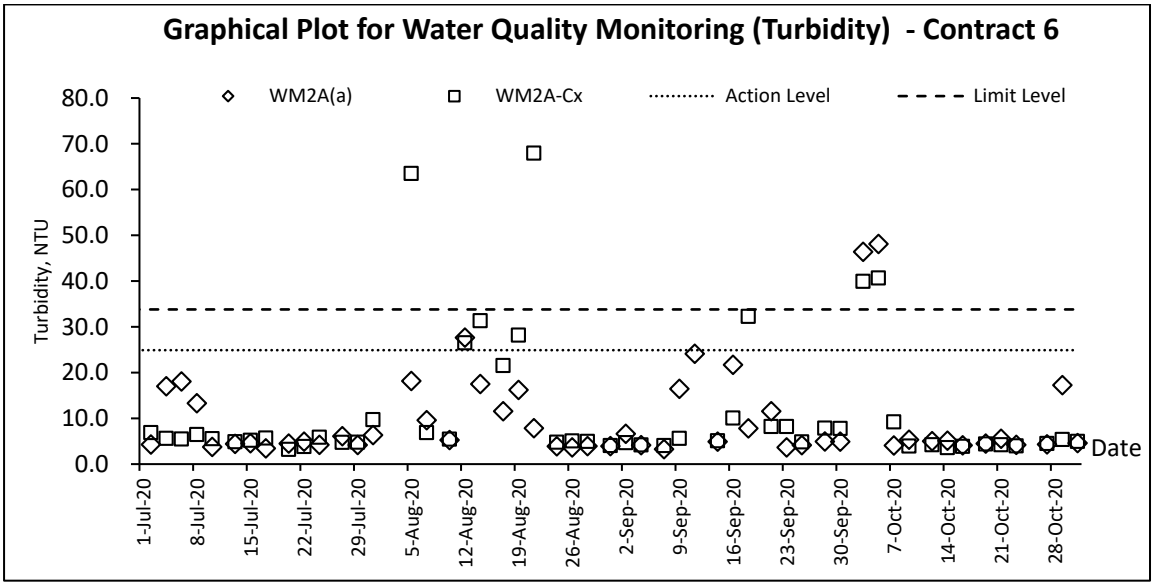
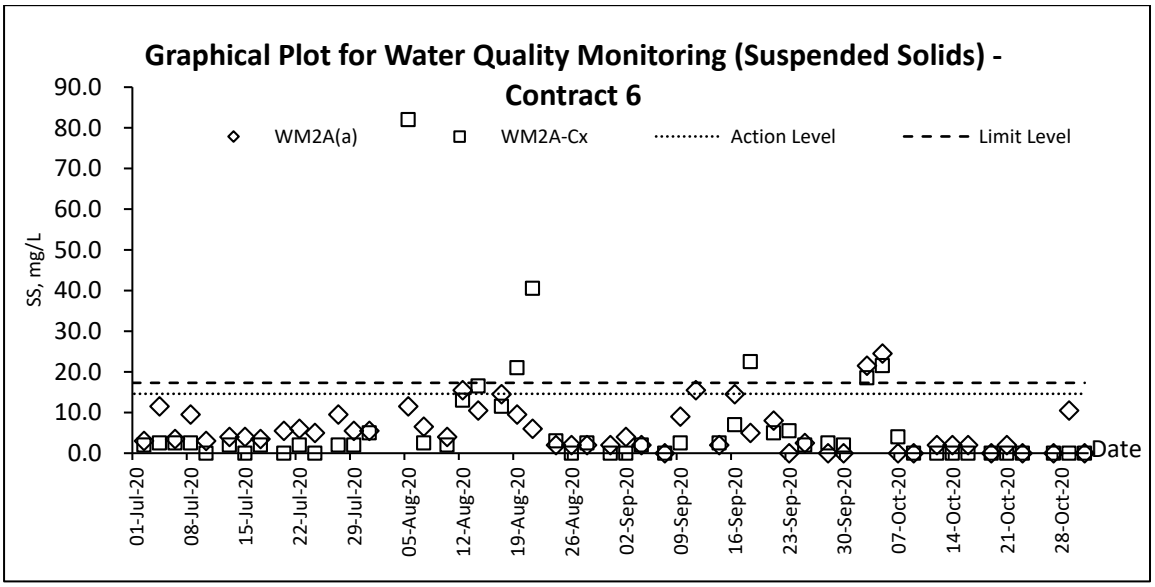
23-Sep-20
30-Sep-20
07-Oct-20
14-Oct-20
21-Oct-20
28-Oct-20


Graphical Plot for Water Quality Monitoring (Turbidity) - Contracts 2 and 6
WM3x
WM3-C
Action Level
Limit Level
Turbidity, NTU
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Date
01-Jul-20
12-Jul-20
23-Jul-20
03-Aug-20
14-Aug-20
25-Aug-20
05-Sep-20
16-Sep-20
27-Sep-20
08-Oct-20
19-Oct-20
30-Oct-20


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contracts 2 and 6
WM3x
WM3-C
Action Level
Limit Level
SS, mg/L
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Date
01-Jul-20
12-Jul-20
23-Jul-20
03-Aug-20
14-Aug-20
25-Aug-20
05-Sep-20
16-Sep-20
27-Sep-20
08-Oct-20
19-Oct-20
30-Oct-20


Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contracts 6
WM2A(a)
WM2A-Cx
Action Level
Limit Level
DO, mg/L
Date


Graphical Plot for Water Quality Monitoring (Turbidity) - Contract 6
WM2A(a)
WM2A-Cx
Action Level
Limit Level
Turbidity, NTU
Date


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contract 6
WM2A(a)
WM2A-Cx
Action Level
Limit Level
SS, mg/L
Date

Appendix K

Meteorological Data

Date		Weather	Total Rainfall (mm)	Ta Kwu Ling Station			
				Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Oct-20	Thu	Sunny periods in the following few days.	0.1	27.1	2.8	69	S/SE
2-Oct-20	Fri	Rain will ease off later.	0	27.7	7.2	72	E
3-Oct-20	Sat	Cloudy with a few rain patches.	0	27.8	5	71.5	S/SE
4-Oct-20	Sun	Moderate to fresh north to northeasterly winds.	0	27.4	4.5	78	S/SE
5-Oct-20	Mon	Dry with sunny intervals during the day.	106.1	27.7	7.5	80	E
6-Oct-20	Tue	Moderate to fresh east to northeasterly winds, occasionally strong offshore.	2.7	25.1	9.2	77.5	N
7-Oct-20	Wed	Mainly cloudy. One or two rain patches tomorrow morning.	0	24.5	12	68.5	N/NE
8-Oct-20	Thu	Mainly cloudy and dry with sunny intervals.	0	24.5	12.5	63.7	N/NE
9-Oct-20	Fri	Dry with sunny intervals during the day.	Trace	25.8	12.5	59.7	N/NE
10-Oct-20	Sat	Moderate to fresh north to northeasterly winds.	Trace	24.6	10	67	N/NE
11-Oct-20	Sun	Sunny periods in the following few days.	0	26.2	7.5	68	E/SE
12-Oct-20	Mon	Rain will ease off later.	0.6	27.9	7.5	71.5	E/SE
13-Oct-20	Tue	Cloudy with a few rain patches.	26	25.1	14.2	86.5	E
14-Oct-20	Wed	Seas will be very rough with swells.	1.2	25.9	13.2	78.5	E
15-Oct-20	Thu	Mainly fine tomorrow. Dry during the day.	0	27.4	11.2	67.5	E
16-Oct-20	Fri	Moderate northeasterly winds	Trace	27.6	15.7	68	E/NE
17-Oct-20	Sat	Cloudy periods and one or two rain patches tonight.	0.2	25.1	12.5	71	E/NE
18-Oct-20	Sun	Moderate northeasterly winds	0.7	24.3	7.5	66.5	N/NE
19-Oct-20	Mon	Mainly fine tomorrow. Dry during the day.	0	24.1	11.2	65	N/NE
20-Oct-20	Tue	Fine and dry. Moderate northerly winds, fresh offshore.	0	24.5	15	62.5	N
21-Oct-20	Wed	One or two light rain patches tonight.	0	23.9	16	61	N/NE
22-Oct-20	Thu	Strong north to northeasterly winds	0	24.5	17	56.2	N/NE
23-Oct-20	Fri	Mainly cloudy. Dry with bright	0	23.2	17.2	45	N/NE
24-Oct-20	Sat	Mainly cloudy with a few rain patches.	Trace	23.1	8.2	73	E/SE
25-Oct-20	Sun	Mainly cloudy. Dry with bright	0	24.9	11	69	E/SE
26-Oct-20	Mon	Dry with sunny intervals during the day.	0	25.9	8.2	73	E/SE
27-Oct-20	Tue	Fresh east to northeasterly winds	0	26	8	72.5	E/SE
28-Oct-20	Wed	Rain will be more frequent later.	4.7	25.3	15.7	79	E/NE
29-Oct-20	Thu	Mainly cloudy with one or two light rain patches.	0.1	24.1	7	78.2	E/SE
30-Oct-20	Fri	Mainly cloudy. Dry with bright	Trace	25	7.5	87.5	N/NE
31-Oct-20	Sat	Strong north to northeasterly winds	0	23.6	6.2	73.7	N

Appendix L

Waste Flow Table

Name of Department: CEDD

Contract No.: CV/2012/09

Monthly Summary Waste Flow Table for 2020 (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	0.280	0.000	0.000	0.000	0.280	0.000	0.000	0.000	0.000	0.000	0.015
Feb	0.069	0.000	0.000	0.000	0.069	0.000	0.000	0.000	0.000	0.000	0.020
Mar	0.089	0.000	0.000	0.000	0.089	0.000	0.000	0.000	0.000	0.000	0.025
Apr	0.298	0.000	0.000	0.000	0.298	0.000	0.000	0.000	0.000	0.000	0.010
May	0.167	0.000	0.000	0.000	0.167	0.000	0.000	0.000	0.000	0.000	0.015
Jun	0.004	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.010
Sub-total	0.907	0.000	0.000	0.000	0.907	0.000	0.000	0.000	0.000	0.000	0.095
Jul	0.164	0.000	0.000	0.000	0.164	0.000	0.000	0.000	0.000	0.000	0.010
Aug	0.103	0.000	0.000	0.000	0.103	0.000	0.000	0.000	0.000	0.000	0.010
Sep	0.149	0.000	0.000	0.000	0.149	0.000	0.000	0.000	0.000	0.000	0.010
Oct	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nov											
Dec											
Total	1.323	0.000	0.000	0.000	1.323	0.000	0.000	0.000	0.000	0.000	0.125

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.

Monthly Summary Waste Flow Table for 2020 (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	10.280	0	0	0	10.280	0	0	0	0.22	0	0.377
Feb	21.439	0	0	0	21.439	0	0	0	0	0	0.522
Mar	7.623	0	0	0	7.623	0	0	0	0	0	0.417
Apr	1.567	0	0	0	1.567	0	0	0.310	0	0	0.419
May	3.590	0	0	0	3.590	0	0	0	0	0	0.477
Jun	1.390	0	0	0	1.390	0	0	0	0	0	0.218
Sub-total	45.889	0.000	0.000	0.000	45.889	0.000	0.000	0.310	0.220	0.000	2.430
Jul	1.336	0	0	0	1.336	0	0	0.325	0	0	0.360
Aug	2.876	0	0	0	2.876	0	0	0	0	0	0.217
Sep	1.045	0	0	0	1.045	0	0	0.282	0	0	0.240
Oct	0.321	0	0	0	0.321	0	0	0	0	0	0.187
Nov	0	0	0	0	0	0	0	0	0	0	0
Dec	0	0	0	0	0	0	0	0	0	0	0
Total	51.467	0.000	0.000	0.000	51.467	0.000	0.000	0.917	0.220	0.000	3.434

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 M

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					

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?
		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

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?
		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

Appendix N

Implementation Status of Mitigation Measures for Operation Phase

EP/EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status	Remarks
Air Quality Impact (Operation)							
EP C3.11/ 3.5.2.2	The sewage treatment plant installed for the Project shall be installed at the location shown in Figure 3 of the EP The plant shall be designed with the following odour containment and control measures : 1. Negative Pressure Ventilation (a) The treatment plant shall be totally enclosed with negative pressure ventilation to avoid odorous emission from the treatment works. The tanks will be connected to deodorisation facilities designed for a minimum removal of 90% directly to eliminate odour problem. 2. Total Containment of Sewage Channels (a) air-tight cover shall be installed to sewage channels, sewage tanks, and equipment with potential odour emission and the trapped gases shall be collected by air handling equipment for containing and directing odorous gases to deodorisation facilities.	To minimize potential odour impact from operation of the proposed sewage treatment work at BCP	DSD	Sewage Treatment Plant (STP) at BCP	Operation Phase	Implemented Implemented Implemented	STP was implemented at BCP and it was handover to DSD on 29 July 2019 for operation. The STP was enclosed with negative pressure ventilation and the tanks are connected to deodorisation facilities. The underground sewage tank, sewage channel and potential odour emission with air tight cover and were connected to deodorisation facilities.

EP/EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status	Remarks
	(b) Gravity sewer, equalization and sludge holding tanks shall be designed with suitable sewer distance and retention time to prevent sewage septicity. 3. <u>Deodorisation</u> (a) Deodorisation facilities at the sewage treatment plant shall be designed with a minimum odour removal efficiency of 90%.					Implemented	The deodorisation facilities was monitored by control room to ensure odour removal efficiency of 90%.
<u>Noise Impact (Operation)</u>							
	<u>Road Traffic Noise</u>						
EP C3.5 / Table 4.42 and Figure 4.20.1 to 4.20.4	Erection of noise barrier/ enclosure along the viaduct section. - To mitigate the traffic noise impact arising from the operation of the Project, the noise mitigation measures shall be implemented in accordance with Fig 4, 5, 6 and 7 attached to the EP, or otherwise approved by the Director subject to the submission of a Noise Mitigation Plan by the Permit Holder to cater for the final layout and design of the Project.	To minimize the road traffic noise along the connecting road of BCP	Contractor	Loi Tung and Fanling Highway Interchange	Before Operation	Implemented	Noise barriers were installed in accordance with the Noise Mitigation Plan.
	<u>Fixed Plant Noise</u>						
Table	Specification of the maximum allowable	To minimize the fixed	Managing	BCP,	Before Operation	Implemented	

EP/EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status	Remarks
4.46	sound power levels of the proposed fixed plants during daytime and night-time.	plant noise impact	Authority of the buildings / Contractor	Administration Building (Admin bldg.) and all ventilation buildings			
4.6.2	Commissioning test should be conducted for all major fixed noise sources to ensure compliance of the operational for all major fixed noise sources before operation.	To minimize the fixed plant noise impact	Managing Authority of the buildings / Contractor	BCP, Administration Building and all ventilation buildings	Before Operation	Implemented	
4.5.2.4	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;	To minimize the fixed plant noise impact	Managing Authority of the buildings / Contractor	BCP, Administration Building and all ventilation buildings	Before Operation	Implemented	
	• Include noise levels specification when ordering new plant (including chillier and E/M equipment);					Implemented	
	• Locate fixed plant/louver away from any NSRs as far as practicable;					Implemented	
	• Locate fixed plant in walled plant rooms or in specially designed enclosures;					Implemented	
	• Locate noisy machines in a basement or a completely separate building;					Implemented	

EP/EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status	Remarks
	• Install direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosure where necessary; and;					Implemented	
	• 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.					Implemented	
Sewage and Sewerage Treatment Impact (Operation)							
6.6.3	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	Implemented	STP was implemented at BCP and it was handover to DSD on 29 July 2019 for operation.
6.5.3	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	Implemented	
Waste Management (Operation Phase)							
7.6.2.1	**General refuse** General refuse should be collected on daily basis and delivered to the refuse	To minimize impacts resulting from collection and transportation of	Managing Authority of the BCP	BCP and its Associated facilities	Operation phase	Implemented	NA

EP/EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status	Remarks
	collection point accordingly. A reputable waste collector should be employed to remove general refuse regularly to avoid odour nuisance or pest and vermin problem. Recycling containers are recommended to be provided to encourage recycling of aluminium cans and waste paper.	general refuse for off-site disposal					

EP/EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status	Remarks
7.6.2.2	**Chemical waste** • Register with the EPD as a chemical waste producer should be made and guidelines stated in the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes* should be followed. • 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 waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. Licensed collector should be deployed to transport and dispose of the chemical wastes, to the licensed Chemical Waste Treatment Centre, or licensed facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	To minimize impacts resulting from collection and transportation of chemical waste for off-site disposal	Managing Authority of the BCP	BCP and its associated facilities	Operation phase	Implemented	NA

EP/EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status	Remarks
Ecological Impact							
9.8	**Mitigation to Anthropogenic Disturbance** • Buffer planting shall be provided for screening the proposed structures and associated facilities.	To screen the Proposed structures and associated facilities.	Contractors	Contractors	In proximity to proposed new development structures and associated facilities.	Refer to OM4 below	N/A
9.8	**Mitigation to Habitat Fragmentation** • Landscape fragmentation should be kept to a minimum and key wildlife routes preserved as far as possible (i.e. OM1 of EM&A Manual Chapter 10). • Provision of landscape plantings (i.e. OM3-7 of EM&A Manual Chapter 10)	To minimize the obstruction on wildlife movement	Contractors	All viaduct sections	Operation phase	Refer to OM1 below. Refer to OM3 to 7 below.	N/A
EP C3.6	All measures recommended in the Vegetation Survey Report, updated Woodland Compensation Plan and the Habitat Creation and Management Plan approved under Condition 2.8, 2.9 and 2.10 of this Permit respectively shall be fully implemented and thereafter maintained.	N/A	N/A	N/A	Operation phase	Implemented.	
EP C3.7	To reduce collisions from birds, the design of noise barriers shall avoid/minimize the use of transparent / reflective materials or adopt bird-friendly design on such surfaces.	To avoid bird mortality due to collision with noise barrier	Contractor	Locations with erection of noise barrier	During detailed design and construction phases	Implemented in Designed, construction phase and operation phase	The steel works of noise barrier was painted in different tone of mat finished green and avoid use of transparent / reflective materials.
Landscape, Visual and Glare Impact							

EP/EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status	Remarks
3.8	**(OM1) Detailed Design Considerations** Detailed design of development components should aim to reduce landscape footprint and visibility of structures. The area allowed for any development components should be reduced to a practical minimum.	To reduce architectural footprint on the land and minimize visibility of structures.	Detailed designer/ Consultants	Proposed new development structures.	During Detailed Design & Construction/ Operation Phase	Implemented in Designed and construction phase	The detail landscape design of the project is divided into 3 packages as described in the Landscape Plan.
3.8	**(OM2) Aesthetically Pleasing Design** The form, textures, finishes and colours of the proposed development components should be compatible with the existing surroundings. Light earthy tone colours such as shades of green, shades of grey, shades of brown and off-white may be utilised where technically feasible to reduce the visibility of the development components, including all roadwork, buildings and noise barriers etc. To further improve visual amenity, natural building materials such as stone and timber, should be preferably adopted for architectural features, where technically feasible.	To reduce visibility of structures and increase their compatibility with the surrounding	Detailed designer/ Consultants	Proposed new development structures.	During Detailed Design & Construction/ Operation Phase	Implemented in Designed and construction. Implement in operation phase.	
3.8	**(OM3) Compensatory Planting** All compensatory planting of trees is to be carried out in accordance with ETWB TCW No. 03/2006.	To compensate for loss of trees and some shrubs due to the Project.	Contractors	Proposed new development structures.	During Construction/ Operation Phase	Implemented	
3.8	**(OM4) Buffer Tree Planting** Tree planting shall be provided to screen the proposed structures and associated	To screen the proposed structures and associated facilities	Contractors	In proximity to proposed new development	During Construction/ Operation Phase	Implemented	

EP/EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status	Remarks
	facilities. In addition, the compensatory shrub and ground cover planting detailed in OM4 will provide screening and improve compatibility with the surrounding environment.	including roads.		structures and associated facilities.			
3.8	**(OM5) Aesthetic Improvement Planting - Viaduct Structure** Planters will be provided for trailer planting to soften the hard, straight edges of the viaduct. Where space allows for planters, climbers are proposed to cover vertical, hard surfaces of the piers.	To soften the hard edges on the viaduct and maximize greening opportunity.	Contractors	Viaduct Structure.	During Construction/ Operation Phase	Implemented	
3.8	**(OM6) Aesthetic Improvement Planting – under Viaduct** Shade tolerant plant will be planted, where light is insufficient, to improve value of areas under viaducts.	To soften the hard edges on the viaduct and maximize greening opportunity.	Contractors	Viaduct Structure.	During Construction/ Operation Phase	Implemented	
3.8	**(OM7) Landscaped Slope** Where existing hillside slopes are anticipated to be modified (eg cut slope at the portals of the tunnel sections and embankments along the alignment) the final slope surface will be landscaped by hydroseeding, tree or shrub planting where slope gradient allows.	To prevent soil erosion and reduce visible impact of man-made slopes.	Contractors	Construction Site Works.	During Construction/ Operation Phase	Implemented	
3.8	**(OM8) Green Roof** Green roofing should be established on proposed buildings to reduce exposure to untreated concrete surfaces and mitigate visual impact to VSRs at high levels.	To reduce exposure to untreated concrete surfaces, reduce visual impact to VSRs at high levels and	Contractors	Proposed new buildings.	During Construction/ Operation Phase	Implemented	

EP/EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status	Remarks
		maximize greening opportunity.					
3.8	**(OM9) Vertical Greening** Vertical planting should be established to soften the hard, vertical surfaces of the proposed development components. These components will include walls of administration and ventilation buildings, retaining walls and road abutments.	To reduce visible impact of proposed new structures and facilities and maximize greening opportunity.	Contractors	Proposed new development structures.	During Construction/ Operation Phase	Implemented	
3.8	**(OM10) Roadside Amenity Planting** Roadside amenity planting should be provided, to enhance the landscape and visual quality of the existing and proposed transport routes and car parks.	To soften edges of the proposed engineer structures and associated facilities and enhance the landscape and visual quality of the existing and proposed road.	Contractors	Proposed new development structures.	During Construction/ Operation Phase	Implemented	
3.8	**(OM11) Reinstatement** Certain areas unavoidably disturbed by the Project will be reprovisioned.	Particularly aimed at temporarily disturbed areas, to reduce long term impact on landscape.	Contractors	Construction Site Works.	During Construction/ Operation Phase	Implemented	
3.8	**(OM12) Light Control** Street and night time lighting glare will be controlled to minimize glare impact to adjacent VSRs during the operation stage.	To minimize glare impact to adjacent VSRs.	Contractors	Lit areas around proposed new development buildings and along roads.	During Operation Phase	Implemented	
3.8	**(OM13) Reprovisioned LCSD Garden** The Open Space of Wo Keng Shan public garden falls within the Project Site and	To compensate for loss of Open Space due to the Project.	Contractors	Contractors Near existing Wo Keng Shan	During Construction/ Operation Phase	Implemented	

EP/EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measures	When to implement the measures?	Implementation Status	Remarks
	will be reprovisioned to reprovide the amenities of the garden on a one to one basis.			public garden, subject to confirmation by CEDD and LCSD			

Appendix O

Implementation Status of Water Quality Mitigation Measures

Summary of site Inspection Record

Project:	**Agreement No. CE 45/2008 (CE) - *Liantang/Heung Yuen Wai Boundary Control Point and Associated Works***	**Checklist No:**	CE45/2008-(3)-20201007
Project Contract No.	***~~Contract 2~~ / Contract 3 / ~~Contract~~ 4 / ~~Contract~~ 5 / ~~Contract~~ 6 / ~~Contract~~ 7***	**Inspected by:**	
		IEC	SMEC
Date:	**7 October 2020**	**ER**	AECOM
Time:	1400	**ET**	AUES
Environmental Permit	**EP- 404/2011/D**	**Contractor**	Chun Wo

PART A: GENERAL INFORMATION

Weather:	Sunny	☑	Fine	☐	Cloudy	☐	Rainy	☐	Temperature:	27 ^{0}C
Humidity:	High	☐	Moderate	☑	Low	☐				
Wind:	Strong	☐	Breeze	☑	Light	☐	Calm	☐		

Observation / Issues/ Reminder Recorded on Site:

- No adverse environmental issue was observed.

Status of Water Quality Mitigation Measures:

The work area was hard paved and no adverse water impact was observed. .

Photo recorded for the Recification

Nil

Summary of site Inspection Record

Project:	**Agreement No. CE 45/2008 (CE) - *Liantang/Heung Yuen Wai Boundary Control Point and Associated Works***	**Checklist No:**	CE45/2008-(3)-20201014
Project Contract No.	***~~Contract 2~~ / Contract 3 / ~~Contract~~ 4 / ~~Contract~~ 5 / ~~Contract~~ 6 / ~~Contract~~ 7***	**Inspected by:**	
		IEC	SMEC
Date:	**14 October 2020**	**ER**	AECOM
Time:	1400	**ET**	AUES
Environmental Permit	**EP- 404/2011/D**	**Contractor**	Chun Wo

PART A: GENERAL INFORMATION

Weather:	Sunny	☐	Fine	☑	Cloudy	☐	Rainy	☐	Temperature:	28 ^{0}C
Humidity:	High	☐	Moderate	☑	Low	☐				
Wind:	Strong	☐	Breeze	☑	Light	☐	Calm	☐		

Observation / Issues/ Reminder Recorded on Site:

- No adverse environmental issue was observed.

Status of Water Quality Mitigation Measures:

The work area was hard paved and no adverse water impact was observed. .

Photo recorded for the Recification

Nil

AUES

Summary of site Inspection Record

Project:	**Agreement No. CE 45/2008 (CE) - *Liantang/Heung Yuen Wai Boundary Control Point and Associated Works***	**Checklist No:**	CE45/2008-(3)-20201021
Project Contract No.	***~~Contract 2~~ / Contract 3 / ~~Contract~~ 4 / ~~Contract~~ 5 / ~~Contract~~ 6 / ~~Contract~~ 7***	**Inspected by:**	
		IEC	SMEC
Date:	**21 October 2020**	**ER**	AECOM
Time:	1400	**ET**	AUES
Environmental Permit	**EP- 404/2011/D**	**Contractor**	Chun Wo

PART A: GENERAL INFORMATION

Weather:	Sunny	☑	Fine	☐	Cloudy	☐	Rainy	☐	Temperature:	28 ^{0}C
Humidity:	High	☐	Moderate	☑	Low	☐				
Wind:	Strong	☐	Breeze	☑	Light	☐	Calm	☐		

Observation / Issues/ Reminder Recorded on Site:

- No adverse environmental issue was observed.

Status of Water Quality Mitigation Measures:

The work area was hard paved and no adverse water impact was observed. .

Photo recorded for the Recification

Nil

AUES

Summary of site Inspection Record

Project:	**Agreement No. CE 45/2008 (CE) - *Liantang/Heung Yuen Wai Boundary Control Point and Associated Works***	**Checklist No:**	CE45/2008-(3)-20201028
Project Contract No.	***~~Contract 2~~ / Contract 3 / ~~Contract~~ 4 / ~~Contract~~ 5 / ~~Contract~~ 6 / ~~Contract~~ 7***	**Inspected by:**	
		IEC	SMEC
Date:	**28 October 2020**	**ER**	AECOM
Time:	0945	**ET**	AUES
Environmental Permit	**EP- 404/2011/D**	**Contractor**	Chun Wo

PART A: GENERAL INFORMATION

Weather:	Sunny	☐	Fine	☐	Cloudy	☑	Rainy	☐	Temperature: 26	^{0}C
Humidity:	High	☐	Moderate	☑	Low	☐				
Wind:	Strong	☐	Breeze	☑	Light	☐	Calm	☐		

Observation / Issues/ Reminder Recorded on Site:

- No adverse environmental issue was observed.

Status of Water Quality Mitigation Measures:

The work area was hard paved and no adverse water impact was observed. .

Photo recorded for the Recification

Nil

Summary of site Inspection Record

AUES

10Project:	**Agreement No. CE 45/2008 (CE) - *Liantang/Heung Yuen Wai Boundary Control Point and Associated Works***	**Checklist No:**	CE45/2008-(6)-20201007
Project Contract No.	***~~Contract 2~~ / ~~Contract~~ 3 / ~~Contract~~ 4 / ~~Contract~~ 5 / Contract 6 / ~~Contract~~ 7***	**Inspected by:**	
Date:	**7 October 2020**	**IEC**	SMEC
Time:	1500	**ER**	AECOM
Environmental Permit	**EP- 404/2011/D**	**ET**	AUES
		Contractor	CRBC-CEC-Kaden JV

PART A: GENERAL INFORMATION

Weather:	Sunny	☑	Fine	☐	Cloudy	☐	Rainy	☐	Temperature:	27 ^{0}C
Humidity:	High	☐	Moderate	☑	Low	☐				
Wind:	Strong	☐	Breeze	☑	Light	☐	Calm	☐		

Observation / Issues/ Reminder Recorded on Site:

- No adverse environmental issue was observed.

Status of Water Quality Mitigation Measures:

The work area was hard paved and no adverse water impact was observed.

Photo recorded for the Recification

NA.

Summary of site Inspection Record

10Project:	**Agreement No. CE 45/2008 (CE) - *Liantang/Heung Yuen Wai Boundary Control Point and Associated Works***	**Checklist No:**	CE45/2008-(6)-20201014
Project Contract No.	***~~Contract 2~~ / ~~Contract~~ 3 / ~~Contract~~ 4 / ~~Contract~~ 5 / Contract 6 / ~~Contract~~ 7***	**Inspected by:**	
		IEC	SMEC
Date:	**14 October 2020**	**ER**	AECOM
Time:	1500	**ET**	AUES
Environmental Permit	**EP- 404/2011/D**	**Contractor**	CRBC-CEC-Kaden JV

PART A: GENERAL INFORMATION

Weather:	Sunny	☐	Fine	☑	Cloudy	☐	Rainy	☐	Temperature:	27 ^{0}C
Humidity:	High	☐	Moderate	☑	Low	☐				
Wind:	Strong	☐	Breeze	☑	Light	☐	Calm	☐		

Observation / Issues/ Reminder Recorded on Site:

- No adverse environmental issue was observed.

Status of Water Quality Mitigation Measures:

Hydroseeding was applied on the exposed work area.

Photo recorded for the Recification

NA.

AUES

Summary of site Inspection Record

10Project:	**Agreement No. CE 45/2008 (CE) - *Liantang/Heung Yuen Wai Boundary Control Point and Associated Works***	**Checklist No:**	CE45/2008-(6)-20201021
Project Contract No.	***~~Contract 2~~ / ~~Contract~~ 3 / ~~Contract~~ 4 / ~~Contract~~ 5 / Contract 6 / ~~Contract~~ 7***	**Inspected by:**	
Date:	**21 October 2020**	**IEC**	SMEC
Time:	1500	**ER**	AECOM
Environmental Permit	**EP- 404/2011/D**	**ET**	AUES
		Contractor	CRBC-CEC-Kaden JV

PART A: GENERAL INFORMATION

Weather:	Sunny	☑	Fine	☐	Cloudy	☐	Rainy	☐	Temperature:	28 ^{0}C
Humidity:	High	☐	Moderate	☑	Low	☐				
Wind:	Strong	☐	Breeze	☑	Light	☐	Calm	☐		

Observation / Issues/ Reminder Recorded on Site:

- No adverse environmental issue was observed.

Status of Water Quality Mitigation Measures:

The work area was hard paved and no adverse water impact was observed.

Photo recorded for the Recification

NA.

Summary of site Inspection Record

10Project:	**Agreement No. CE 45/2008 (CE) - *Liantang/Heung Yuen Wai Boundary Control Point and Associated Works***	**Checklist No:**	CE45/2008-(6)-20201029
Project Contract No.	***~~Contract 2~~ / ~~Contract~~ 3 / ~~Contract~~ 4 / ~~Contract~~ 5 / Contract 6 / ~~Contract~~ 7***	**Inspected by:**	
		IEC	SMEC
Date:	**29 October 2020**	**ER**	AECOM
Time:	1400	**ET**	AUES
Environmental Permit	**EP- 404/2011/D**	**Contractor**	CRBC-CEC-Kaden JV

PART A: GENERAL INFORMATION

Weather:	Sunny	☐	Fine	☐	Cloudy	☑	Rainy	☐	Temperature:	25 ^{0}C
Humidity:	High	☐	Moderate	☑	Low	☐				
Wind:	Strong	☐	Breeze	☑	Light	☐	Calm	☐		

Observation / Issues/ Reminder Recorded on Site:

- No adverse environmental issue was observed.

Status of Water Quality Mitigation Measures:

The work area was hard paved and no adverse water impact was observed.

Photo recorded for the Recification

NA.