

JOB No.: TCS00670/13

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

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT
REPORT (NO.16) – NOVEMBER 2014

PREPARED FOR
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
(CEDD)

Date	Reference No.	Prepared By	Certified By
11 December 2014	TCS00670/13/600/R0282v2	 Nicola Hon (Environmental Consultant)	 Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	8 December 2014	First Submission
2	11 December 2014	Amended according to the IEC's comments on 9 December 2014

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12 December 2014

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By Email & Post

Attention: Mr Simon LEUNG

Dear Sirs

Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary Control Point and Associated Works
Independent Environmental Checker – Investigation
Monthly EM&A Report (No. 16) – November 2014

With reference to the Monthly EM&A Report No. 16 for November 2014 (Version 2) certified by the ET Leader provided to us on 12 December 2014, please be noted that we have no adverse comments on the captioned submission. We herewith verify the captioned submission in accordance with Condition 5.4 of the Environmental Permit No. EP-404/2011/A.

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 Francis LEE on tel. 3995 8144 or by email to francis.lee@smec.com.

Yours faithfully
For and on behalf of
SMEC Asia Limited



Antony WONG
Independent Environmental Checker

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EXECUTIVE SUMMARY

ES01 This is the 16th monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1 to 30 November 2014** (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 five CEDD contracts including Contract 2 (CV/2012/08), Contract 3 (CV/2012/09), Contract 4 (TCSS), Contract 5 (CV/2013/03) and Contract 6 (CV/2013/08).

ES03 Currently, the construction works has been undertaken for Contract 2, Contract 3 and Contract 5. 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	6	90
	24-hour TSP	6	30
Construction Noise	L _{eq(30min)} Daytime	8	40
Water Quality	Water sampling	5	13(*)
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	Contract 2	4
		Contract 3	4
		Contract 5	4

(*) Monitoring day

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES04 In the Reporting Period, no exceedance for noise and water quality monitoring was registered. However, three (3) Action Level exceedances for 24-hour TSP of air quality were recorded at AM2 on 14 November 2014 and AM7b on 14 and 26 November 2014. The summary of breach of environmental performance is shown below.

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation Result	Corrective Actions
Air Quality	1-hour TSP	0	0	0	-	-
	24-hour TSP	3	0	3	Investigation in progress	Investigation in progress
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 In this Reporting Period, three (3) documented environmental complaints was received and lodged for Contracts 2 and 3 regarding to dust and noise impact. Follow up actions have been undertaken by both Contractor to resolve the complaints and deficiencies in due time. Investigation reports for the complaint have been submitted to all relevant parties for review.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

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

REPORTING CHANGE

ES07 No reporting changes were made in the Reporting Period.

SITE INSPECTION

ES08 In this Reporting Period, joint site inspection to evaluate the site environmental performance at *Contract 2* has been carried out by the RE, IEC, ET and the Contractor on **7, 14, 21 and 28 November 2014**. No non-compliance was noted.

ES09 In the Reporting Period, joint site inspection to evaluate the site environmental performance at *Contract 3* has been carried out by the RE, IEC, ET and the Contractor on **3, 10, 19 and 24 November 2014**. No non-compliance was noted.

ES10 In the Reporting Period, joint site inspection to evaluate the site environmental performance at *Contract 5* has been carried out by the RE, IEC, ET and the Contractor on **6, 13, 20 and 27 November 2014**. No non-compliance was noted.

FUTURE KEY ISSUES

ES11 During dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to villages. The Contractor should fully implement the construction dust mitigation measures properly.

ES12 Muddy water or other water pollutants from sites surface flow to local stream such as Kong Yiu Channel and Ma Wat Channel or public area should properly avoided. Water quality mitigation measures to prevent surface runoff into nearby water bodies or public areas should be fully implemented.

ES13 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/A issued on 28 October 2013.
- 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 **16th** monthly EM&A report presenting the monitoring results and inspection findings for reporting period from **1** to **30 November 2014**.

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
Section 7 Waste Management

- Section 8* *Site Inspections*
- Section 9* *Environmental Complaints and Non-Compliance*
- Section 10* *Implementation Status of Mitigation Measures*
- Section 11* *Conclusions and Recommendations*

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 CONSTRUCTION CONTRACT PACKAGING

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

- Contract 2 (CV/2012/08)
- Contract 3 (CV/2012/09)
- Contract 4 (TCSS)
- Contract 5 (CV/2013/03)
- Contract 6 (CV/2013/08)

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 (Contract number to be assigned)

2.1.5 Contract 4 has not yet been awarded. The work of the Contract 4 includes provision and installation of Traffic Control and Surveillance System and the associated electrical and mechanical works for the Project.

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 is still yet awarded. 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.

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.

Environmental Protection Department (EPD)

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

Engineer or Engineers Representative (ER)

2.2.4 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)

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

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

Environmental Team (ET)

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

- Monitor and audit various environmental parameters as required in this EM&A Manual
- Analyse the environmental monitoring and audit data, review the success of EM&A programme and the adequacy of mitigation measures implemented, confirm the validity of the EIA predictions and identify any adverse environmental impacts arising
- Carry out regular site inspection to investigate and audit the Contractors' site practice, equipment/plant and work methodologies with respect to pollution control and environmental mitigation, and effect proactive action to pre-empt problems
- Monitor compliance with conditions in the EP, environmental protection, pollution prevention and control regulations and contract specifications
- Audit environmental conditions on site
- Report on the environmental monitoring and audit results to EPD, the ER, the IEC and Contractor(s) or their delegated representatives
- Recommend suitable mitigation measures to the Contractor in the case of exceedance of Action and Limit levels in accordance with the Event and Action Plans
- Liaise with the IEC on all environmental performance matters and timely submit all relevant EM&A proforma for approval by IEC
- Advise the Contractor(s) on environmental improvement, awareness, enhancement measures etc., on site
- Adhere to the procedures for carrying out complaint investigation
- Liaison with the client departments, Engineer/Engineer's Representative, ET, IEC and the Contractor(s) of the concurrent projects as listed under Section 2.3 below regarding the cumulative impact issues.

Independent Environmental Checker (IEC)

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

- Provide proactive advice to the ER and the Project Proponent on EM&A matters related to

the project, independent from the management of construction works, but empowered to audit the environmental performance of construction

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

2.3 CONCURRENT PROJECTS

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

- (a) Regulation of Shenzhen River Stage IV (Environmental Permit EP-430/2011);
- (b) Building works and road works by contractors of Architectural Services Department (ArchSD) (Environmental Permit EP-404/2011/A);
- (c) Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange – Contract No. HY/2012/06;
- (d) Construction of cross-boundary vehicular and pedestrian bridges (total 5 numbers) across the Shenzhen River; and
- (e) Construction of BCP facilities in Shenzhen.

2.4 CONSTRUCTION PROGRESS

2.4.1 In the Reporting Period, the major construction activity conducted under the Project is located in Contracts 2, 3 and 5 and they are summarized in below. Moreover, the 3-month rolling construction program of the Contracts 2, 3 and 5 is enclosed in *Appendix C*.

Contract 2 (CV/2012/08)

The contract commenced in May 2014. In this Reporting Period, construction activities conducted are listed below:

- Project wide –Ground Investigation (GI) Field Works
- North Portal – Permanent Slope Formation for Tunnel Boring Machine (TBM) Site Installation
- North Portal – Sub-station Construction
- North Portal – Contractor's site office: Construction of Core and Material Store
- North Portal – Soil nailing works
- North Portal – Excavation Stage 2
- North Portal – Top heading canopies
- North Portal – Site Installation and Logistics for TBM Works
- North Portal –Permanent drainage implementation at Mid Valley
- North Portal –Tree felling works
- North Portal –Top heading canopies
- Mid Vent Portal –Site Installation (Tunnel and Portal)
- Mid Vent Portal –Top heading canopies and bench excavation

- South Portal –Temporary bridge: finishing and surfacing works
- South Portal –Sub-station Construction + CLP Installation
- South Portal –Tree removal
- South Portal –Sub-station Construction + CLP Installation
- South Portal –Temporary access road

Contract 3 (CV/2012/09)

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

- Pile cap construction for Bridge E
- Automatic Deformation Monitoring System (ADMS) installation
- Cable detection and trial trenches
- Catch fence erection
- Filling Works at Tong Hang East
- Lagging wall and capping beam for bored pile wall
- Storm drains laying
- Storm drains laying
- Sewer pipes laying
- Construction of noise barriers
- Pier Construction
- Pile cap works
- Piling works
- Pre-drilling works
- Construction of valve control and telemetry house
- Retaining structure construction
- Traffic diversion for Fanling Highway
- Road works at Fanling Highway
- Socket H-pile installation
- Utilities duct laying

Contract 4 (Contract number to be assigned)

- The contract has not yet been awarded.

Contract 5 (CV/2013/03)

The Contract awarded in April 2013 and commenced on August 2013. In this Reporting Period, construction activities conducted are listed below:

- Bituminous laying at proposed Lin Ma Hang (LMH) road
- Construction of Eastern pedestrian subway and pump room at LMH
- Construction of Western pedestrian subway and staircase at Lin Ma Hang
- Abutment construction works at Bridge J
- Construction of retaining wall No.1 & 2a
- Preparation works for soil cement slope along BCP Area.
- Pipe Jacking for CLP cable across Kong Yuen River (pit no. 2)
- Pipe laying/pulling for CLP cable ducting of 3 nos. of steel sleeve pipe across Kong Yuen River
- Drainage works at existing / proposed Lin Ma Hang Road
- Drainage works at BCP area
- Water works at existing / proposed Lin Ma Hang Road
- Formation Works at BCP Area
- Pruning/ felling/ transplanting of existing tree
- Environmental impact monitoring
- Preparation works for soil cement slope along BCP Area.
- Installation of Underground utilities (CLP cables) at proposed LMH road.
- Diversion of Underground utilities (CLP cables) at existing LMH road.
- Road works (kerb laying) for proposed LMH Road
- Utility laying (132kV & 11kV) at existing LMH road

Contract 6 (CV/2013/08)

- The contract has not yet been awarded

2.5 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

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

- Project Layout Plans of Contracts 2, 3 and 5
- 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 3 and 5
- Contamination Assessment Plan (CAP) for Po Kat Tsai, Loi Tung and the workshops in Fanling
- Contamination Assessment Report (CAR) for Po Kat Tsai, Loi Tung and the workshops in Fanling
- Vegetation Survey Report

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	
Contract 2			
1	Air pollution Control (Construction Dust) Regulation	Ref No.: 368864	31 Dec 2013
2	Chemical Waste Producer Registration	North Portal Waste Producers Number: No. 5213-652-D2523-01 Mid-Vent Portal Waste Producers Number: No. 5213-634-D2524-01 South Portal Waste Producers Number: No. 5213-634-D2526-01	Valid from 25 Mar 2014 Valid from 25 Mar 2014 Valid from 9 Apr 2014
3	Water Pollution Control Ordinance - Discharge License	No.WT00018374-2014 No.: W5/1I389 No.: W5/1I390 No.: W5/1I391 No.: W5/1I392	Valid from 3 Mar 2014 to 28 Feb 2019 Valid from 28 Mar 2014 to 31 Mar 2019 Valid from 24 Mar 2014 to 31 Mar 2019 Surrendered, effective 19 June 2014 Valid from 28 Mar 2014 to 31 Mar 2019 Valid from 28 Mar 2014 to 31 Mar 2019
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7019105	Valid from 8 Jan 2014

Item	Description	License/Permit Status	
5	Construction Noise Permit	GW-RN0693-14	Valid 11 Nov 2014 - 10 May 2015
		GW-RN0656-14	Valid 27 Oct 2014 - 21 Apr 2015
		GW-RN0430-14	Valid 8 Jul 2014 - 29 Dec 2014
		GW-RN0707-14	Valid 1 Dec 2014 - 29 Dec 2014
		GW-RN0704-14	Valid 1 Dec 2014 - 31 Jan 2015
Contract 3			
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 362101	Notification received by EPD on 17 Jul 2013
2	Chemical Waste Producer Registration	Waste Producers Number: No.:5113-634-C3817-01	Valid form 7 Oct 2013 till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.:WT00016832 – 2013	Valid from 28 Aug 13 to 31 Aug 2018
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7017914	Valid form 2 Aug 13 till the end of Contract
5	Construction Noise Permit	GW-RN0397-14	Valid on 29 Jun 2014 till 28 Dec 2014
		GW-RN0445-14	Valid on 28 Jul 2014 till 25 Jan 2015
		GW-RN0485-14	Valid on 5 Aug 2014 till 5 Feb 2015
		GW-RN0513-14	Valid on 5 Aug 2014 till 5 Feb 2015
		GW-RN0557-14	Valid on 15 Sep 2014 till 28 Dec 2014
		GW-RN0651-14	Valid on 21 Oct 2014 till 20 Nov 2015
		GW-RN0684-14	Valid on 16 Nov 2014 till 26 Apr 2015
		GW-RN0720-14	Valid on 21 Nov 2014 till 3 Jan 2015
Contract 5			
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 359338	Notified EPD on 13 May 2013
2	Chemical Waste Producer Registration	Waste Producers Number No.: 5213-642-S3735-01	Valid form 8 Jun 2013 till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: W5/1G44/1	Valid from 8 Jun 13 to 30 Jun 2018
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7017351	Valid form 29 Apr 13 till the end of Contract
5	Construction Noise Permit	NA	NA

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

3.3 MONITORING LOCATIONS

3.3.1 The designated monitoring locations as recommended in the *EM&A Manual* are shown in *Appendix 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 proposed alternative monitoring locations has updated in the revised EM&A Programme which verified by IEC and certified by ET Leader prior submitted to EPD on 10 July 2013. *Table 3-2*, *Table 3-3* and *Table 3-4* are respectively listed the air quality, construction noise and water quality monitoring locations for the Project and a map showing these monitoring stations is presented in *Appendix E*.

Table 3-2 Impact Monitoring Stations - Air Quality

Station ID	Description	Works Area	Related to the Work Contract
AM1a*	Garden Farm, Tsung Yuen Ha Village	BCP	Contract 5
AM2	Village House near Lin Ma Hang Road	LMH to Frontier Closed Area	Contract 5, Contract 6
AM3	Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village.	LMH to Frontier Closed Area	Contract 5, Contract 6

Station ID	Description	Works Area	Related to the Work Contract
AM4a	A village house located at about 160m east side of the original point AM4	LMH to Frontier Closed Area	Contract 6
AM5	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
AM8	Po Kat Tsai Village No. 4	Po Kat Tsai	Contract 2
AM9b [#]	Nam Wa Po Village House No. 80	Fanling	Contract 3

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

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

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

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	Contract 5
NM2	Village House near Lin Ma Hang Road	Lin Ma Hang to Frontier Closed Area	Contract 5, Contract 6
NM3	Ping Yeung Village House (facade facing northeast)	Ping Yeung to Wo Keng Shan	Contract 6
NM4	Wo Keng Shan Village House	Ping Yeung to Wo Keng Shan	Contract 6
NM5	Village House, Loi Tung	Sha Tau Kok Road	Contract 2, Contract 6
NM6	Tai Tong Wu Village House 2	Sha Tau Kok Rpad	Contract 2, Contract 6
NM7	Po Kat Tsai Village	Po Kat Tsai	Contract 2
NM8	Village House, Tong Hang	Fanling	Contract 2 Contract 3
NM9	Village House, Kiu Tau Village	Fanling	Contract 3
NM10	Nam Wa Po Village House No. 80	Fanling	Contract 3

Table 3-4 Impact Monitoring Stations - Water Quality

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
WM1	Downstream of Kong Yiu Channel	833 679	845 421	Alternative location located at upstream 51m of the designated location	Contract 5
WM1-Control	Upstream of Kong Yiu Channel	834 185	845 917	NA	Contract 5
WM2A	Downstream of River Ganges	834 204	844 471	Alternative location located at downstream 81m of the designated location	Contract 6

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
WM2A-Control	Upstream of River Ganges	835 270	844 243	Alternative location located at upstream 78m 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
WM3	Downstream of River Indus	836 324	842 407	NA	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

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”), 3 consecutive $L_{eq(5min)}$ measurement will depended CNP requirements to undertake. Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.

Water Quality Monitoring

3.4.3 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
<i>24-Hr TSP</i>	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Model TE-5025A
<i>1-Hour TSP</i>	
Portable Dust Meter	Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter

Wind Data Monitoring Equipment

- 3.5.4 According to the approved EM&A Manual, wind data monitoring equipment shall also be provided and set up for logging wind speed and wind direction near the dust monitoring locations. The equipment installation location shall be proposed by the ET and agreed with the IEC. For installation and operation of wind data monitoring equipment, the following points shall be observed:
- 1) The wind sensors should be installed 10 m above ground so that they are clear of obstructions or turbulence caused by buildings.
 - 2) The wind data should be captured by a data logger. The data shall be downloaded for analysis at least once a month.
 - 3) The wind data monitoring equipment should be re-calibrated at least once every six months.
 - 4) Wind direction should be divided into 16 sectors of 22.5 degrees each.
- 3.5.5 ET has liaised with the landlords of the successful granted HVS installation premises. However, the owners rejected to provide premises for wind data monitoring equipment installation.
- 3.5.6 Under this situation, the ET proposed alternative methods to obtain representative wind data. Meteorological information as extracted from “the Hong Kong Observatory Ta Kwu Ling Station” is alternative method to obtain representative wind data. For Ta Kwu Ling Station, it is located nearby the Project site. Moreover, this station is located at 15m above mean sea level while its anemometer is located at 13m above the existing ground which in compliance with the general setting up requirement. Furthermore, this station also can be to provide the humidity, rainfall, and air pressure and temperature etc. meteorological information. In Hong Kong of a lot development projects, weather information extracted from Hong Kong Observatory is common alternative method if weather station installation not allowed.

Noise Monitoring

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

Table 3-6 Construction Noise Monitoring Equipment

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

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

Water Quality Monitoring

3.5.10 DO and water temperature should be measured in-situ by a DO/temperature meter. The instrument should be portable and weatherproof using a DC power source. It should have a membrane electrode with automatic temperature compensation complete with a cable. The equipment should be capable of measuring:

- 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 °C without being frozen), and delivered to the laboratory in the same day as the samples were collected.

3.5.16 Analysis of suspended solids should be carried out in a HOKLAS or other accredited laboratory. Water samples of about 1L should be collected at the monitoring stations for carrying out the laboratory suspended solids determination. The SS determination work should start within 24 hours after collection of the water samples. The SS analyses should follow the *APHA Standard Methods 2540D* with Limit of Reporting of 2 mg/L.

3.5.17 Water quality monitoring equipment used in the impact monitoring is listed in **Table 3-7**. Suspended solids (SS) analysis is carried out by a local HOKLAS-accredited laboratory, namely *ALS Technichem (HK) Pty Ltd*.

Table 3-7 Water Quality Monitoring Equipment

Equipment	Model
Water Depth Detector	Eagle Sonar or tape measures
Water Sampler	A 2-litre transparent PVC cylinder with latex cups at both ends or teflon/stainless steel bailer or self-made sampling bucket

Equipment	Model
Thermometer & DO meter	YSI PRO20 Handheld Dissolved Oxygen Instrument / YSI 550A Multifunctional Meter
pH meter	AZ8685 pH pen-style meter
Turbidimeter	Hach 2100Q
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-liter plastic cool box with Ice pad

3.6 MONITORING METHODOLOGY

1-hour TSP Monitoring

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

- 3.6.2 The 1-hour TSP meter is used within the valid period as follow manufacturer’s Operation and Service Manual.

24-hour TSP Monitoring

- 3.6.3 The equipment used for 24-hour TSP measurement is Thermo Andersen Model GS2310 TSP high volume air sampling system, which complied with *EPA Code of Federal Regulation, Appendix B to Part 50*. The High Volume Air Sampler (HVS) consists of the following:
- An anodized aluminum shelter;
 - A 8”x10” stainless steel filter holder;
 - A blower motor assembly;
 - A continuous flow/pressure recorder;
 - A motor speed-voltage control/elapsed time indicator;
 - A 7-day mechanical timer, and
 - A power supply of 220v/50 Hz
- 3.6.4 The HVS is operated and calibrated on a regular basis in accordance with the manufacturer’s instruction using Tisch Calibration Kit Model TE-5025A. Calibration would carry out in two month interval.
- 3.6.5 24-hour TSP is collected by the ET on filters of HVS and quantified by a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (ALS), upon receipt of the samples. The ET keep all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% RH (Relative Humidity) and 25°C, for six months prior to disposal.

Noise Monitoring

- 3.6.6 Noise measurements were taken in terms of the A-weighted equivalent sound pressure level (L_{eq}) measured in decibels dB(A). Supplementary statistical results (L_{10} and L_{90}) were also obtained for reference.
- 3.6.7 During the monitoring, all noise measurements would be performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq(30min)}$ in six consecutive $L_{eq(5min)}$ measurements will use as the monitoring parameter for the time period between 0700-1900 hours on weekdays; and also $L_{eq(15min)}$ in three consecutive $L_{eq(5min)}$ measurements 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 locations. The sampling produce with the in-situ monitoring are presented as below:

Sampling Procedure

- 3.6.10 A Digital Global Positioning System (GPS) is used to identify the designated monitoring stations prior to water sampling. A portable, battery-operated echo sounder is used for the determination of water depth at each station. At each station, water sample would be collected from 0.1m below water surface or the water surface to prevent the river bed sediment for stirring.
- 3.6.11 The sample container will be rinsed with a portion of the water sample. The water sample then will be transferred to the high-density polythene bottles as provided by the laboratory, labeled with a unique sample number and sealed with a screw cap.
- 3.6.12 Before sampling, general information such as the date and time of sampling, weather condition as well as the personnel responsible for the monitoring would be recorded on the field data sheet.
- 3.6.13 A 'Willow' 33-liter plastic cool box packed with ice will be used to preserve the water samples prior to arrival at the laboratory for chemical determination. The water temperature of the cool box is maintained at a temperature as close to 4⁰C as possible without being frozen. Samples collected are delivered to the laboratory upon collection.

In-situ Measurement

- 3.6.14 YSI PRO20 Handheld Dissolved Oxygen Instrument or YSI 550A Multifunctional Meter is used for water in-situ measures, which automates the measurements and data logging of temperature, dissolved oxygen and dissolved oxygen saturation.
- 3.6.15 A portable AZ Model 8685 pH pen-style meter is used for in-situ pH measurement. The pH meter is capable of measuring pH in the range of 0 – 14 and readable to 0.1.
- 3.6.16 A portable Hach 2100Q Turbidimeter is used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU.
- 3.6.17 All in-situ measurement equipment are calibrated by HOKLAS accredited laboratory of three month interval.

Laboratory Analysis

- 3.6.18 All water samples 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 ($\mu\text{g}/\text{m}^3$)		Limit Level ($\mu\text{g}/\text{m}^3$)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AM1a	265	143	500	260
AM2	268	149		
AM3	269	145		
AM4a	267	148		
AM5	268	143		
AM6	269	148		
AM7b	275	156		
AM8	269	144		
AM9b	271	151		

Table 3-9 Action and Limit Levels for Construction Noise

Monitoring Location	Action Level	Limit Level in dB(A)
	Time Period: 0700-1900 hours on normal weekdays	
NM1, NM2, NM3, NM4, NM5, NM6, NM7, NM8, NM9, NM10	When one or more documented complaints are received	75 dB(A) ^{Note 1 & Note 2}

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

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

Table 3-10 Action and Limit Levels for Water Quality

Parameter	Performance criteria	Monitoring Location				
		WM1	WM2A	WM2B	WM3	WM4
DO (mg/L)	Action Level	(*)4.23	(**)4.00	(*)4.74	(**)4.00	(*)4.14
	Limit Level	(#)4.19	(**)4.00	(#)4.60	(**)4.00	(#)4.08
Turbidity (NTU)	Action Level	51.3	24.9	11.4	13.4	35.2
		AND 120% of upstream control station of the same day				
	Limit Level	67.6	33.8	12.3	14.0	38.4
SS (mg/L)	Action Level	54.5	14.6	11.8	12.6	39.4
		AND 120% of upstream control station of the same day				
	Limit Level	64.9	17.3	12.4	12.9	45.5
		AND 130% of upstream control station of the same day				

Remarks:

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

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

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

3.8.2 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan which presented in **Appendix 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 In the Reporting Period, construction works under the project have been commenced in Contracts 2, 3 and 5 and air quality monitoring was performed at **6** relevant designated locations as below:

- AM1a - Garden Farm, Tsung Yuen Ha Village;
- AM2 - Village House near Lin Ma Hang Road;
- AM3 - Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village;
- AM7b – Loi Tung Village;
- AM8 - Po Kat Tsai Village;
- AM9b - Nam Wa Po Village House No. 80

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 IN REPORTING MONTH

4.2.1 In the Reporting Period, a total of **90** events of 1-hour TSP and **30** events of 24-hours TSP monitoring were carried out and the monitoring results are summarized in *Tables 4-1 to 4-6*. 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 – AM1a

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
3-Nov-14	108	1-Nov-14	10:30	216	218	159
8-Nov-14	33	7-Nov-14	10:43	160	171	211
14-Nov-14	117	13-Nov-14	13:00	206	217	222
20-Nov-14	74	19-Nov-14	13:00	240	222	199
26-Nov-14	97	25-Nov-14	10:01	53	53	61
Average (Range)	86 (74-117)	Average (Range)		174 (53-240)		

Table 4-2 Summary of 24-hour and 1-hour TSP Monitoring Results – AM2

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
3-Nov-14	125	1-Nov-14	10:19	169	182	142
8-Nov-14	49	7-Nov-14	10:30	220	265	209
14-Nov-14	230	13-Nov-14	11:12	202	219	231
20-Nov-14	141	19-Nov-14	13:12	254	216	208
26-Nov-14	137	25-Nov-14	9:49	68	57	58
Average (Range)	136 (49-230)	Average (Range)		180 (57-265)		

Remark: bold and italic value indicated Action Level exceedance.

Table 4-3 Summary of 24-hour and 1-hour TSP Monitoring Results – AM3

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
3-Nov-14	128	1-Nov-14	10:10	152	166	120
8-Nov-14	45	7-Nov-14	10:17	142	160	191
14-Nov-14	141	13-Nov-14	11:03	216	218	230
20-Nov-14	90	19-Nov-14	13:22	202	203	228

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
26-Nov-14	111	25-Nov-14	9:38	83	58	52
Average (Range)	103 (45-141)	Average (Range)		161 (52-230)		

Remark: bold and italic value indicated Action Level exceedance.

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

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
3-Nov-14	134	4-Nov-14	10:23	237	252	230
8-Nov-14	40	10-Nov-14	13:17	100	85	67
14-Nov-14	201	15-Nov-14	12:54	156	179	66
20-Nov-14	97	21-Nov-14	13:00	152	194	170
26-Nov-14	253	27-Nov-14	9:23	189	188	202
Average (Range)	145 (40-253)	Average (Range)		164 (66 – 252)		

Remark: bold and italic value indicated Action Level exceedance.

Table 4-5 Summary of 24-hour and 1-hour TSP Monitoring Results – AM8

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
3-Nov-14	122	4-Nov-14	10:45	237	220	186
8-Nov-14	41	10-Nov-14	13:42	65	93	59
14-Nov-14	71	15-Nov-14	13:13	58	48	50
20-Nov-14	68	21-Nov-14	13:36	76	71	65
26-Nov-14	90	27-Nov-14	9:39	166	152	153
Average (Range)	78 (41-122)	Average (Range)		113 (48-237)		

Table 4-6 Summary of 24-hour and 1-hour TSP Monitoring Results – AM9b

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
3-Nov-14	145	1-Nov-14	9:23	98	112	123
8-Nov-14	34	7-Nov-14	10:02	142	151	164
14-Nov-14	98	13-Nov-14	9:28	186	211	182
20-Nov-14	119	19-Nov-14	9:57	225	222	219
26-Nov-14	147	25-Nov-14	13:00	88	138	90
Average (Range)	109 (34-147)	Average (Range)		157 (88-225)		

4.2.2 As shown in *Tables 4-1 to 4-6*, the 1-hour TSP monitoring results were below the Action/ Limit Level. However, three (3) Action Level exceedance of 24-hour TSP was recorded, namely one exceedance at AM2 and two exceedance at AM7b. NOE was issued to relevant parties upon confirmation of the monitoring result and investigation for the cause of exceedance is being carried out by the ET.

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

Investigation Result for the exceedance on 22 October 2014 (last Reporting Period)

- 4.2.4 An Action Level exceedance at AM2 and AM3 was recorded on 22 October 2014 and the investigation has completed in this Reporting Period. The summary of investigation result is shown below.
- 4.2.5 Air quality monitoring locations AM2 and AM3 are both located at close proximity of the construction site and adjacent to the Lin Ma Hang Road. According to the information provided by the Contractor (SRJV), drainage and watermain works were conducted along the Lin Ma Hang Road. The construction activities were carried out close to AM3 whereas the works areas near AM2 were idled.
- 4.2.6 During weekly site inspections on 23 October 2014, 6 and 13 November 2014, dust control measures has been implemented for the contract works and our observations included the following:-
- water sprayed on the construction site and haul road to suppress fugitive dust
 - soil ground surfaces of the works areas were compacted and wetted
 - road sweeper and water bowser were arranged to clean up the road surface at Lin Ma Hang Road
- 4.2.7 According to the site records provided by SRJV, 447 vehicles of the import fill materials were passing through the Lin Ma Hang Road on 22 October 2014. All vehicles used for transported import fill materials were entirely covered which complied with the Air Pollution Control (Construction Dust) Regulation requirements.
- 4.2.8 The relationship of air quality monitoring results and number of import fill vehicles using the Lin Ma Hang Road on 16 October 2014 and 28 October 2014 were reviewed. There were 299 and 311 vehicles of import fill material passing through the Lin Ma Hang Road on 16 October 2014 and 28 October 2014 respectively. On 16 October 2014, the 24-hour TSP dust concentration detected at AM2 was 134ug/m³ and AM3 was 118ug/m³. On 28 October 2014, the 24-hour TSP dust concentration detected at AM2 was 143ug/m³ and AM3 was 103ug/m³. It revealed that the more vehicles passing through the Lin Ma Hang Road, the higher dust concentration collected at AM2 and AM3. It was considered that the traffic emissions from vehicles such as exhaust from tailpipe as well as fugitive dust from road surface due to traffic movement deteriorated the air quality at the vicinity.
- 4.2.9 During regular site inspection, it was observed that construction activities by other contracts were concurrently in progress and they were close to monitoring location AM2. Therefore, the construction dust brought from the works at other project was inevitable.
- 4.2.10 Based on the above investigation, it is concluded that the exceedances were likely due to the high traffic flow of specific day and not entirely related to the works under Contract 5. SRJV is advised to enhance the dust mitigation measures during dry season.

5 CONSTRUCTION NOISE MONITORING

5.1 GENERAL

5.1.1 In the Reporting Period, construction works under the project have been commenced in Contracts 2, 3 and 5 and noise monitoring was performed at 8 relevant designated locations as below:

- NM1 - Tsung Yuen Ha Village House No. 63;
- NM2 - Village House near Lin Ma Hang Road;
- NM5 - Village House, Loi Tung
- NM6 - Tai Tong Wu Village House 2
- NM7 - Po Kat Tsai Village
- NM8 - Village House, Tong Hang;
- NM9 - Village House, Kiu Tau Village; and
- NM10 - Nam Wa Po Village House No. 80

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 IN REPORTING MONTH

5.2.1 In the Reporting Period, a total of 40 event 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 NM1, NM2, NM5, NM6, NM7, NM8 and NM9. Therefore, no façade correction (+3 dB(A)) is added according to acoustical principles and EPD guidelines. However, free-field status was performed at NM10. So, 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 **Table 5-1**. 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 ($L_{eq,30min}$), dB(A)									
Date	NM1	NM2	NM8	NM9	(*)NM10	Date	NM5	NM6	NM7
1-Nov-14	53	62	57	57	67	4-Nov-14	56	62	75
7-Nov-14	54	65	58	55	64	10-Nov-14	60	63	64
13-Nov-14	50	63	58	75	64	15-Nov-14	56	63	61
19-Nov-14	52	61	58	69	65	21-Nov-14	55	63	64
25-Nov-14	56	62	57	62	66	27-Nov-14	57	63	69
Limit Level	75 dB(A)								

Remarks

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

5.2.2 As shown in **Table 5-1**, the noise level measured at all designated monitoring locations were below 75dB(A). In addition, there was no noise complaints (Action Level exceedance) received by the RE, Contractor or CEDD 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 5 and water quality monitoring was performed at 5 relevant designated locations as below:

- WM1 – Contract 5 working site downstream at Kong Yiu Channel;
- WM1 – Control – Contract 5 working site upstream at Kong Yiu Channel;
- WM4 – Contract 3 working site Downstream of Ma Wat Channel
- WM4 – Control A - Contract 3 working site Kau Lung Hang Stream
- WM4 – Control B - Contract 3 working site Upstream of Ma Wat Channel

6.1.2 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 **13** sampling days were performed for water quality monitoring at Contracts 3 and 5. The key monitoring parameters including Dissolved Oxygen, Turbidity and Suspended Solids are summarized in *Tables 6-1 and 6-2*. Breaches of water quality monitoring criteria are shown in *Table 6-3*. 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 Summary of Water Quality Monitoring Results for Contract 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
1-Nov-14	5.83	7.30	6.66	11.6	4.0	9.4	12.5	4.0	9.5
3-Nov-14	5.33	7.60	4.80	12.9	5.5	12.1	12.5	6.5	12.5
5-Nov-14	5.34	7.26	3.53	25.7	8.3	7.5	38.0	7.0	11.5
7-Nov-14	4.65	6.58	4.36	34.6	7.3	9.4	32.5	6.5	4.0
10-Nov-14	6.02	8.26	6.41	24.2	4.5	7.8	29.5	2.0	11.0
13-Nov-14	6.05	8.66	6.96	11.8	3.3	15.5	13.0	2.0	10.5
15-Nov-14	6.27	7.77	6.63	9.2	3.2	6.3	21.0	2.0	6.5
17-Nov-14	5.94	7.15	7.20	9.7	5.1	7.3	12.5	4.0	6.5
19-Nov-14	5.42	7.17	5.65	9.5	3.3	8.7	12.0	3.0	10.0
21-Nov-14	4.94	7.60	4.31	14.4	2.7	5.2	25.0	2.0	4.0
25-Nov-14	5.47	6.14	5.80	14.5	5.2	7.0	25.0	2.0	4.0
27-Nov-14	6.68	6.92	4.77	17.6	3.2	5.2	26.5	3.0	5.0
29-Nov-14	5.03	7.08	3.76	14.2	4.2	7.8	16.0	2.0	7.5

Table 6-2 Summary of Water Quality Monitoring Results for Contract 5

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
1-Nov-14	5.14	4.87	10.2	13.6	8.5	6.0
3-Nov-14	4.41	6.16	14.1	7.8	5.5	12.0
5-Nov-14	6.51	8.70	6.3	5.9	4.0	5.5
7-Nov-14	5.84	5.93	6.5	8.8	3.5	6.5
10-Nov-14	6.02	6.41	24.2	7.8	20.0	2.0
13-Nov-14	6.49	8.09	14.8	4.7	12.0	2.0
15-Nov-14	7.49	10.28	13.2	6.2	9.5	2.0
17-Nov-14	5.38	9.38	18.1	10.7	21.5	7.0
19-Nov-14	6.72	9.01	6.3	5.3	6.0	2.0
21-Nov-14	7.21	9.80	5.0	5.3	2.5	2.0
25-Nov-14	5.50	9.24	7.4	8.0	3.0	6.0
27-Nov-14	6.81	8.56	11.0	5.3	8.0	2.0
29-Nov-14	5.24	5.75	27.6	6.2	19.5	3.0

Table 6-3 Breaches of Water Quality Monitoring Criteria in Reporting Period

Location	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)		Total Exceedance	
	Action	Limit	Action	Limit	Action	Limit	Action	Limit
WM1	0	0	0	0	0	0	0	0
WM4	0	0	0	0	0	0	0	0
No of Exceedance	0	0	0	0	0	0	0	0

6.2.2 In view of the monitoring results of Dissolved Oxygen, turbidity and Suspended Solids at WM1 and WM4, all the measured results were all complied with performance criteria.

7 WASTE MANAGEMENT

7.1 GENERAL WASTE MANAGEMENT

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

7.2 RECORDS OF WASTE QUANTITIES

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

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

7.2.2 The quantities of waste for disposal in this Reporting Period are summarized in *Tables 7-1* and *7-2* and the Monthly Summary Waste Flow Table is shown in *Appendix L*. Whenever possible, materials were reused on-site as far as practicable.

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

Type of Waste	Contract 2		Contract 3		Contract 5		Total Quantity
	Quantity	Disposal Location	Quantity	Disposal Location	Quantity	Disposal Location	
C&D Materials (Inert) (in '000m ³)	81.8833	--	4.295	--	0	--	86.1783
Reused in this Project (Inert) (in '000 m ³)	0	--	0.645	--	0	--	0.645
Reused in other Projects (Inert) (in '000 m ³)	81.1527	C5	0	--	0	--	81.1527
Disposal as Public Fill (Inert) (in '000 m ³)	0.7306	Tuen Mun 38	3.650	Tuen Mun 38	0	--	43.806

Table 7-2 Summary of Quantities of C&D Wastes for the Project

Type of Waste	Contract 2		Contract 3		Contract 5		Total Quantity
	Quantity	Disposal Location	Quantity	Disposal Location	Quantity	Disposal Location	
Recycled Metal (in '000m ³)	0	-	0	-	0	--	0
Recycled Paper / Cardboard Packing (in '000m ³)	0.1190	Licensed collector	0	-	0	--	0.1190
Recycled Plastic (in '000m ³)	0	-	0.010	Licensed collector	0	--	0.010
Chemical Wastes (in '000m ³)	1.8900	Licensed collector	0.001	--	0	--	1.891
General Refuses (in '000m ³)	0.0367	NENT	0.110	NENT	0.755	NENT	0.9017

8 SITE INSPECTION

8.1 REQUIREMENTS

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

8.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

The Contract 2

8.2.1 In the Reporting Period, joint site inspection for Contract 2 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **7, 14, 21 and 28 November 2014**. No non-compliance was noted.

8.2.2 The findings / deficiencies of **Contract 2** that observed during the weekly site inspection are listed in **Table 8-1**.

Table 8-1 Site Observations for Contract 2

Date	Findings / Deficiencies	Follow-Up Status
31 October 2014 (last Reporting Period)	<ul style="list-style-type: none"> The contaminated soil was packed in plastic bag and placed a storage room, the Contractor should treat and dispose the contaminated soil in accordance with Waste Disposal (Chemical Waste) (General) Regular under Waste Disposal Ordinance. (North Portal) 	<ul style="list-style-type: none"> The contaminated soil was received by the license collector.
7 November 2014	<ul style="list-style-type: none"> Chemical container should be placed with drip tray underneath. (North Portal) The exposed slope at the edge of the site should be properly covered or paved with concrete to prevent surface runoff to the existing stream. (South Portal) 	<ul style="list-style-type: none"> Every free standing chemical container has been placed into a drip tray and covered by tarpaulin. The described zone has been concreted.
14 November 2014	<ul style="list-style-type: none"> Generator without drip tray was observed. The contractor was reminded to provide drip tray and maintain all the drip tray on site are in good condition. (North Portal) Oil leakage from the generator was observed. The contractor was requested to clean and dispose the waste properly. (North Portal) 	<ul style="list-style-type: none"> Described equipment has been demobilized from site. Stagnant water has been removed to avoid mosquito breeding.
21 November 2014	<ul style="list-style-type: none"> Several air compressor/generator without drip tray was observed. The contractor was reminded to provide drip tray underneath and maintain the drip tray properly to prevent stagnant water accumulation inside the drip tray. (North Portal) During the dry season, the contractor should put more effort for dust emission control to minimize dust generation. 	<ul style="list-style-type: none"> Drip tray was provided for the air compressor and the skirt was installed to prevent stagnant water cumulated inside the drip tray. Not required for reminder.

Date	Findings / Deficiencies	Follow-Up Status
28 November 2014	<ul style="list-style-type: none"> Dust emission was observed when loading material to track. The contractor was reminded to increase water spraying to minimize dust generation. (North Portal) 	<ul style="list-style-type: none"> Further water sprinklers have been implemented on site.

The Contract 3

8.2.3 In the Reporting Period, joint site inspection for Contract 3 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **3, 10, 19 and 24 November 2014**. No non-compliance was noted.

8.2.4 The findings / deficiencies of **Contract 3** that observed during the weekly site inspection are listed in **Table 8-2**.

Table 8-2 Site Observations for Contract 3

Date	Findings / Deficiencies	Follow-Up Status
3 November 2014	<ul style="list-style-type: none"> Stockpile without cover was observed. The contractor was reminded to cover the stockpile with tarpaulin sheets to reduce dust generation. (Tolo EW) Soil and mud tail was observed at the site exit. The contractor was reminded to clean. (SA12) It was reminded that when storage more than 20 bags of cement, the contractor should provide tarpaulin sheet covering the cement bags to minimize dust generation. 	<ul style="list-style-type: none"> The stockpile has been removed. Regular washing has been implemented at the site exit. The Contractor was noted.
10 November 2014	<ul style="list-style-type: none"> Free standing chemical containers were observed, the Contractor should provide drip tray for them or remove straight after use. 	<ul style="list-style-type: none"> The chemical containers have been removed.
19 November 2014	<ul style="list-style-type: none"> Free standing chemical containers were observed, the Contractor should provide drip tray for all chemical containers (SA11C) Plugs should be provided for the drip trays underneath the generator and air compressor. (SA11C) Suspected oil stain was observed on bare ground, the Contractor should treat and dispose the contaminated soil in accordance with the waste disposal ordinance, if necessary (SA11C) It was reminded that general housekeeping should be improved. (SA11C) It was reminded that tree protection zone should be well maintained.(SA11C) 	<ul style="list-style-type: none"> The chemical containers have been removed. The described drip tray has been plugged. The Contractor confirmed that it was not oil stain on bare ground. The Contractor was noted. The Contractor was noted.

Date	Findings / Deficiencies	Follow-Up Status
24 November 2014	<ul style="list-style-type: none"> No specific findings were observed. 	NA

The Contract 5

- 8.2.5 In the Reporting Period, joint site inspection for Contract 5 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **6, 13, 20 and 27 November 2014**. No non-compliance was noted.
- 8.2.6 The findings / deficiencies of **Contract 5** that observed during the weekly site inspection are listed in **Table 8-3**.

Table 8-3 Site Observations for Contract 5

Date	Findings / Deficiencies	Follow-Up Status
6 November 2014	<ul style="list-style-type: none"> The Contractor should ensure the cement storage is covered with tarpaulin on top and 3-sides. 	<ul style="list-style-type: none"> Improvement for the tarpaulin sheeting at cement storage is provided.
13 November 2014	<ul style="list-style-type: none"> Free standing chemical container was observed at the work area near Box 2, the Contractor was reminded to provide drip tray for chemical container. 	<ul style="list-style-type: none"> The free standing chemical container was removed at the work area near Box 2,
20 November 2014	<ul style="list-style-type: none"> It was reminded that Dust control should be properly followed in accordance with EMS requirement. 	<ul style="list-style-type: none"> The Contractor was noted.
27 November 2014	<ul style="list-style-type: none"> It was reminded that during the dry season, the Contractor should pay more attention on the dust control, such as provide tarpaulin to stockpile. 	<ul style="list-style-type: none"> The Contractor was noted.

- 8.2.7 Overall, general housekeeping such as daily site tidiness and cleanliness should be maintained for all Contracts in accordance with the PS requirements. Moreover, cleaning the wheel washing bay in regular basis is reminded. For chemical waste management, the Contractor was reminded to set up proper storage area for all chemical waste before dispose of site.

Other Contracts

- 8.2.8 Since the construction works at the Contract 4 and Contract 6 have not yet been commenced, no site inspection is performed for these Contracts.

9 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

9.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

9.1.1 In the Reporting Period, no summons and prosecution under the EM&A Programme was lodged for Contracts 2, 3 and 5. However, three (3) documented environmental complaints was received and lodged for Contracts 2 and 3. Follow up actions have been undertaken by both Contractor to resolve the complaints and deficiencies in due time. The details of complaint are listed below:-

- 3 November 2013 - A complaint was lodged from the RE on 3 November 2013 regarding dust emission at North Portal Site near TA01. The area TA01 includes the site entrance/exit, wheel washing facilities, weighbridge and the associated area.
- 11 November 2014 - A received was lodged from the RE on 10 November 2014 regarding noise generated from Mid Vent at night, suspecting from machinery. The complainant claimed that he has no objection to evening construction works but hopes the noise could be reduced and that not cause disturbance to the villagers nearby. Moreover, he expressed his concern on the dust emission from site area especially during the change of season.
- 20 November 2014 - A complaint was lodged from EPD on 20 November 2014 regarding milky water observed throughout the Ng Tung River near Bridge NF426 and suspected illegal discharge by nearby factories. It was suspected that the source of the pollution was near the site of the Liantang/ Heung Yuen Wai BCP Project

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

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

Table 9-1 Statistical Summary of Environmental Complaints

Reporting Period	Contract No	Environmental Complaint Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 – 31 Sep 2014	Contract 2	0	3	(2) Water Quality
06 Nov 2013 – 31 Sep 2014	Contract 3	0	2	(1) Construction Dust (1) Water Quality
16 Aug 2013 – 31 Oct 2014	Contract 5	0	1	(1) Construction Dust
1 – 30 Nov 2014	Contract 2	2	3	(2) Water Quality (2) Construction Dust (1) Noise
	Contract 3	1	2	(1) Construction Dust (2) Water quality
	Contract 5	0	1	(1) Construction Dust

Table 9-2 Statistical Summary of Environmental Summons

Reporting Period	Contract No	Environmental Summons Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 – 31 Sep 2014	Contract 2	0	0	NA
06 Nov 2013 – 31 Sep 2014	Contract 3	0	0	NA
16 Aug 2013 – 31 Oct 2014	Contract 5	0	0	NA
1 – 30 Nov 2014	Contract 2	0	0	NA
	Contract 3	0	0	NA
	Contract 5	0	0	NA

Table 9-3 Statistical Summary of Environmental Prosecution

Reporting Period	Contract No	Environmental Prosecution Statistics		
		Frequency	Cumulative	Complaint Nature

19 May 2014 – 31 Sep 2014	Contract 2	0	0	NA
06 Nov 2013 – 31 Sep 2014	Contract 3	0	0	NA
16 Aug 2013 – 31 Oct 2014	Contract 5	0	0	NA
1 – 30 Nov 2014	Contract 2	0	0	NA
	Contract 3	0	0	NA
	Contract 5	0	0	NA

The Other Contracts

- 9.1.4 Since the construction works at the Contract 4 and Contract 6 have not yet commenced, no environmental complaint, summons and prosecution under the EM&A Programme are registered in the Reporting Period.

10 IMPLEMENTATION STATUS OF MITIGATION MEASURES

10.1 GENERAL REQUIREMENTS

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

10.1.2 All contracts under the Project shall be implementing the required environmental mitigation measures according to the approved EM&A Manual as subject to the site condition. Environmental mitigation measures generally implemented by Contracts 2, 3 and 5 in this Reporting Period are summarized in *Table 10-1*.

Table 10-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	<ul style="list-style-type: none"> Wastewater to be treated by the filtration systems i.e. sedimentation tank or AquaSed before to discharge.
Air Quality	<ul style="list-style-type: none"> Maintain damp / wet surface on access road Keep slow speed in the sites All vehicles must use wheel washing facility before off site Sprayed water during breaking works A cleaning truck was regularly performed on the public road to prevent fugitive dust emission
Noise	<ul style="list-style-type: none"> Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. Keep good maintenance of plants Place noisy plants away from residence or school Provide noise barriers or hoarding to enclose the noisy plants or works Shut down the plants when not in used.
Waste and Chemical Management	<ul style="list-style-type: none"> On-site sorting prior to disposal Follow requirements and procedures of the “Trip-ticket System” Predict required quantity of concrete accurately Collect the unused fresh concrete at designated locations in the sites for subsequent disposal
General	<ul style="list-style-type: none"> The site was generally kept tidy and clean.

10.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

10.2.1 Construction activities as undertaken in the coming month for the Project lists below:

Contract 2

- Project wide – Ground Investigation (GI) Field Works
- Mid Vent Portal –Blast door installation + Noise Measurements
- Mid Vent Portal –Excavation for Site Installation (Tunneling and Portal)
- Mid Vent Portal – Top heading canopies & Bench Excavation
-
- North Portal –Permanent Slope Formation for Tunnel Boring Machine (TBM) Site Installation
- North Portal –Top heading canopies
- North Portal –Excavation works Stage 2
- North Portal –Sub-station Construction
- North Portal –Blast door installation + Noise Measurements
- North Portal –Site Installation and Logistics for TBM Works
- North Portal –Permanent Slope Formation (Remaining)
- North Portal –Instrument Installation for Strengthening Works for WSD Tunnel
- South Portal –Tree removal and transplanting works
- South Portal –Sub-station Construction + CLP Installation
- South Portal –Permanent and temporary cut slope

- South Portal –Completion of temporary bridge
- South Portal –Site formation

Contract 3

- Pile cap construction for Bridge E
- Automatic Deformation Monitoring System (ADMS) installation
- Cable detection and trial trenches
- Catch fence erection
- Filling Works at Tong Hang East
- Lagging wall and capping beam for bored pile wall
- Storm drains laying
- Water pipes laying
- Sewer pipes laying
- Construction of noise barriers
- Pier construction
- Pile cap works
- Piling works
- Pre-drilling
- Construction of valve control and telemetry house
- Retaining structure construction
- Traffic diversion for Fanling Highway
- Road works at Fanling Highway
- Socket H-pile installation
- Utilities duct laying

Contract 5

- Construction of retaining wall No.1
- Construction of retaining wall No.2b
- Construction of soil cement slope along BCP Area
- Road works (kerb laying) for proposed LMH Road
- Formation Works at BCP Area
- Piling works at footbridge
- Construction of substructure of Bridge J
- Construction of Depressed Road at BCP3
- Pipe jacking for CLP cable across Kong Yuen (pit no.2)
- Construction of Eastern pedestrian subway and pump room at Lin Ma Hang
- Construction of Western pedestrian subway at Lin Ma Hang
- Filing Works for ArcHD permanent office
- Transplantation, Pruning/felling of existing tree
- Drainage works at proposed and existing LMH Road
- Water works at proposed and existing LMH Road
- Drainage works at BCP area
- Installation of Underground utilities (CLP cables) at proposed LMH road
- Diversion of Underground utilities (CLP cables) at existing LMH road.

10.3 KEY ISSUES FOR THE COMING MONTH

10.3.1 Key issues to be considered in the coming month for Contracts 2, 3 and 5 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

10.3.2 For other Contracts, no environmental issue is considered as these contracts have yet to commence.

11 CONCLUSIONS AND RECOMMENDATIONS

11.1 CONCLUSIONS

- 11.1.1 This is 16th monthly EM&A report presenting the monitoring results and inspection findings for the Reporting Period from 1 to 30 November 2014.
- 11.1.2 No 1-hour TSP monitoring results that triggered the Action or Limit Levels were recorded. However, three (3) Action Level exceedances for 24-hour TSP of air quality were recorded at AM2 on 14 November 2014 and AM7b on 14 and 26 November 2014. NOE was issued to relevant parties upon confirmation of the monitoring result and investigation for the cause of exceedance is being carried out by the ET.
- 11.1.3 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in the Reporting Period. No NOEs or the associated corrective actions were therefore issued.
- 11.1.4 For water quality monitoring, no exceedance was triggered in this Reporting Period.
- 11.1.5 No notification of summons or successful prosecution under the EM&A Programme of the Project was received in the reporting period for Contract 2, 3 and 5.
- 11.1.6 Three (3) environmental complaints under the EM&A Programme of the Project were received in the reporting period for Contracts 2 and 3. Follow up actions have been undertaken by both Contractor to resolve the complaints and deficiencies in due time. Investigation reports for the complaint have been submitted to all relevant parties for review.
- 11.1.7 During the Reporting Period, four (4), four (4) and four (4) events of joint site inspection by the RE, IEC, ET and Main-contractor were carried out for Contracts 2, 3 and 5 respectively in accordance with the EM&A Manual stipulation. No non-compliance observed during the site inspection. The environmental performance of the Project of Contracts 2, 3 and 5 was therefore considered as satisfactory.

11.2 RECOMMENDATIONS

- 11.2.1 During dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to villages. The Contractor should fully implement the construction dust mitigation measures properly.
- 11.2.2 Muddy water or other water pollutants from site surface runoff into Kong Yiu Channel and Ma Wat Channel should be also be alerted. Water quality mitigation measures to prevent surface runoff into nearby water bodies should be fully implemented.
- 11.2.3 Construction noise should be a key environmental impact during the works. The noise mitigation measures such as use of quiet plants or temporary noise barrier installation at the construction noise predominate area should be implemented as accordance with the EM&A requirement.
- 11.2.4 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.

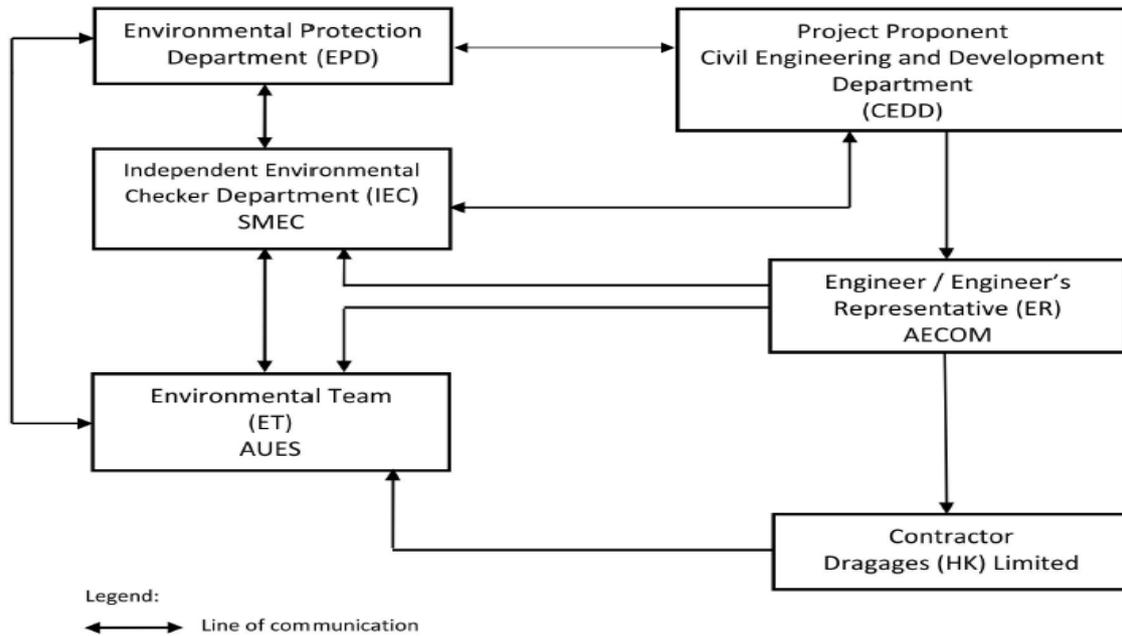
Appendix A

Layout plan of the Project

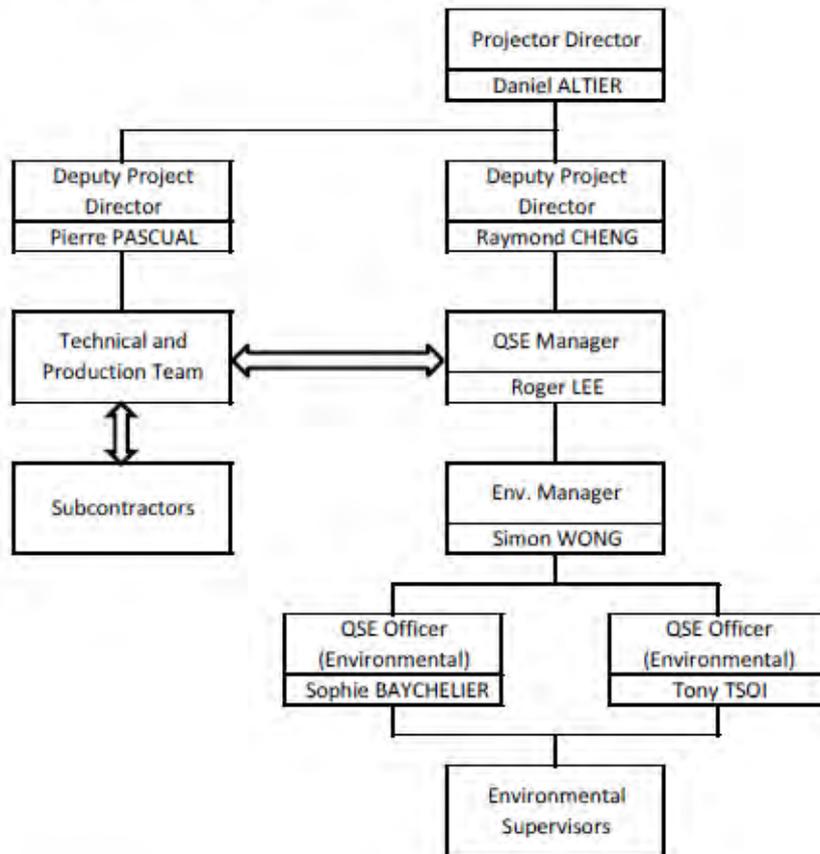
Appendix B

Organization Chart

Project Organization Structure



Structure Within Dragages (HK) Limited



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

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

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Gregory Lo	2171 3300	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
DHK	Project Director	Daniel Altier	2171 3004	2171 3299
DHK	Deputy Project Manager	Raymond Cheng / Pierre Pascual	2171 3004	2171 3299
DHK	QSE Manager	Roger Lee	6293 8726	2171 3299
DHK	Environmental Manager (Environmental Officer)	Simon Wong	9281 4346	2171 3299
DHK	QSE Officer (Environmental)	Sophie Baycheuer	6321 5001	2171 3299
DHK	QSE Officer (Environmental)	Tony Tsoi	6028 5623	2171 3299
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

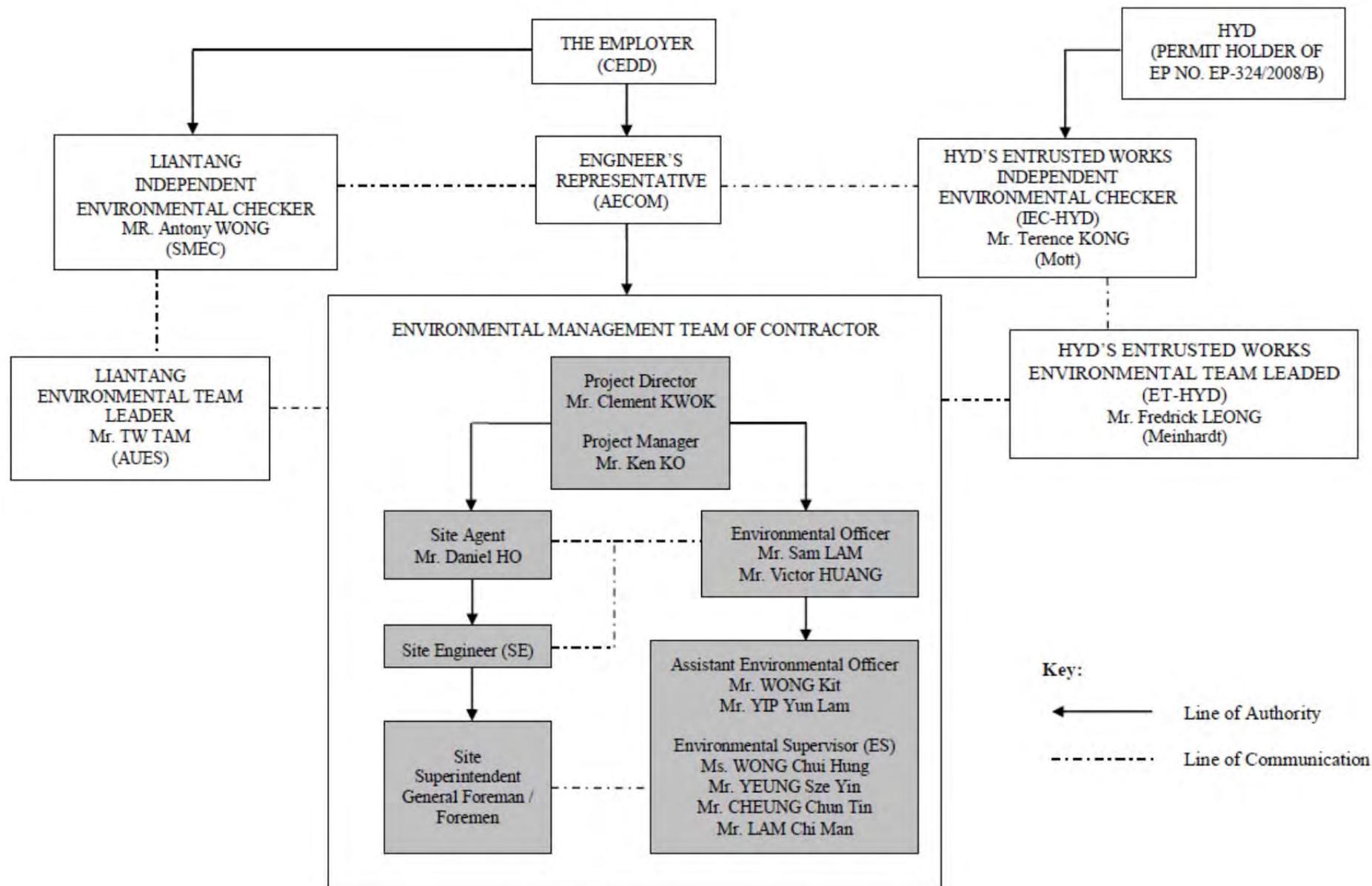
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

DHK(Main Contractor) –Dragages Hong Kong Ltd.

SMEC (IEC) – SMEC Asia Limited

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



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

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

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Alan Lee	2171 3300	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
Chun Wo	Project Director	Clement Kwok	3758 8735	2638 7077
Chun Wo	Project Manager	Ken Ko	2638 6136	2638 7077
Chun Wo	Site Agent	Daniel Ho	2638 6144	2638 7077
Chun Wo	Environmental Officer	Sam Lam/ Victor Huang	2638 6115	2638 7077
Chun Wo	Assistant Environmental Officer	Wong Kit	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:

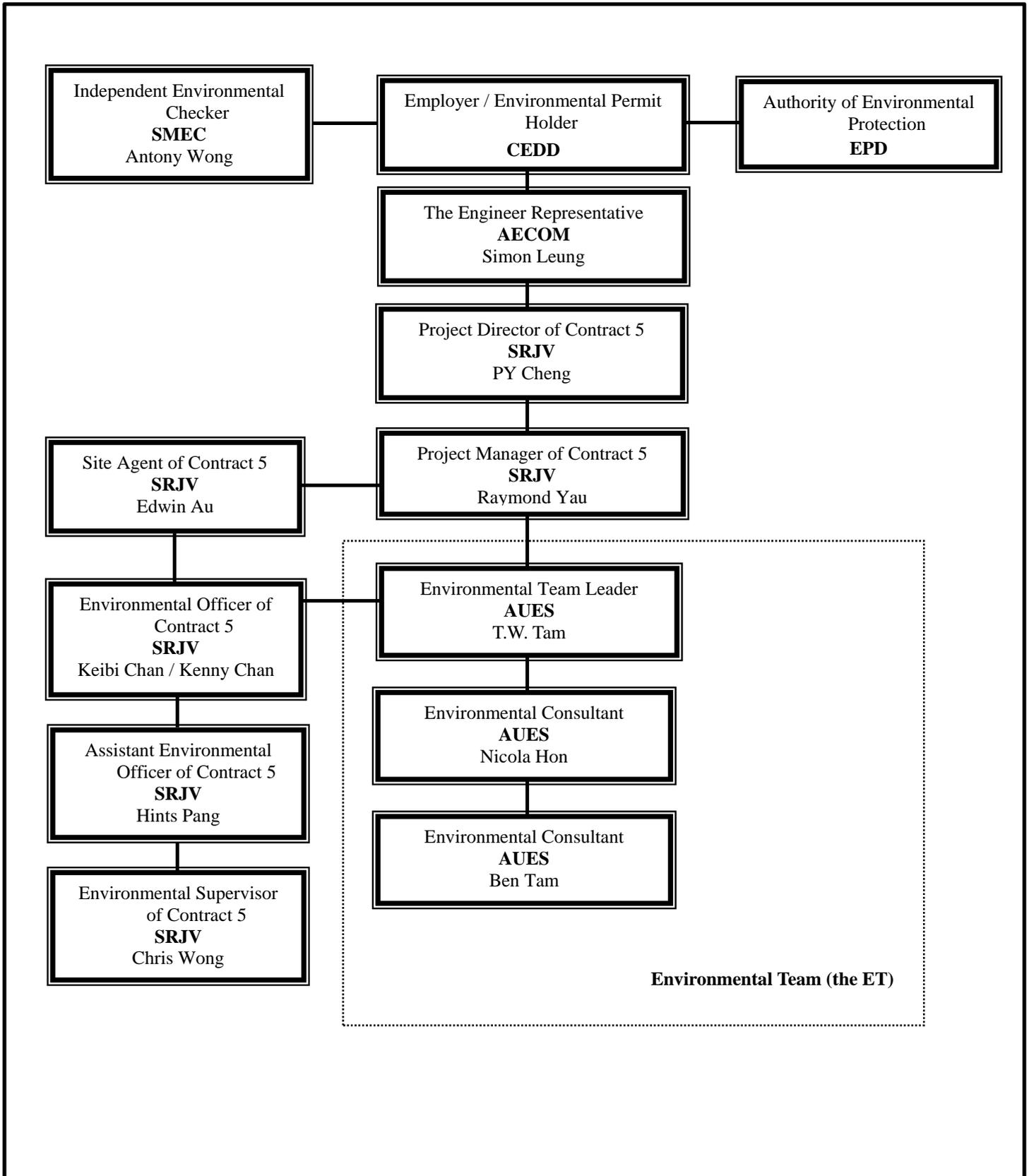
CEDD (Employer) – Civil Engineering and Development Department

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/2013/03

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

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
AECOM	Engineer's Representative	Simon Leung	2674 2273	2674 7732
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
SRJV	Project Director	PY Cheng	9023 4821	2403 1162
SRJV	Contract Manager	Raymond Yu	9041 1620	2403 1162
SRJV	Project Manager	Aaron Mak	9464 7095	2403 1162
SRJV	Site Agent	Edwin Au	9208 7329	2403 1162
SRJV	Environmental Officer	Chan Ng jhon-keibi / Kenny Chan	6090 0183	2403 1162
SRJV	Environmental Supervisor	Chris Wong	6387 4683	2403 1162
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

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

SMEC (IEC) – SMEC Asia Limited

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

Appendix C

3-month rolling construction program

Contract 2

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2014		2015		
					Nov	Dec	Jan	Feb	
Total					1020	20-Dec-13	30-Mar-17		
HKLTH Works Programme update 20-Nov-2014 [wpb]					1020	20-Dec-13	30-Mar-17		
2 General					564	20-Jan-14	14-Dec-15		
Programme					141	31-May-14	18-Oct-14		
Works Programme					141	31-May-14	18-Oct-14		
A24050	Works Programme	60	31-May-14	29-Jul-14					
A24065	Engineer's Comment for Works Programme	30	30-Jul-14	28-Aug-14					
A24066	Further Information for Works Programme (if necessary)	21	29-Aug-14	18-Sep-14					
A24067	Engineer's Approval of Works Programme	30	19-Sep-14	18-Oct-14					
Ground Investigation					231	13-Mar-14	19-Dec-14		
GI Works					231	13-Mar-14	19-Dec-14		
DSN018605	GI: Field Works [including pre-drilling works]	200	13-Mar-14	13-Nov-14					
DSN018606	GI: Tests & Reports (Contract Boreholes)	30	14-Nov-14	18-Dec-14					
DSN018607	KD2: Sect. II (Completion of Geotechnical investigation fieldworks + laboratory tests) (Contract Boreholes)	0		19-Dec-14					
Project Wide Procurement					66	14-Jun-14	30-Aug-14		
A01001a34	Explosives, Accessories, and Services	66	14-Jun-14	30-Aug-14					
Geotechnical Interpretative Report 1st Revision					28	10-May-14	12-Jun-14		
DDA Submission					28	10-May-14	12-Jun-14		
GIR2022060	ER/IP's Approval	28	10-May-14	12-Jun-14					
Geotechnical Interpretative Report 2nd Revision					223	22-Sep-14	25-Feb-15		
DDA Submission					223	22-Sep-14	25-Feb-15		
GIR21021890	Preparation of DDA for formal submission to ER/ICE/IP	65	22-Sep-14	08-Dec-14					
GIR21021940	IPs/ER's Review	28	09-Dec-14	13-Jan-15					
GIR21021960	Preparation of DDA with ICE Certification for resubmission to ER/ICE/IP	13	14-Jan-15	28-Jan-15					
GIR21022050	ER/IP's Approval	28	29-Jan-15	25-Feb-15					
Project Wide E&M					564	20-Jan-14	14-Dec-15		
E&M Design Works for Civil Design Interface					409	20-Jan-14	18-Feb-15		
PD.AE.1050	Establish E&M Procurement Matrix & Pre-Qualification Process	195	06-Mar-14	31-Oct-14					
PD.AE.1000	Develop E&M Design and Submission Schedule	42	20-Jan-14	12-Mar-14					
PD.AE.1020	Review Civil Programme & Develop E&M Programme	88	16-Apr-14	04-Aug-14					
PD.AE.1030	Establish Civil/E&M Interface Matrix	50	09-Apr-14	12-Jun-14					
PD.AE.1060	Overall Technical Review of E&M System	260	04-Feb-14	16-Dec-14					
PD.AE.1070	Review Civil Design Submission on Tunnel Space Proofing & Vent Buildings	260	04-Feb-14	16-Dec-14					
PD.AE.1080	Civil Provisions Check for Utility Cable Trough in Tunnels	112	09-Apr-14	25-Aug-14					
PD.AE.1090	Civil Provisions Check for E&M Installations in Tunnels	118	05-May-14	23-Sep-14					
PD.AE.1110	Spatial Study and Installation Coordination for Tunnel Cable Brackets	92	13-Jun-14	30-Sep-14					
PD.AE.1120	E&M Structural Openings Check in Tunnel and Cross Passage	90	05-Jun-14	19-Sep-14					
PD.AE.1130	E&M Spatial Study and Structural Provisions Check for Ventilation Buildings	110	29-Aug-14	10-Jan-15					
PD.AE.1140	E&M Spatial Study and Structural Provisions Check for Administration Building	125	20-Sep-14	18-Feb-15					
PD.AE.1150	Design Verification and Development for Tunnel Ventilation System	170	07-May-14	26-Nov-14					
PD.AE.1160	Design Verification and Development for Tunnel Lighting System	128	07-May-14	08-Oct-14					
E&M Design & Engineering Works					418	17-Apr-14	29-Aug-15		
Engineering Design Submission					340	17-Apr-14	12-Jun-15		
PD.FS.DS	Fire Service System Submission and Approval by the Engineer	230	21-Jul-14	30-Apr-15					
PD.CM.DS	CMC System Submission and Approval by the Engineer	230	21-Jul-14	30-Apr-15					
PD.EC.DS	Tunnel Ventilation System Submission and Approval by the Engineer	340	17-Apr-14	12-Jun-15					
PD.EC.DS.a	Environmental Control System Submission and Approval by the Engineer	230	21-Jul-14	30-Apr-15					
PD.EL.DS	Electrical System Submission and Approval by the Engineer	230	21-Jul-14	30-Apr-15					
PD.EV.DS	ELV System Submission and Approval by the Engineer	230	21-Jul-14	30-Apr-15					
PD.PD.DS	Plumbing & Drainage System Submission and Approval by the Engineer	230	21-Jul-14	30-Apr-15					

					MAIN CONTRACTOR  香港寶嘉 Dragages HongKong <small>A member of the Bouygues Construction group</small>		CLIENT  土木工程拓展署 Civil Engineering and Development Department		THE ENGINEER  CONTRACTOR'S DESIGNER 		PROJECT Contract No. CV/2012/08 Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 2		DOCUMENT NO. LTH/DHK/PGR/PW/PLP/00017/A		
A Monthly Report No.11 20/11/2014 RAN RBS/SJO PPL/DAL									DOC. STATUS FOR INFO. CREATION DATE 20/11/2014 REVISION A		PAPER SIZE A3 SCALE N/A PAGE 1 of 12				
REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED										

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2014		2015		
					Nov	Dec	Jan	Feb	
Shop Drawing & Builder's Drawing Submission					205	17-Dec-14	29-Aug-15		
PD.DW.1000	Shop Drawings & Builder's Drawings Preparation	176	17-Dec-14	27-Jul-15					
PD.DW.1010	Shop Drawings & Builder's Drawings Submission & Approval	177	22-Jan-15	29-Aug-15					
Equipment Selection & Submission					409	01-Aug-14	14-Dec-15		
PD.PQ.1080	Electrical Services System Submission and Approval by the Engineer	338	27-Oct-14	14-Dec-15					
PD.PQ.1150	Tunnel Ventilation System Submission and Approval by the Engineer	228	07-Nov-14	15-Aug-15					
PD.PQ.1480	ELV System Submission and Approval by the Engineer	294	01-Aug-14	29-Jul-15					
PD.PQ.1910	P&D System Submission and Approval by the Engineer	169	01-Nov-14	30-May-15					
PD.PQ.2010	FS System Submission and Approval by the Engineer	278	01-Nov-14	09-Oct-15					
3 South Portal Area					599	20-Dec-13	27-May-15		
3.0 South Portal Site Possession Contract Dates					218	20-Apr-14	20-Apr-14		
A2450	LS12 (near South Portal)	0	20-Apr-14						
A2470	LS2 (near South Vent. Demolition & Noise Barrier)	0	20-Apr-14						
3.1 South Portal Subcontract & Procurement					247	31-Jul-14	16-Apr-15		
SPS&P0030	Subcontract : Earthworks	60	31-Jul-14	11-Oct-14					
SPS&P0040	Subcontract : Soil Nailing Works	60	31-Jul-14	11-Oct-14					
SPS&P0050	Subcontract : Tunnel Spoil Disposal	60	26-Aug-14	06-Nov-14					
SPS&P0060	Subcontract : Ventilation Building Foundation Works	60	29-Jan-15	16-Apr-15					
3.2 South Portal Design Submission					376	17-Feb-14	27-May-15		
South Portal: Temp. Bridge at LS1					28	19-Mar-14	15-Apr-14		
DDA Submission					28	19-Mar-14	15-Apr-14		
DSN01500	ER/IP's Approval	28	19-Mar-14	15-Apr-14					
South Portal: South Portal Site Formation					225	17-Feb-14	18-Nov-14		
DDA Submission					225	17-Feb-14	18-Nov-14		
DSN019800	Preparation for formal submission to ER/ICE/IP	147	17-Feb-14	15-Aug-14					
DSN019850	IPs/ ER's Review	28	16-Aug-14	18-Sep-14					
DSN019870	Preparation for resubmission to ER/ICE/IP with ICE Certification	26	19-Sep-14	21-Oct-14					
DSN019970	ER/IP's Approval	28	22-Oct-14	18-Nov-14					
South Portal Permanent Works for Retaining Wall (Lower Section Slope)					78	26-May-14	24-Oct-14		
DDA Submission					78	26-May-14	24-Oct-14		
DSN29120	Preparation for formal submission to ER/ICE/IP	50	26-May-14	24-Jul-14					
DSN29130	IPs/ ER's Review	28	25-Jul-14	26-Aug-14					
DSN29140	Preparation for resubmission to ER/ICE/IP with ICE Certification	26	27-Aug-14	26-Sep-14					
DSN29150	ER/IP's Approval	28	27-Sep-14	24-Oct-14					
South Portal: Temp Support For Retaining Wall					270	01-Mar-14	11-Nov-14		
DDA Submission					270	01-Mar-14	11-Nov-14		
DSN03140	Preparation for formal submission to ER/ICE/IP	130	01-Mar-14	08-Aug-14					
DSN03190	IPs/ ER's Review	28	09-Aug-14	11-Sep-14					
DSN03210	Preparation for resubmission to ER/ICE/IP with ICE Certification	26	12-Sep-14	14-Oct-14					
DSN03310	ER/IP's Approval	28	15-Oct-14	11-Nov-14					
South Portal: Permanent Retaining Wall					186	30-Jun-14	26-Nov-14		
DDA Submission					186	30-Jun-14	26-Nov-14		
DSN019440	Preparation for formal submission to ER/ICE/IP	47	30-Jun-14	23-Aug-14					
DSN019490	IPs/ ER's Review	28	25-Aug-14	26-Sep-14					
DSN019510	Preparation for resubmission to ER/ICE/IP with ICE Certification	26	27-Sep-14	29-Oct-14					
DSN019610	ER/IP's Approval	28	30-Oct-14	26-Nov-14					
South Portal: Ventilation Buildings - Foundation Design					276	10-Apr-14	28-Jan-15		
AIP Submission					161	10-Apr-14	25-Oct-14		
DSN07620	Preparation for formal submission to ER/ICE/IP	88	10-Apr-14	29-Jul-14					
DSN07690	IPs/ ER's Review	28	30-Jul-14	30-Aug-14					
DSN07710	Preparation for resubmission to ER/ICE/IP with ICE Certification	23	01-Sep-14	27-Sep-14					

					MAIN CONTRACTOR 		CLIENT 		THE ENGINEER  CONTRACTOR'S DESIGNER 		PROJECT Contract No. CV/2012/08 Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 2		DOCUMENT NO. LTH/DHK/PGR/PW/PLP/00017/A		
A Monthly Report No.11 20/11/2014 RAN RBS/SJO PPL/DAL											DOC. STATUS FOR INFO.	CREATION DATE 20/11/2014	REVISION A		
REV DESCRIPTION DATE PREPARED CHECKED APPROVED											PAPER SIZE A3	SCALE N/A	PAGE 2 of 12		

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2014		2015	
					Nov	Dec	Jan	Feb
DSN07810	ER/IP's Approval	28	28-Sep-14	25-Oct-14				
DDA Submission		189	29-Jul-14	28-Jan-15				
DSN07820	Preparation for formal submission to ER/ICE/IP	74	29-Jul-14	25-Oct-14				
DSN07870	IPs/ ER's Review	28	27-Oct-14	27-Nov-14				
DSN07890	Preparation for resubmission to ER/ICE/IP with ICE Certification	27	28-Nov-14	31-Dec-14				
DSN07990	ER/IP's Approval	28	01-Jan-15	28-Jan-15				
South Portal: Temp Works For Mined Tunnelling		197	29-Mar-14	26-Nov-14				
DDA Submission		197	29-Mar-14	26-Nov-14				
DSN010510	Preparation for formal submission to ER/ICE/IP	118	29-Mar-14	22-Aug-14				
DSN010560	IPs/ ER's Review	28	23-Aug-14	25-Sep-14				
DSN010580	Preparation for resubmission to ER/ICE/IP with ICE Certification	27	26-Sep-14	29-Oct-14				
DSN010680	ER/IP's Approval	28	30-Oct-14	26-Nov-14				
South Portal: Temp Works For D&B Tunnelling		188	23-Jul-14	24-Jan-15				
DDA Submission		188	23-Jul-14	24-Jan-15				
DSN010150	Preparation for formal submission to ER/ICE/IP	75	23-Jul-14	21-Oct-14				
DSN010200	IPs/ ER's Review	28	22-Oct-14	22-Nov-14				
DSN010220	Preparation for resubmission to ER/ICE/IP with ICE Certification	28	24-Nov-14	27-Dec-14				
DSN010320	ER/IP's Approval	28	28-Dec-14	24-Jan-15				
South Tunnel Permanent Lining		301	14-Apr-14	22-Apr-15				
AIP Submission		235	14-Apr-14	13-Nov-14				
STPL1023340	Preparation for formal submission to ER/ICE/IP	108	14-Apr-14	25-Aug-14				
STPL1023390	IPs/ ER's Review	24	26-Aug-14	23-Sep-14				
STPL1023410	Preparation for resubmission to ER/ICE/IP with ICE Certification	18	24-Sep-14	16-Oct-14				
STPL1023510	ER/IP's Approval	28	17-Oct-14	13-Nov-14				
DDA Submission		48	18-Feb-15	22-Apr-15				
STPL1023520	Preparation for formal submission to ER/ICE/IP	48	18-Feb-15	22-Apr-15				
South Tunnel Internal Structures		306	16-May-14	27-May-15				
AIP Submission		183	16-May-14	13-Nov-14				
STIS1L1023340	Preparation for formal submission to ER/ICE/IP	77	16-May-14	15-Aug-14				
STIS1L1023390	IPs/ ER's Review	24	16-Aug-14	13-Sep-14				
STIS1L1023410	Preparation for resubmission to ER/ICE/IP with ICE Certification	26	15-Sep-14	16-Oct-14				
STIS1L1023510	ER/IP's Approval	28	17-Oct-14	13-Nov-14				
DDA Submission		45	30-Mar-15	27-May-15				
STIS1L1023520	Preparation for formal submission to ER/ICE/IP	45	30-Mar-15	27-May-15				
Cross Passages - Temp Works D&B Tunnel - Soft Ground		50	27-Jan-15	28-Mar-15				
DDA Submission		50	27-Jan-15	28-Mar-15				
DSN26930	Preparation for formal submission to ER/ICE/IP	50	27-Jan-15	28-Mar-15				
CBAR South Tunnels		138	15-Jul-14	30-Dec-14				
A26040a	Preparation and Submission of CBAR - 1st Submission	54	15-Jul-14	16-Sep-14				
A26040b	ER/IP's Review	28	17-Sep-14	21-Oct-14				
A26040c	Preparation and Submission of CBAR - 2nd Submission	30	22-Oct-14	25-Nov-14				
A26040d	ER/IP's Review & Approval of CBAR	28	26-Nov-14	30-Dec-14				
CIA- South Portal & South D&B Tunnels inc Mid Vent Junction & CP		31	14-Nov-14	04-Jan-15				
SC01140	Draft Report	31	14-Nov-14	14-Dec-14				
SC01175	*Final CIA Report (14d)	21	15-Dec-14	04-Jan-15				
As-Built Drawings [Contractor's Design/ Contractor's Alternative Design]		60	15-Oct-14	13-Dec-14				
SC1630	As-Built Drawings Submission - Temporary Vehicular Bridge	60	15-Oct-14	13-Dec-14				
3.3 South Portal Method Statement Submission		333	28-Apr-14	28-Apr-15				
South Portal: Temporary Bridge		28	28-Apr-14	31-May-14				
FL560	Engineer's Approval	28	28-Apr-14	31-May-14				
South Portal: Temporary Slopeworks		164	16-Aug-14	29-Nov-14				

					MAIN CONTRACTOR  香港寶嘉 Dragages HongKong <small>A member of the Bouygues Construction group</small>		CLIENT  土木工程拓展署 Civil Engineering and Development Department		THE ENGINEER  CONTRACTOR'S DESIGNER 		PROJECT Contract No. CV/2012/08 Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 2		DOCUMENT NO. LTH/DHK/PGR/PW/PLP/00017/A		
A Monthly Report No.11					20/11/2014		RAN		RBS/SJO		PPL/DAL		DOC. STATUS FOR INFO.	CREATION DATE 20/11/2014	REVISION A
REV DESCRIPTION					DATE		PREPARED		CHECKED		APPROVED		PAPER SIZE A3	SCALE N/A	PAGE 3 of 12

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2014		2015	
					Nov	Dec	Jan	Feb
FL2022081	Prepare Method Statement	20	16-Aug-14	08-Sep-14				
FL2022082	Engineer's Comment	28	10-Sep-14	14-Oct-14				
FL2022083	Re-submission Method Statement	12	15-Oct-14	28-Oct-14	■			
FL2022084	Engineer's Approval	28	29-Oct-14	29-Nov-14	■			
South Portal: Earthworks & Bulk Excavation Works		164	16-Aug-14	29-Nov-14				
FL2022089	Prepare Method Statement	20	16-Aug-14	08-Sep-14				
FL2022090	Engineer's Comment	28	10-Sep-14	14-Oct-14				
FL2022091	Re-submission Method Statement	12	15-Oct-14	28-Oct-14	■			
FL2022092	Engineer's Approval	28	29-Oct-14	29-Nov-14	■			
South Portal: Site Drainage Management		150	16-Aug-14	29-Nov-14				
FL2022085	Prepare Method Statement	20	16-Aug-14	08-Sep-14				
FL2022086	Engineer's Comment	28	10-Sep-14	14-Oct-14				
FL2022087	Re-submission Method Statement	12	15-Oct-14	28-Oct-14	■			
FL2022088	Engineer's Approval	28	29-Oct-14	29-Nov-14	■			
South Portal: Tunnel Mechanical Excavation		48	24-Jan-15	24-Mar-15				
FL2022093	Prepare Method Statement	48	24-Jan-15	24-Mar-15			■	■
South Tunnels: Blasting Method Statement		160	13-Oct-14	28-Apr-15				
FL2022101	Preparation and Submission of Blasting Method Statement	135	13-Oct-14	25-Mar-15	■			
FL2022104	Engineer's/IP's Review & Approval	113	06-Dec-14	28-Apr-15			■	■
South Portal: Bored Piling Works		48	24-Jan-15	24-Mar-15				
A25485	Prepare Method Statement	48	24-Jan-15	24-Mar-15				■
South Portal: Pilecap, Footings & Tie beams		100	27-Oct-14	26-Feb-15				
A2330	Prepare Method Statement	48	27-Oct-14	20-Dec-14	■			
A2340	Engineer's Comment	28	22-Dec-14	26-Jan-15			■	
A2350	Re-submission Method Statement	24	27-Jan-15	26-Feb-15				■
South Portal: Permanent Retaining Walls		76	08-Dec-14	12-Mar-15				
A25481	Prepare Method Statement	48	08-Dec-14	04-Feb-15			■	■
A25482	Engineer's Comment	28	05-Feb-15	12-Mar-15				■
3.4 South Portal General Submission		84	09-Jul-14	17-Oct-14				
South Portal: Temp.CLP Substation		84	09-Jul-14	17-Oct-14				
TSS2050	Prepare & Submit CLP Sub-station Proposal + CLP's Approval	84	09-Jul-14	17-Oct-14				
3.5 South Portal Works		599	20-Dec-13	23-May-15				
South Portal: CLP Substation		106	18-Oct-14	28-Feb-15				
SCLP2060	Sub-station Construction + CLP Installation	106	18-Oct-14	28-Feb-15				
South Portal: Demolition		96	12-Jun-14	13-Oct-14				
SV2840	Precautionary Measures	24	12-Jun-14	12-Jul-14				
SV2860	Demolish Existing Building (LS2 - GLL T14097)	36	14-Jul-14	27-Aug-14				
SV2870	Demolish Existing Building (LS1 - GLL T5729)	36	28-Aug-14	13-Oct-14				
South Portal: Tree Transplant & Felling		413	21-Jan-14	04-Nov-14				
SV2135	Tree Transplant	72	21-Jan-14	22-Apr-14				
SV2145	Tree Felling for Bridge	30	21-Jan-14	27-Feb-14				
SV2155	Tree Felling Remaining	24	08-Oct-14	04-Nov-14	■			
South Portal: 132kV Diversion (South Portal)		1	20-Dec-13	20-Dec-13				
SC01300	*CLP 132kV Diversion (by Others) - CLP Pylon at Portal	1	20-Dec-13	20-Dec-13				
South Portal: Temp.Bridge (South Portal)		178	26-May-14	15-Oct-14				
SV2620	Foundation works (East)	24	03-Jun-14	03-Jul-14				
SV2625	Ramp + Columns (East)	18	04-Jul-14	26-Jul-14				
SV2630	Foundation works (West)	30	26-May-14	04-Jul-14				
SV2640	Ramp + Columns (West)	38	05-Jul-14	22-Aug-14				
SV2650	Main Deck Installation	40	08-Aug-14	26-Sep-14				

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REV DESCRIPTION DATE PREPARED CHECKED APPROVED									TITLE Monthly Report No.11 3-Months Rolling Programme (Works Programme Rev. B) PAPER SIZE A3 SCALE N/A PAGE 4 of 12						

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2014		2015	
					Nov	Dec	Jan	Feb
SV2660	Surfacing works + Finishing works	24	15-Sep-14	14-Oct-14				
SV2670	KD9 - Stage 1 (Completion of Temp.Bridge Construction)	0		15-Oct-14				
South Portal: Slopeworks		174	15-Oct-14	23-May-15				
SV2680	Temp.Access Road (~+26.0 >> +57.0)	18	15-Oct-14	04-Nov-14	█			
SV2690	Permanent Cut Slope (+68.0 to approx +45.0mPD)	55	05-Nov-14	10-Jan-15	█	█		
SV2700	Temporary Slope Cut below +45.0mPD (soft) w/Soil Nails	48	12-Jan-15	14-Mar-15			█	█
SV2702dwp	Temporary Soil Nails between +44.6mPd to +26.7mPD	71	16-Feb-15	23-May-15				█
4 Middle Portal Area		481	28-Feb-14	11-Aug-15				
4.1 Middle Portal Subcontract & Procurement		187	05-Feb-15	11-Aug-15				
MPS&P0040	Subcontract : Tunnel Lining Works	60	05-Feb-15	23-Apr-15				█
MPS&P0050	Subcontract : Tunnel Lining Formworks (Design, Fabrication, Delivery, & On-Site Assembly)	150	05-Feb-15	11-Aug-15				█
MPS&P0060	Subcontract : Ventilation Building Foundation Works	60	12-Feb-15	30-Apr-15				█
4.2 Middle Portal Design Submission		354	18-Mar-14	24-Apr-15				
Middle Portal: Site & Portal Formation		28	18-Mar-14	14-Apr-14				
DDA Submission		28	18-Mar-14	14-Apr-14				
DSN29051	IPs/ ER's Review /Approval	28	18-Mar-14	14-Apr-14				
Mid Vent Building - ELS		50	15-Apr-14	18-Jun-14				
DDA Submission		50	15-Apr-14	18-Jun-14				
DSN29056	Preparation for resubmission to ER/ICE/IP with ICE Certification	27	15-Apr-14	21-May-14				
DSN29057	ER/IP's Approval	28	22-May-14	18-Jun-14				
Mid Vent Building - Foundation		226	26-May-14	11-Feb-15				
AIP Submission		71	26-May-14	18-Aug-14				
DSN29059	IPs/ ER's Review	24	26-May-14	23-Jun-14				
DSN29060	Preparation for resubmission to ER/ICE/IP with ICE Certification	23	24-Jun-14	21-Jul-14				
DSN29061	ER/IP's Approval	28	22-Jul-14	18-Aug-14				
DDA Submission		195	03-Jul-14	11-Feb-15				
DSN29062	Preparation for formal submission to ER/ICE/IP	108	03-Jul-14	08-Nov-14	█			
DSN29063	IPs/ ER's Review	28	10-Nov-14	11-Dec-14		█		
DSN29064	Preparation for resubmission to ER/ICE/IP with ICE Certification	26	12-Dec-14	14-Jan-15			█	
DSN29065	ER/IP's Approval	28	15-Jan-15	11-Feb-15				█
Middle Portal: Temp Support for Mined and D&B Tunnelling		64	16-May-14	31-Jul-14				
DDA Submission		64	16-May-14	31-Jul-14				
DSN29068	Preparation for resubmission to ER/ICE/IP with ICE Certification	40	16-May-14	03-Jul-14				
DSN29069	ER/IP's Approval	28	04-Jul-14	31-Jul-14				
Mid Vent Adit Permanent Lining		241	21-Jun-14	04-Feb-15				
AIP Submission		28	21-Jun-14	18-Jul-14				
DSN29073	ER/IP's Approval	28	21-Jun-14	18-Jul-14				
DDA Submission		189	22-Aug-14	04-Feb-15				
DSN29074	Preparation for formal submission to ER/ICE/IP	57	22-Aug-14	30-Oct-14	█			
DSN29075	IPs/ ER's Review	28	31-Oct-14	02-Dec-14		█		
DSN29076	Preparation for resubmission to ER/ICE/IP with ICE Certification	28	03-Dec-14	07-Jan-15			█	
DSN29077	ER/IP's Approval	28	08-Jan-15	04-Feb-15				█
Mid Vent Adit Internal Structure		75	05-Jul-14	03-Oct-14				
AIP Submission		75	05-Jul-14	03-Oct-14				
DSN29079	IPs/ ER's Review	28	05-Jul-14	06-Aug-14				
DSN29080	Preparation for resubmission to ER/ICE/IP with ICE Certification	26	07-Aug-14	05-Sep-14				
DSN29081	ER/IP's Approval	28	06-Sep-14	03-Oct-14				
Mid Vent Adit/Junction - Temp Works For D&B Tunnelling		165	25-Sep-14	28-Feb-15				
DDA Submission		165	25-Sep-14	28-Feb-15				
DSN29086	Preparation for formal submission to ER/ICE/IP	49	25-Sep-14	22-Nov-14	█			
DSN29087	IPs/ ER's Review	28	24-Nov-14	27-Dec-14			█	

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Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2014		2015	
					Nov	Dec	Jan	Feb
DSN29088	Preparation for resubmission to ER/ICE/IP with ICE Certification	29	29-Dec-14	31-Jan-15				
DSN29089	ER/IP's Approval	28	01-Feb-15	28-Feb-15				
Mid Vent Adit/Junction Permanent Lining & Backfill		293	05-Jun-14	24-Apr-15				
AIP Submission		127	05-Jun-14	04-Nov-14				
DSN29090	Preparation for formal submission to ER/ICE/IP	49	05-Jun-14	01-Aug-14				
DSN29091	IPs/ ER's Review	28	02-Aug-14	03-Sep-14				
DSN29092	Preparation for resubmission to ER/ICE/IP with ICE Certification	26	04-Sep-14	07-Oct-14				
DSN29093	ER/IP's Approval	28	08-Oct-14	04-Nov-14				
DDA Submission		49	23-Feb-15	24-Apr-15				
DSN29094	Preparation for formal submission to ER/ICE/IP	49	23-Feb-15	24-Apr-15				
Mid Vent Junction Internal Structure		230	19-Jun-14	18-Nov-14				
AIP Submission		230	19-Jun-14	18-Nov-14				
DSN29098	Preparation for formal submission to ER/ICE/IP	49	19-Jun-14	15-Aug-14				
DSN29099	IPs/ ER's Review	28	16-Aug-14	18-Sep-14				
DSN29100	Preparation for resubmission to ER/ICE/IP with ICE Certification	26	19-Sep-14	21-Oct-14				
DSN29101	ER/IP's Approval	28	22-Oct-14	18-Nov-14				
CBAR Mid Vent Adit		78	27-May-14	27-Aug-14				
A26020c	Preparation and Submission of CBAR - 2nd Submission	54	27-May-14	30-Jul-14				
A26020d	ER/IP's Review & Approval of CBAR	28	31-Jul-14	27-Aug-14				
CBAR Cavern		141	27-Jun-14	12-Dec-14				
A26020a1	Preparation and Submission of CBAR- 1st Submission	50	27-Jun-14	25-Aug-14				
A26020b1	ER/IP's Review	28	26-Aug-14	27-Sep-14				
A26020c1	Preparation and Submission of CBAR - 2nd Submission	39	29-Sep-14	14-Nov-14				
A26020d1	ER/IP's Review & Approval of CBAR	28	15-Nov-14	12-Dec-14				
4.3 Middle Portal Method Statement Submission		417	28-Feb-14	28-Jul-15				
Middle Ventilation Adit Blasting Method Statement		100	12-Jun-14	10-Oct-14				
FL2022105	Preparation and Submission of Blasting Method Statement	75	12-Jun-14	08-Sep-14				
FL2022106	Engineer's IP's Review & Approval	45	16-Aug-14	10-Oct-14				
Cavern Blasting Method Statement		125	14-Oct-14	03-Mar-15				
FL2022107	Preparation and Submission of Blasting Method Statement	90	14-Oct-14	29-Jan-15				
FL2022108	Engineer's IP's Review & Approval	90	12-Nov-14	03-Mar-15				
Middle Portal: Pipe Pile Works		128	12-Mar-14	16-Aug-14				
A2290	Prepare Method Statement for Pipe Pile Works	48	12-Mar-14	13-May-14				
A2300	Engineer's Comment	28	14-May-14	16-Jun-14				
A2310	Re-submission Method Statement for Pipe Pile Works	24	17-Jun-14	15-Jul-14				
A2320	Engineer's Approval	28	16-Jul-14	16-Aug-14				
Middle Portal: Site and Portal Formation		38	28-Feb-14	14-Apr-14				
A25470	Re-submission Method Statement for Portal Formation	14	28-Feb-14	15-Mar-14				
A25480	Engineer's Approval	24	17-Mar-14	14-Apr-14				
Middle Portal: Water Management Plan		38	28-Feb-14	14-Apr-14				
A25499	Re-submission Method Statement for Portal Formation	14	28-Feb-14	15-Mar-14				
A25500	Engineer's Approval	24	17-Mar-14	14-Apr-14				
Middle Portal: Soil Nailing Works		28	05-Mar-14	07-Apr-14				
A25508	Engineer's Comment & Approval	28	05-Mar-14	07-Apr-14				
Middle Portal: Tunnel Mechanical Excavation		62	31-Mar-14	18-Jun-14				
A25502	Engineer's Comment	24	31-Mar-14	02-May-14				
A25503	Re-submission Method Statement for Portal Formation	14	03-May-14	20-May-14				
A25504	Engineer's Approval	24	21-May-14	18-Jun-14				
Middle Ventilation Adit Lining Works		48	05-Feb-15	09-Apr-15				
A25513	Prepare Method Statement	48	05-Feb-15	09-Apr-15				

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Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish	2014		2015		
					Nov	Dec	Jan	Feb	
Cavern Permanent Lining					48	01-Jun-15	28-Jul-15		
A25521	Prepare Method Statement	48	01-Jun-15	28-Jul-15					
Mid Vent Bldg. Foundation					48	12-Feb-15	16-Apr-15		
A25509	Prepare Method Statement	48	12-Feb-15	16-Apr-15					
Mid Vent Building Construction					48	14-Jan-15	13-Mar-15		
FL5900	Prepare Method Statement for Mid Vent Building Construction	48	14-Jan-15	13-Mar-15					
4.4 Middle Portal General Submission					84	18-Jun-14	25-Sep-14		
Middle Portal: Temp.CLP Substation					84	18-Jun-14	25-Sep-14		
TSS332020	Prepare & Submit CLP Sub-station Proposal + CLP's Approval	84	18-Jun-14	25-Sep-14					
4.5 Middle Portal Works					327	04-Mar-14	05-Mar-15		
Middle Portal: CLP Substation					111	26-Sep-14	07-Feb-15		
TSS3P2060	Sub-station Construction + CLP Installation	110	26-Sep-14	06-Feb-15					
TSS3P2090	Energization	1	07-Feb-15	07-Feb-15					
Middle Portal: Site Establishment					60	04-Mar-14	21-May-14		
MV2800	Permanent Slope Stabilization	60	04-Mar-14	21-May-14					
Middle Portal: Portal Formation					241	15-Apr-14	14-Nov-14		
MV2480	Excavation up to Portal Formation (+15.5.0mPD)	54	15-Apr-14	28-Jun-14					
MV2481	Excavation for Site Installation and up to Temporary Working Platform for Pipe Pile Works (+25.0mPD)	54	15-Apr-14	28-Jun-14					
MV2482	Temporary Ramp Formation	2	30-Jun-14	02-Jul-14					
MV2806	Pipe Piling Works	60	30-Jun-14	15-Sep-14					
MV2817	Excavation for Site Installation (Tunneling Works) upto (+22.0mPD)	50	16-Sep-14	14-Nov-14					
Adit Construction - Mid Portal					238	03-Jul-14	05-Mar-15		
MV2490dwp1	Top Heading Canopies & Bench Excavation Ch0>Ch24	85	03-Jul-14	13-Oct-14					
MV2490dwp2a	Top Heading Canopies & Bench Excavation Ch24>Ch70	91	14-Oct-14	29-Jan-15					
MV2490dwp3	Blast door installation + Noise Measurement and 24Hr permit approval	30	30-Jan-15	05-Mar-15					
5 North Portal Area					997	20-Jan-14	30-Mar-17		
5.1 North Portal Subcontract & Procurement					997	20-Jan-14	30-Mar-17		
NPS&P0050	Subcontract : Tunnel Spoil Disposal	60	21-May-14	31-Jul-14					
NPS&P0060	Subcontract : Ventilation Building Bored Piling Works	60	24-May-14	04-Aug-14					
North Portal: TBM Procurement & Delivery					997	20-Jan-14	30-Mar-17		
DSN027980	TBM Procurement, Fabrication & Delivery	405	20-Jan-14	28-Feb-15					
DSN027981	Conveyor Belt System Procurement & Delivery	90	03-Nov-14	31-Jan-15					
N21400	Precast Segment Mould Fabrication and Delivery to Precasting Yard	116	02-May-14	29-Sep-14					
N21410a	Precast Segment Fabrication (1.6m Ring) - Temporary Segments	190	30-Sep-14	23-May-15					
N21410b	Precast Segment Fabrication (2.2m Ring)	715	01-Nov-14	30-Mar-17					
5.2 North Portal Design Submission					407	21-Jan-14	28-Mar-15		
TBM Design					327	21-Jan-14	17-Aug-14		
A24660a	*TBM Detailed Design (Group C)	175	21-Jan-14	14-Jul-14					
A24660b	Engineer Review & Comments (Group C)	14	15-Jul-14	28-Jul-14					
A24660c	Re-submission for (Group C)	10	29-Jul-14	07-Aug-14					
A24660d	Engineer Review & Comments for Re-submission (Group C)	10	08-Aug-14	17-Aug-14					
Engineer and Contractor Site Offices					12	18-Feb-14	03-Mar-14		
N21345	Engineer's Approval for Site Office	12	18-Feb-14	03-Mar-14					
North Portal Site Formation					35	08-May-14	18-Jun-14		
DDA Submission					35	08-May-14	18-Jun-14		
FL2022115	Preparation for resubmission to ER/ICE/IP with ICE Certification	12	08-May-14	21-May-14					
FL2022116	ER/IP's Approval	28	22-May-14	18-Jun-14					
North Portal: Temp Support for Retaining Wall					35	12-Jun-14	23-Jul-14		
DDA Submission					35	12-Jun-14	23-Jul-14		

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					Nov	Dec	Jan	Feb
FL2022123	Preparation for resubmission to ER/ICE/IP with ICE Certification	12	12-Jun-14	25-Jun-14				
FL2022124	ER/IP's Approval	28	26-Jun-14	23-Jul-14				
North Portal: Permanent Retaining Wall		65	21-May-14	06-Aug-14				
DDA Submission		65	21-May-14	06-Aug-14				
FL2022126	IPs/ ER's Review	28	21-May-14	23-Jun-14				
FL2022127	Preparation for resubmission to ER/ICE/IP with ICE Certification	13	24-Jun-14	09-Jul-14				
FL2022128	ER/IP's Approval	28	10-Jul-14	06-Aug-14				
North Portal: Ventilation Building - Foundation Design		103	12-Apr-14	18-Aug-14				
AIP Submission		28	12-Apr-14	09-May-14				
FL2022132	ER/IP's Approval	28	12-Apr-14	09-May-14				
DDA Submission		72	24-May-14	18-Aug-14				
FL2022134	IPs/ ER's Review	28	24-May-14	26-Jun-14				
FL2022135	Preparation for resubmission to ER/ICE/IP with ICE Certification	20	27-Jun-14	21-Jul-14				
FL2022136	ER/IP's Approval	28	22-Jul-14	18-Aug-14				
North Tunnel Curved Section - N/B & S/B- Temp Support in Soft Ground		67	26-Apr-14	17-Jul-14				
DDA Submission		67	26-Apr-14	17-Jul-14				
FL2022138	IPs/ ER's Review	28	26-Apr-14	30-May-14				
FL2022139	Preparation for resubmission to ER/ICE/IP with ICE Certification	16	31-May-14	19-Jun-14				
FL2022140	ER/IP's Approval	28	20-Jun-14	17-Jul-14				
North Tunnel Curved Section - N/B & S/B- Temp Support in Rock		139	19-May-14	01-Nov-14				
DDA Submission		139	19-May-14	01-Nov-14				
FL2022141	Preparation for formal submission to ER/ICE/IP	75	19-May-14	15-Aug-14				
FL2022142	IPs/ ER's Review	28	16-Aug-14	18-Sep-14				
FL2022143	Preparation for resubmission to ER/ICE/IP with ICE Certification	12	19-Sep-14	04-Oct-14				
FL2022144	ER/IP's Approval	28	05-Oct-14	01-Nov-14				
North Tunnel Curved Section Southbound Temp Segmental Lining		89	13-Jun-14	26-Sep-14				
DDA Submission		89	13-Jun-14	26-Sep-14				
FL2022097	Preparation for formal submission to ER/ICE/IP	21	13-Jun-14	08-Jul-14				
FL2022098	IPs/ ER's Review	28	09-Jul-14	09-Aug-14				
FL2022099	Preparation for resubmission to ER/ICE/IP with ICE Certification	12	11-Aug-14	23-Aug-14				
FL2022100	ER/IP's Approval	28	25-Aug-14	26-Sep-14				
North Tunnel Curved Section Southbound Temp Support For Enlargement		73	25-Nov-14	09-Mar-15				
DDA Submission		73	25-Nov-14	09-Mar-15				
FL2022145	Preparation for formal submission to ER/ICE/IP	56	25-Nov-14	31-Jan-15				
FL2022146	IPs/ ER's Review	28	02-Feb-15	09-Mar-15				
Bored Tunnel Space Proofing & Sight Assessment		36	24-Feb-14	07-Apr-14				
AIP Submission		36	24-Feb-14	07-Apr-14				
FL2022151	Preparation for resubmission to ER/ICE/IP with ICE Certification	13	24-Feb-14	10-Mar-14				
FL2022152	ER/IP's Approval	28	11-Mar-14	07-Apr-14				
Bored Tunnel Segmental Lining		180	28-Apr-14	01-Dec-14				
AIP Submission		45	28-Apr-14	21-Jun-14				
FL2022155	Preparation for resubmission to ER/ICE/IP with ICE Certification	22	28-Apr-14	24-May-14				
FL2022156	ER/IP's Approval	28	25-May-14	21-Jun-14				
DDA Submission		73	04-Sep-14	01-Dec-14				
FL2022158	IPs/ ER's Review	28	04-Sep-14	09-Oct-14				
FL2022159	Preparation for resubmission to ER/ICE/IP with ICE Certification	21	10-Oct-14	03-Nov-14				
FL2022160	ER/IP's Approval	28	04-Nov-14	01-Dec-14				
Bored Tunnel OHVD Slab		293	10-Mar-14	05-Mar-15				
AIP Submission		276	10-Mar-14	05-Nov-14				
FL2022161	Preparation for formal submission to ER/ICE/IP	123	10-Mar-14	08-Aug-14				
FL2022162	IPs/ ER's Review	28	09-Aug-14	11-Sep-14				

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					Nov	Dec	Jan	Feb
FL2022163	Preparation for resubmission to ER/ICE/IP with ICE Certification	21	12-Sep-14	08-Oct-14				
FL2022164	ER/IP's Approval	28	09-Oct-14	05-Nov-14	█			
DDA Submission		42	13-Jan-15	05-Mar-15				
FL2022165	Preparation for formal submission to ER/ICE/IP	42	13-Jan-15	05-Mar-15			█	
Bored Tunnel Internal Structure (except OHVD Slab)		364	15-Mar-14	05-Mar-15				
AIP Submission		271	15-Mar-14	01-Nov-14				
FL2022169	Preparation for formal submission to ER/ICE/IP	115	15-Mar-14	05-Aug-14				
FL2022170	IPs/ ER's Review	28	06-Aug-14	06-Sep-14				
FL2022171	Preparation for resubmission to ER/ICE/IP with ICE Certification	21	08-Sep-14	04-Oct-14				
FL2022172	ER/IP's Approval	28	05-Oct-14	01-Nov-14	█			
DDA Submission		42	13-Jan-15	05-Mar-15				
FL2022173	Preparation for formal submission to ER/ICE/IP	42	13-Jan-15	05-Mar-15			█	
Bored Tunnel/ D&B Tunnel Transition - Headwall Structure (N/B & S/B)		198	02-Jul-14	21-Nov-14				
AIP Submission		198	02-Jul-14	21-Nov-14				
FL2022177	Preparation for formal submission to ER/ICE/IP	45	02-Jul-14	22-Aug-14				
FL2022178	IPs/ ER's Review	28	23-Aug-14	25-Sep-14				
FL2022179	Preparation for resubmission to ER/ICE/IP with ICE Certification	23	26-Sep-14	24-Oct-14	█			
FL2022180	ER/IP's Approval	28	25-Oct-14	21-Nov-14	█			
Northbound TBM Dismantling Cavern Temporary Works		42	03-Jan-15	24-Feb-15				
DDA Submission		42	03-Jan-15	24-Feb-15				
FL2022185	Preparation for formal submission to ER/ICE/IP	42	03-Jan-15	24-Feb-15			█	
Bored Tunnel Cross Passages Temp Works (Soft Ground)		50	27-Jan-15	28-Mar-15				
DDA Submission		50	27-Jan-15	28-Mar-15				
FL2022197	Preparation for formal submission to ER/ICE/IP	50	27-Jan-15	28-Mar-15			█	
Bored Tunnel Cross Passages Temp Works (Rock)		50	27-Jan-15	28-Mar-15				
DDA Submission		50	27-Jan-15	28-Mar-15				
FL2022201	Preparation for formal submission to ER/ICE/IP	50	27-Jan-15	28-Mar-15			█	
Bored Tunnel Cross Passages Permanent Lining (Soft Ground)		133	27-Sep-14	03-Feb-15				
AIP Submission		133	27-Sep-14	03-Feb-15				
FL2022205	Preparation for formal submission to ER/ICE/IP	42	27-Sep-14	17-Nov-14	█			
FL2022206	IPs/ ER's Review	28	18-Nov-14	19-Dec-14		█		
FL2022207	Preparation for resubmission to ER/ICE/IP with ICE Certification	12	20-Dec-14	06-Jan-15			█	
FL2022208	ER/IP's Approval	28	07-Jan-15	03-Feb-15			█	
Bored Tunnel Cross Passages Permanent Lining (Rock)		133	27-Sep-14	03-Feb-15				
AIP Submission		133	27-Sep-14	03-Feb-15				
FL2022213	Preparation for formal submission to ER/ICE/IP	42	27-Sep-14	17-Nov-14	█			
FL2022214	IPs/ ER's Review	28	18-Nov-14	19-Dec-14		█		
FL2022215	Preparation for resubmission to ER/ICE/IP with ICE Certification	12	20-Dec-14	06-Jan-15			█	
FL2022216	ER/IP's Approval	28	07-Jan-15	03-Feb-15			█	
Bored Tunnel Cross Passages Internal Structures		53	27-Nov-14	23-Feb-15				
AIP Submission		53	27-Nov-14	23-Feb-15				
FL2022221	Preparation for formal submission to ER/ICE/IP	42	27-Nov-14	17-Jan-15		█		
FL2022222	IPs/ ER's Review	28	19-Jan-15	23-Feb-15			█	
Temp Pre-Cast Reinforced Box for TBM Segment Del in Curved Section		57	03-Dec-14	28-Feb-15				
DDA Submission		57	03-Dec-14	28-Feb-15				
FL2022229	Preparation for formal submission to ER/ICE/IP	42	03-Dec-14	23-Jan-15		█		
FL2022230	IPs/ ER's Review	28	24-Jan-15	28-Feb-15			█	
Confinement Pressure Report		117	14-Oct-14	26-Feb-15				
DDA Submission		117	14-Oct-14	26-Feb-15				
FL2022233	Preparation for formal submission to ER/ICE/IP	42	14-Oct-14	01-Dec-14	█			
FL2022234	IPs/ ER's Review	28	02-Dec-14	06-Jan-15		█		

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					Nov	Dec	Jan	Feb
FL2022235	Preparation for resubmission to ER/ICE/IP with ICE Certification	20	07-Jan-15	29-Jan-15				
FL2022236	ER/IP's Approval	28	30-Jan-15	26-Feb-15				
CBAR North Tunnel (D&B Section)		73	22-Aug-14	18-Nov-14				
A26030a2	ER/IP's Review	28	22-Aug-14	24-Sep-14				
A26030a3	Preparation and Submission of CBAR -2nd Submission	21	25-Sep-14	21-Oct-14				
A26030b	ER/IP's Review&Approval of CBAR	28	22-Oct-14	18-Nov-14				
Construction Impact Assessment - North Portal & North D&B Tunnels		70	07-Jun-14	15-Aug-14				
SC01115	*Final Report	70	07-Jun-14	15-Aug-14				
Construction Impact Assessment - North Tunnels Cross Passages		31	13-Feb-15	15-Mar-15				
FL21090	Draft Report	31	13-Feb-15	15-Mar-15				
Construction Impact Assessment - Bored Tunnel		87	21-Oct-14	27-Dec-14				
FL21140	Draft Report	31	21-Oct-14	20-Nov-14				
FL21175	*Final CIA Report	37	21-Nov-14	27-Dec-14				
Waterworks Impact Assessment - Existing WSD Nam Chung Water Tunnel		90	22-Jul-14	04-Dec-14				
FL2022243	Preparation for formal submission to ER/ICE/IP	42	22-Jul-14	08-Sep-14				
FL2022244	IPs/ ER's Review	28	10-Sep-14	14-Oct-14				
FL2022245	Preparation for resubmission to ER/ICE/IP with ICE Certification	20	15-Oct-14	06-Nov-14				
FL2022246	ER/IP's Approval	28	07-Nov-14	04-Dec-14				
5.3 North Portal Method Statement Submission		382	05-Apr-14	14-Nov-15				
North Portal: Temporary Drainage System		63	05-Apr-14	25-Jun-14				
FL2022274	ER's Comment for Method Statement	30	05-Apr-14	04-May-14				
FL2022284	Prepare & Re-submit Method Statement	18	05-May-14	26-May-14				
FL2022294	ER's Approval for Method Statement	30	27-May-14	25-Jun-14				
North Tunnel (D&B Section) Blasting Method Statement		122	03-Oct-14	24-Jan-15				
FL2022109	Preparation and Submission of Blasting Method Statement	70	03-Oct-14	23-Dec-14				
FL2022110	Engineer's/IP's Review & Approval	60	13-Nov-14	24-Jan-15				
North Portal: MS for Site Installation for TBM		123	22-Aug-14	24-Oct-14				
N21550	Prepare Method Statement	24	22-Aug-14	19-Sep-14				
N21560	Engineer's Review /Approval	28	20-Sep-14	24-Oct-14				
MS for TBM On-Site Assembly		99	27-Oct-14	14-Feb-15				
FL4875	Prepare & Submit Method Statement	24	27-Oct-14	22-Nov-14				
FL4880	ER's Comment for Method Statement	30	23-Nov-14	22-Dec-14				
FL4885	Prepare & Re-submit Method Statement	18	23-Dec-14	15-Jan-15				
FL4890	ER's Approval for Method Statement	30	16-Jan-15	14-Feb-15				
MS for TBM Launching		75	02-Dec-14	14-Mar-15				
FL2022061	Prepare & Submit Method Statement	40	02-Dec-14	20-Jan-15				
FL2022062	ER's Comment for Method Statement	30	21-Jan-15	19-Feb-15				
FL2022063	Prepare & Re-submit Method Statement	18	23-Feb-15	14-Mar-15				
MS for TBM Excavation		67	02-Dec-14	24-Feb-15				
FL2875	Prepare & Submit Method Statement	24	02-Dec-14	31-Dec-14				
FL2880	ER's Comment for Method Statement	30	01-Jan-15	30-Jan-15				
FL2885	Prepare & Re-submit Method Statement	18	31-Jan-15	24-Feb-15				
MS for TBM Turn		24	17-Oct-15	14-Nov-15				
FL3875	Prepare & Submit Method Statement	24	17-Oct-15	14-Nov-15				
North Portal: MS for Temp.CLP Substation		52	04-Aug-14	06-Oct-14				
N21020	Prepare & Submit CLP Sub-station Proposal	24	04-Aug-14	30-Aug-14				
N21030	CLP Review & Approval	28	01-Sep-14	06-Oct-14				
North Portal: WSD Tunnel Instrumentation		56	11-Sep-14	05-Jan-15				
FL2022464	Prepare & Submit Method Statement	30	11-Sep-14	17-Oct-14				
FL2022474	ER's Comment for Method Statement	30	18-Oct-14	16-Nov-14				

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					Nov	Dec	Jan	Feb
FL2022484	Prepare & Re-submit Method Statement	18	17-Nov-14	06-Dec-14				
FL2022494	ER's Approval for Method Statement	30	07-Dec-14	05-Jan-15				
5.5 North Portal Works					881	04-Feb-14	30-Sep-15	
Engineer's Principal Site Office & Contractor's Site Office					240	05-Mar-14	29-Nov-14	
N21355	Site Office Procurement & Erection	100	05-Mar-14	08-Jul-14				
N21564	Construction of Core and Material Store	25	01-Nov-14	29-Nov-14				
CLP Substation					251	04-May-14	14-Feb-15	
N21059	Prepare & Submit CLP Sub-station Proposal + CLP's Approval	150	04-May-14	30-Sep-14				
N21060	Sub-station Construction	110	07-Oct-14	14-Feb-15				
N21090	Energization	1	14-Feb-15	14-Feb-15				
North Portal: Strengthening Works for WSD Tunnel					18	08-Dec-14	30-Dec-14	
DSN018310	Instrument Installation	18	08-Dec-14	30-Dec-14				
North Portal: Site Establishment					102	04-Feb-14	14-Jun-14	
N20530	Hoarding Erection & Site Installation	18	04-Feb-14	24-Feb-14				
N20560a1	Haul Road Widening	39	24-Apr-14	14-Jun-14				
North Portal: Site Formation					464	29-Apr-14	30-Sep-15	
N20495	Permanent Slope Formation for TBM Site Installation	150	29-Apr-14	07-Nov-14				
N20505	Permanent Slope Formation (Remaining)	200	08-Nov-14	25-Jul-15				
N20515	SB: Stage 1 Open Cut to +30mPD	22	19-Jun-14	17-Jul-14				
N20525	SB: Stage 2 Cut Slope w/Temp. Soil Nails from +30mPD to +20mPD	30	18-Jul-14	25-Aug-14				
N20545	SB: Stage 3 Cut Slope from +20mPD to +12.50mPD w/3 rows Soil Nail	24	08-Sep-14	08-Oct-14				
N20615	NB: Stage 1 Cut Slope to +38mPD	40	18-Jul-14	06-Sep-14				
N20625	NB: Pre-bored H Piles [Retaining Wall]	36	08-Sep-14	22-Oct-14				
N20635	NB: Stage 2 Excavation from +38mPD to +18mPD w/10 rows Soil Nail	74	23-Oct-14	20-Jan-15				
N20655	NB: Stage 3 Permanent Slope from +75mPD to +30mPD	192	21-Jan-15	30-Sep-15				
N20695	Site Clearance for CR6A	96	16-Jun-14	16-Oct-14				
N21562	KD-12 Stage IV Completion of site clearance in Portions CR5A, CR6A and TA-1	0		19-Dec-14				
North Portal: Site Installation for TBM					129	08-Nov-14	06-May-15	
SC01310	Site Installation and Logistics for TBM Works	60	08-Nov-14	20-Jan-15				
TD1000	Conveyor Belt System Construction	75	26-Jan-15	06-May-15				
Southbound Tunnel (Mined Excavation) inc Enlargement					175	26-Aug-14	09-Mar-15	
DB6370a	Top Heading Excavation (Canopies) (Ch6,450>Ch6,415) (35m) [P21: 4850 to 4815]	80	26-Aug-14	28-Nov-14				
DB6370b	Blast door installation + Noise Measurement and 24Hr permit approval	30	06-Nov-14	05-Dec-14				
DB6370c	Top Heading Excavation (Canopies) (Ch6,415>Ch6,355) (60m) [P21: 4815 to 4755]	72	06-Dec-14	02-Mar-15				
DB6370d	Platform excavation for bench excavation	22	12-Feb-15	09-Mar-15				
5.6 Administration Building:					299	23-May-14	04-May-15	
5.62 Administration Building: Design Submission					299	23-May-14	10-Mar-15	
Admin. Building - Foundation Design					299	23-May-14	10-Mar-15	
AIP Submission					71	23-May-14	15-Aug-14	
DSN015060	IPs/ ER's Review	24	23-May-14	20-Jun-14				
DSN015080	Preparation for resubmission to ER/ICE/IP with ICE Certification	19	21-Jun-14	14-Jul-14				
DSN015180	ER/IP's Approval	28	15-Jul-14	15-Aug-14				
DDA Submission					123	20-Dec-14	10-Mar-15	
DSN29107	Preparation for formal submission to ER/ICE/IP	35	20-Dec-14	02-Feb-15				
DSN29108	IPs/ ER's Review	28	03-Feb-15	10-Mar-15				
5.63 Administration Building: Method Statement Submission					56	09-Jan-15	18-Mar-15	
Method Statement for Admin. Building Construction					52	14-Jan-15	18-Mar-15	
A1990	Prepare Method Statement for Administration Building Construction	24	14-Jan-15	10-Feb-15				
A2000	ER's Comment	28	11-Feb-15	18-Mar-15				
MS for Administration Building: Demolition					47	09-Jan-15	07-Mar-15	
SV2905	Prepare & Submit Demolition Plan & Method Statement	24	09-Jan-15	05-Feb-15				

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					Nov	Dec	Jan	Feb
SV2910	ER's Comment for Demolition Plan & Method Statement	30	06-Feb-15	07-Mar-15				
5.64 Administration Building: General Submission			48	02-Jan-15	02-Mar-15			
Administration Building: Egress/Ingress			48	02-Jan-15	02-Mar-15			
N21275	Appoint Consultant for TTMs	12	02-Jan-15	15-Jan-15				
N21285	Prepare & Submit Temp.Traffic Management Scheme	12	16-Jan-15	29-Jan-15				
N21295	TMLG Meeting	12	30-Jan-15	12-Feb-15				
N21305	TTMS Reviewed & Comment	12	13-Feb-15	02-Mar-15				
5.65 Administration Building: Works			24	31-Mar-15	04-May-15			
Administration Building: Site Formation			24	31-Mar-15	04-May-15			
AD2000	Site Hoarding	24	31-Mar-15	04-May-15				

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							Nov	Dec	Jan	Feb	Mar
3-Month Rolling Programme 2014-11-21											
Key Dates (Contractual)											
KD-0010	Commencement of Works	0	0	31-Jul-13 A							
Dependent Milestones from Other Contracts											
MS-0100	Completion of Temporary Vehicular Bridge by C2 Contractor	0	0		31-Dec-14*	-99				◆ Completion of Temporary Vehicular Bridge by C2 Contractor	
Major Milestones and Events											
MS-2000A1	T1a: TTA to shift FLHS SB eastward to the widened pavement (shift 1st lanes)	1	0	08-Nov-14 A	09-Nov-14 A					■ T1a: TTA to shift FLHS SB eastward to the widened pavement (shift 1st lanes)	
MS-2000A2	T1b: TTA to shift FLHS SB eastward to the widened pavement (shift 2nd lanes)	1	1	28-Dec-14*	28-Dec-14	9				▮ T1b: TTA to shift FLHS SB eastward to the widened pavement (shift 2nd lanes)	
MS-2000A3	T1c: TTA to shift FLHS SB eastward to the widened pavement (shift 3rd lanes)	1	1	18-Jan-15*	18-Jan-15	9				▮ T1c: TTA to shift FLHS SB eastward to the widened pavement (shift 3rd lanes)	
MS-2000B	T2: TTA to shift FLHS NB & TWSRW eastward	1	1	15-Feb-15*	15-Feb-15	17				▮ T2: TTA to shift FLHS NB & TWSRW eastward	
Major Procurement & Delivery											
Water Supply Pipeworks											
MM-1050	DN450 DI pipe and pipe fittings	60	7	21-Jun-14 A	28-Nov-14	147				DN450 DI pipe and pipe fittings, DN450 DI pipe and pipe fittings	
MM-1060	E&M equipment for the re-provisioned WSD Valve Control House	60	60	21-Nov-14	02-Feb-15	8				E&M equipment for the re-provisioned WSD Valve Control House	
Precast Bridge Segment Lifting Frames and Precast Yard											
MM-2040	Deliver to Site and assembly works	44	26	28-Sep-14 A	20-Dec-14	10				Deliver to Site and assembly works, Deliver to Site and assembly works	
MM-2050	Certification of lifting frame	6	6	22-Dec-14	30-Dec-14	10				Certification of lifting frame	
Design and Submissions											
Statutory Approval											
PRE-1040	Submission & approval of temporary works on nullah for construction of pad footing of Bridge E - DSD	40	7	11-Sep-14 A	28-Nov-14	2				Submission & approval of temporary works on nullah for construction of pad footing of Bridge E - DSD, Submission & approval of temporary works on nullah for construction of pad footing of Bridge E - DSD	
PRE-1500	Confirmation of Noise Barrier Footing Design for NB71 (CH7150 to CH7290)	70	14	17-Apr-14 A	06-Dec-14	1385				Confirmation of Noise Barrier Footing Design for NB71 (CH7150 to CH7290), Confirmation of Noise Barrier Footing Design for NB71 (CH7150 to CH7290)	
PRE-1220	Consent for construction of noise barrier (NB1a) within WSD Tau Pass Restricted Zone - WSD	45	21	09-Apr-14 A	15-Dec-14	188				Consent for construction of noise barrier (NB1a) within WSD Tau Pass Restricted Zone - WSD, Consent for construction of noise barrier (NB1a) within WSD Tau Pass Restricted Zone - WSD	
PRE-1230B	Consent for installation of bored pile within 30m from WSD Tau Pass Restricted Zone -WSD	90	21	15-Jan-14 A	15-Dec-14	0				Consent for installation of bored pile within 30m from WSD Tau Pass Restricted Zone -WSD, Consent for installation of bored pile within 30m from WSD Tau Pass Restricted Zone -WSD	
PRE-1210	Consent for Dong Jiang watermains connection for DN1400 - WSD	0	0		02-Jan-15*	0				◆ Consent for Dong Jiang watermains connection for DN1400 - WSD	
Method Statement and Design (Major) Approved by AECOM											
PRE-2020	Submission of noise barrier design for absorptive panels, transparent panels and associated fixing details	60	30	11-Mar-14 A	27-Dec-14	154				Submission of noise barrier design for absorptive panels, transparent panels and associated fixing details	
Contractor's Alternative Design (AD) Submission & Approval											
PRE-4220	Pier Design Package B (AB6-AB11)	43	0	28-Nov-13 A	20-Nov-14 A					Pier Design Package B (AB6-AB11)	
PRE-4260	Pier Design Package F (AD8-AD13)	50	0	20-Jan-14 A	20-Nov-14 A					Pier Design Package F (AD8-AD13)	
PRE-4280	Portal Beam Design Package 2 (AB7/AD9/AC12, AB8, AD11)	38	0	23-Aug-14 A	20-Nov-14 A					Portal Beam Design Package 2 (AB7/AD9/AC12, AB8, AD11)	
PRE-4310A	Superstructure Design Package 9 for Bridge A1 (AA1-AA5)	118	35	16-May-14 A	03-Jan-15	362				Superstructure Design Package 9 for Bridge A1 (AA1-AA5), Superstructure Design Package 9 for Bridge A1 (AA1-AA5)	
PRE-4310D	Superstructure Design Package 6 for Bridge A4 (AA14-AA18)	108	35	16-May-14 A	03-Jan-15	101				Superstructure Design Package 6 for Bridge A4 (AA14-AA18), Superstructure Design Package 6 for Bridge A4 (AA14-AA18)	
PRE-4320B	Superstructure Design Package 7 for Bridge B2 (AB7-AB12)	196	35	21-May-14 A	03-Jan-15	7				Superstructure Design Package 7 for Bridge B2 (AB7-AB12), Superstructure Design Package 7 for Bridge B2 (AB7-AB12)	
PRE-4340B	Superstructure Design Package 8 for Bridge D2 (AD6-AD8)	56	35	30-Jul-14 A	03-Jan-15	229				Superstructure Design Package 8 for Bridge D2 (AD6-AD8), Superstructure Design Package 8 for Bridge D2 (AD6-AD8)	

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							Nov	Dec	Jan	Feb	Mar	
PRE-4340C	Superstructure Design Package 5 for Bridge D3 (AD9-AD14)	196	35	07-May-14 A	03-Jan-15	36						
PRE-4310C	Superstructure Design Package 3 for Bridge A3 (AA10-AA13)	158	65	04-Apr-14 A	07-Feb-15	81						
PRE-4310B	Superstructure Design Package 10 for Bridge A2 (AA6-AA9)	154	65	16-May-14 A	07-Feb-15	471						
Temporary Traffic Arrangement (TTA) Submission and Approval												
TTA for Tai Wo Service Road East												
PRE-6220	TTA submission & approval - Scheme ER2 (shifting TWSR East westward towards Fanling Highway for pipe laying works)	30	30	21-Nov-14*	27-Dec-14	1369						
PRE-6210	TTA submission & approval - Scheme ER1 (shifting TWSR East to Access Road A)	20	20	22-Dec-14*	16-Jan-15	1353						
Section IA & IB - Fanling Highway Widening (KD-1 & KD-2)												
Fanling Highway South Portion between CH6935 and CH7470												
Fanling Highway Zone 1 between CH6935 and CH7130 (within SBZ2)												
At-Grade Roadworks (195m)												
FHW-1160	Road Formation, Road Drainage, Kerb and Pavement (Eastern Side)	48	0	31-Jul-14 A	08-Nov-14 A							
FHW-1110*	Pipe Laying - DN1200 Watermains (CHC) across Fanling Highway (total 80m for 2 shafts)	275	40	09-Jun-14 A	09-Jan-15	711						
FHW-1150*	Pipe Laying - DN1200 Watermains (CHC) along Fanling Highway (80m long, 4m depth)	182	160	20-Feb-14 A	12-Jun-15	711						
Fanling Highway Zone 2 between CH7130 and CH7290												
At-Grade Roadworks (160m)												
FHW-2120*	Pipe Laying - Twin DN1400 Watermains (CHE & G) along Fanling Highway (44m long, 6m depth)	85	22	09-Jul-14 A	16-Dec-14	287						
FHW-2110B	Noise Barrier NB71 - Footing adjacent to SB lane (96m) (affected due to design change)	128	154	26-Jul-14 A	05-Jun-15	75						
FHW-2200	Noise Barrier NB67 - Mini-Piling adjacent to NB lane (CSD: 36 nos)	108	108	16-Feb-15	07-Jul-15	9						
FHW-2130*	Pipe Laying - DN1200 & DN600 Watermains (CHB & CHC) along Fanling Highway (183m long, 4m depth)	95	249	26-May-14 A	26-Sep-15	459						
Fanling Highway Zone 3 between CH7290 and CH7380												
At-Grade Roadworks (130m)												
FHW-3130	Noise Barrier NB71 - Footing adjacent to SB lane (130m) Including pile cap	109	84	23-May-14 A	09-Mar-15	132						
FHW-3210	Noise Barrier NB69 - Mini-Piling adjacent to NB lane (CSD: 34nos)	68	68	16-Feb-15	18-May-15	140						
FHW-3150*	Pipe Laying - DN600, DN1200 Watermains (CHB & CHC) along Fanling Highway (90m long, 3m depth)	150	429	07-Jun-14 A	13-May-16	387						
Fanling Highway Zone 4 between CH7380 and CH7470												
At-Grade Roadworks (90m)												
FHW-4120*	Pipe Laying - Twin DN1400 Watermains (CHE & CHG) along Fanling Highway (90m long, 3m depth)	155	123	15-Oct-14 A	28-Apr-15	186						
Miscellaneous Works for Facilitating Traffic Diversion of Fanling Highway												
FHW-M-1010	Permanent Road Formation with 1 lanes width between CH7130 and CH7380 (Eastern Side)	62	0	13-Jul-14 A	08-Nov-14 A							
FHW-M-1020	Permanent Road Formation with 2 lanes width between CH7130 and CH7380 (Eastern Side)	29	30	10-Nov-14 A	27-Dec-14	6						
FHW-M-1030	Permanent Road Formation with 3 lanes width between CH7130 and CH7380 (Eastern Side)	17	17	29-Dec-14	17-Jan-15	7						
FHW-M-1000	Demolition of Central Barrier & Make Good of Road Pavement for further Traffic Diversion	24	24	19-Jan-15	14-Feb-15	8						
Fanling Highway North Portion between CH7470 and CH7925												
Fanling Highway Zone 5 between CH7470 and CH7600 (Provision of Kiu Tau Footbridge)												
Kiu Tau Footbridge Re-provision (East)												
FHW-5000B	KT-AB2 - Piling Works (4 nos of Pile)	20	8	24-Sep-14 A	29-Nov-14	276						

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							Nov	Dec	Jan	Feb	Mar	
FHW-5000D	KT-P3 - Piling Works (6 nos of Pile)	40	33	06-Oct-14 A	31-Dec-14	111	KT-P3 - Piling Works (6 nos of Pile), KT-P3 - Piling Works (6 nos of Pile)					
FHW-5000A	KT-AB1 - Piling Works (12 nos of Pile)	60	60	29-Sep-14 A	02-Feb-15	84	KT-AB1 - Piling Works (12 nos of Pile), KT					
FHW-5000C	KT-P2 - Piling Works (6 nos of Pile)	30	75	04-Oct-14 A	26-Feb-15	268						
FHW-5000E	KT-P4 - Piling Works (8 nos of Pile)	40	40	03-Feb-15	27-Mar-15	84						
FHW-5010D	KT-P3 - Pile Cap & Pier	75	75	02-Jan-15	10-Apr-15	281						
FHW-5010B	KT-AB2 - Pile Cap & Abutment	105	105	01-Dec-14	16-Apr-15	276						
FHW-5010A	KT-AB1 - Pile Cap & Abutment	105	105	03-Feb-15	18-Jun-15	224						
Fanling Highway Zone 7 between CH7660 and CH7925												
At-Grade Roadworks (265m)												
FHW-7100	Site Formation, Preparation Works & Tree Transplant	127	75	30-Aug-13 A	26-Feb-15	282	Site Formatio					
Section II - Remainder of the Works (KD-3)												
WSD Works												
DN450 Fire Mains (CHA)												
WA-1030	Pipe Laying - CHA 260 - 360 (DN450) near Ext. TWSR West, 100m long & 2m depth	65	65	16-Feb-15	14-May-15	18						
DN600 Water Mains (CHB)												
WB-0100	Temporary Local Diversion for DN600 near Abutment AD1	80	33	25-Sep-14 A	31-Dec-14	580						
WB-1000	Pipe Laying - CHB 0 - 153 (DN600) near Fanling Highway S/B (FHW: CH7130-7290), 153m long (common trench with NB)	95	35	26-May-14 A	03-Jan-15	673						
WB-1080	Pipe Laying - CHB 700 - 756 (DN600) near Realigned TWSR East (along Roundabout), 56m long & GL	35	35	02-Jan-15*	11-Feb-15	12	Pipe Laying - CHB 700 - 756 (D					
WB-1090	Pipe Laying - CHB 756 - 849 (DN600) near Realigned TWSR East (along Slip Road A), 93m long & GL	72	72	12-Feb-15	19-May-15	12						
DN1200 Water Mains (CHC)												
WC-1030A	Excavation - CHC 100 - 155 (DN1200) across Fanling Highway by Trenchless Method, 110m long for 2 shafts	169	0	19-Sep-14 A	25-Oct-14 A							
WC-1030B	Pipe Laying - CHC 100 - 155 (DN1200) across Fanling Highway & associated Grouting Works	46	40	14-Nov-14 A	09-Jan-15	711						
WC-1140	Pipe Laying - CHC 980 - 1030 (DN1200) near Realigned TWSR East (along Roundabout), 50m long & GL	35	35	02-Jan-15*	11-Feb-15	12	Pipe Laying - CHC 980 - 1030					
WC-1150	Pipe Laying - CHC 1030 - 1123 (DN1200) near Realigned TWSR East (along Slip Road A), 93m long & GL	72	72	12-Feb-15	19-May-15	12						
WC-1050A	Pipe Laying - CHC 155 - 235 (DN1200) near Fanling Highway S/B (FHW: CH6935-7130), 50m long, 4m depth	120	120	10-Jan-15	12-Jun-15	711						
Twin DN1400 Water Mains (CHE & CHG)												
WE-1000	Pipe Laying - CHE & CHG 0 - 45 (Twins DN1400) near Fanling Highway S/B (FHW: CH7130-7290), 45m long & 6m depth	85	22	09-Jul-14 A	16-Dec-14	287	Pipe Laying - CHE & CHG 0 - 45 (Twins DN1400) near Fanling Highway S/B (FHW: CH7130-729					
WE-1020	Pipe Laying - CHE & CHG 135 - 225 (Twins DN1400) near Fanling Highway S/B (FHW: CH7380-7470), 90m long & 3m depth	155	123	15-Oct-14 A	28-Apr-15	186						
DN2300 Water Mains and Leakage Collection System (CHJ & CHKA/CHK)												
WJ-1110	DN300 Washout at CHJ 155	45	45	21-Nov-14	15-Jan-15	169	DN300 Washout at CHJ 155					
WJ-1050	Pipe Laying - CHJ 200 - 292 (DN2300) near Realigned TWSR East (along Access Road A), 92m long & GL	97	57	01-Sep-14 A	29-Jan-15	23	Pipe Laying - CHJ 200 - 292 (DN2300) near F					
WJ-1010	Pipe Laying - CHJ 0 - 100 (DN2200) near existing TWSR East, 100m long & 6m depth	120	81	13-Oct-14 A	09-Feb-15	189						
WJ-1020B	Pipe Laying - CHKA 0 - 73 (DN1400) near Realigned TWSR East, 73m long & 4m depth	65	65	30-Dec-14	04-Mar-15	11	Pipe L					

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							Nov	Dec	Jan	Feb	Mar						
WJ-1100	DN300 Washout at CHJ 212	65	65	23-Dec-14	18-Mar-15	122											
WJ-1000	Implementation of TTA - Scheme EX2 (Shifting TWSRE toward newly formation area beside Fanling Highway)	28	28	10-Feb-15	20-Mar-15	1305											
Kau Lung Hang Valve Control & Telemetry House Reprovision																	
VCTH-1010	BS and E&M Works	90	90	03-Feb-15	01-Jun-15	8											
Existing Nam Wa Po Trunk Sewage Pumping Station (PST3)																	
PS-1000	Demolition of Existing Boundary Wall of Pumping Station (PST3)	25	25	05-Jan-15*	02-Feb-15	841										Demolition of Existing Boundary Wall of P	
PS-1010	Construction of New Boundary Wall for Pumping Station (PST3)	35	35	03-Feb-15	21-Mar-15	841											
Stage 1A - Realignment of Tai Wo Service Road West (KD-7)																	
TWSRW Zone 1 between CH100 and CH155																	
At-Grade Roadworks																	
TWSRW-1130	Laying of Southern Trunk Sewer (West)	95	0	23-Apr-14 A	12-Nov-14 A											Laying of Southern Trunk Sewer (West)	
TWSRW-1100	Tree Survey, Tree Felling and Transplanting (All areas at TWSRW)	81	14	16-Oct-13 A	06-Dec-14	4										Tree Survey, Tree Felling and Transplanting (All areas at TWSRW), Tree Survey, Tree Felling and Transplanting	
TWSRW-1150	Installation of Cable Ducts for Utilities Diversion Works at Zone 1 & Zone 2 (Approx. 100m) (by utilities undertakers)	167	137	22-Oct-14 A	06-Apr-15	66											
TWSRW-1160	Road Formation, Road Drainage, Kerb, Planter & Pavement	286	286	21-Nov-14	12-Nov-15	53											
TWSRW Zone 2 between CH155 and CH280																	
At-Grade Roadworks																	
TWSRW-2120	Road Formation, Road Drainage, Kerb, Planter and Pavement	337	306	16-Oct-14 A	05-Dec-15	33											
TWSRW Zone 3 between CH280 and CH315																	
At-Grade Roadworks																	
TWSRW-3110	Installation of Cable Ducts for Utilities Diversion Works at Zone 3 (Approx. 120m) (by utilities undertakers)	209	209	31-Dec-14*	27-Jul-15	0											
TWSRW-3120	Road Formation, Road Drainage, Kerb, Planter and Pavement	248	248	31-Jan-15	05-Dec-15	33											
TWSRW Zone 4 between CH315 and CH376																	
Construction of Bridge E																	
TWSRW-4050B	Pile Cap for AE2	50	21	13-Oct-14 A	15-Dec-14	33										Pile Cap for AE2 Pile Cap for AE2	
TWSRW-4000B	CLP Overhead 11KV Cable Diversion at Area B (Phase 2)	140	21	04-Nov-13 A	15-Dec-14	0										CLP Overhead 11KV Cable Diversion at Area B (Phase 2), CLP Overhead 11KV Cable Diversion a	
TWSRW-4010A	Pre-Drilling for AE1 (refer to conditions of WSD)	15	15	16-Dec-14*	05-Jan-15	0										Pre-Drilling for AE1 (refer to conditions of WSD)	
TWSRW-4060	Construction of Temporary Support at DSD nullah (Work in dry season)	45	45	29-Nov-14	23-Jan-15	2										Construction of Temporary Support at DSD nullah (W	
TWSRW-4030A	Bored Pile Works for AE1	65	65	20-Dec-14	16-Mar-15	0											
TWSRW-4070	In-situ Casting for Bridge Segment (North Bay & Middle Bay)	110	110	24-Jan-15	15-Jun-15	2											
TWSRW Zone 5 between CH376 and CH520																	
Construction of Retaining Structures																	
TWSRW-5050D	Construction of Remaining Portion of Bored Pile Wall at formation level	85	0	02-Sep-14 A	05-Nov-14 A											Construction of Remaining Portion of Bored Pile Wall at formation level	
TWSRW-5080	Retaining Structure along Slope no. 3SW-C/C898 (to be covered by VO)	45	45	29-Nov-14	23-Jan-15	22											
TWSRW-5090	Lagging Wall Construction and Capping Beam	135	122	06-Nov-14 A	21-May-15	22											
At-Grade Roadworks																	
TWSRW-5100	Noise Barrier NB2 - Footing and Retaining Structure adjacent to Realigned TWSR West (66m)	90	90	24-Jan-15	21-May-15	22											

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Activity ID	Activity Name	OD	RD	Start	Finish	TF	2014					2015		
							Nov	Dec	Jan	Feb	Mar			
B-2030	Completion of CLP Overhead 11KV Cable Diversion at Area B (Phase 2)	0	0		15-Dec-14	87		◆ Completion of CLP Overhead 11KV Cable Diversion at Area B (Phase 2)						
B-5010	Provide a Temporary Cycle Track (Scheme 2, along DSD maintenance access)	12	12	02-Jan-15	15-Jan-15	65								
B-9000	Trial Operation (AC8 - Early Start on 26 Nov 14)	18	18	26-Jan-15	14-Feb-15	53								
Foundation & Pier Construction														
Bridge A														
BA-13-1020	Pier AA13 - Pile Cap	30	0	13-Aug-14 A	28-Oct-14 A									
BA-14-1020	Pier AA14 - Pile Cap	30	0	16-Oct-14 A	31-Oct-14 A									
BA-02-2010	Pier AA2E - Pile Test	7	0	25-Oct-14 A	14-Nov-14 A									
BA-16-1000	Pier AA16 - Piling Works	12	12	29-Nov-14	12-Dec-14	101								
BA-13-1030	Pier AA13 - Pier Construction	38	30	06-Nov-14 A	27-Dec-14	67								
BA-15-1030	Pier AA15 - Pier Construction	31	31	11-Nov-14 A	29-Dec-14	37								
BA-16-1010	Pier AA16 - Pile Test	7	7	02-Jan-15	09-Jan-15	101								
BA-14-1030	Pier AA14 - Pier Construction	30	30	15-Dec-14	21-Jan-15	37								
BA-02-1000	Pier AA2W - Piling Works	12	12	16-Jan-15	29-Jan-15	136								
BA-18-1020	Pier AA18 - Pile Cap	30	30	07-Jan-15	10-Feb-15	132								
BA-02-1010	Pier AA2W - Pile Test	7	7	16-Feb-15	02-Mar-15	178								
BA-01-1000	Abutment AA1 - Piling Works	24	24	30-Jan-15	05-Mar-15	136								
BA-16-1020	Pier AA16 - Pile Cap	30	30	05-Feb-15	18-Mar-15	79								
BA-03-1020	Pier AA3 - Pile Cap	30	30	11-Feb-15	24-Mar-15	132								
Bridge B														
BB-06-1020A	Pier AB6E - Pile Cap	30	0	10-Oct-14 A	19-Nov-14 A									
BB-08-1020B	Pier AB8W - Pile Cap	30	2	04-Nov-14 A	22-Nov-14	-34								
BB-09-1000	Pier AB9 - Piling Works	24	2	25-Oct-14 A	22-Nov-14	26								
BB-07-1010	Pier AB7 - Pile Test	7	7	13-Sep-14 A	28-Nov-14	-45								
BB-09-1010	Pier AB9 - Pile Test	7	7	10-Dec-14	17-Dec-14	26								
BB-06-1020B	Pier AB6W - Pile Cap	30	30	24-Nov-14	30-Dec-14	229								
BB-08-1020A	Pier AB8E - Pile Cap	30	30	27-Nov-14*	03-Jan-15	-97								
BB-07-1020	Pier AB7 - Pile Cap	30	30	29-Nov-14	06-Jan-15	-45								
BB-10-1000	Pier AB10 - Piling Works	24	24	10-Dec-14	09-Jan-15	-6								
BB-08-1030	Pier AB8W - Pier Construction	24	24	29-Dec-14*	26-Jan-15	-62								
BB-08-1040	Pier AB8E - Pier Construction	24	24	05-Jan-15	31-Jan-15	-97								

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

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CEDD Contract No. CV/2012/09

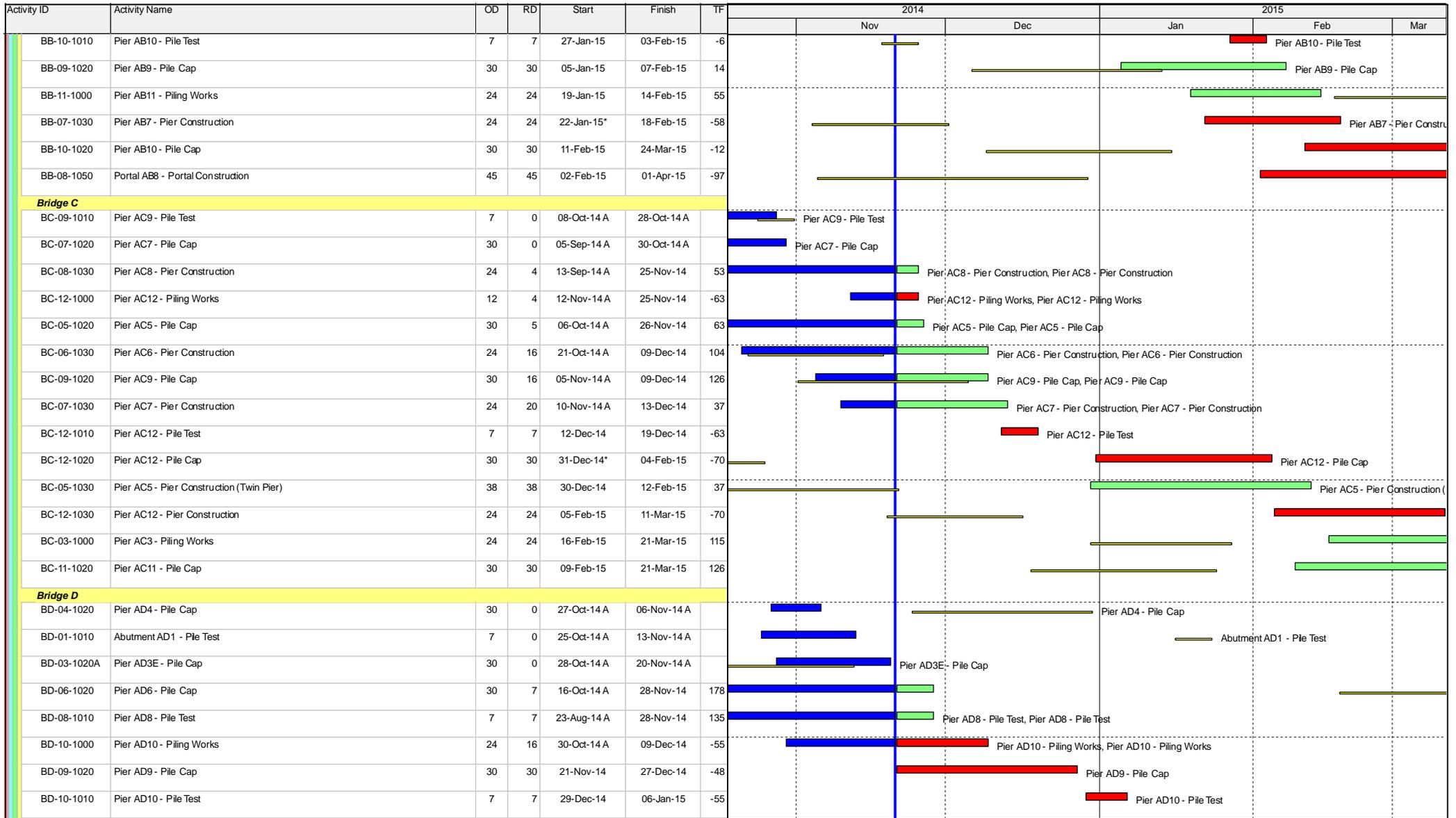
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3

3-Month Rolling Programme

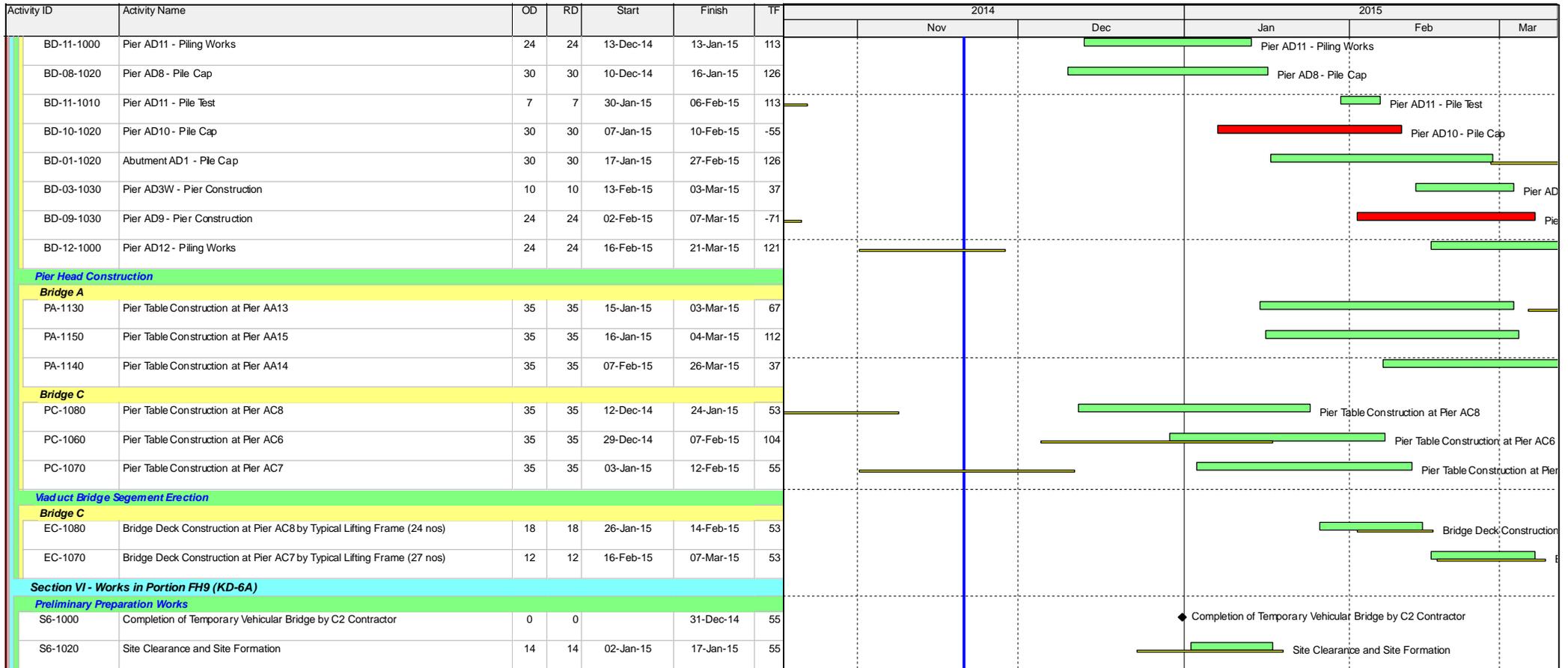
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3-Month Rolling Programme updated to 2014-11-21

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 俊和建築工程有限公司 CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.	 Actual Work  Remaining Work  Summary Bar  Critical Remaining Work  Milestone  Project Baseline Bar	CEDD Contract No. CV/2012/09 Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3 3-Month Rolling Programme	3-Month Rolling Programme updated to 2014-11-21 <table border="1"> <tr> <th>Date</th> <th>Revision</th> <th>Checked</th> <th>Approved</th> </tr> <tr> <td>24-Nov-14</td> <td>Rev.1</td> <td>SL</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Date	Revision	Checked	Approved	24-Nov-14	Rev.1	SL													
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Contract 5

ID	WBS	Task Name	Duration	Start	Finish	% Complete	2014											
							2nd Half			1st Half								
							Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
1	1	Key Dates	1110 days	28/3/2013	10/4/2016	0%												
2	1.1	Contract Award & Commencement	15 days	28/3/2013	11/4/2013	100%												
3	1.1.1	Letter of Acceptance	0 days	28/3/2013	28/3/2013	100%												
4	1.1.2	Commencement of Works	0 days	11/4/2013	11/4/2013	100%												
5	1.2	Site Possession Date	330 days	11/4/2013	7/3/2014	100%												
6	1.2.1	Portion BCP 1	0 days	11/5/2013	11/5/2013	100%												
7	1.2.2	Portion BCP 2	0 days	10/6/2013	10/6/2013	100%												
8	1.2.3	Portion BCP 3 (villagers illegal occupation)	0 days	8/9/2013	8/9/2013	100%												
9	1.2.4	Portion BCP 4 (delaying site possession)	0 days	7/3/2014	7/3/2014	100%												
10	1.2.5	Portion BCP 5	0 days	8/9/2013	8/9/2013	100%												
11	1.2.6	Portion BCP 6	0 days	8/9/2013	8/9/2013	100%												
12	1.2.7	Portion BCP 7	0 days	8/9/2013	8/9/2013	100%												
13	1.2.8	Portion CR 2	0 days	7/12/2013	7/12/2013	100%												
14	1.2.9	Portion CR 40 (delaying site possession)	0 days	7/3/2014	7/3/2014	100%												
15	1.2.10	Portion CR 41 (delaying site possession)	0 days	7/3/2014	7/3/2014	100%												
16	1.2.11	Portion CR 42 (delaying site possession)	0 days	7/3/2014	7/3/2014	100%												
17	1.2.12	Portion CR 44 (delaying site possession)	0 days	5/2/2014	5/2/2014	100%												
18	1.2.13	Area LMH 0	0 days	11/4/2013	11/4/2013	100%												
19	1.2.14	Area LMH 1	0 days	8/9/2013	8/9/2013	100%												
20	1.2.15	Area LMH 2	0 days	11/5/2013	11/5/2013	100%												
21	1.2.16	Area LMH 3	0 days	7/3/2014	7/3/2014	100%												
22	1.2.17	Area LMH 4	0 days	8/9/2013	8/9/2013	100%												
23	1.2.18	Area LMH 5	0 days	8/10/2013	8/10/2013	100%												
24	1.2.19	Area RS 1	0 days	11/5/2013	11/5/2013	100%												
25	1.2.20	Area RS 2 (Omitted)	0 days	11/5/2013	11/5/2013	100%												
26	1.2.21	Area RS 3	0 days	11/5/2013	11/5/2013	100%												
27	1.2.22	Area RS 4	0 days	11/5/2013	11/5/2013	100%												
28	1.3	Section Completion Date	976 days	8/8/2013	10/4/2016	0%												
29	1.3.1	KD-1 Section I of the Works - G.I. field works	0 days	4/2/2014	4/2/2014	100%												
30	1.3.2	KD-2 Section II of the Works - All laboratory tests for Section I	0 days	6/3/2014	6/3/2014	100%												
31	1.3.3	KD-3 Section III of the Works - Site formation works for portion RS1, RS2 & RS3	0 days	8/8/2013	8/8/2013	100%												
32	1.3.4	KD-4 Section IV of the Works - Village house within portion RS4	0 days	5/1/2014	5/1/2014	100%												
33	1.3.5	KD-5 Section V of the Works - All works within portion RS4 exclude Section IV	0 days	5/1/2014	5/1/2014	100%												
34	1.3.6	KD-7 Section VII of the Works - All works within Area CRD	0 days	15/5/2014	15/5/2014	100%												
35	1.3.7	KD-8 Section VIII of the Works - All works within Area BCPA	0 days	12/10/2014	12/10/2014	0%				◆ 12/10								
36	1.3.8	KD-8 Section IX of the Works - All works within Area BCPB	0 days	11/4/2015	11/4/2015	0%											◆ 11/4	
37	1.3.9	KD-10 Section X of the Works - All works within Area BCPC	0 days	4/6/2014	4/6/2014	100%												
38	1.3.10	KD-11 Section XI of the Works - All works within Area BCPD	0 days	11/4/2015	11/4/2015	0%											◆ 11/4	
39	1.3.11	KD-12 Section XII of the Works - All works within Area LMH	0 days	1/12/2014	1/12/2014	0%					◆ 1/12							
40	1.3.12	KD-13 Section XIII of the Works - Works not covered in any other Sections	0 days	11/4/2015	11/4/2015	0%											◆ 11/4	
41	1.3.13	KD-14 Section XIV of the Works - Trees preservation and protection	0 days	11/4/2015	11/4/2015	0%											◆ 11/4	
42	1.3.14	KD-15 Section XV of the Works - Landscape soft works	0 days	11/4/2015	11/4/2015	0%											◆ 11/4	
43	1.3.15	KD-16 Section XVI of the Works - Establishment works for landscape soft works	0 days	10/4/2016	10/4/2016	0%												
44	1.4	Stage Completion Date	60 days	8/8/2013	7/10/2013	100%												
47	2	Preliminaries and Statuary / Contractual Submissions	424 days	11/4/2013	9/6/2014	100%												
78	3	Stage of the Works	180 days	11/4/2013	7/10/2013	100%												
79	3.1	Stage I of the Works - Temporary vehicular bridge B and temporary Lin Ma Hang Road	179 days	12/4/2013	7/10/2013	100%												
90	3.2	Stage II of the Works - Temporary ArchSD Depot (LMH2)	78 days	11/4/2013	27/6/2013	100%												
94	4	Section of the Works	1095 days	12/4/2013	10/4/2016	47%												
95	4.1	Section I of the Works - Ground Investigation field works (Drg. 7101A-7111A)	251 days	30/5/2013	4/2/2014	100%												
100	4.2	Section II of the Works - All laboratory tests for Section I	188 days	31/8/2013	6/3/2014	100%												

ID	WBS	Task Name	Duration	Start	Finish	% Complete	2nd Half						1st Half							
							Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May			
105	4.3	Section III of the Works - Site formation works for Portions RS1, RS2 & RS3 (seek for certificate of completion in letter ref. SRJV/W47/SO/J5/1308/00416 dated 23/8/2013)	89 days	12/5/2013	8/8/2013	100%														
111	4.4	Section IV of the Works - Village house within portion RS4	399 days	12/4/2013	15/5/2014	100%														
123	4.5	Section V of the Works-All works within portion RS4 exclude Section IV	509 days	12/4/2013	2/9/2014	42%														
124	4.5.1	ISSUED EOT2	241 days	5/1/2014	2/9/2014	100%														
125	4.5.2	Submissions and method statement	37 days	12/4/2013	18/5/2013	100%														
126	4.5.3	Approvals from ER	30 days	26/4/2013	25/5/2013	100%														
127	4.5.4	Construction of footbridge and staircase with mini-piles 8 nos. x Ø 273 and staircase (Drg. 2201A to 2207B, 6001B)	235 days	11/1/2014	2/9/2014	0%														
128	4.5.4.1	Mini-piles	61 days	11/1/2014	12/3/2014	0%														
129	4.5.4.2	Pile Caps	52 days	14/2/2014	6/4/2014	0%														
130	4.5.4.3	Abutments	45 days	10/3/2014	23/4/2014	0%														
131	4.5.4.4	Wing walls	45 days	27/3/2014	10/5/2014	0%														
132	4.5.4.5	Mass concrete	41 days	13/4/2014	23/5/2014	0%														
133	4.5.4.6	Remove sheetpiles from abutments	11 days	24/5/2014	3/6/2014	0%														
134	4.5.4.7	Beams	45 days	4/6/2014	18/7/2014	0%														
135	4.5.4.8	Deck	34 days	19/7/2014	21/8/2014	0%														
136	4.5.4.9	Compact fill behind abutments	14 days	4/6/2014	17/6/2014	0%														
137	4.5.4.10	New footpath	21 days	18/6/2014	8/7/2014	0%														
138	4.5.4.11	New staircase	36 days	9/7/2014	13/8/2014	0%														
139	4.5.4.12	Miscellaneous (pedestrian parapet, granite tile etc.)	20 days	14/8/2014	2/9/2014	0%														
140	4.6	Section VII of the Works - All works within Area CRD	249 days	9/9/2013	15/5/2014	100%														
177	4.7	Section VIII of the Works - All works within Area BCPA	489 days	11/6/2013	12/10/2014	49%														
178	4.7.1	Submission for Site Formation Works & import fill	72 days	11/6/2013	21/8/2013	100%														
179	4.7.2	Approval of submission for Site Formation Works	50 days	22/8/2013	10/10/2013	100%														
180	4.7.3	Approval for sources of import fill	69 days	28/9/2013	5/12/2013	100%														
181	4.7.4	Site formation of land (import fill 121433m3)	263 days	11/10/2013	30/6/2014	61%														
182	4.7.4.1	site formation (A1-A9)	82 days	11/10/2013	31/12/2013	98%														
183	4.7.4.2	site formation (A10-13, A15-20, A23, A24-A25)	90 days	1/1/2014	31/3/2014	90%														
184	4.7.4.3	site formation (A14, A22, A26)	91 days	1/4/2014	30/6/2014	0%														
185	4.7.5	Slope drainage works (Drg. 7156B-7159B)	284 days	2/1/2014	12/10/2014	37%														
186	4.7.5.1	submission of design of sedimentation tank/pond	38 days	2/1/2014	8/2/2014	100%														
187	4.7.5.2	approval of design of sedimentation tank/pond	36 days	9/2/2014	16/3/2014	100%														
188	4.7.5.3	discharge to existing Box Culvert No. 4 & sedimentation tank	16 days	17/3/2014	1/4/2014	60%														
189	4.7.5.4	DN1050 from CP to sedimentation tank	73 days	2/4/2014	13/6/2014	0%														
190	4.7.5.5	shortcreted TC (from A3,A2,A1,A5)	31 days	31/5/2014	30/6/2014	90%														
191	4.7.5.6	shortcreted TC (from A10-13)	30 days	1/7/2014	30/7/2014	0%														
192	4.7.5.7	shortcreted TC (from A10,A15,A19)	25 days	31/7/2014	24/8/2014	0%														
193	4.7.5.8	shortcreted TC (from A20-24A26,A14)	49 days	25/8/2014	12/10/2014	0%														
194	4.7.6	Chain link fence (1120m)	195 days	1/4/2014	12/10/2014	0%														
195	4.7.6.1	chain link fence (A1-5,A10,A15,A19)	102 days	1/4/2014	11/7/2014	0%														
196	4.7.6.2	chain link fence (A4,A9,A14,A26,A24)	58 days	12/7/2014	7/9/2014	0%														
197	4.7.6.3	chain link fence (A21-24)	35 days	8/9/2014	12/10/2014	0%														
198	4.8	Section IX of the Works - All works within Area BCPB	492 days	6/12/2013	11/4/2015	11%														
199	4.8.1	Submission for demolition of existing building structures	37 days	20/12/2013	25/1/2014	100%														
200	4.8.2	Approval of submission for demolish existing building structures	41 days	26/1/2014	7/3/2014	100%														
201	4.8.3	Demolition of existing building structures UPON instruction (Drg. 6152A, 6153A)	118 days	8/3/2014	3/7/2014	0%														
202	4.8.4	Site formation works (import fill 370523m3)	492 days	6/12/2013	11/4/2015	3%														
203	4.8.4.1	site formation works (B20)	28 days	6/12/2013	2/1/2014	0%														
204	4.8.4.2	site formation works (B1,3,6,9,21,22)	89 days	3/1/2014	1/4/2014	16%														
205	4.8.4.3	site formation works (B2,5)	92 days	2/4/2014	2/7/2014	0%														
206	4.8.4.4	site formation works (B7,11,12)	93 days	3/7/2014	3/10/2014	0%														
207	4.8.4.5	site formation works (4,8,10,13,14,16,17)	91 days	4/10/2014	2/1/2015	0%														
208	4.8.4.6	site formation works (B15,18,19)	99 days	3/1/2015	11/4/2015	0%														
209	4.8.5	Temp. boundary fence, chain link fence (Drg.1002C, 1032B, 1033B)	320 days	27/5/2014	11/4/2015	0%														
210	4.8.5.1	chain link fence (780m)	99 days	3/1/2015	11/4/2015	0%														

ID	WBS	Task Name	Duration	Start	Finish	% Complete	2014											
							2nd Half						1st Half					
							Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
211	4.8.5.2	fabricate temporary boundary fence & post	37 days	27/5/2014	2/7/2014	0%												
212	4.8.5.3	fix temporary boundary fence (105m)	35 days	3/7/2014	6/8/2014	0%												
213	4.9	Section X of the Works - All works within Area BCPC	269 days	9/9/2013	4/6/2014	100%												
229	4.10	Section XI of the Works - All works within Area BCPD	598 days	22/8/2013	11/4/2015	14%												
230	4.10.1	Submissions	23 days	22/8/2013	13/9/2013	100%												
231	4.10.2	Approval of Submissions	37 days	14/9/2013	20/10/2013	100%												
232	4.10.3	Construction of retaining wall RW2 - CH0 to 840 (length 840m)	281 days	21/10/2013	28/7/2014	35%												
248	4.10.4	Boundary fence (Drg.1002C, 1003A)	267 days	12/4/2014	3/1/2015	0%												
253	4.10.5	Modified CEDD hoarding Type III (Drg. 1032B)	176 days	18/10/2014	11/4/2015	0%												
257	4.10.6	Site Formation works (import fill 104958m3) including slope drainage works (Drg. 7155B-7159B)	423 days	7/1/2014	5/3/2015	18%												
258	4.10.6.1	D1-D2	84 days	7/1/2014	31/3/2014	60%												
259	4.10.6.2	D3, D10,D11, D17, D12- D14	95 days	27/5/2014	29/8/2014	18%												
260	4.10.6.3	D4, D15, D16	94 days	30/8/2014	1/12/2014	0%												
261	4.10.6.4	D5-D9	94 days	2/12/2014	5/3/2015	0%												
262	4.10.7	Sewerage, Drainage & Water Works (Drg. 1323B,1305C,1309A)	368 days	21/10/2013	23/10/2014	0%												
277	4.10.8	Irrigation system (sequence 3)(see Appendix C) adjacent to underpass & depressed road	44 days	29/8/2014	11/10/2014	0%												
278	4.10.9	Irrigation system (sequence 4) (see Appendix C) next to BCPC	44 days	29/8/2014	11/10/2014	0%												
279	4.10.10	Utilities works (Drg. 1405A) (see Appendix A)	369 days	18/12/2013	21/12/2014	0%												
280	4.10.10.1	Sequence 1 - allow ducts for 11kV & LV across the underpass	13 days	18/12/2013	30/12/2013	0%												
281	4.10.10.2	Sequence 5a - 132kV	12 days	12/10/2014	23/10/2014	0%												
282	4.10.10.3	Sequence 5b - 11kV	24 days	24/10/2014	16/11/2014	0%												
283	4.10.10.4	Sequence 5c - LV	23 days	17/11/2014	9/12/2014	0%												
284	4.10.10.5	Sequence 5d - PCCW	12 days	10/12/2014	21/12/2014	0%												
285	4.10.11	Road works and Road lighting works (Drg.1205A,1505C,1605B)	111 days	22/12/2014	11/4/2015	0%												
286	4.10.12	Construction of depressed road & underpass-9.3m wide x168m long	241 days	31/12/2013	28/8/2014	0%												
292	4.11	Section XII of the Works - All works within Area LMH	467 days	22/8/2013	1/12/2014	59%												
293	4.11.1	Submissions for method statement of subway & staircase	70 days	22/8/2013	30/10/2013	100%												
294	4.11.2	Approval of Submissions for method statement of subway & staircase	68 days	30/8/2013	5/11/2013	100%												
295	4.11.3	Construction of retaining wall RW1 - CH0 to 561.053m	213 days	26/9/2013	26/4/2014	94%												
296	4.11.3.1	Bay 1075 to Bay 1068 (8 bays) -H1	77 days	26/9/2013	11/12/2013	100%												
297	4.11.3.2	Bay 1067 to Bay 1060 (8 bays) -H2	77 days	8/10/2013	23/12/2013	100%												
298	4.11.3.3	Bay 1059 to Bay 1052 (8 bays) -H3	93 days	15/11/2013	15/2/2014	100%												
299	4.11.3.4	Bay 1051 to Bay 1044 (8 bays) -H4	80 days	29/11/2013	16/2/2014	100%												
300	4.11.3.5	Bay 1043 to Bay 1036 (8 bays) -H5	79 days	13/12/2013	1/3/2014	100%												
301	4.11.3.6	Bay 1035 to Bay 1028 (8 bays) -H5,H6	83 days	17/1/2014	9/4/2014	100%												
302	4.11.3.7	Bay 1027 to Bay 1020 (8 bays) -H6	79 days	16/12/2013	4/3/2014	100%												
303	4.11.3.8	Bay 1019 to Bay 1012 (8 bays) -H7	105 days	28/12/2013	11/4/2014	100%												
304	4.11.3.9	Bay 1011 to Bay 1004 (8 bays) H7,H8	87 days	30/12/2013	26/3/2014	77%												
305	4.11.3.10	Bay 1003 to Bay 1001 (3 bays) -H8	31 days	27/3/2014	26/4/2014	0%												
306	4.11.4	Construction of retaining wall RW1A-CH561.053 to 612.457m (length approx.. 51.4m)	368 days	11/9/2013	13/9/2014	100%												
307	4.11.4.1	Bay 1076 to Bay 1078 (base & wall)	49 days	11/9/2013	29/10/2013	100%												
308	4.11.4.2	Bay 1079 to Bay 1082 (after divert existing Rd i.e. after Staircase & Lift Shaft)	60 days	16/7/2014	13/9/2014	100%												
309	4.11.5	Filling & Slope drainage behind RW1A (involve TTA)	79 days	14/9/2014	1/12/2014	5%												
310	4.11.6	Site formation works (import fill 15300m3) including slope drainage works (Drg. 7154B, 7159B) (see Appendix B)	294 days	24/12/2013	13/10/2014	48%												
311	4.11.6.1	site formation (H1-H8) & slope drainage works	157 days	24/12/2013	29/5/2014	58%												
312	4.11.6.1.1	fill H1	36 days	24/4/2014	29/5/2014	5%												
313	4.11.6.1.2	fill H2	20 days	24/12/2013	12/1/2014	100%												
314	4.11.6.1.3	fill H3	17 days	17/2/2014	5/3/2014	100%												
315	4.11.6.1.4	fill H4	17 days	17/2/2014	5/3/2014	100%												
316	4.11.6.1.5	fill H5	18 days	10/4/2014	27/4/2014	95%												
317	4.11.6.1.6	fill H6	19 days	16/4/2014	4/5/2014	95%												
318	4.11.6.1.7	fill H7	18 days	12/4/2014	29/4/2014	20%												
319	4.11.6.1.8	fill H8	19 days	27/3/2014	14/4/2014	0%												

ID	WBS	Task Name	Duration	Start	Finish	% Complete	2nd Half						1st Half							
							Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May			
385	4.11.14	Construction of pedestrian subway & pump room	202 days	6/11/2013	26/5/2014	92%														
386	4.11.14.1	prepare formation of sheetpiling/excavation	9 days	6/11/2013	14/11/2013	100%														
387	4.11.14.2	excavation &/or sheetpiling	33 days	15/11/2013	17/12/2013	100%														
388	4.11.14.3	rubble mound	16 days	2/12/2013	17/12/2013	100%														
389	4.11.14.4	cast blinding layer	17 days	11/12/2013	27/12/2013	100%														
390	4.11.14.5	pump house	30 days	16/12/2013	14/1/2014	100%														
391	4.11.14.6	subway 8th bay	27 days	15/1/2014	10/2/2014	100%														
392	4.11.14.7	subway 7th bay	23 days	11/2/2014	5/3/2014	99%														
393	4.11.14.8	subway 6th bay	17 days	25/2/2014	13/3/2014	100%														
394	4.11.14.9	miscellaneous works	74 days	14/3/2014	26/5/2014	75%														
395	4.11.15	Construction of staircase with lift shaft with 6 nos. of mini pile	225 days	14/10/2013	26/5/2014	100%														
396	4.11.15.1	mini-piles	54 days	14/10/2013	6/12/2013	100%														
397	4.11.15.2	lift shaft	41 days	7/12/2013	16/1/2014	100%														
398	4.11.15.3	Bay 9	33 days	17/1/2014	18/2/2014	100%														
399	4.11.15.4	Staircase	64 days	19/2/2014	23/4/2014	100%														
400	4.11.15.5	miscellaneous works	73 days	15/3/2014	26/5/2014	100%														
401	4.11.16	1 no. DN1650 pipe jacking LV009 including jacking & receiving pits	147 days	6/11/2013	1/4/2014	87%														
402	4.11.16.1	Pits construction	36 days	6/11/2013	11/12/2013	100%														
403	4.11.16.1.1	utility detection of the area	3 days	6/11/2013	8/11/2013	100%														
404	4.11.16.1.2	inspection pits for jacking pit and receiving pit	5 days	9/11/2013	13/11/2013	100%														
405	4.11.16.1.3	temporary work & excavation for receiving pit	14 days	28/11/2013	11/12/2013	100%														
406	4.11.16.1.4	temporary work & excavation for jacking pit	14 days	14/11/2013	27/11/2013	100%														
407	4.11.16.2	Jack sleeve Pipes	89 days	12/12/2013	10/3/2014	100%														
408	4.11.16.2.1	establishment of jacking equipment	15 days	12/12/2013	26/12/2013	100%														
409	4.11.16.2.2	jack pipe and excavate	74 days	27/12/2013	10/3/2014	100%														
410	4.11.16.3	HDPE pipes	22 days	11/3/2014	1/4/2014	16%														
411	4.11.16.3.1	Lay HDPE pipes	7 days	11/3/2014	17/3/2014	50%														
412	4.11.16.3.2	Grout HDPE pipes	7 days	18/3/2014	24/3/2014	0%														
413	4.11.16.3.3	Remove temporary works and backfilling	8 days	25/3/2014	1/4/2014	0%														
414	4.11.17	Construction of retaining wall RW9 - CH0 to 75m (length 75m)	110 days	2/4/2014	20/7/2014	0%														
415	4.11.17.1	drive sheetpile & excavation	14 days	2/4/2014	15/4/2014	0%														
416	4.11.17.2	grade 200 rock fill	14 days	6/4/2014	19/4/2014	0%														
417	4.11.17.3	cast blinding layer	14 days	14/4/2014	27/4/2014	0%														
418	4.11.17.4	Bay 9001-9010	94 days	18/4/2014	20/7/2014	0%														
419	4.11.18	Construction of Bridge J with 6 x Ø 1500 bored piles	217 days	7/12/2013	11/7/2014	49%														
420	4.11.18.1	bored piles	73 days	7/12/2013	17/2/2014	100%														
421	4.11.18.2	pile caps	15 days	18/2/2014	4/3/2014	100%														
422	4.11.18.3	abutment walls	24 days	3/3/2014	26/3/2014	80%														
423	4.11.18.4	falsework for deck	15 days	25/3/2014	8/4/2014	0%														
424	4.11.18.5	deck	55 days	9/4/2014	2/6/2014	0%														
425	4.11.18.6	parapet	39 days	3/6/2014	11/7/2014	0%														
426	4.11.19	Construction of retaining wall RW5 - CH0 to 60m (length 60m)	44 days	27/3/2014	9/5/2014	0%														
427	4.11.19.1	drive sheetpile & excavation	11 days	27/3/2014	6/4/2014	0%														
428	4.11.19.2	grade 200 rock fill	4 days	7/4/2014	10/4/2014	0%														
429	4.11.19.3	cast blinding layer	5 days	11/4/2014	15/4/2014	0%														
430	4.11.19.4	Bay 5001-5008	24 days	16/4/2014	9/5/2014	0%														
431	4.12	Section XIII of the Works - Works not covered in any other Sections	598 days	22/8/2013	11/4/2015	31%														
432	4.12.1	Submissions	70 days	22/8/2013	30/10/2013	100%														
433	4.12.2	Approval of Submissions	68 days	16/9/2013	22/11/2013	100%														
434	4.12.3	Temporary Traffic Arrangement (TTA) Scheme for Works at existing LMH Rd	92 days	23/8/2013	22/11/2013	100%														
435	4.12.3.1	Preparation of TTA scheme	21 days	23/8/2013	12/9/2013	100%														
436	4.12.3.2	Comment & approval of TTA scheme by TD & RMO	55 days	13/9/2013	6/11/2013	100%														
437	4.12.3.3	Obtain roadwork advice from RMO	16 days	7/11/2013	22/11/2013	100%														
438	4.12.4	Northbound of Re-aligned Lin Ma Hang Road (west side)	382 days	23/11/2013	9/12/2014	29%														
439	4.12.4.1	Works from chainage 190 to chainage 310	229 days	23/11/2013	9/7/2014	54%														
440	4.12.4.1.1	Drainage & slope drain	76 days	23/11/2013	6/2/2014	100%														
441	4.12.4.1.2	Waterwork	38 days	7/2/2014	16/3/2014	97%														

ID	WBS	Task Name	Duration	Start	Finish	% Complete	2nd Half						1st Half							
							Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May			
537	4.12.6	Archaeological survey (Sections T1 to T3)(Drg. 6403A)	167 days	24/10/2013	8/4/2014	100%														
543	4.12.7	Construction of retaining wall RW8 - CH0 to 22 (3 bays)	70 days	13/8/2014	21/10/2014	0%														
545	4.12.8	Site Formation works for ArchSD Depot (Drg. 1001B)	35 days	22/10/2014	25/11/2014	0%														
546	4.12.9	Existing road to be improved & run-in to the site to be constructed at RS1 (Drg.1203A, 1001B)	108 days	4/8/2014	19/11/2014	44%														
547	4.12.10	Access road to be re-constructed / upgraded at RS3 (Drg/1203)	111 days	20/11/2014	10/3/2015	0%														
548	4.13	Section XIV of the Works - Trees preservation and protection	730 days	12/4/2013	11/4/2015	74%														
549	4.13.1	Submissions	69 days	12/4/2013	19/6/2013	100%														
550	4.13.2	Approval of Submissions	70 days	20/6/2013	28/8/2013	100%														
551	4.13.3	Tree felling/removal works and tree transplanting works	499 days	6/9/2013	17/1/2015	76%														
552	4.13.4	Preservation and Protection of Existing Trees in all Portion of the Site	591 days	29/8/2013	11/4/2015	66%														
553	4.14	Section XV of the Works - Landscape soft works (including transplant trees to permanent locations)	332 days	15/5/2014	11/4/2015	11%														
554	4.14.1	tree & shrub planting at re-aligned Lin Ma Hang Road (west) for Section XIII of the Works	58 days	10/12/2014	5/2/2015	0%														
555	4.14.2	tree & shrub planting at re-aligned Lin Ma Hang Road (east) for Section XIII of the Works	65 days	6/2/2015	11/4/2015	0%														
556	4.14.3	shrub planting at BCPC for Section X of the Works	21 days	15/5/2014	4/6/2014	100%														
557	4.14.4	tree & shrub planting at BCPD Section XI of the Works	55 days	16/2/2015	11/4/2015	0%														
558	4.15	Section XVI of the Works - Establishment works for landscape soft works	365 days	12/4/2015	10/4/2016	0%														

Appendix D

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

LEGEND:

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

PA	REV TO	REVISION	FIRST ISSUE	DC	WT
Rev	Date	Drawn	Description	DC	WT

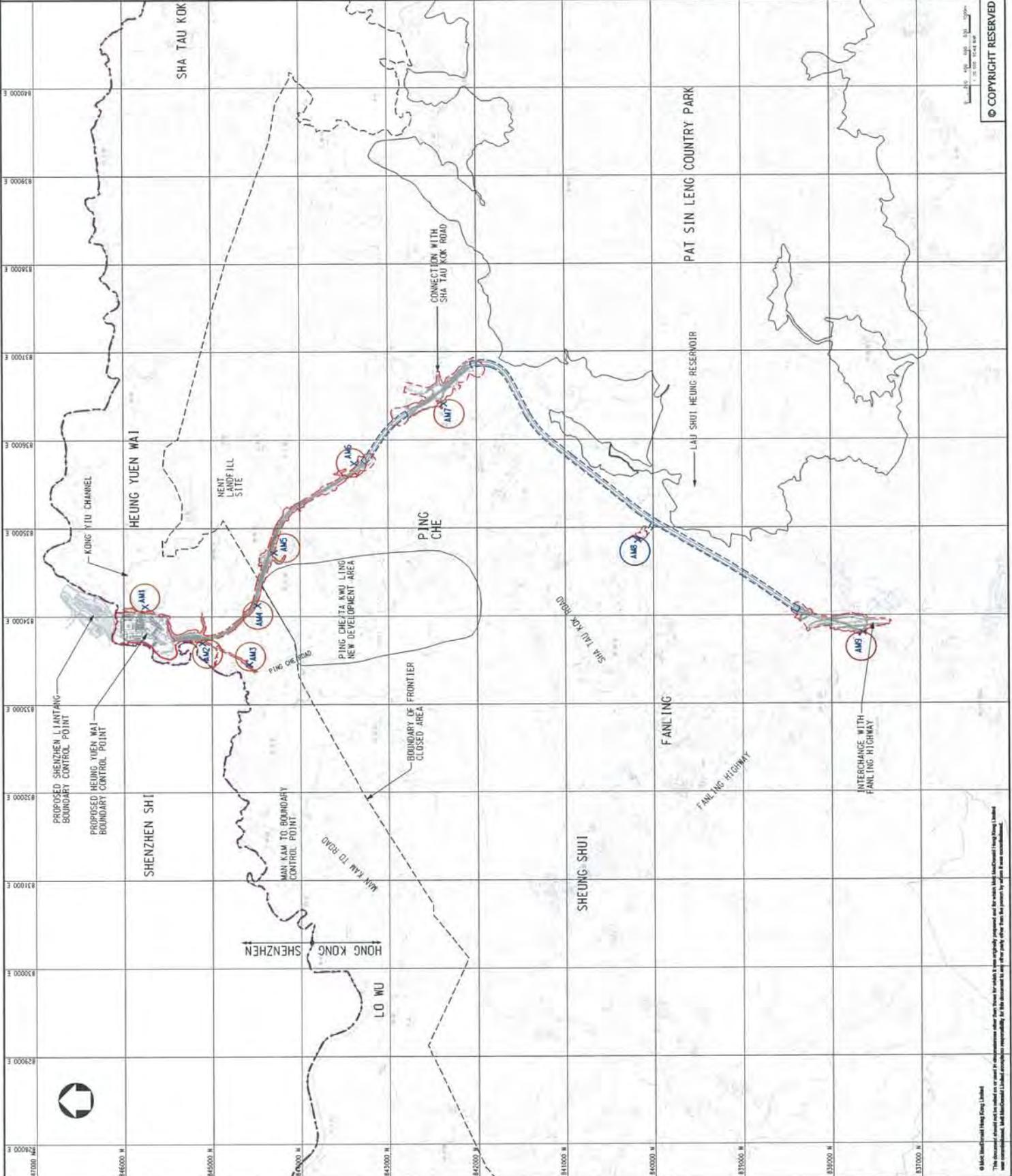


CIVIL ENGINEERING
AND DEVELOPMENT
DEPARTMENT

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

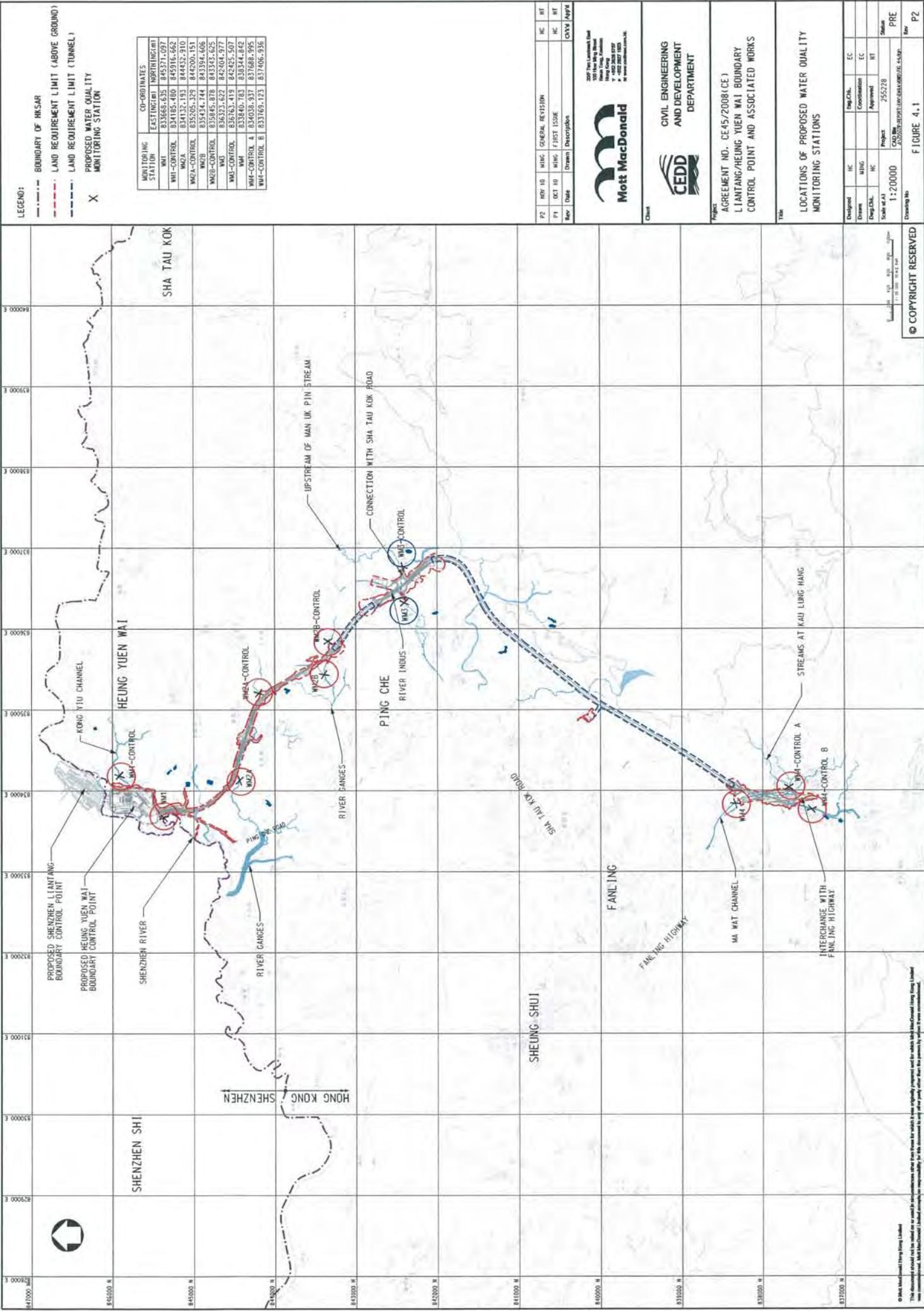
PROPOSED LOCATION OF CONSTRUCTION
AIR QUALITY MONITORING STATIONS

Designed	DC	Eng. Check	EC
Drawn	H/HC	Coordination	EC
Design Check	DC	Approval	WT
Scale at A1	1:20000	Project	253228
Drawing No.	CE45/2008(CE)001/002/003/004/005/006/007/008/009/010/011/012/013/014/015/016/017/018/019/020/021/022/023/024/025/026/027/028/029/030/031/032/033/034/035/036/037/038/039/040/041/042/043/044/045/046/047/048/049/050/051/052/053/054/055/056/057/058/059/060/061/062/063/064/065/066/067/068/069/070/071/072/073/074/075/076/077/078/079/080/081/082/083/084/085/086/087/088/089/090/091/092/093/094/095/096/097/098/099/100	Status	PRE
Drawing by		Scale	P1



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LEGEND:

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

MONITORING STATION	CO-ORDINATES	
	EASTING (M)	NORTHING (M)
WMA	837683.635	845371.097
WMA-CONTROL 1	834185.460	845916.662
WMA-CONTROL 2	834132.193	844432.910
WMA-CONTROL 3	835205.329	844200.151
WMA-CONTROL 4	835334.744	843394.606
WMA-CONTROL 5	835945.878	843343.625
WMA-CONTROL 6	836323.622	842404.977
WMA-CONTROL 7	836763.419	842425.507
WMA-CONTROL 8	834038.937	837688.995

REV	DATE	BY	CHKD	DESCRIPTION
P1	DEC 10	MING		FIRST ISSUE
P2	NOV 10	MING		GENERAL REVISION

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CIVIL ENGINEERING
 AND DEVELOPMENT
 DEPARTMENT

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

TITLE
 LOCATIONS OF PROPOSED WATER QUALITY
 MONITORING STATIONS

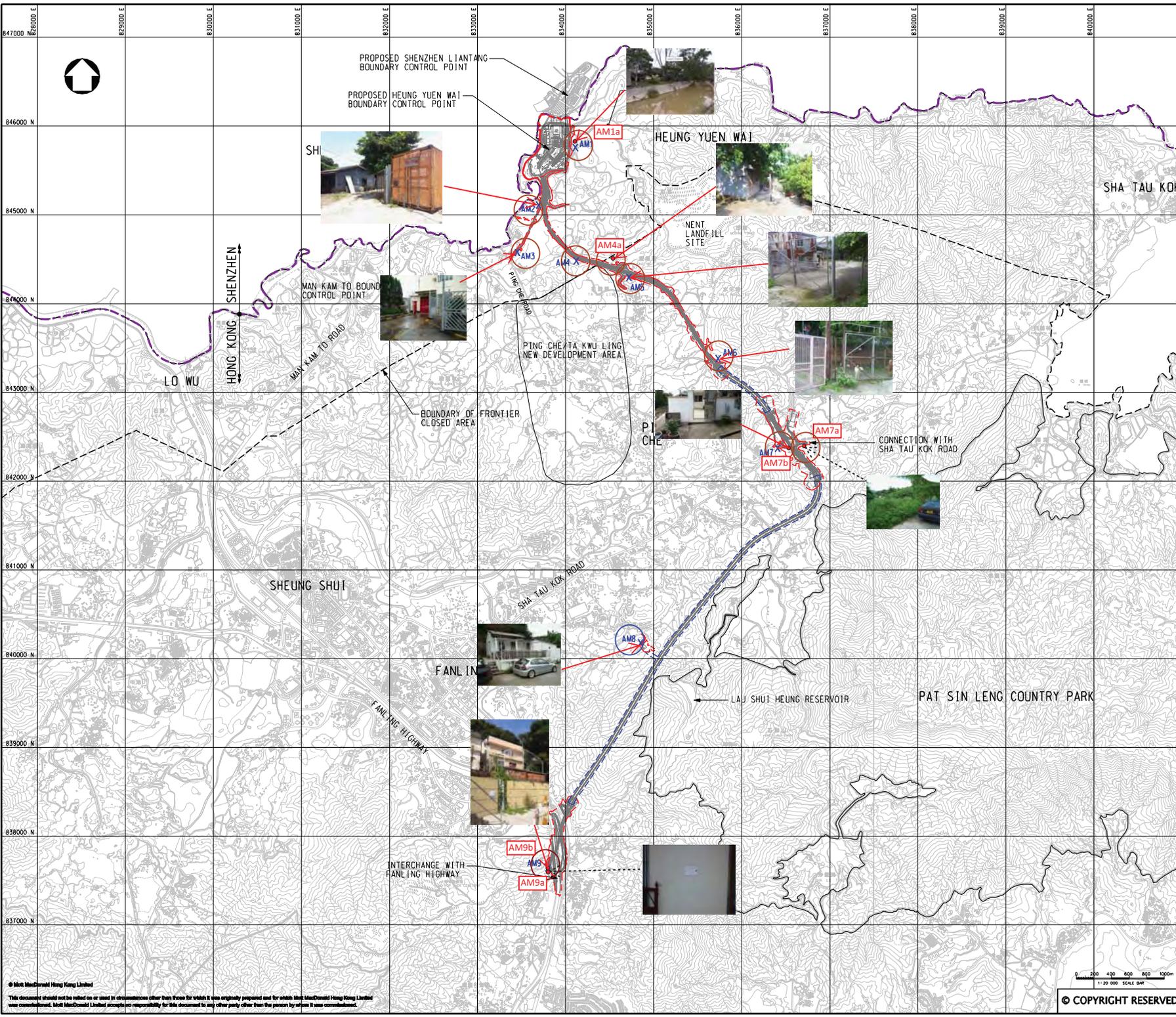
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Drawn	HC	WHG	EC
Checked	HC	WHG	EC
Scale at A1	Project 255228		
Scale at A3	Project 255228		
Scale at A4	Project 255228		
Scale at A5	Project 255228		
Scale at A6	Project 255228		
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Scale at A9	Project 255228		
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Scale at A11	Project 255228		
Scale at A12	Project 255228		
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Scale at A98	Project 255228		
Scale at A99	Project 255228		
Scale at A100	Project 255228		

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Appendix E

Monitoring Locations for Impact Monitoring



- LEGEND:
- BOUNDARY OF HKSAR
 - WORKS AREA (ABOVE GROUND)
 - WORKS AREA (TUNNEL)
 - X AIR MONITORING STATIONS

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

20F Two Landmark East
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Client

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

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

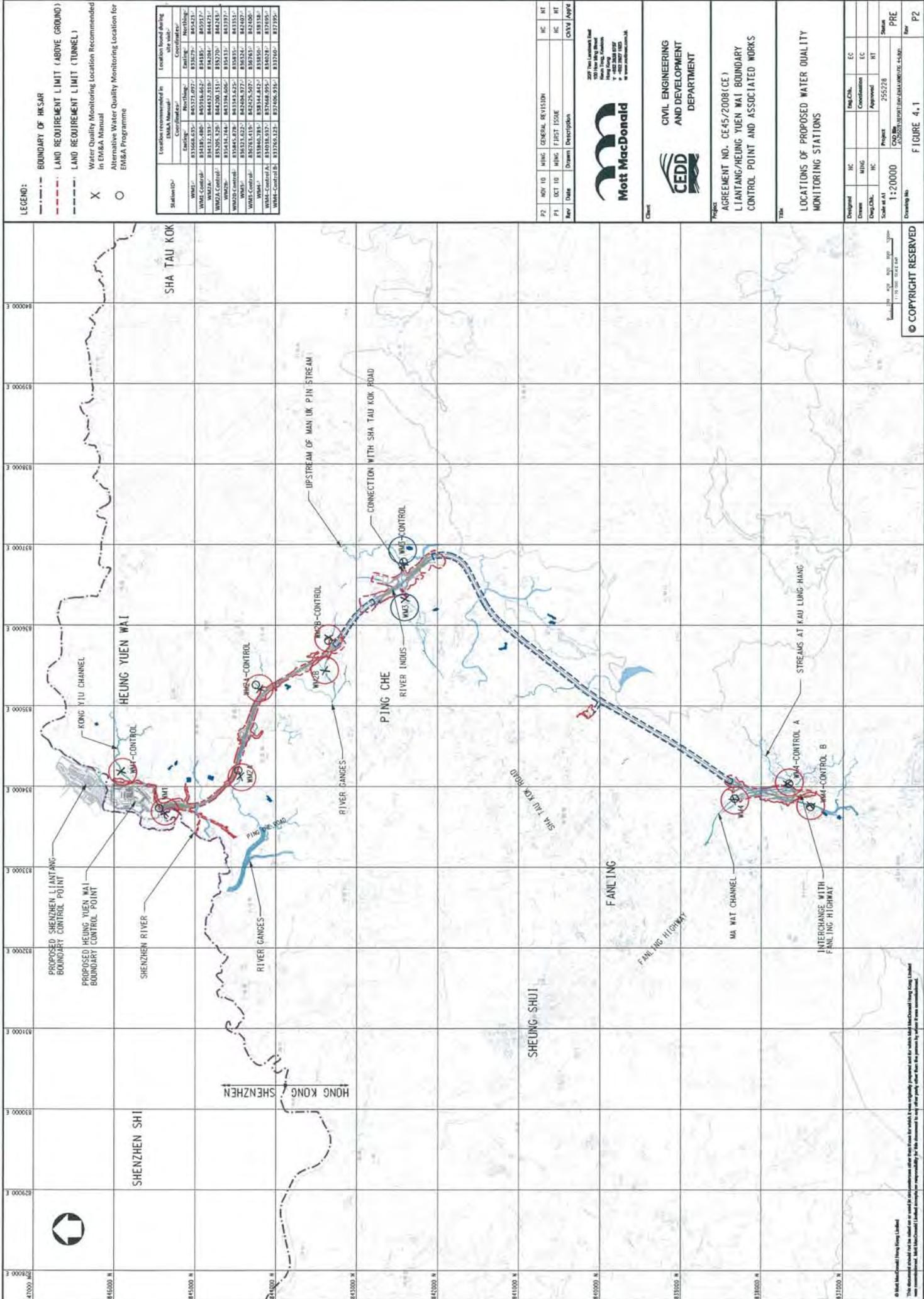
Title
 PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

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

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0 200 400 600 800 1000m
 1:20 000 SCALE BM
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FIGURE 2.1



LEGEND:

- BOUNDARY OF HK SAR
- - - 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

Station ID	Location recommended in EM&A Manual		Location based on the site visit	
	Easting	Northing	Easting	Northing
WMA1	83366.433	845372.097	83367	845473
WMA2	84412.183	844452.816	84414	844471
WMA3	85205.326	844200.331	85207	844215
WMA4	83743.744	843358.606	83745	843372
WMA5	83585.878	843348.625	83587	843361
WMA6	83765.415	842528.507	83767	842547
WMA7	83846.283	838144.842	83848	838163
WMA8	83403.837	837668.595	83405	837689
WMA9	83765.427	837606.916	83767	837627

P2	REV 10	HWG	GENERAL REVISION	HC	HT
P1	REV 10	HWG	FIRST ISSUE	HC	HT
Rev	Date	Drawn	Description	Checked	App'd



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**Civil Engineering
AND DEVELOPMENT
DEPARTMENT**

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

Scale at A1
1:20000

Project
2552/08

Scale
PRE

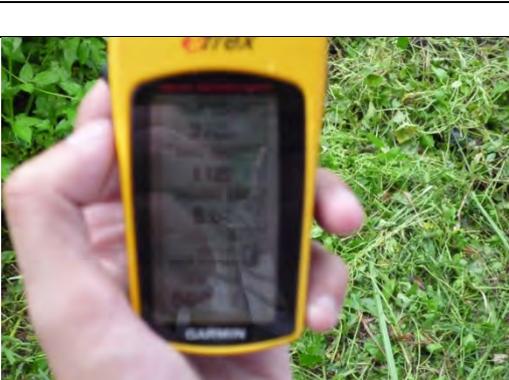
Drawing No.
FIGURE 4_1

Designed	HC	HWG	EC	EC
Drawn	MHC	HWG	EC	EC
Checked	HC	HWG	EC	EC
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Project	2552/08	Scale	PRE	Rev
Project	2552/08	Scale	PRE	Rev

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Photographic Records for Water Quality Monitoring Location

	
<p>Alternative Location of WM1</p>	<p>Co-ordinates of Alternative Location of WM1</p>
	
<p>Alternative Location of WM1 - Control</p>	<p>Co-ordinates of Alternative Location of WM1 - Control</p>
	
<p>Alternative Location of WM2A</p>	<p>Co-ordinates of Alternative Location of WM2A</p>
	
<p>Alternative Location of WM2-Control A</p>	<p>Co-ordinates of Alternative Location of WM2 - Control</p>



Location of WM2B-Control



Co-ordinates of WM2B-Control



Location of WM2B



Co-ordinates of WM2B



Location of WM3-Control



Co-ordinates of WM3-Control



Location of WM3



Co-ordinates of WM3



Location of WM4-Control A



Co-ordinates of WM4-Control A



Location of WM4-Control B



Co-ordinates of WM4-Control B



Location of WM4



Co-ordinates of WM4

Appendix F

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

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Garden Farm, Tsung Yuen Ha Village
 Location ID : AM1a

Date of Calibration: 21/10/2014
 Next Calibration Date: 21/12/2014
 Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa) 1015.2
 Temperature (°C) 27.3

Corrected Pressure (mm Hg) 761.4
 Temperature (K) 300

CALIBRATION ORIFICE

Make-> TISCH
 Model-> 5025A
 Serial # -> 1612

Qstd Slope -> 2.00757
 Qstd Intercept -> -0.01628

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	6.1	6.1	12.2	1.743	50	49.85	Slope =	31.2132	
13	4.7	4.7	9.4	1.531	43	42.87	Intercept =	-4.6874	
10	3.6	3.6	7.2	1.341	37	36.89	Corr. coeff. =	0.9989	
7	2.2	2.2	4.4	1.050	29	28.92			
5	1.5	1.5	3.0	0.868	22	21.94			

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H20(Pa/Pstd)(Tstd/Ta))-b]$$

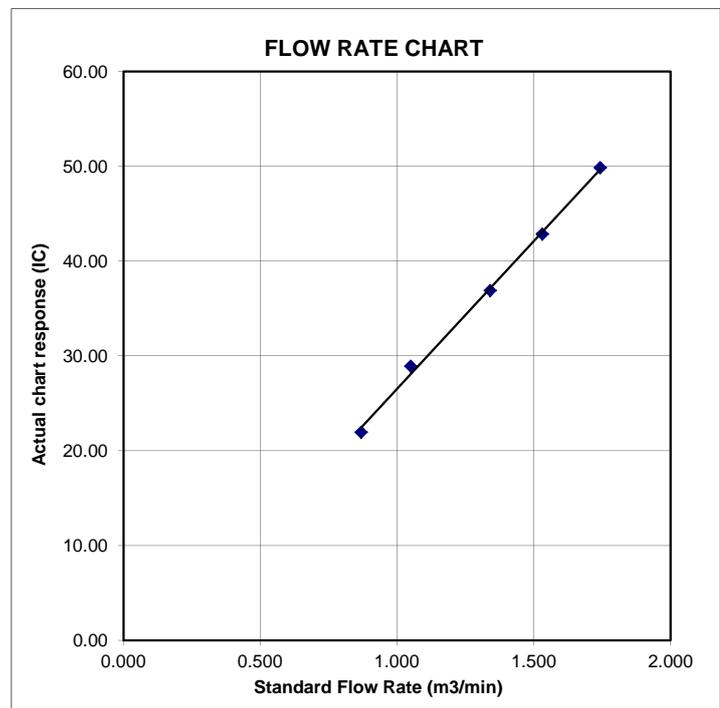
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate
 IC = corrected chart responses
 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:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

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 near Lin Ma Hang Road
 Location ID : AM2

Date of Calibration: 21/10/2014
 Next Calibration Date: 21/12/2014
 Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1015.2	Corrected Pressure (mm Hg)	761.4
Temperature (°C)	27.3	Temperature (K)	300

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00757
Model->	5025A	Qstd Intercept ->	-0.01628
Serial # ->	1612		

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.6	5.6	11.2	1.670	58	57.83	Slope = 34.4826 Intercept = -0.4064 Corr. coeff. = 0.9957
13	4.5	4.5	9.0	1.498	52	51.85	
10	3.6	3.6	7.2	1.341	44	43.87	
7	2.3	2.3	4.6	1.073	37	36.89	
5	1.3	1.3	2.6	0.809	28	27.92	

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

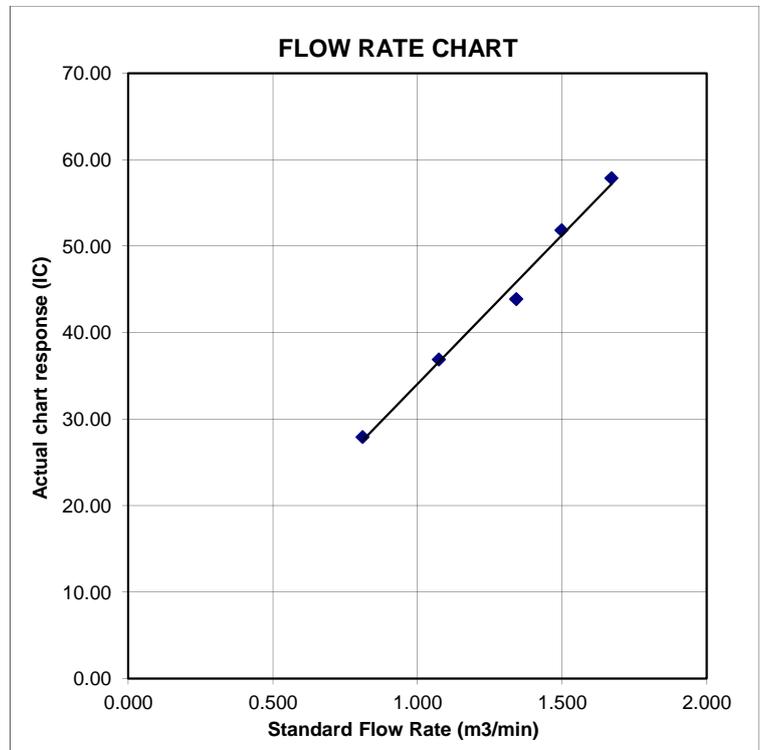
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate
 IC = corrected chart responses
 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:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

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
 Location ID : AM3

Date of Calibration: 21/10/2014
 Next Calibration Date: 21/12/2014
 Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1015.2	Corrected Pressure (mm Hg)	761.4
Temperature (°C)	27.3	Temperature (K)	300

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00757
Model->	5025A	Qstd Intercept ->	-0.01628
Serial # ->	1612		

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.9	5.9	11.8	1.714	56	55.84	Slope = 31.6174 Intercept = 0.1254 Corr. coeff. = 0.9932
13	4.7	4.7	9.4	1.531	48	47.86	
10	3.7	3.7	7.4	1.359	42	41.88	
7	2.4	2.4	4.8	1.096	34	33.90	
5	1.4	1.4	2.8	0.839	28	27.92	

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

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:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

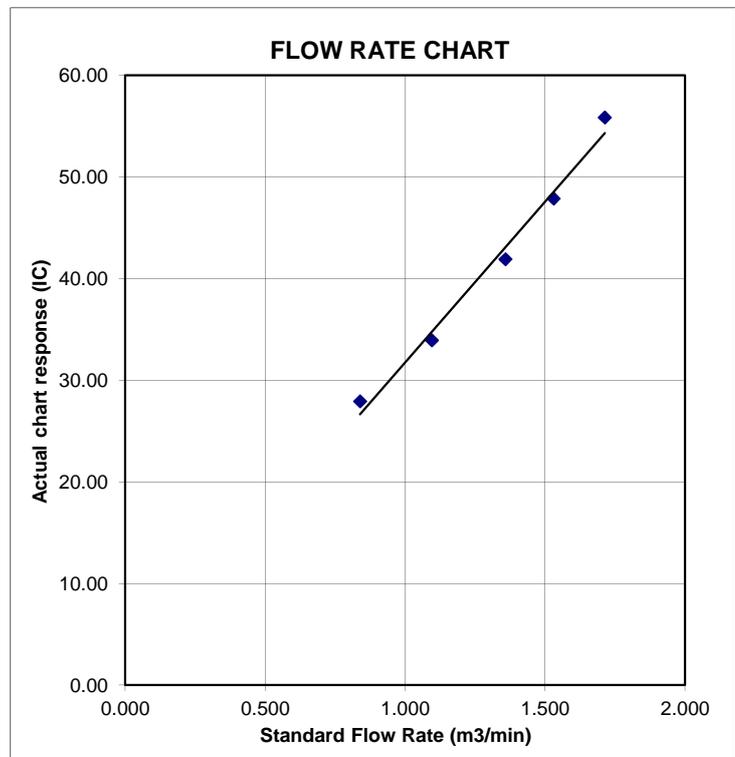
m = sampler slope

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

Date of Calibration: 21/10/2014

Location ID : AM7b

Next Calibration Date: 21/12/2014

Technician: C Y Keung

CONDITIONS

Sea Level Pressure (hPa) 1015.2
 Temperature (°C) 27.3

Corrected Pressure (mm Hg) 761.4
 Temperature (K) 300

CALIBRATION ORIFICE

Make-> TISCH
 Model-> 5025A
 Serial # -> 1612

Qstd Slope -> 2.00757
 Qstd Intercept -> -0.01628

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.5	4.5	9.0	1.498	54	53.84	Slope = 36.0946 Intercept = -0.1066 Corr. coeff. = 0.9998
13	3.5	3.5	7.0	1.322	48	47.86	
10	2.7	2.7	5.4	1.162	42	41.88	
7	1.8	1.8	3.6	0.950	34	33.90	
5	1.1	1.1	2.2	0.745	27	26.92	

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

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:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

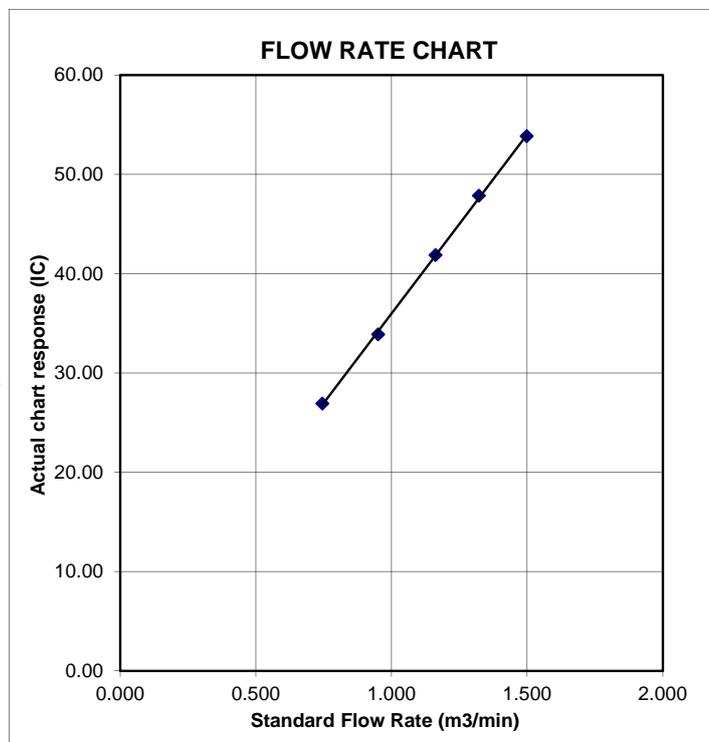
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Po Kat Tsai Village No. 4
 Location ID : AM8

Date of Calibration: 21/10/2014
 Next Calibration Date: 21/12/2014
 Technician: C Y Keung

CONDITIONS

Sea Level Pressure (hPa)	1015.2	Corrected Pressure (mm Hg)	761.4
Temperature (°C)	27.3	Temperature (K)	300

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00757
Model->	5025A	Qstd Intercept ->	-0.01628
Serial # ->	1612		

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	5.8	5.8	11.6	1.700	63	62.82	Slope = 38.2955 Intercept = -3.3425 Corr. coeff. = 0.9952		
13	4.7	4.7	9.4	1.531	55	54.84			
10	3.7	3.7	7.4	1.359	49	48.86			
7	2.9	2.9	5.8	1.204	41	40.88			
5	1.4	1.4	2.8	0.839	30	29.91			

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

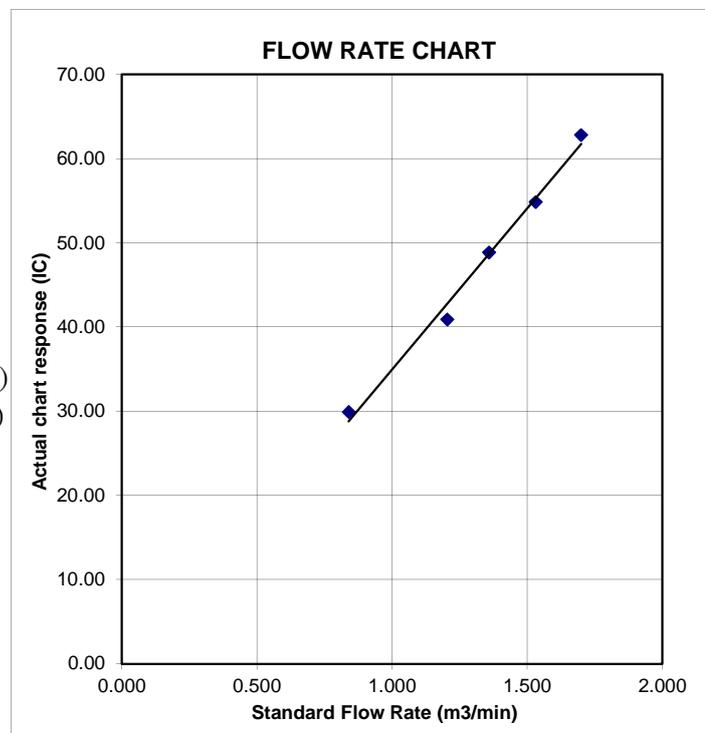
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate
 IC = corrected chart responses
 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:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

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
 Location ID : AM9b

Date of Calibration: 21/10/2014
 Next Calibration Date: 21/12/2014
 Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1015.2	Corrected Pressure (mm Hg)	761.4
Temperature (°C)	27.3	Temperature (K)	300

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00757
Model->	5025A	Qstd Intercept ->	-0.01628
Serial # ->	1612		

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.9	5.9	11.8	1.714	57	56.83	Slope = 28.0192 Intercept = 8.1853 Corr. coeff. = 0.9983
13	4.7	4.7	9.4	1.531	51	50.85	
10	3.6	3.6	7.2	1.341	45	44.87	
7	2.2	2.2	4.4	1.050	38	37.89	
5	1.4	1.4	2.8	0.839	32	31.91	

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

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:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

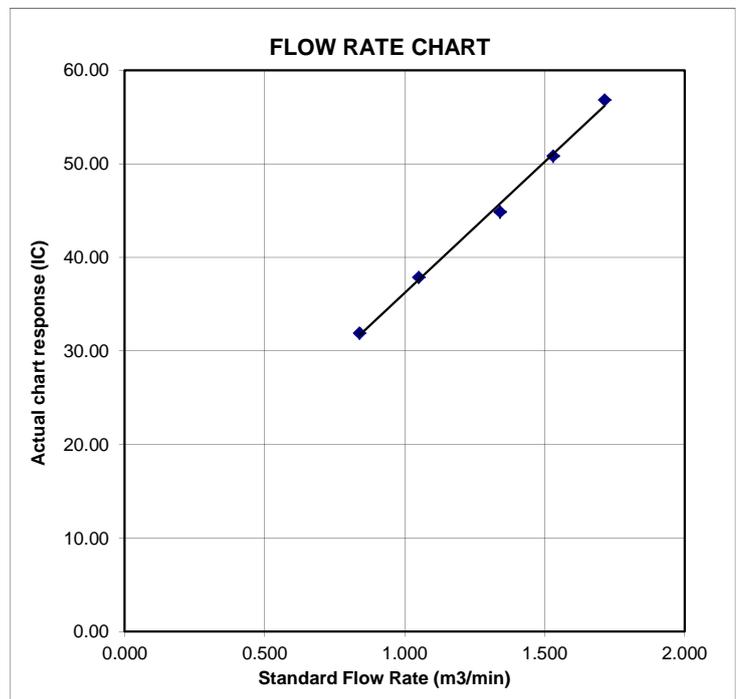
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





TISCH ENVIRONMENTAL, INC.
 145 SOUTH MIAMI AVE
 VILLAGE OF CLEVELAND, OH
 45002
 513.467.9000
 877.263.7610 TOLL FREE
 513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Apr 07, 2014 Rootmeter S/N 0438320 Ta (K) - 294
 Operator Tisch Orifice I.D. - 1612 Pa (mm) - 742.95

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3940	3.2	2.00
2	NA	NA	1.00	0.9790	6.4	4.00
3	NA	NA	1.00	0.8800	7.8	5.00
4	NA	NA	1.00	0.8350	8.8	5.50
5	NA	NA	1.00	0.6910	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9866	0.7077	1.4077	0.9957	0.7142	0.8896
0.9823	1.0034	1.9908	0.9914	1.0127	1.2581
0.9804	1.1140	2.2258	0.9894	1.1243	1.4066
0.9791	1.1726	2.3345	0.9881	1.1834	1.4753
0.9739	1.4094	2.8155	0.9829	1.4224	1.7793
Qstd slope (m) = 2.00757			Qa slope (m) = 1.25710		
intercept (b) = -0.01628			intercept (b) = -0.01029		
coefficient (r) = 0.99989			coefficient (r) = 0.99989		
y axis = $\text{SQRT}[\text{H2O}(\text{Pa}/760)(298/\text{Ta})]$			y axis = $\text{SQRT}[\text{H2O}(\text{Ta}/\text{Pa})]$		

CALCULATIONS

$V_{std} = \text{Diff. Vol} [(\text{Pa} - \text{Diff. Hg}) / 760] (298 / \text{Ta})$
 $Q_{std} = V_{std} / \text{Time}$

$V_a = \text{Diff Vol} [(\text{Pa} - \text{Diff Hg}) / \text{Pa}]$
 $Q_a = V_a / \text{Time}$

For subsequent flow rate calculations:

$Q_{std} = 1/m \{ [\text{SQRT}(\text{H2O}(\text{Pa}/760)(298/\text{Ta}))] - b \}$
 $Q_a = 1/m \{ [\text{SQRT}(\text{H2O}(\text{Ta}/\text{Pa}))] - b \}$

CALIBRATION CERTIFICATE

Date: February 26, 2014

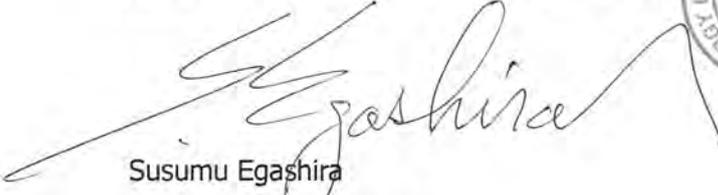
Equipment Name	:	Laser Dust Monitor, Model LD-3B
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	3Y6502
Sensitivity	:	0.001 mg/m ³
Sensitivity Adjustment	:	563 CPM
Scale Setting	:	February 25, 2014

We hereby certify that the above mentioned instrument has been calibrated satisfactorily.

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.




Susumu Egashira
Overseas Sales Division

SIBATA SCIENTIFIC TECHNOLOGY LTD.

1-1-62, Nakane, Soka, Saitama, 340-0005 Japan

TEL : 048-933-1582 FAX : 048-933-1591

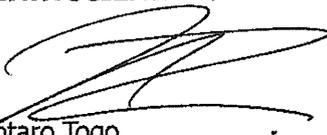
CALIBRATION CERTIFICATE

Date: December 18, 2013

Equipment Name	:	Laser Dust Monitor, Model LD-3B
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	3Y6505
Sensitivity	:	0.001 mg/m ³
Sensitivity Adjustment	:	591 CPM
Calibration Date	:	November 12, 2013

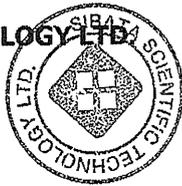
We hereby certify that the above mentioned instrument has been calibrated satisfactorily.

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.
Kentaro Togo

Section Manager

Overseas Sales Division



CALIBRATION CERTIFICATE

Date: May 30, 2014

Equipment Name	:	Laser Dust Monitor, Model LD-3B	(EQ113)
Code No.	:	080000-42	
Quantity	:	1 unit	
Serial No.	:	456658	
Sensitivity	:	0.001 mg/m ³	
Sensitivity Adjustment	:	702 CPM	
Scale Setting	:	May 24, 2014	

We hereby certify that the avobe mentioned instrmt has been calibrated satisfactory.

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.



Kentaro Togo

Overseas Sales Division

CALIBRATION CERTIFICATE

Date: May 30, 2014

Equipment Name	:	Laser Dust Monitor, Model LD-3B (EQ116)
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	456659
Sensitivity	:	0.001 mg/m ³
Sensitivity Adjustment	:	727 CPM
Scale Setting	:	May 24, 2014

We hereby certify that the avobe mentioned instrment has been calibrated satisfactory.

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.



Kentaro Togo
Overseas Sales Division

CALIBRATION CERTIFICATE

Date: May 30, 2014

Equipment Name	: Laser Dust Monitor, Model LD-3B	(EQU117)
Code No.	: 080000-42	
Quantity	: 1 unit	
Serial No.	: 456660	
Sensitivity	: 0.001 mg/m3	
Sensitivity Adjustment	: 598 CPM	
Scale Setting	: May 24, 2014	

We hereby certify that the avobe mentioned instrmt has been calibrated satisfactory.

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.

Kentaro Togo
Overseas Sales Division

Equipment Calibration Record

Equipment Calibrated:

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

Standard Equipment:

Standard Equipment: Higher Volume Sampler
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018
 Last Calibration Date: 6 January 2014

Equipment Calibration Results:

Calibration Date: 16 & 17 January 2014

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
4hr23min	10:20 ~ 14:43	19.5	1024.3	0.031	3528	13.4
2hr55min	14:55 ~ 17:50	19.5	1024.3	0.052	3722	21.2
5hr19min	12:45 ~ 18:04	20.1	1023.3	0.102	14812	46.4

Sensitivity Adjustment Scale Setting (Before Calibration) 590 (CPM)

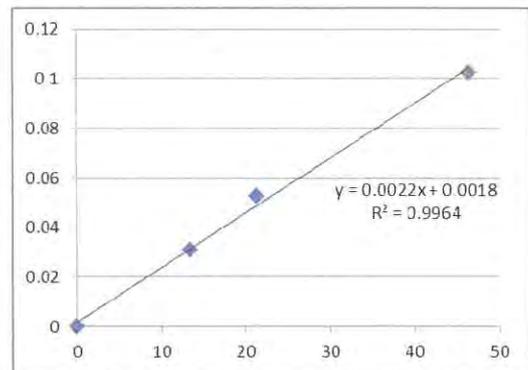
Sensitivity Adjustment Scale Setting (After Calibration) 597 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9964

Validity of Calibration Record 22 Jan 2014



Operator: Tung Chi Sun Signature:  Date: 22 January 2014

QC Reviewer: Ben Tam Signature:  Date: 22 January 2014

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Gold King Industrial Building, Kwai Chung
 Location ID : Calibration Room

Date of Calibration: 6-Jan-14
 Next Calibration Date: 6-Apr-14

CONDITIONS

Sea Level Pressure (hPa)	1018	Corrected Pressure (mm Hg)	763.5
Temperature (°C)	18.5	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11662
Model->	5025A	Qstd Intercept ->	-0.01714
Calibration Date->	9-Apr-13	Expiry Date->	9-Apr-14

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	5.8	5.8	11.6	1.639	56	56.75	23.4751	17.5690	0.9966
13	4.6	4.6	9.2	1.460	50	50.67			
10	2.8	2.8	5.6	1.141	44	44.59			
8	1.6	1.6	3.2	0.865	38	38.51			
5	0.9	0.9	1.8	0.650	32	32.43			

Calculations :

$$Q_{std} = 1/m[\text{Sqrt}(H_2O(P_a/P_{std})(T_{std}/T_a))-b]$$

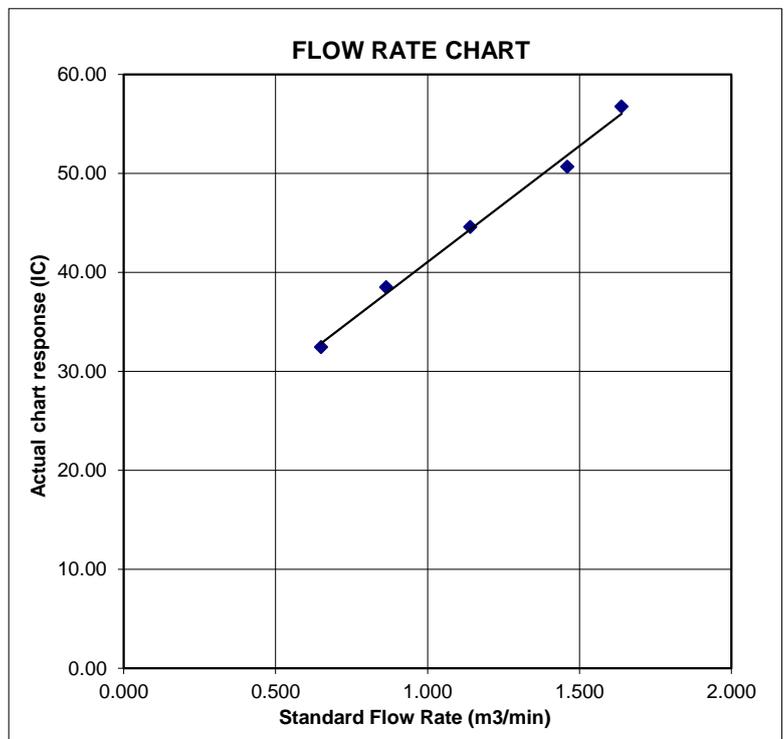
$$IC = I[\text{Sqrt}(P_a/P_{std})(T_{std}/T_a)]$$

Qstd = standard flow rate
 IC = corrected chart responses
 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:

$$1/m((I)[\text{Sqrt}(298/T_{av})(P_{av}/760)]-b)$$

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





輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C142545

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-0853)

Date of Receipt / 收件日期 : 14 April 2014

Description / 儀器名稱 : Acoustical Calibrator (EQ081)

Manufacturer / 製造商 : Brüel & Kjær

Model No. / 型號 : 4231

Serial No. / 編號 : 2326408

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 : $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 : $(55 \pm 20)\%$

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 26 April 2014

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

All results are within 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
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By

測試


K C Lee
Project Engineer

Certified By

核證


K M Wu
Engineer

Date of Issue

簽發日期

29 April 2014

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室所書面批准。

Sun Creation Engineering Limited - Calibration & Testing Laboratory

c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

c/n 香港新界屯門興安里一號青山灣機樓四樓

Tel/電話: 2927 2606

Fax/傳真: 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C142545

證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C133632
CL281	Multifunction Acoustic Calibrator	DC130171
TST150A	Measuring Amplifier	C141558

- Test procedure : MA100N.

- 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	94.0	± 0.2	± 0.2
114 dB, 1 kHz	114.0		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000 0	1 kHz ± 0.1 %	± 0.1

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

Note :

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.



輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration 校正證書

Certificate No. : C142221

證書編號

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

Note :

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.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室所書面批准。

Sun Creation Engineering Limited - Calibration & Testing Laboratory

c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號青山灣機樓四樓

Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com



Certificate of Calibration 校正證書

Certificate No. : C142223
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-0853) Date of Receipt / 收件日期 : 28 March 2014
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 : $(23 \pm 2)^{\circ}\text{C}$ Relative Humidity / 相對濕度 : $(55 \pm 20)\%$
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 8 April 2014

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within 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
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By : 
測試 : K C Lee
Project Engineer

Certified By : 
核證 : K M Wu
Engineer

Date of Issue : 10 April 2014
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室所書面批准。

Certificate of Calibration

校正證書

Certificate No. : C142223
證書編號

- 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.
- Self-calibration was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C140016
CL281	Multifunction Acoustic Calibrator	DC130171

- Test procedure : MA101N.

- 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	93.9	± 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	93.9 (Ref.)
				104.00		103.9
				114.00		113.9

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	93.9	Ref.
			Slow			93.9	± 0.3

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C142223

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	67.7	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.5
					250 Hz	85.2	-8.6 ± 1.4
					500 Hz	90.6	-3.2 ± 1.4
					1 kHz	93.9	Ref.
					2 kHz	95.1	+1.2 ± 1.6
					4 kHz	94.9	+1.0 ± 1.6
					8 kHz	92.8	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.4	-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 _A	C	Fast	94.00	63 Hz	93.0	-0.8 ± 1.5
					125 Hz	93.7	-0.2 ± 1.5
					250 Hz	93.9	0.0 ± 1.4
					500 Hz	93.9	0.0 ± 1.4
					1 kHz	93.9	Ref.
					2 kHz	93.7	-0.2 ± 1.6
					4 kHz	93.1	-0.8 ± 1.6
					8 kHz	90.9	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.5	-6.2 (+3.0 ; -6.0)

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 04596

- 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 :

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.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。



輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C142224

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-0853)

Date of Receipt / 收件日期 : 28 March 2014

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 : $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 : $(55 \pm 20)\%$

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 8 April 2014

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

All results are within manufacturer's specification.

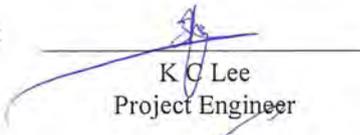
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By :

測試


K C Lee
Project Engineer

Certified By :

核證


K M Wu
Engineer

Date of Issue :

簽發日期

10 April 2014

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Sun Creation Engineering Limited - Calibration & Testing Laboratory

c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號青山灣機樓四樓

Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C142224

證書編號

- 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.
- Self-calibration was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C140016
CL281	Multifunction Acoustic Calibrator	DC130171

- Test procedure : MA101N.

- 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	93.7	± 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	93.7 (Ref.)
				104.00		103.7
				114.00		113.7

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	93.7	Ref.
			Slow			93.7	± 0.3

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Certificate No. : C142224

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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	67.4	-26.2 ± 1.5
					125 Hz	77.5	-16.1 ± 1.5
					250 Hz	85.0	-8.6 ± 1.4
					500 Hz	90.4	-3.2 ± 1.4
					1 kHz	93.7	Ref.
					2 kHz	94.9	+1.2 ± 1.6
					4 kHz	94.7	+1.0 ± 1.6
					8 kHz	92.6	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.3	-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 _A	C	Fast	94.00	63 Hz	92.8	-0.8 ± 1.5
					125 Hz	93.5	-0.2 ± 1.5
					250 Hz	93.7	0.0 ± 1.4
					500 Hz	93.7	0.0 ± 1.4
					1 kHz	93.7	Ref.
					2 kHz	93.5	-0.2 ± 1.6
					4 kHz	92.9	-0.8 ± 1.6
					8 kHz	90.7	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.3	-6.2 (+3.0 ; -6.0)

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 04223

- 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 :

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.

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TEST REPORT
for
PRECISION
SOUND LEVEL METER
(NX-42EX installed)

Model : N L - 5 2

Serial No. : 00142580

Microphone No. : 06011

Preamplifier No. : 32608

Condition : Temperature 25 °C

Humidity 30 %RH

Date : March, 12, 2014

Signature : *Y. Narayana*

Pass

1. Frequency weightings (Fig. 1)

- Frequency weighting A
- Frequency weighting C
- Frequency weighting Z

2. Level linearity error (dB)

Reference signal level (Ref.) : 94.0 dB (at 1 kHz, 8 kHz), 74.0 dB (at 31.5 Hz)

Frequency weighting : A

Frequency \ Indicated value	Difference with Reference signal level (dB)						
	25.0	74.0	94.0	98.0	114.0	136.0	138.0
31.5 Hz	-0.2	Ref.	—	-0.1	—	—	—
1 kHz	0.0	—	Ref.	—	0.0	—	0.0
8 kHz	0.0	—	Ref.	—	—	0.0	—
Tolerance limit	±0.3	—	—	±0.3	±0.2	±0.3	±0.3

3. Toneburst response (Time weighted sound level)

Input signal level : 127 dB

Toneburst : Frequency : 4 kHz, duration : 0.25 ms

Frequency weighting : A, Time-weighting : F

(dB)			
Design goal	Indicated value	Difference	Tolerance limit
100.0	99.7	-0.3	±1.0

4. Time weighting I (impulse)

Input signal level : 120 dB

Toneburst : Frequency : 4 kHz, duration : 5 ms, period : 500 ms

Frequency weighting : A

(dB)			
Design goal	Indicated value	Difference	Tolerance limit
111.2	110.3	-0.9	±2.0

*When the optional Extended Function Program NX-42EX is installed, time weighting I(impulse) can be selected in only sub-channel.

5. Peak sound level (dB)

Frequency weighting : C

Frequency (Hz)	Number of cycles in test signal	(dB)				
		Input signal level	Design goal	Indicated value	Difference	Tolerance limit
			L_c	L_{cpeak}		
31.5	1 cycle	137.0	136.5	137.3	0.8	±2.0
500	Positive half cycle	137.0	139.4	139.2	-0.2	±1.0
	Negative half cycle	137.0	139.4	139.2	-0.2	±1.0

6. Response to repeated to toneburst

Input signal level : 130.0 dB + 8 dB

Frequency weighting : A, Time-weighting : S

Toneburst : Frequency : 2 kHz, duration : 5 ms, period : 25 ms

(dB)				
Peak-to-rms ratio	Design goal	Indicated value	Difference	Tolerance limit
3.16	131.0	131.0	0.0	±0.5

7. Inherent noise level (dB)

(dB)		
Frequency weighting	Indicated value	Tolerance limit
A	10.5	17 or less
C	15.0	25 or less
Z	20.6	30 or less

8. Instrumental error

84.0 dB ± 0.7 dB

0.0 dB

Applicable standards

JIS C 1509-1 : 2005 Class 1

IEC 61672-1 : 2002 Class 1

ANSI S1.4-1983 Type 1

ANSI S1.43-1997 Type 1

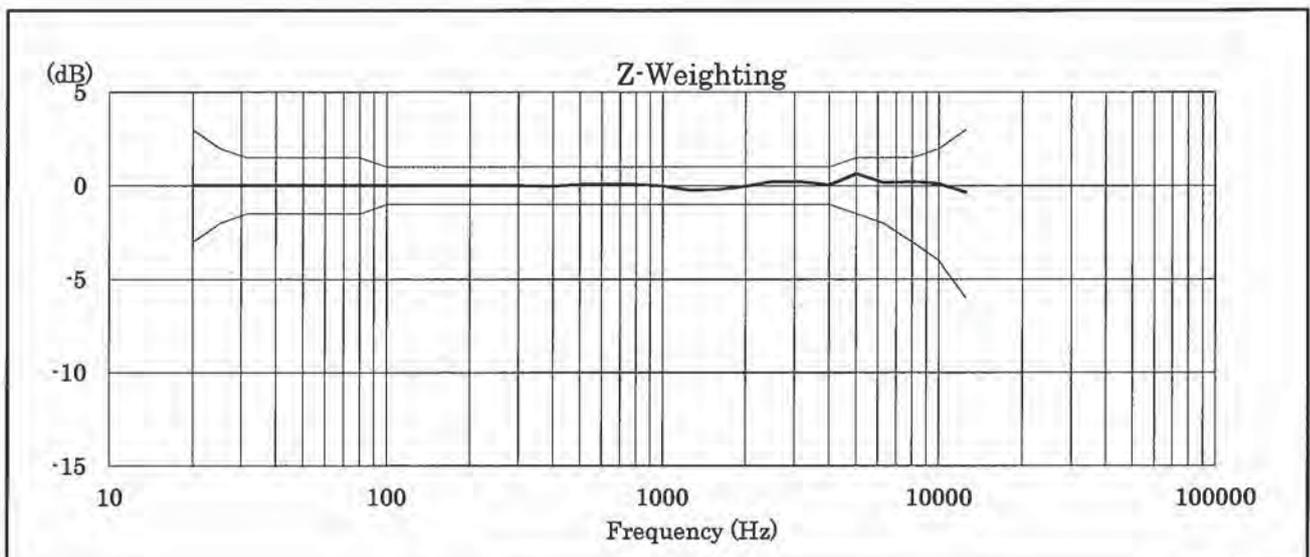
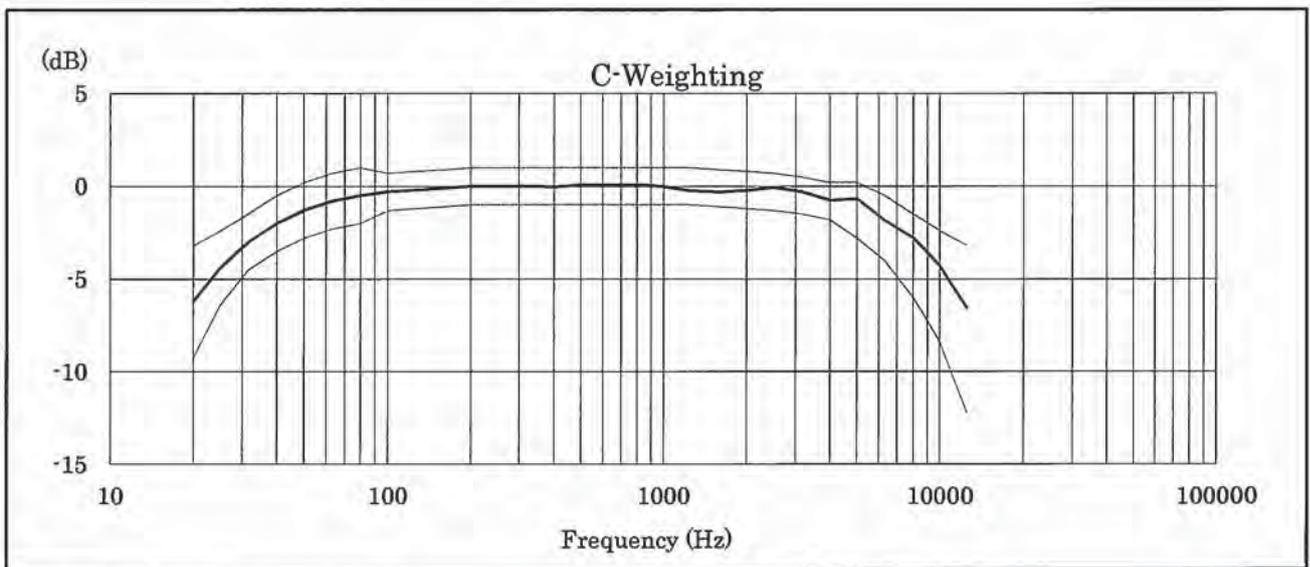
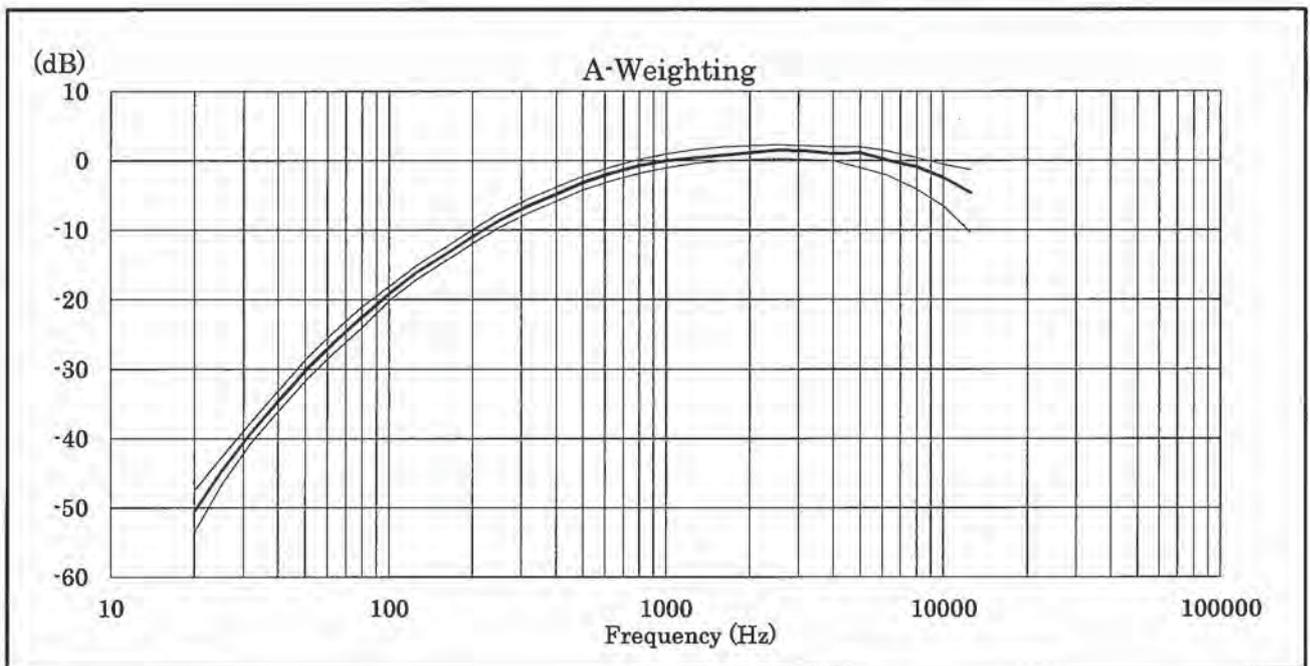
CE marking (EMC Directive 2004/108/EC, Low Voltage Directive 2006/95/EC)

WEEE Directive (2002/96/EC)

Chinese RoHS



Relative free field frequency response





輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C142547

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-0853)

Date of Receipt / 收件日期 : 14 April 2014

Description / 儀器名稱 : Sound Level Meter (EQ067)

Manufacturer / 製造商 : Rion

Model No. / 型號 : NL-31

Serial No. / 編號 : 00410221

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 : $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 : $(55 \pm 20)\%$

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 26 April 2014

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

All results are within 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
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By :
測試


K C Lee
Project Engineer

Certified By :
核證


K M Wu
Engineer

Date of Issue : 29 April 2014
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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e/n 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

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Tel/電話: 2927 2606

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E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C142547

證書編號

- 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.
- Self-calibration was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C140016
CL281	Multifunction Acoustic Calibrator	DC130171

- Test procedure : MA101N.

- 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)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L _A	A	Fast	94.00	1	93.8	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L _A	A	Fast	94.00	1	93.8 (Ref.)
				104.00		103.8
				114.00		113.9

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)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L _A	A	Fast	94.00	1	93.8	Ref.
			Slow			93.8	± 0.3

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Certificate of Calibration

校正證書

Certificate No. : C142547

證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class I Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L _A	A	Fast	94.00	63 Hz	67.6	-26.2 ± 1.5
					125 Hz	77.6	-16.1 ± 1.5
					250 Hz	85.1	-8.6 ± 1.4
					500 Hz	90.5	-3.2 ± 1.4
					1 kHz	93.8	Ref.
					2 kHz	95.1	+1.2 ± 1.6
					4 kHz	94.9	+1.0 ± 1.6
					8 kHz	92.8	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.9	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class I Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L _C	C	Fast	94.00	63 Hz	92.9	-0.8 ± 1.5
					125 Hz	93.6	-0.2 ± 1.5
					250 Hz	93.8	0.0 ± 1.4
					500 Hz	93.8	0.0 ± 1.4
					1 kHz	93.8	Ref.
					2 kHz	93.7	-0.2 ± 1.6
					4 kHz	93.2	-0.8 ± 1.6
					8 kHz	90.9	-3.0 (+2.1 ; -3.1)
					12.5 kHz	88.0	-6.2 (+3.0 ; -6.0)

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Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C142547

證書編號

Remarks : - UUT Microphone Model No. : UC-53A & S/N : 319734

- 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 :

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輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration 校正證書

Certificate No. : C142873
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-0853)

Date of Receipt / 收件日期 : 8 May 2014

Description / 儀器名稱 : Integrating Sound Level Meter (EQ065)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2238
Serial No. / 編號 : 2337676
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 : (55 ± 20)%

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 13 May 2014

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within 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
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By
測試


K C Lee
Project Engineer

Certified By
核證


K M Wu
Engineer

Date of Issue
簽發日期

15 May 2014

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Certificate No. : C142873

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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 laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.
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	C140016
CL281	Multifunction Acoustic Calibrator	DC130171

5. Test procedure : MA101N.

6. Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

- 6.1.1.1 Before Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L _{AFF}	A	F	94.00	1	94.2

- 6.1.1.2 After Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L _{AFF}	A	F	94.00	1	94.0	± 0.7

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L _{AFF}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

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Certificate of Calibration

校正證書

Certificate No. : C142873

證書編號

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L _{AFP}	A	F	94.00	1	94.0	Ref.
	L _{ASP}		S			94.0	± 0.1
	L _{AIP}		I			94.1	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L _{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L _{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L _{ASP}	S	Continuous		106.0	Ref.	
	L _{ASMax}		500 ms		102.0	-4.1 ± 1.0	

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L _{AFP}	A	F	94.00	31.5 Hz	54.8	-39.4 ± 1.5
					63 Hz	67.9	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.7	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)					

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室所書面批准。

Certificate of Calibration

校正證書

Certificate No. : C142873
證書編號

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L _{CFP}	C	F	94.00	31.5 Hz	91.1	-3.0 ± 1.5
					63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.0
					250 Hz	93.9	0.0 ± 1.0
					500 Hz	94.0	0.0 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L _{Aeq}	A	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
								90	89.7	± 0.5
								80	79.7	± 1.0
								70	69.7	± 1.0
			60 sec.			1/10 ²				
			5 min.			1/10 ³				
						1/10 ⁴				

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2812708

- Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB	31.5 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)
	Burst equivalent level	: ± 0.2 dB (Ref. 110 dB continuous sound level)

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

Note :

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.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校準之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

Sun Creation Engineering Limited - Calibration & Testing Laboratory

Unit 4/F, Tsing Shan Wai Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

Unit 4/F, Tsing Shan Wai Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT: MR BEN TAM
CLIENT: ACTION UNITED ENVIRO SERVICES
ADDRESS: RM A 20/F., GOLDEN KING IND BLDG,
NO. 35-41 TAI LIN PAI ROAD,
KWAI CHUNG,
N.T., HONG KONG

WORK ORDER: HK1434253
LABORATORY: HONG KONG
DATE RECEIVED: 07/10/2014
DATE OF ISSUE: 27/10/2014

COMMENTS

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 ALS Hong Kong laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test: Dissolved Oxygen and Temperature
Description: Multifunctional Meter
Brand Name: YSI
Model No.: 550A
Serial No.: 05F2063AZ
Equipment No.: --
Date of Calibration: 07 October, 2014

NOTES

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.


Mr Fung Lim Chee, Richard
General Manager
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1434253
Date of Issue: 27/10/2014
Client: ACTION UNITED ENVIRO SERVICES



Description: Multifunctional Meter
Brand Name: YSI
Model No.: 550A
Serial No.: 05F2063AZ
Equipment No.: --
Date of Calibration: 07 October, 2014

Date of next Calibration: 07 January, 2015

Parameters:

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

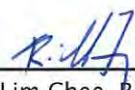
Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.00	2.99	-0.01
5.02	4.93	-0.09
8.05	8.01	-0.04
Tolerance Limit (mg/L)		±0.20

Temperature

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

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)
11.0	11.8	+0.8
22.0	23.0	+1.0
38.0	38.5	+0.5
Tolerance Limit (°C)		±2.0

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


 Mr Fung Lim Chee, Richard
 General Manager
 Greater China & Hong Kong



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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT: MR BEN TAM
CLIENT: ACTION UNITED ENVIRO SERVICES
ADDRESS: RM A 20/F., GOLDEN KING IND BLDG,
NO. 35-41 TAI LIN PAI ROAD,
KWAI CHUNG,
PROJECT: N.T., HONG KONG

WORK ORDER: HK1432526
LABORATORY: HONG KONG
DATE RECEIVED: 07/10/2014
DATE OF ISSUE: 16/10/2014

COMMENTS

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 ALS Hong Kong laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test: pH
Description: pH meter
Brand Name: --
Model No.: 8685
Serial No.: 212632
Equipment No.: --
Date of Calibration: 07 October, 2014

NOTES

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.


Mr Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1432526
Date of Issue: 16/10/2014
Client: ACTION UNITED ENVIRO SERVICES



Description: pH meter
Brand Name: --
Model No.: 8685
Serial No.: 212632
Equipment No.: --

Date of Calibration: 07 October, 2014

Date of next Calibration:

07 January, 2015

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	7.1	+0.10
10.0	10.1	+0.10
	Tolerance Limit (pH Unit)	±0.20

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


Mr Fung Lim Chee, Richard
General Manager -
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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT: MR BEN TAM
CLIENT: ACTION UNITED ENVIRO SERVICES
ADDRESS: RM A 20/F., GOLDEN KING IND BLDG,
NO. 35-41 TAI LIN PAI ROAD,
KWAI CHUNG,
N.T., HONG KONG

WORK ORDER: HK1434245
LABORATORY: HONG KONG
DATE RECEIVED: 21/10/2014
DATE OF ISSUE: 27/10/2014

COMMENTS

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 ALS Hong Kong laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test: Turbidity
Equipment Type: Turbidimeter
Brand Name: HACH
Model No.: 2100Q
Serial No.: 11030C008499
Equipment No.: --
Date of Calibration: 24 October, 2014

NOTES

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.


Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION



Work Order: HK1434245
Date of Issue: 27/10/2014
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: Turbidimeter
Brand Name: HACH
Model No.: 2100Q
Serial No.: 11030C008499
Equipment No.: --
Date of Calibration: 24 October, 2014

Date of next Calibration: 24 January, 2015

Parameters:

Turbidity

Method Ref: APHA 21st Ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.02	--
4	3.67	-8.3
40	38.1	-4.8
80	74.2	-7.3
400	377	-5.8
800	830	+3.8
	Tolerance Limit (%)	±10

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

A handwritten signature in blue ink, appearing to read 'Richard Fung Lim Chee'.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong



Hong Kong Accreditation Service
香港認可處

Certificate of Accreditation
認可證書

This is to certify that
特此證明

ALS TECHNICHEM (HK) PTY LIMITED

11/F., Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, New Territories, Hong Kong
香港新界葵涌永業街1-3號忠信針織中心11樓

has been accepted by the HKAS Executive, on the recommendation of the Accreditation Advisory Board, as a
為香港認可處執行機關根據認可諮詢委員會建議而接受的

HOKLAS Accredited Laboratory
「香港實驗所認可計劃」認可實驗所

This laboratory meets the requirements of ISO / IEC 17025 : 2005 – General requirements for the competence of testing and calibration laboratories and it has been accredited for performing specific tests or calibrations as listed in the HOKLAS Directory of Accredited Laboratories within the test category of
此實驗所符合ISO / IEC 17025 : 2005 – 《測試及校正實驗所能力的通用規定》所訂的要求，獲認可進行載於香港實驗所認可計劃《認可實驗所名冊》內下述測試類別中的指定
測試或校正工作

Environmental Testing
環境測試

This laboratory is accredited in accordance with the recognised International Standard ISO / IEC 17025 : 2005.
本實驗所乃根據公認的國際標準 ISO / IEC 17025 : 2005 獲得認可。

This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (see joint IAF-ILAC-ISO Communiqué).
這項認可資格演示在指定範疇所需的技術能力及實驗所質量管理體系的運作
(見國際認可論壇、國際實驗所認可合作組織及國際標準化組織的聯合公報)。

The common seal of the Hong Kong Accreditation Service is affixed hereto by the authority of the HKAS Executive
香港認可處根據認可處執行機關的權限在此蓋上通用印章

CHAN Sing Sing, Terence, Executive Administrator
執行幹事 陳成城
Issue Date : 5 May 2009
簽發日期：二零零九年五月五日

Registration Number : **HOKLAS 066**
註冊號碼：

Date of First Registration : 15 September 1995
首次註冊日期：一九九五年九月十五日



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

Event and Action Plan for Construction Noise

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

Event and Action Plan for Water Quality

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

Appendix H

Impact Monitoring Schedule

Impact Monitoring Schedule for the Reporting Period – November 2014

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
Sat	1-Nov-14	C3&C5		C3&C5	C3 & C5
Sun	2-Nov-14				
Mon	3-Nov-14		C2&C3 & C5		C3 & C5
Tue	4-Nov-14	C2		C2	
Wed	5-Nov-14				C3 & C5
Thu	6-Nov-14				
Fri	7-Nov-14	C3&C5		C3&C5	C3 & C5
Sat	8-Nov-14		C2&C3 & C5		
Sun	9-Nov-14				
Mon	10-Nov-14	C2		C2	C3 & C5
Tue	11-Nov-14				
Wed	12-Nov-14				
Thu	13-Nov-14	C3&C5		C3&C5	C3 & C5
Fri	14-Nov-14		C2&C3 & C5		
Sat	15-Nov-14	C2		C2	C3 & C5
Sun	16-Nov-14				
Mon	17-Nov-14				C3 & C5
Tue	18-Nov-14				
Wed	19-Nov-14	C3&C5		C3&C5	C3 & C5
Thu	20-Nov-14		C2&C3 & C5		
Fri	21-Nov-14	C2		C2	C3 & C5
Sat	22-Nov-14				
Sun	23-Nov-14				
Mon	24-Nov-14				
Tue	25-Nov-14	C3&C5		C3&C5	C3 & C5
Wed	26-Nov-14		C2&C3 & C5		
Thu	27-Nov-14	C2		C2	C3 & C5
Fri	28-Nov-14				
Sat	29-Nov-14				C3 & C5
Sun	30-Nov-14				

	Monitoring Day
	Sunday or Public Holiday

Monitoring Location

Contract 2 (C2)	Air Quality	AM7b & AM8
	Construction Noise	NM5, NM6, NM7, NM8

Contract 5 (C5)	Air Quality	AM1a, AM2 & AM3
	Construction Noise	NM1, NM2
	Water Quality	WM1 & WM1-Control

Contract 3 (C3)	Air Quality	AM9b
	Construction Noise	NM8, NM9 & NM10
	Water Quality	WM4, WM4-Control A & WM4-Control B

Impact Monitoring Schedule for next Reporting Period – December 2014

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
MON	1-DEC-14	C3&C5		C3&C5	C3 & C5
TUE	2-DEC-14		C2&C3 & C5		
WED	3-DEC-14	C2		C2	C3 & C5
THU	4-DEC-14				
FRI	5-DEC-14				
SAT	6-DEC-14	C3&C5		C3&C5	C3 & C5
SUN	7-DEC-14				
MON	8-DEC-14		C2&C3 & C5		C3 & C5
TUE	9-DEC-14	C2		C2	
WED	10-DEC-14				C3 & C5
THU	11-DEC-14				
FRI	12-DEC-14	C3&C5		C3&C5	C3 & C5
SAT	13-DEC-14		C2&C3 & C5		
SUN	14-DEC-14				
MON	15-DEC-14	C2		C2	C3 & C5
TUE	16-DEC-14				
WED	17-DEC-14				
THU	18-DEC-14	C3&C5		C3&C5	C3 & C5
FRI	19-DEC-14		C2&C3 & C5		
SAT	20-DEC-14	C2		C2	C3 & C5
SUN	21-DEC-14				
MON	22-DEC-14				C3 & C5
TUE	23-DEC-14	C3&C5		C3&C5	
WED	24-DEC-14	C2	C2&C3 & C5	C2	C3 & C5
THU	25-DEC-14				
FRI	26-DEC-14				
SAT	27-DEC-14				C3 & C5
SUN	28-DEC-14				
MON	29-DEC-14	C3&C5		C3&C5	C3 & C5
TUE	30-DEC-14	C2	C2&C3 & C5	C2	
WED	31-DEC-14				C3 & C5

	Monitoring Day
	Sunday or Public Holiday

Monitoring Location

Contract 2 (C2)	Air Quality	AM7b & AM8
	Construction Noise	NM5, NM6, NM7, NM8
Contract 5 (C5)	Air Quality	AM1a, AM2 & AM3
	Construction Noise	NM1, NM2
	Water Quality	WM1 & WM1-Control
Contract 3 (C3)	Air Quality	AM9b
	Construction Noise	NM8, NM9 & NM10
	Water Quality	WM4, WM4-Control A & WM4-Control B

Appendix I

Database of Monitoring Result

24-hour TSP Monitoring Data

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP (°C)	AVG AIR PRESS (hPa)	STANDARD FLOW RATE (m ³ /min)	AIR VOLUME (std m ³)	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED (g)	24-HR TSP (µg/m ³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG					INITIAL	FINAL		
AM1a - Garden Farm, Tsung Yuen Ha Village															
3-Nov-14	27358	9148.77	9172.77	1440.00	43	44	43.5	21.7	1017.4	1.55	2238	2.7817	3.0240	0.2423	108
8-Nov-14	27377	9172.77	9196.77	1440.00	42	43	42.5	20.5	1017.9	1.53	2196	2.7075	2.7793	0.0718	33
14-Nov-14	27410	9196.77	9220.77	1440.00	42	43	42.5	20.9	1019.9	1.53	2197	2.6881	2.9441	0.2560	117
20-Nov-14	27428	9220.78	9244.78	1440.00	42	45	43.5	21.5	1018.4	1.56	2240	2.6788	2.8436	0.1648	74
26-Nov-14	27414	9244.78	9268.78	1440.00	43	45	44.0	23.4	1013.6	1.56	2252	2.6771	2.8957	0.2186	97
AM2 - Village House near Lin Ma Hang Road															
3-Nov-14	27359	4633.92	4657.81	1433.40	38	42	40.0	21.7	1017.4	1.18	1692	2.7678	2.9788	0.2110	125
8-Nov-14	27378	4657.81	4681.68	1432.20	35	40	37.5	20.5	1017.9	1.11	1590	2.7014	2.7795	0.0781	49
14-Nov-14	27409	4681.68	4705.53	1431.00	36	40	38.0	20.9	1019.9	1.13	1610	2.6974	3.0674	0.3700	230
20-Nov-14	27429	4705.53	4729.40	1432.20	38	42	40.0	21.5	1018.4	1.18	1692	2.7039	2.9423	0.2384	141
26-Nov-14	27415	4729.40	4753.39	1439.40	38	40	39.0	23.4	1013.6	1.15	1650	2.6931	2.9197	0.2266	137
AM3 - Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village															
3-Nov-14	27360	5678.13	5702.13	1440.00	40	44	42.0	21.7	1017.4	1.33	1922	2.7704	3.0155	0.2451	128
8-Nov-14	27375	5702.13	5726.13	1440.00	40	44	42.0	20.5	1017.9	1.34	1926	2.7549	2.8418	0.0869	45
14-Nov-14	27408	5726.13	5750.13	1440.00	39	41	40.0	20.9	1019.9	1.27	1835	2.7054	2.9647	0.2593	141
20-Nov-14	27430	5750.13	5774.13	1440.00	39	44	41.5	21.5	1018.4	1.32	1900	2.7085	2.8804	0.1719	90
26-Nov-14	27461	5774.13	5798.13	1440.00	38	39	38.5	23.4	1013.6	1.22	1753	2.7008	2.8949	0.1941	111
AM7b - Loi Tung Village House															
3-Nov-14	27361	13212.50	13236.50	1440.00	45	45	45.0	21.7	1017.4	1.26	1813	2.7700	3.0123	0.2423	134
8-Nov-14	27372	13236.50	13260.50	1440.00	44	46	45.0	20.5	1017.9	1.26	1817	2.7739	2.8460	0.0721	40
14-Nov-14	27412	13260.50	13284.50	1440.00	44	46	45.0	20.9	1019.9	1.26	1818	2.6881	3.0537	0.3656	201
20-Nov-14	27379	13284.55	13308.55	1440.00	40	44	42.0	21.5	1018.4	1.18	1694	2.7078	2.8728	0.1650	97
26-Nov-14	27458	13308.58	13332.58	1440.00	42	46	44.0	23.4	1013.6	1.23	1765	2.6743	3.1213	0.4470	253
AM8 - Po Kat Tsai Village No. 4															
3-Nov-14	27362	7083.04	7107.04	1440.00	38	39	38.5	21.7	1017.4	1.10	1584	2.7782	2.9713	0.1931	122
8-Nov-14	27373	7107.04	7131.04	1440.00	39	40	39.5	20.5	1017.9	1.13	1626	2.7796	2.8460	0.0664	41
14-Nov-14	27413	7131.04	7155.04	1440.00	39	39	39.0	20.9	1019.9	1.12	1607	2.6850	2.7984	0.1134	71
20-Nov-14	27442	7155.04	7179.04	1440.00	38	41	39.5	21.5	1018.4	1.13	1624	2.7193	2.8302	0.1109	68
26-Nov-14	27459	7179.04	7203.04	1440.00	39	41	40.0	23.4	1013.6	1.13	1634	2.7041	2.8504	0.1463	90
AM9b - Nam Wa Po Village House No. 80															
3-Nov-14	27361	14642.32	14666.32	1440.00	26	28	27.0	21.7	1017.4	0.68	977	2.7686	2.9104	0.1418	145
8-Nov-14	27378	14666.32	14690.32	1440.00	26	33	29.5	20.5	1017.9	0.77	1110	2.7250	2.7624	0.0374	34
14-Nov-14	27411	14690.36	14714.36	1440.00	28	33	30.5	20.9	1019.9	0.81	1163	2.7023	2.8164	0.1141	98
20-Nov-14	27427	14714.36	14738.36	1440.00	28	30	29.0	21.5	1018.4	0.75	1082	2.7034	2.8327	0.1293	119
26-Nov-14	27460	14738.36	14762.36	1440.00	28	30	29.0	23.4	1013.6	0.75	1074	2.7356	2.8936	0.1580	147

Construction Noise Monitoring Results, dB(A)

Date	Start Time	1 st Leq _{5min}	L10	L90	2 nd Leq _{5min}	L10	L90	3 rd Leq _{5min}	L10	L90	4 th Leq _{5min}	L10	L90	5 th Leq _{5min}	L10	L90	6 th Leq _{5min}	L10	L90	Leq30	façade correction
NM1 - Tsung Yuen Ha Village House No. 63																					
1-Nov-14	10:25	51.0	52.9	48.8	51.5	53.3	49.2	54.2	55.9	51.8	52.9	54.8	49.3	53.2	54.9	50.2	52.1	53.7	49.3	53	NA
7-Nov-14	10:40	54.3	54.7	50.3	55.2	57.4	50.8	53.9	57.0	50.1	53.9	55.4	50.1	55.0	56.7	49.7	53.2	53.5	46.6	54	NA
13-Nov-14	11:27	50.3	52.2	48.6	49.8	50.8	48.1	50.6	52.3	48.2	49.2	51.2	46.9	49.8	52.6	46.6	47.6	49.5	45.5	50	NA
19-Nov-14	16:41	55.3	55.6	49.2	50.4	52.1	48.5	52.8	56.3	49.0	51.5	53.5	48.5	50.8	52.8	49.0	52.0	54.1	48.2	52	NA
25-Nov-14	15:58	53.7	55.8	51.1	54.8	56.6	51.6	55.3	58.9	51.2	57.9	61.4	50.7	56.1	60.2	50.1	54.6	56.8	50.7	56	NA
NM2 - Village House near Lin Ma Hang Road																					
1-Nov-14	11:27	61.7	65.7	49.3	62.5	66.5	48.4	62.1	66.1	51.5	60.8	65.7	46.1	60.0	64.5	49.4	63.4	67.7	46.2	62	NA
7-Nov-14	11:30	70.1	75.1	51.7	63.2	67.0	46.9	59.5	64.1	45.6	61.9	66.6	47.4	61.9	66.5	45.4	62.5	67.1	46.8	65	NA
13-Nov-14	15:33	62.2	67.4	51.9	62.4	67.4	53.2	64.7	69.0	54.3	54.4	69.6	56.3	62.5	66.3	53.9	63.9	67.9	55.9	63	NA
19-Nov-14	17:36	63.7	66.2	50.2	59.9	65.2	48.9	55.3	58.2	48.7	55.7	58.9	49.5	61.8	63.2	51.7	63.0	66.5	50.6	61	NA
25-Nov-14	16:52	61.7	65.0	56.7	60.0	62.5	56.7	62.8	65.9	55.4	60.3	63.7	51.8	61.8	63.0	56.8	64.5	68.5	56.8	62	NA
NM5- Ping Yeung Village House (façade facing northeast)																					
4-Nov-14	14:02	57.4	58.4	50.6	55.7	58.8	49.8	55.1	57.6	50.4	55.3	58.2	50.5	55.5	58.3	49.3	56.1	59.3	51.5	56	NA
10-Nov-14	16:30	65.7	56.5	47.2	54.2	57.6	48.0	55.8	59.6	48.9	55.1	58.0	49.1	54.4	57.5	49.2	56.3	59.4	50.2	60	NA
15-Nov-14	15:25	54.8	58.3	47.2	53.7	57.1	48.0	54.9	58.3	47.7	53.8	58.3	45.7	54.3	58.3	46.7	59.2	59.8	49.4	56	NA
21-Nov-14	15:06	54.7	58.0	49.5	54.5	57.4	49.2	54.6	57.4	49.7	55.2	58.2	49.9	55.5	59.1	49.7	55.8	57.7	49.9	55	NA
27-Nov-14	11:00	56.6	59.3	51.5	60.8	63.7	49.9	57.2	60.1	49.5	54.5	57.0	48.8	54.1	56.7	49.9	55.0	57.5	49.8	57	NA
NM6 - Tai Tong Wu Village House 2																					
4-Nov-14	11:26	61.5	66.0	48.6	62.5	66.6	46.9	61.5	65.4	50.1	61.7	65.8	46.9	62.1	65.6	51.8	61.1	65.4	48.4	62	NA
10-Nov-14	15:33	62.9	66.7	54.1	63.5	67.3	50.8	64.4	67.9	55.6	61.7	65.0	50.9	63.1	66.4	54.6	63.1	67.0	55.0	63	NA
15-Nov-14	14:49	62.4	65.6	50.6	63.4	66.9	47.5	62.8	66.6	54.6	62.7	66.1	52.9	62.3	65.6	51.6	63.3	67.2	53.9	63	NA
21-Nov-14	14:28	61.9	65.3	50.7	62.2	65.6	49.7	62.7	65.9	55.0	61.6	65.3	49.0	61.5	65.2	53.3	67.0	67.4	54.1	63	NA
27-Nov-14	10:23	62.5	66.1	52.1	62.5	67.1	48.7	63.1	65.4	53.4	62.8	66.1	53.1	62.7	66.0	51.2	62.2	66.3	50.0	63	NA
NM7 - Po Kat Tsai Village																					
4-Nov-14	10:43	76.5	76.5	65.9	76.3	75.7	65.9	77.1	77.8	64.3	72.8	72.7	68.6	71.8	72.2	71.2	71.5	71.8	70.8	75	NA
10-Nov-14	13:43	60.0	58.1	53.1	59.7	61.8	53.1	62.5	61.5	51.6	68.4	66.0	50.6	67.5	70.1	52.1	55.1	56.9	53.0	64	NA
15-Nov-14	16:15	58.2	60.9	54.4	60.8	64.0	52.2	60.9	65.5	50.9	61.6	66.5	50.0	61.6	64.0	48.6	60.9	64.3	50.9	61	NA
21-Nov-14	17:49	62.3	67.2	49.2	62.6	65.8	48.6	57.2	62.6	49.9	61.6	64.2	53.8	68.9	69.7	57.8	60.9	65.3	52.0	64	NA
27-Nov-14	9:38	65.2	66.7	51.4	75.0	81.7	50.9	63.9	68.5	50.0	64.6	66.3	50.9	65.8	67.3	56.3	59.9	63.8	51.3	69	NA
NM8 - Village House, Tong Hang																					
1-Nov-14	10:51	56.7	59.8	52.5	56.3	58.8	52.5	55.7	58.7	51.5	55.7	58.9	51.8	57.9	60.7	52.7	59.6	61.8	51.9	57	NA
7-Nov-14	10:19	57.7	62.4	51.2	56.5	60.6	51.5	56.6	62.4	50.5	60.4	63.5	52.6	55.5	62.6	50.4	57.6	61.7	51.5	58	NA
13-Nov-14	10:14	56.7	61.1	49.7	58.0	64.0	49.5	57.9	60.7	49.6	58.2	62.4	50.7	57.3	61.6	49.5	58.5	60.5	52.2	58	NA
19-Nov-14	10:04	58.5	61.4	50.6	57.6	60.5	49.5	56.7	60.6	50.2	60.4	62.5	51.0	58.5	61.7	49.3	57.2	61.2	50.4	58	NA
25-Nov-14	15:55	56.6	56.5	46.8	57.6	63.6	47.9	55.3	66.2	47.7	57.5	62.5	47.3	57.2	63.3	48.5	56.3	61.5	47.8	57	NA
NM9 - Village House, Kiu Tau Village																					
1-Nov-14	11:29	57.5	58.3	50.6	53.9	56.0	50.8	54.6	57.1	51.5	53.6	56.4	49.5	54.8	57.0	51.0	60.9	59.1	51.2	57	NA
7-Nov-14	13:17	54.5	58.3	46.4	56.6	57.5	47.5	56.4	56.5	47.6	53.5	57.6	45.5	53.3	56.5	46.4	52.1	55.2	47.5	55	NA

Date	Start Time	1 st Leq _{5min}	L10	L90	2 nd Leq _{5min}	L10	L90	3 rd Leq _{5min}	L10	L90	4 th Leq _{5min}	L10	L90	5 th Leq _{5min}	L10	L90	6 th Leq _{5min}	L10	L90	Leq30	façade correction
13-Nov-14	9:32	79.7	68.0	53.0	74.0	70.0	64.0	65.5	66.0	64.5	67.5	68.5	65.0	69.8	66.0	64.0	78.0	67.0	64.0	75	NA
19-Nov-14	10:01	67.0	68.0	59.5	68.0	68.5	64.0	68.9	70.5	65.0	71.0	71.0	66.5	69.2	69.0	66.0	68.5	70.5	65.0	69	NA
25-Nov-14	14:11	68.9	59.9	47.6	53.9	58.1	46.5	53.7	55.0	45.7	54.5	55.3	46.3	55.2	56.5	45.7	53.3	55.2	46.8	62	NA
NM10 - Nam Wa Po Village House No. 80																					
1-Nov-14	9:30	62.4	65.0	57.1	62.7	65.5	56.9	63.5	65.4	60.0	64.3	66.9	60.2	64.9	67.5	61.4	64.9	66.9	62.3	64	67
7-Nov-14	14:03	61.9	63.5	59.0	61.9	63.5	59.0	60.8	62.0	59.0	60.4	62.0	58.5	60.0	61.5	57.0	61.0	62.5	59.0	61	64
13-Nov-14	10:03	60.0	61.0	57.5	59.8	61.0	58.0	61.0	62.0	57.5	58.9	60.0	57.0	61.8	62.0	58.0	62.1	64.0	58.5	61	64
19-Nov-14	10:32	62.0	63.5	59.0	59.7	60.5	57.0	61.4	63.5	57.5	62.4	64.5	58.5	62.0	63.5	59.0	61.5	63.5	57.5	62	65
25-Nov-14	11:23	61.8	64.1	57.8	62.1	65.1	58.0	63.6	66.6	58.8	64.6	66.6	61.9	63.2	66.6	58.6	62.9	64.6	59.4	63.0	66

Water Quality Monitoring Data for Contract 5

Date	1-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:41	0.42	27	27.0	4.85	4.9	60.9	61.1	13.7	13.6	8.1	8.1	6	6.0
			27		4.89		61.3		13.5		8.1		6	
WM1	11:07	0.48	26	26.1	5.16	5.1	63.7	63.5	10.0	10.2	8.4	8.5	9	8.5
			26.1		5.12		63.3		10.4		8.5		8	

Date	3-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:42	0.39	21.2	21.2	6.14	6.2	68.8	69.1	7.8	7.8	7.3	7.3	12	12.0
			21.2		6.18		69.3		7.7		7.3		12	
WM1	10:56	0.38	22.6	22.6	4.38	4.4	48.2	49.0	13.9	14.1	6.6	6.6	5	5.5
			22.6		4.44		49.8		14.2		6.6		6	

Date	5-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	12:45	0.40	24.8	24.7	8.67	8.7	103.7	58.8	5.8	5.9	9	9.1	5	5.5
			24.6		8.73		13.9		5.9		9.1		6	
WM1	13:07	0.48	25	25.0	6.57	6.5	79.0	78.3	6.2	6.3	8.9	8.9	4	4.0
			25		6.45		77.6		6.3		8.9		4	

Date	7-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:10	0.40	23.1	23.0	5.92	5.9	68.8	68.9	8.7	8.8	9.6	9.6	6	6.5
			22.9		5.93		69.0		9.0		9.6		7	
WM1	12:06	0.47	24	24.0	5.83	5.8	69.0	69.1	6.5	6.5	8.8	8.8	4	3.5
			23.9		5.85		69.2		6.4		8.8		3	

Date	10-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:36	0.19	25.7	25.7	6.39	6.4	78.3	78.6	7.8	7.8	8.7	8.7	<2	2.0

			25.7		6.43		78.9		7.9		8.7		<2	
WM1	12:03	0.25	25	25.1	6.08	6.0	73.5	73.1	24.6	24.2	8.6	8.6	20	20.0
			25.2		5.95		72.6		23.7		8.6		20	

Date		13-Nov-14												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:43	0.40	20.2	20.2	8.18	8.1	90.1	89.0	4.6	4.7	9	9.0	<2	2.0
			20.1		7.99		87.8		4.8		8.9		<2	
WM1	12:20	0.46	22.8	22.8	6.52	6.5	75.6	75.2	15.0	14.8	8.3	8.4	12	12.0
			22.8		6.46		74.8		14.6		8.4		12	

Date		15-Nov-14												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	14:02	0.37	24.6	24.6	10.44	10.3	125.4	123.2	6.1	6.2	8.5	8.5	<2	2.0
			24.5		10.11		121.0		6.3		8.5		<2	
WM1	14:23	0.42	24.5	24.5	7.48	7.5	88.6	88.8	13.4	13.2	8.1	8.1	9	9.5
			24.4		7.5		89.0		12.9		8.1		10	

Date		17-Nov-14												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	17:20	0.40	22.5	22.4	9.42	9.4	108.8	108.0	10.3	10.7	8.8	8.8	7	7.0
			22.3		9.34		107.2		11.0		8.8		7	
WM1	17:40	0.44	22.6	22.6	5.47	5.4	62.5	61.4	18.8	18.1	8.2	8.2	22	21.5
			22.6		5.29		60.2		17.3		8.2		21	

Date		19-Nov-14												
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	17:00	0.40	23.3	23.3	9.04	9.0	105.3	105.0	5.5	5.3	8.4	8.4	<2	2.0
			23.3		8.97		104.7		5.2		8.3		2	
WM1	17:26	0.43	22.5	22.5	6.75	6.7	77.5	77.3	6.4	6.3	8.2	8.2	6	6.0
			22.4		6.68		77.1		6.1		8.2		6	

Date	21-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	14:05	0.42	26	26.0	9.83	9.8	120.0	119.3	5.3	5.3	9	9.0	<2	2.0
			26		9.77		118.5		5.2		9		<2	
WM1	13:37	0.47	26.5	26.4	7.25	7.2	90.0	89.4	4.8	5.0	8.8	8.9	3	2.5
			26.3		7.16		88.8		5.2		8.9		2	

Date	25-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	15:57	0.36	27.6	27.5	9.2	9.2	117.5	117.9	7.8	8.0	8.5	8.5	6	6.0
			27.4		9.28		118.2		8.1		8.5		6	
WM1	16:17	0.47	26.3	26.3	5.51	5.5	68.3	68.2	7.3	7.4	8.2	8.2	3	3.0
			26.3		5.48		68.1		7.4		8.2		3	

Date	27-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	17:14	0.44	23.4	23.4	8.69	8.6	102.0	99.3	5.2	5.3	8.6	8.6	<2	2.0
			23.3		8.42		96.5		5.4		8.5		2	
WM1	17:42	0.49	24.4	24.4	6.92	6.8	82.6	80.4	11.4	11.0	8.6	8.6	8	8.0
			24.4		6.7		78.1		10.5		8.6		8	

Date	29-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:52	0.38	25.3	25.3	5.89	5.8	71.6	69.5	6.3	6.2	8.7	8.8	3	3.0
			25.3		5.61		67.4		6.1		8.8		3	
WM1	11:27	0.43	25.5	25.5	5.31	5.2	64.8	63.7	27.8	27.6	8.9	8.9	19	19.5
			25.5		5.16		62.6		27.4		8.9		20	

Water Quality Monitoring Data for Contract 2 and 3

Date	1-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	12:51	0.08	30	30.1	7.39	7.3	98.0	96.3	4.2	4.0	8.6	8.7	4	4.0
			30.1		7.21		94.5		3.8		8.7		4	
WM4-CB	13:12	0.19	31.2	31.2	6.6	6.7	88.3	89.5	9.4	9.4	8	8.0	9	9.5
			31.2		6.71		90.7		9.3		8		10	
WM4	12:30	0.22	29.7	29.7	5.77	5.8	76.9	77.5	11.8	11.6	8	8.0	13	12.5
			29.7		5.89		78.1		11.3		8		12	

Date	3-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	12:05	0.08	22.1	22.1	7.64	7.6	88.0	87.4	5.6	5.5	6.9	6.9	7	6.5
			22.1		7.55		86.8		5.4		6.9		6	
WM4-CB	12:23	0.15	22.4	22.5	4.77	4.8	55.2	55.6	12.8	12.1	6.6	6.6	13	12.5
			22.5		4.83		55.9		11.4		6.6		12	
WM4	11:45	0.16	21.8	21.8	5.23	5.3	59.8	60.4	13.6	12.9	6.7	6.7	13	12.5
			21.8		5.43		61.0		12.2		6.7		12	

Date	5-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	15:38	0.08	24.8	24.8	7.34	7.3	88.7	87.9	8.2	8.3	8	8.2	7	7.0
			24.7		7.18		87.0		8.4		8.3		7	
WM4-CB	16:02	0.16	25.2	25.2	3.45	3.5	44.8	45.4	7.3	7.5	7.9	7.9	12	11.5
			25.2		3.61		45.9		7.7		7.9		11	
WM4	15:16	0.19	25.5	25.5	5.35	5.3	65.2	65.0	25.1	25.7	8.1	8.1	39	38.0
			25.4		5.33		64.8		26.3		8		37	

Date	7-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	16:02	0.09	23	23.0	6.54	6.6	76.2	76.6	7.4	7.3	8.6	8.6	6	6.5
			23		6.61		77.0		7.1		8.6		7	

WM4-CB	16:33	0.23	23.3	23.4	4.33	4.4	50.9	51.1	9.5	9.4	8.3	8.3	4	4.0
			23.4		4.38		51.3		9.3		8.3		4	
WM4	15:36	0.29	23.7	23.7	4.63	4.7	55.4	55.6	35.4	34.6	8.2	8.2	32	32.5
			23.7		4.67		55.7		33.7		8.2		33	

Date	10-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	12:24	0.08	25.4	25.4	8.32	8.3	101.8	101.0	4.4	4.5	8.6	8.9	2	2.0
			25.4		8.19		100.1		4.5		9.2		2	
WM4-CB	11:36	0.19	25.7	25.7	6.39	6.4	78.3	78.6	7.8	7.8	8.7	8.7	11	11.0
			25.7		6.43		78.9		7.9		8.7		11	
WM4	12:03	0.25	25	25.1	6.08	6.0	73.5	73.1	24.6	24.2	8.6	8.6	29	29.5
			25.2		5.95		72.6		23.7		8.6		30	

Date	13-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	13:30	0.09	22.7	22.7	8.69	8.7	100.8	100.4	3.1	3.3	8.2	8.2	<2	2.0
			22.6		8.63		100.0		3.4		8.2		<2	
WM4-CB	13:51	0.21	23.5	23.5	7.05	7.0	83.1	82.4	15.7	15.5	8	8.0	10	10.5
			23.5		6.87		81.7		15.3		8		11	
WM4	14:33	0.24	23.4	23.4	6.08	6.0	71.4	71.0	11.4	11.8	8	8.0	13	13.0
			23.3		6.01		70.6		12.2		8		13	

Date	15-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	13:11	0.08	26.1	26.1	7.81	7.8	95.6	95.0	3.1	3.2	9	9.0	<2	2.0
			26.1		7.72		94.4		3.3		9		<2	
WM4-CB	13:30	0.21	27.2	27.1	6.56	6.6	82.9	83.7	6.1	6.3	8.4	8.4	7	6.5
			27		6.7		84.4		6.4		8.3		6	
WM4	12:41	0.25	27	27.0	6.22	6.3	77.5	78.0	9.3	9.2	8.6	8.6	21	21.0
			26.9		6.31		78.4		9.2		8.6		21	

Date	17-Nov-14													
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Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM4-CA	14:51	0.08	24.2	24.2	7.09	7.1	83.9	85.0	5.2	5.1	8.8	8.9	4	4.0
			24.2		7.2		86.0		5.0		8.9		4	
WM4-CB	14:07	0.19	25.5	25.4	7.22	7.2	88.8	88.4	7.4	7.3	8.6	8.6	7	6.5
			25.3		7.17		87.9		7.2		8.6		6	
WM4	14:31	0.25	25.4	25.4	5.93	5.9	72.6	72.7	9.9	9.7	8.5	8.5	13	12.5
			25.3		5.95		72.7		9.5		8.5		12	

Date	19-Nov-14														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM4-CA	15:51	0.08	24.2	24.2	7.29	7.2	86.2	84.1	3.2	3.3	8.5	8.5	3	3.0	
			24.1		7.04		81.9		3.3		8.5		3		
WM4-CB	16:13	0.21	24.2	24.2	5.77	5.7	69.0	66.8	9.0	8.7	8.1	8.1	10	10.0	
			24.2		5.53		64.6		8.5		8.1		10		
WM4	15:30	0.25	24.7	24.7	5.54	5.4	66.8	64.8	9.7	9.5	8.2	8.2	12	12.0	
			24.7		5.29		62.7		9.3		8.2		12		

Date	21-Nov-14														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM4-CA	16:42	0.09	24.7	24.7	7.87	7.6	88.6	88.3	3.0	2.7	8.6	8.7	<2	2.0	
			24.7		7.32		87.9		2.5		8.7		<2		
WM4-CB	17:18	0.20	25.6	25.6	4.41	4.3	53.7	52.1	5.3	5.2	8.2	8.2	4	4.0	
			25.5		4.2		50.4		5.0		8.2		4		
WM4	16:15	0.25	25.9	25.9	4.89	4.9	60.4	60.9	14.5	14.4	8.4	8.4	24	25.0	
			25.9		4.98		61.3		14.3		8.4		26		

Date	25-Nov-14														
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM4-CA	14:25	0.08	27	27.0	6.2	6.1	77.7	77.0	5.1	5.2	8.5	8.5	<2	2.0	
			27		6.08		76.3		5.2		8.5		<2		
WM4-CB	15:05	0.24	27.8	27.8	5.73	5.8	76.3	75.1	7.0	7.0	8.3	8.3	4	4.0	
			27.8		5.86		73.9		6.9		8.3		4		
WM4	13:59	0.30	28.8	28.8	5.43	5.5	70.2	71.0	15.1	14.5	8.5	8.5	26	25.0	

			28.8		5.5		71.7		13.9		8.5		24	
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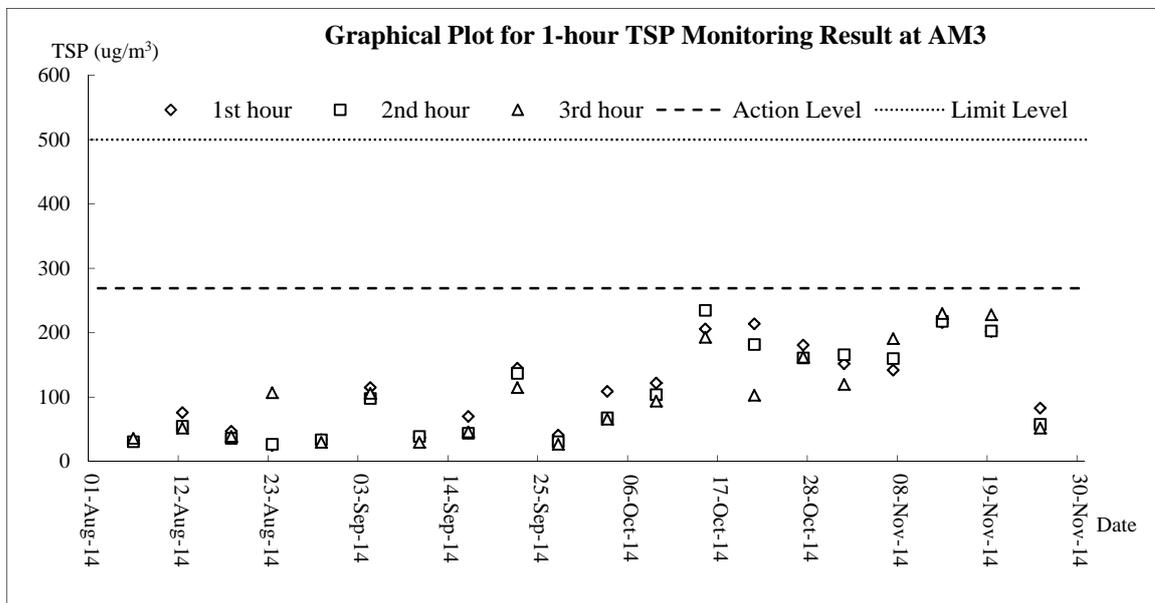
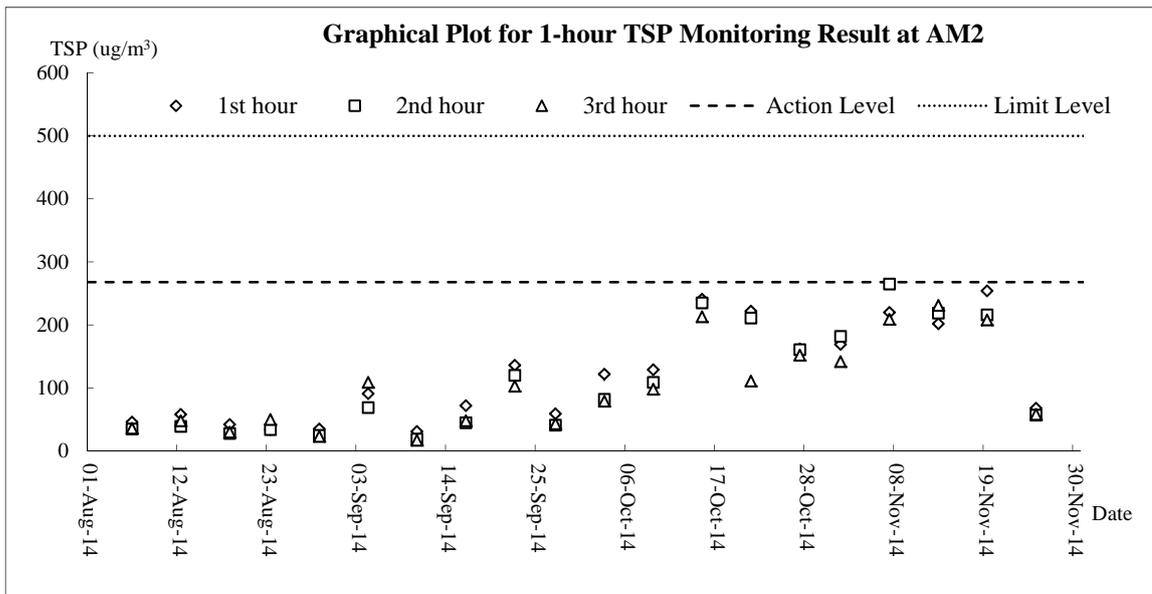
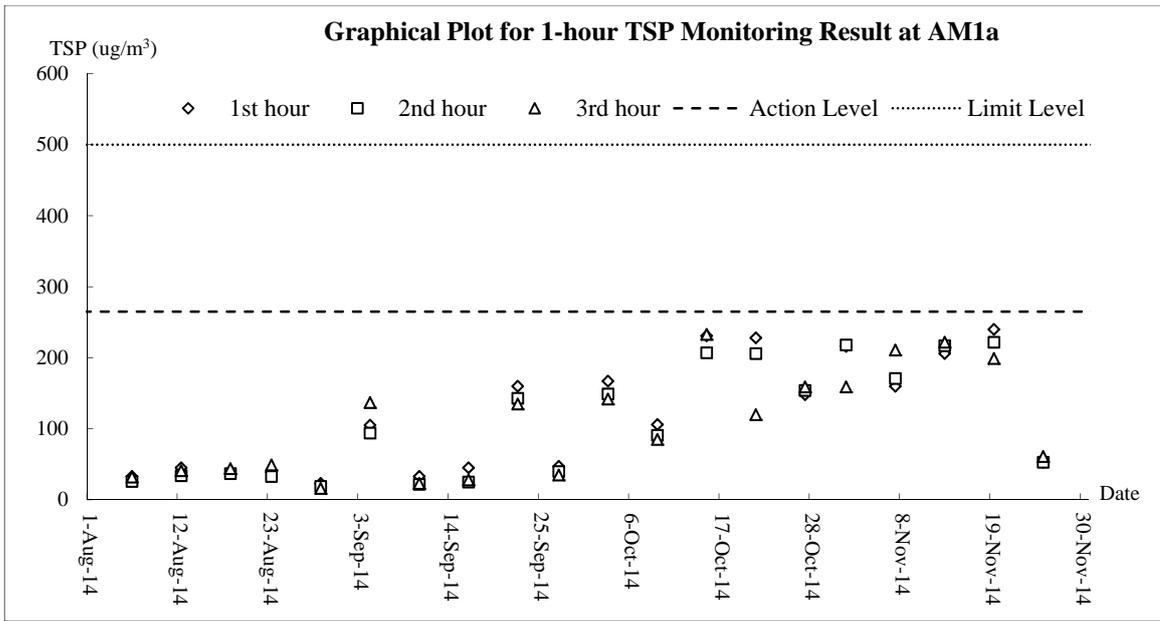
Date		27-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM4-CA	12:42	0.09	24.6	24.6	6.89	6.9	82.5	82.8	3.2	3.2	8.5	8.5	3	3.0	
			24.5		6.95		83.1		3.1		8.5		3		
WM4-CB	13:06	0.21	24.8	24.8	4.91	4.8	59.2	58.3	5.0	5.2	8.4	8.4	5	5.0	
			24.8		4.63		57.4		5.3		8.4		5		
WM4	12:26	0.26	24.9	24.9	6.7	6.7	80.9	80.5	18.0	17.6	9	9.0	26	26.5	
			24.8		6.65		80.1		17.1		8.9		27		

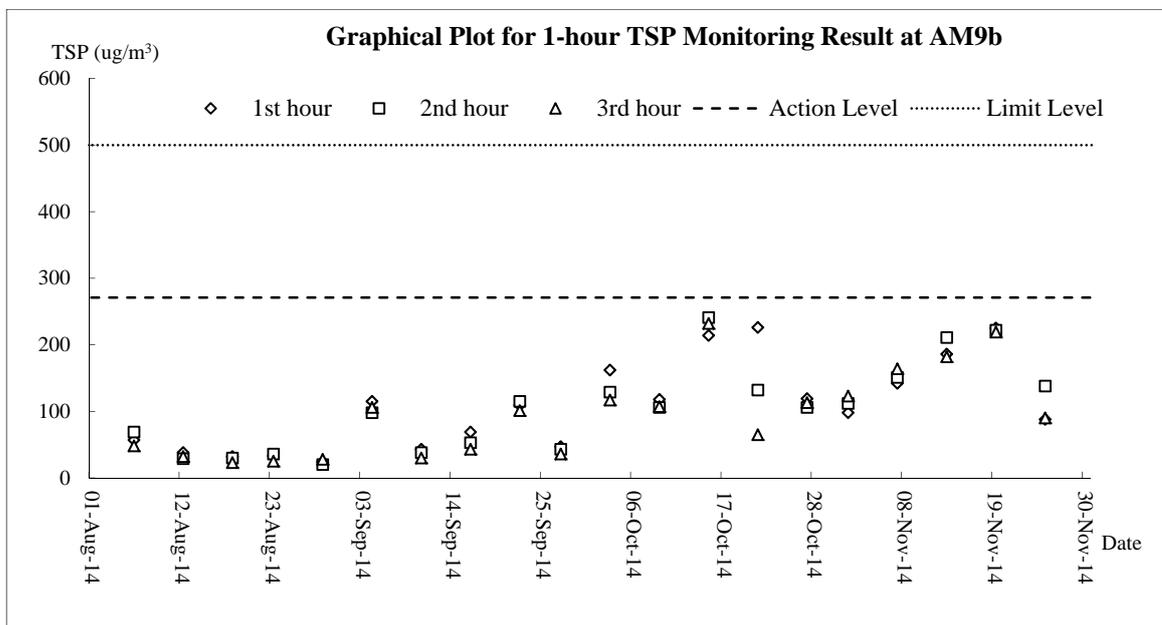
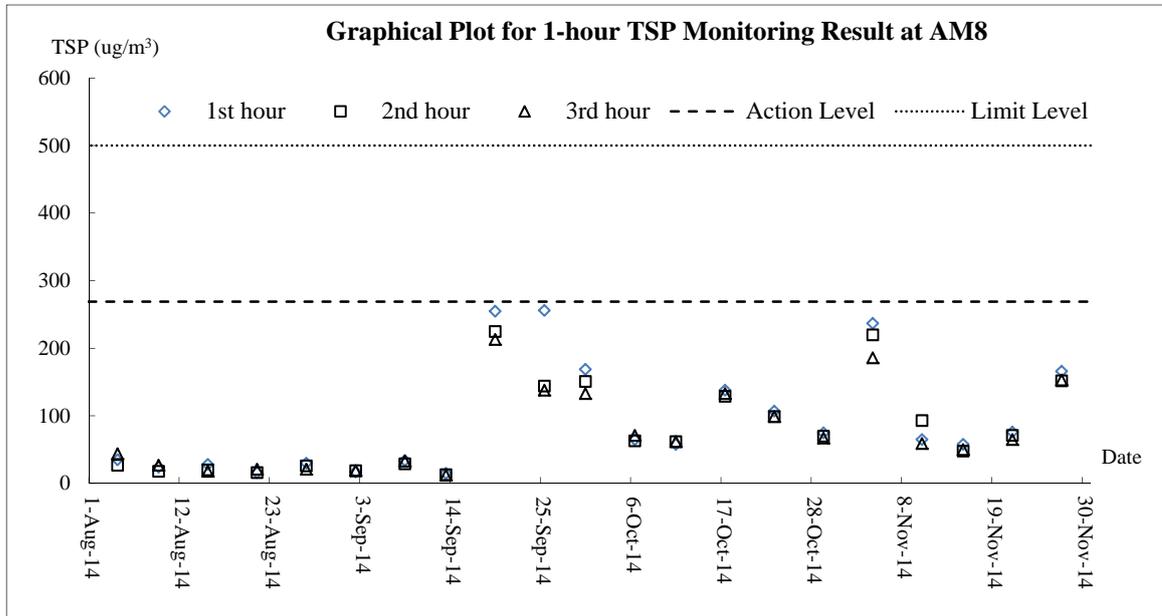
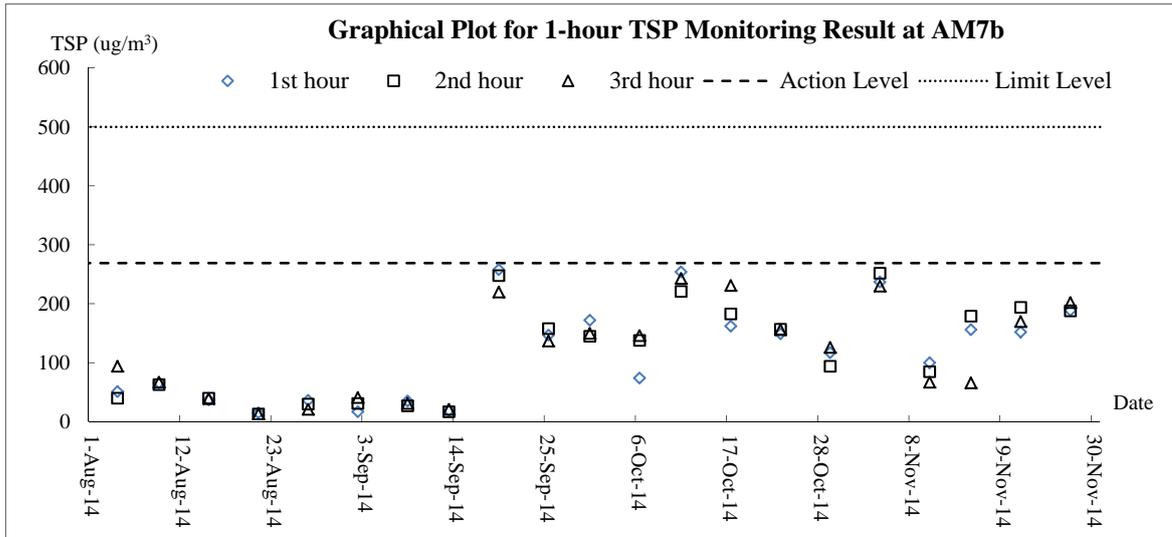
Date		29-Nov-14													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)		
WM4-CA	15:19	0.08	25.4	25.4	7.11	7.1	86.2	85.4	4.1	4.2	8.9	8.9	<2	2.0	
			25.4		7.04		84.5		4.3		8.9		<2		
WM4-CB	15:51	0.21	25.9	25.8	3.79	3.8	46.2	46.0	7.7	7.8	8.3	8.3	7	7.5	
			25.7		3.73		45.8		8.0		8.3		8		
WM4	15:00	0.26	26.1	26.1	5	5.0	61.3	61.8	14.1	14.2	8.7	8.7	16	16.0	
			26		5.06		62.2		14.3		8.7		16		

Appendix J

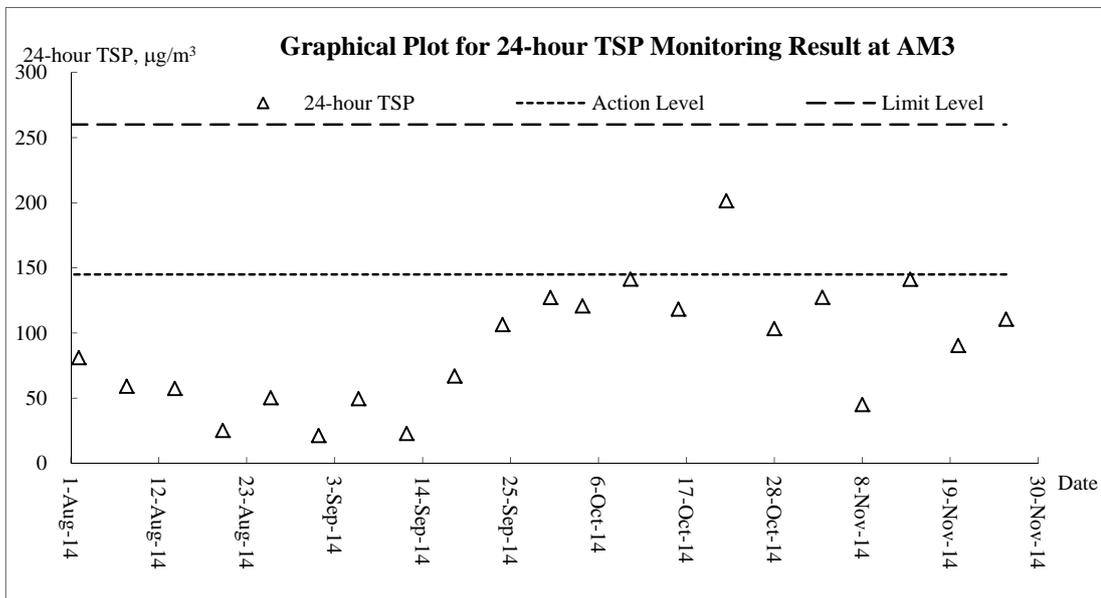
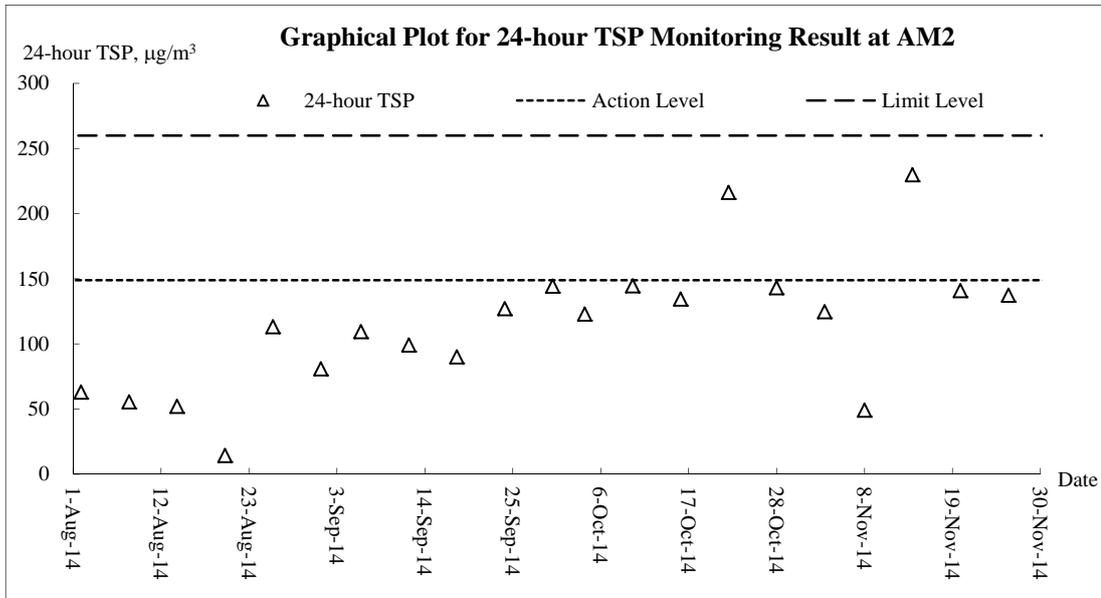
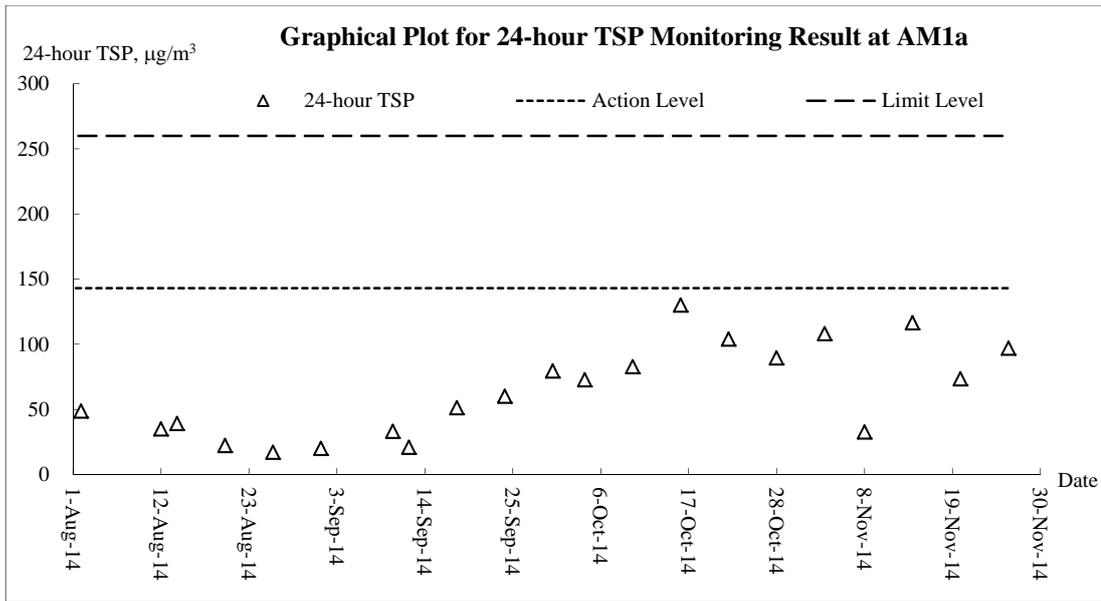
Graphical Plots for Monitoring Result

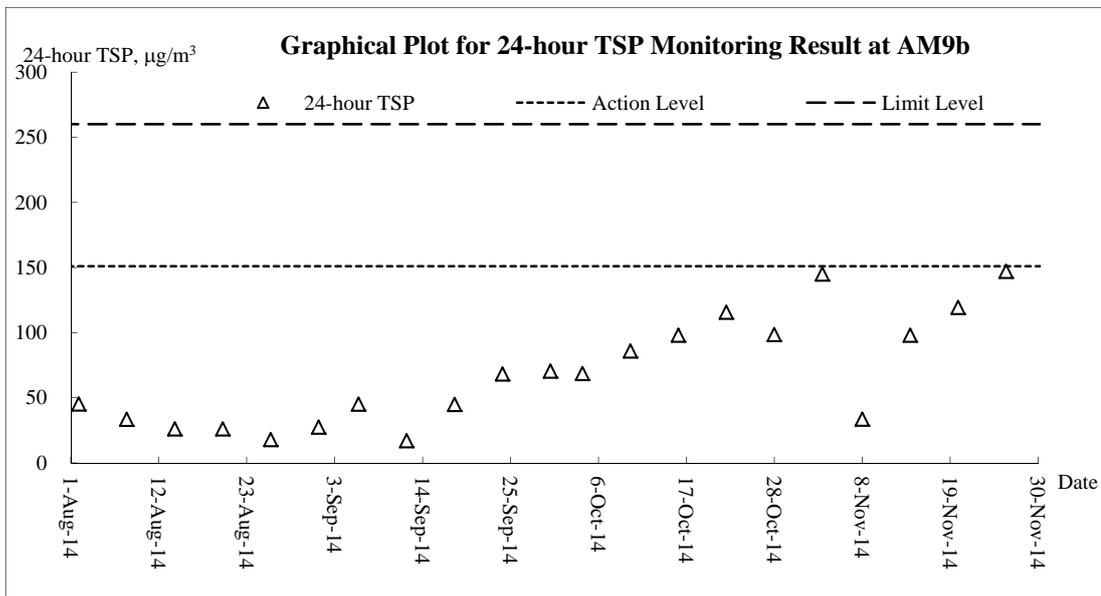
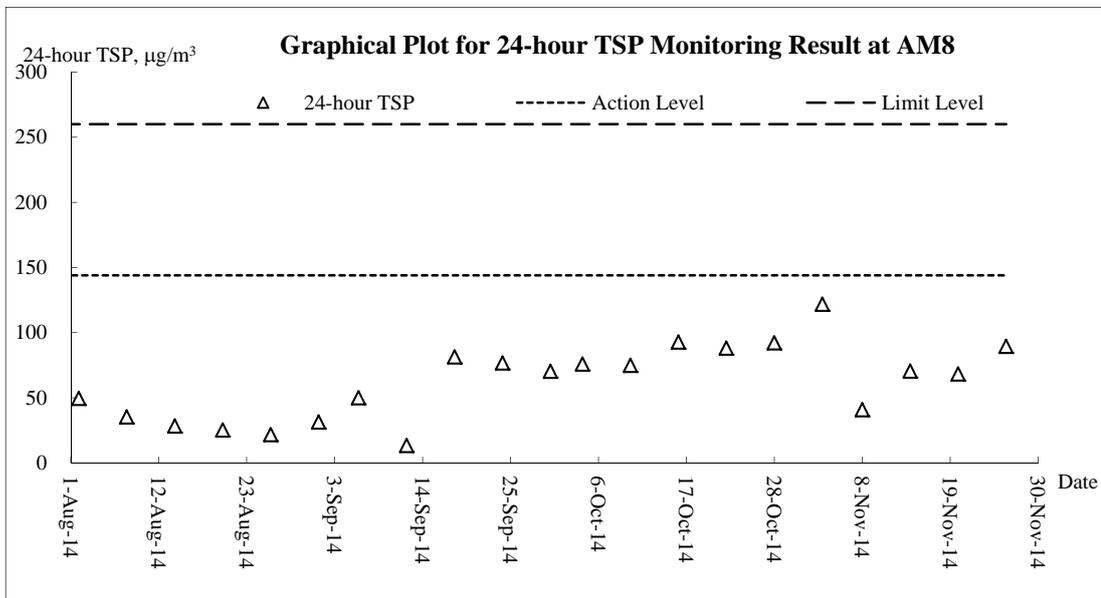
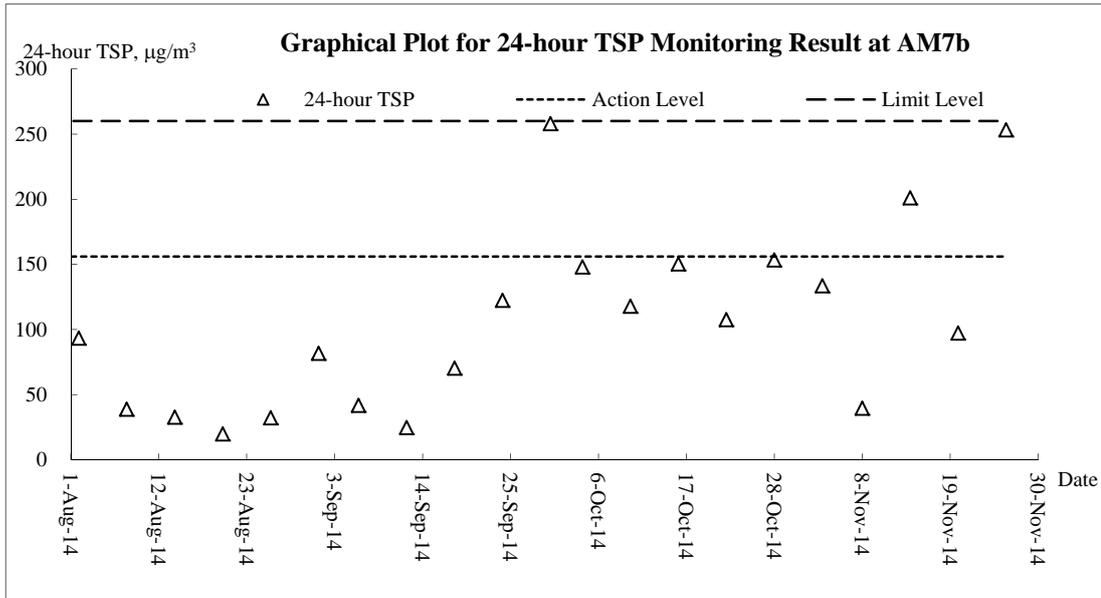
Air Quality – 1-hour TSP



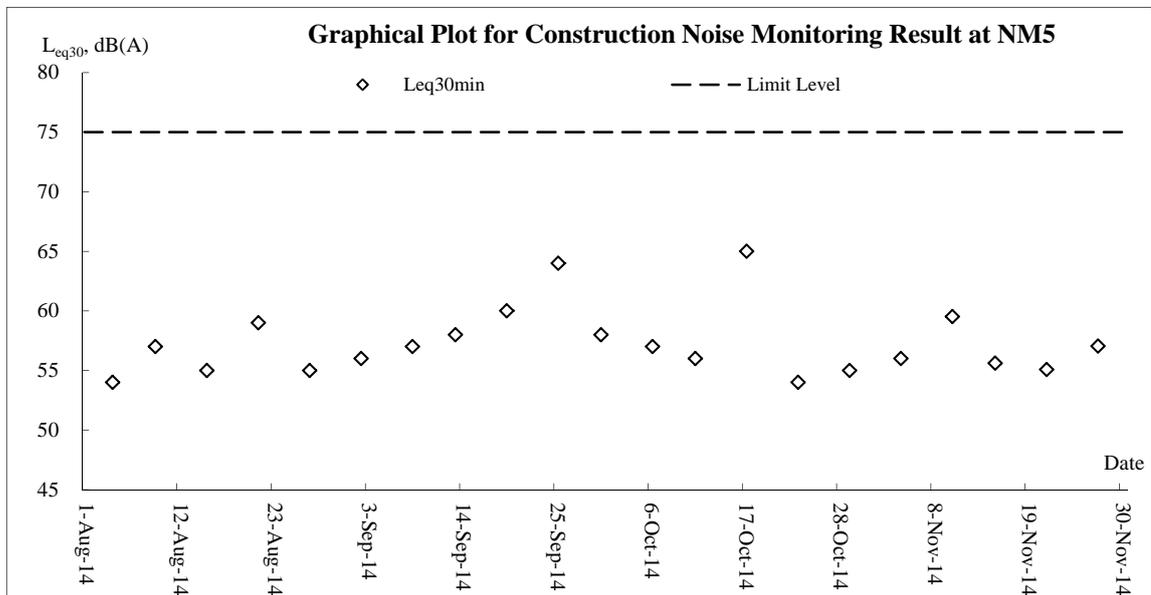
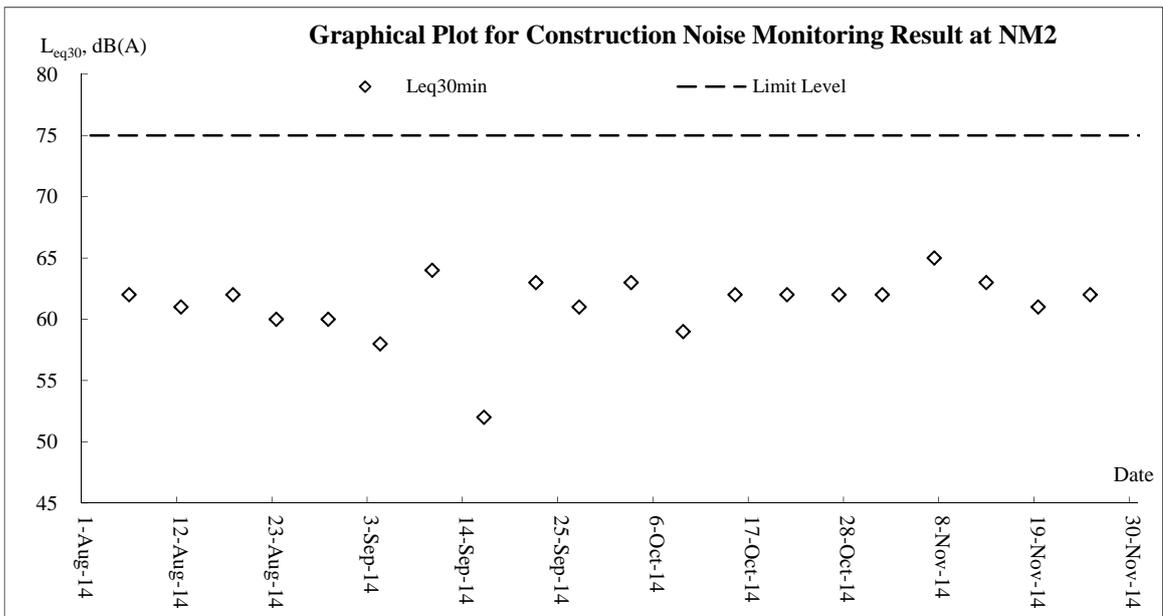
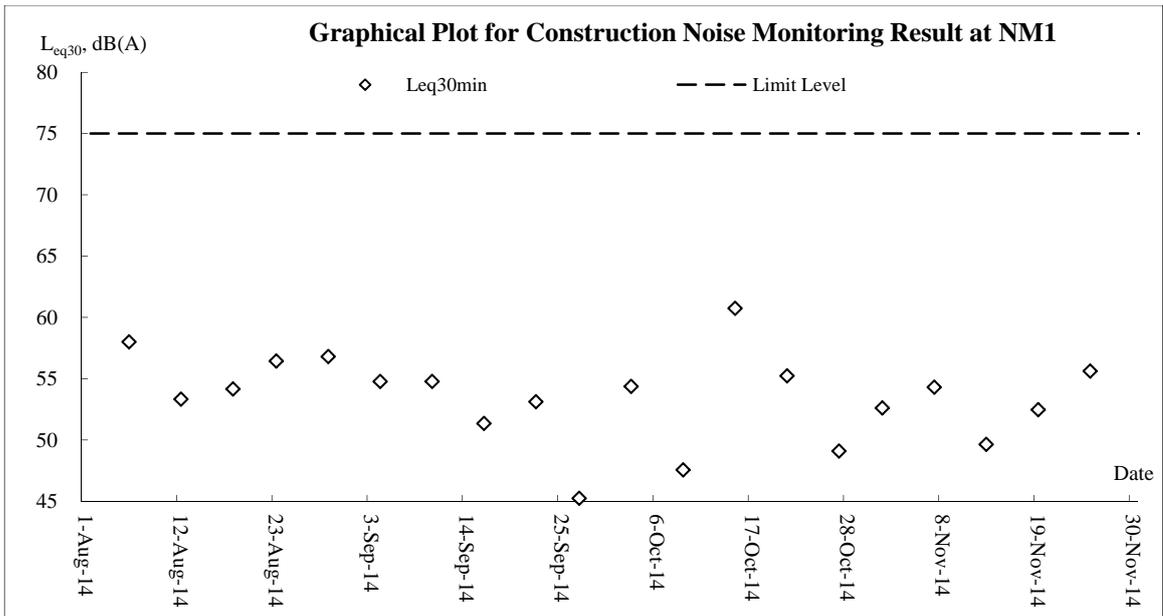


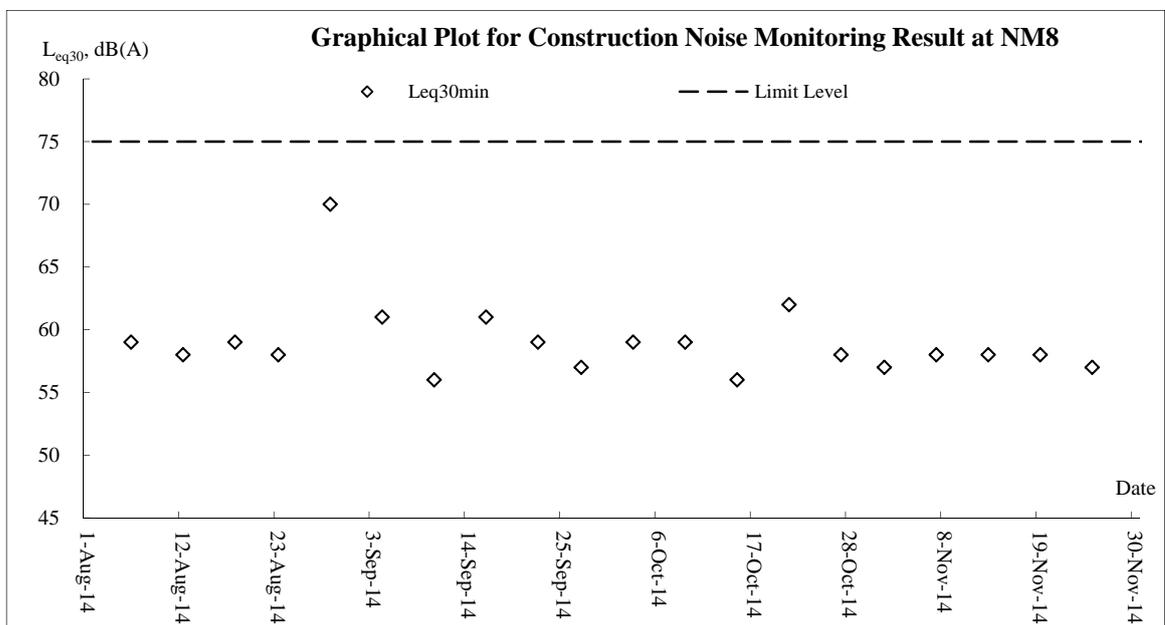
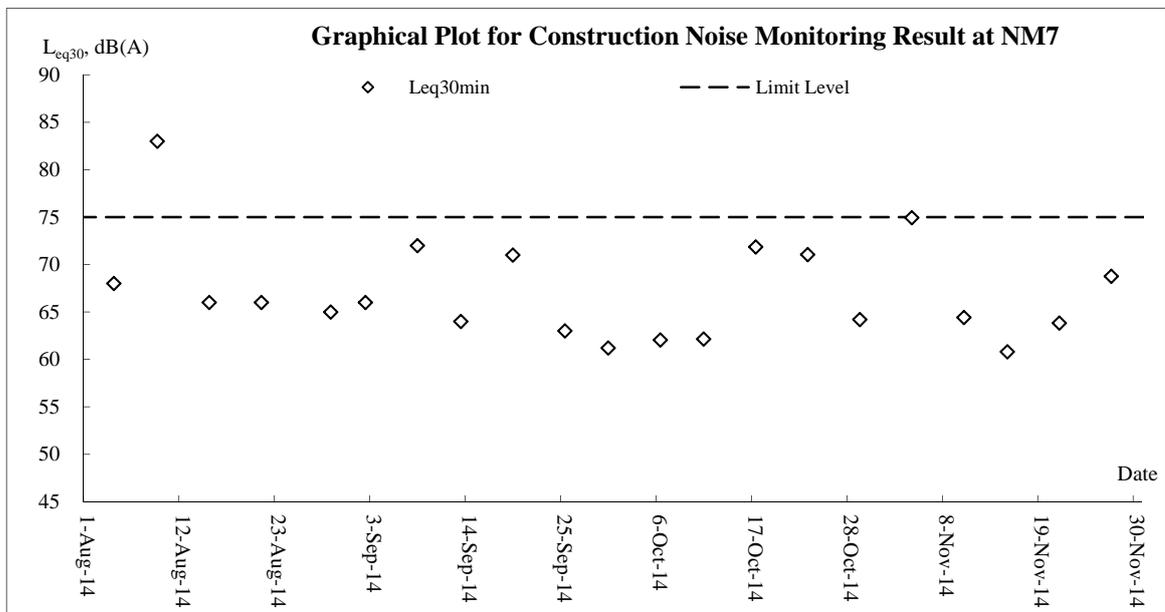
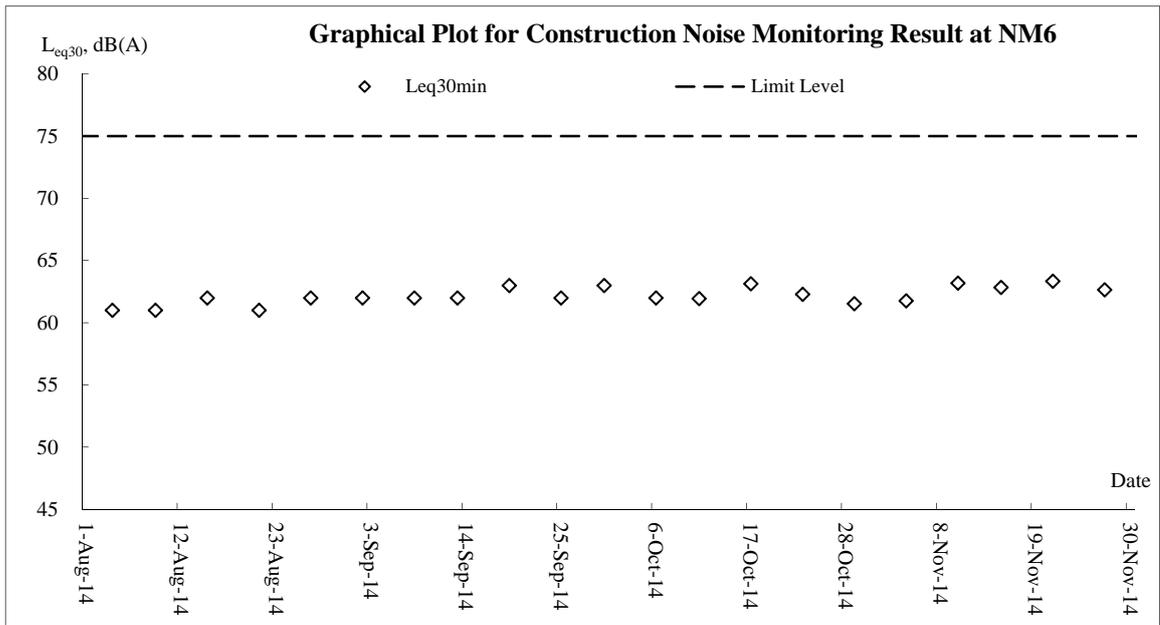
Air Quality – 24-hour TSP

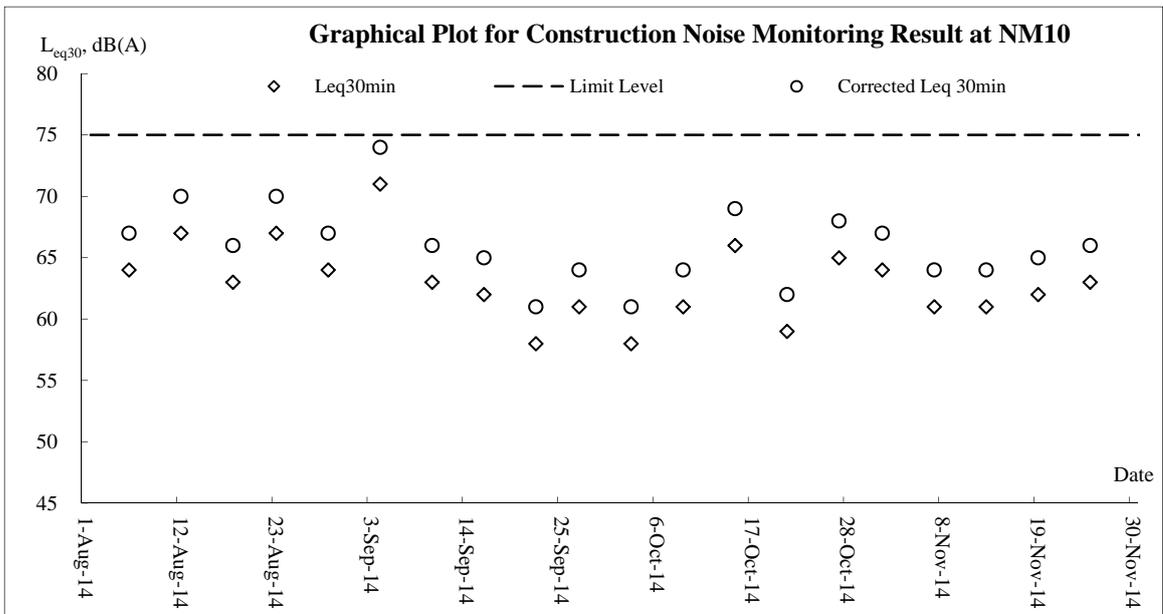
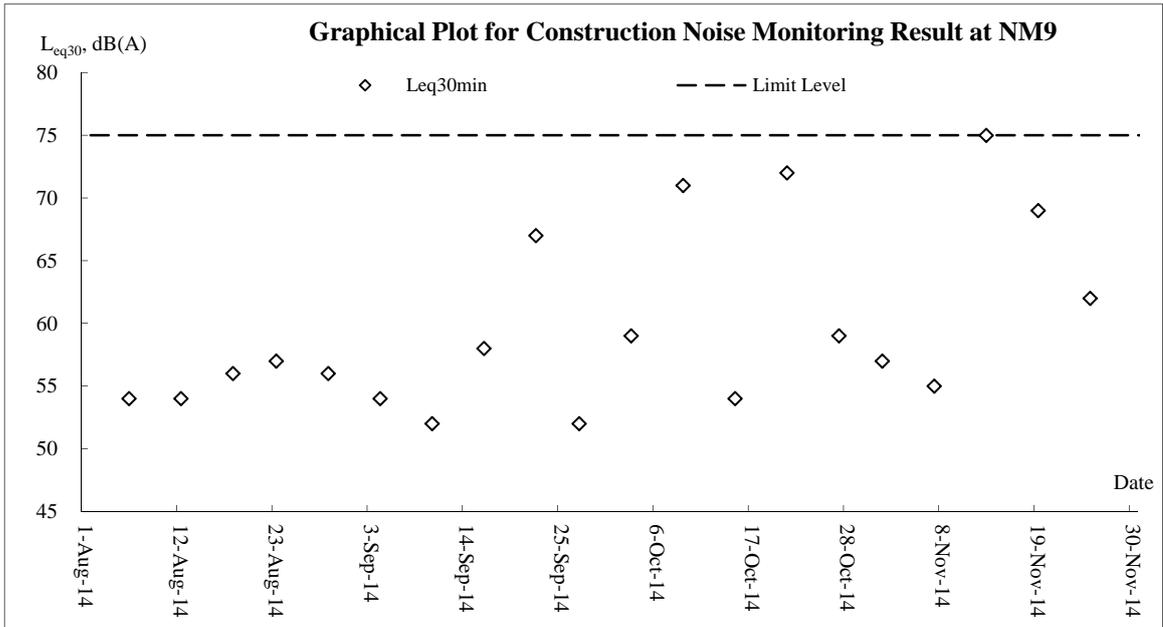




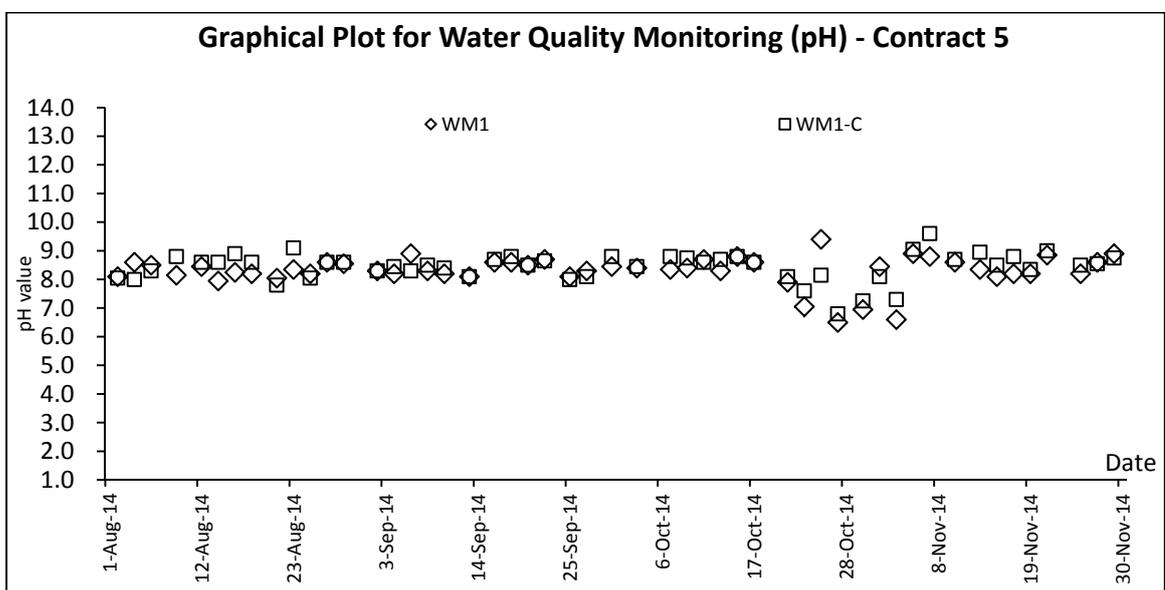
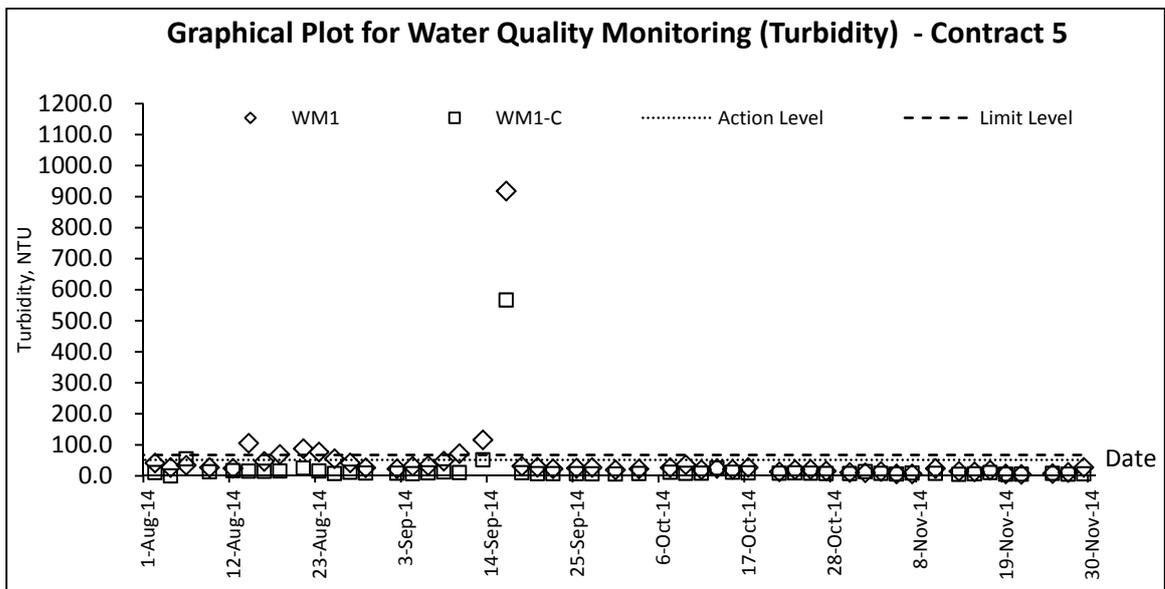
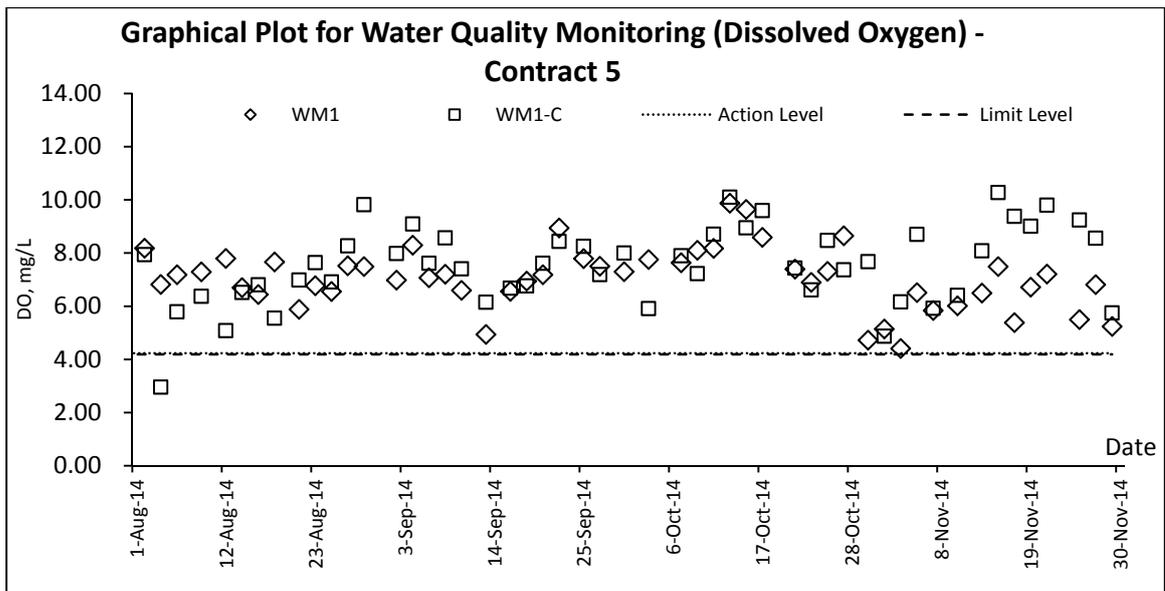
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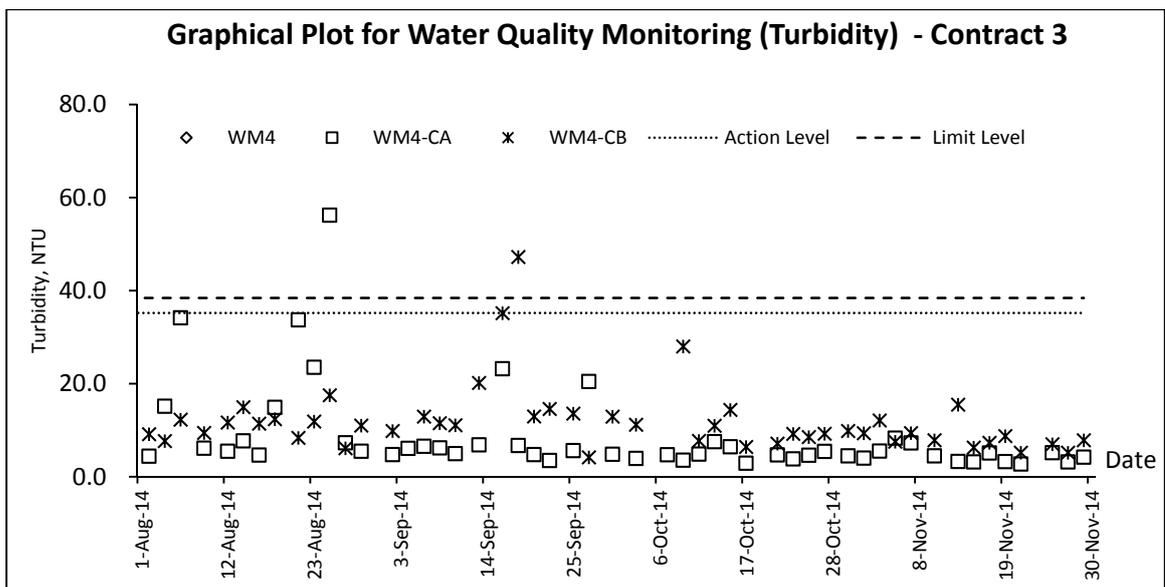
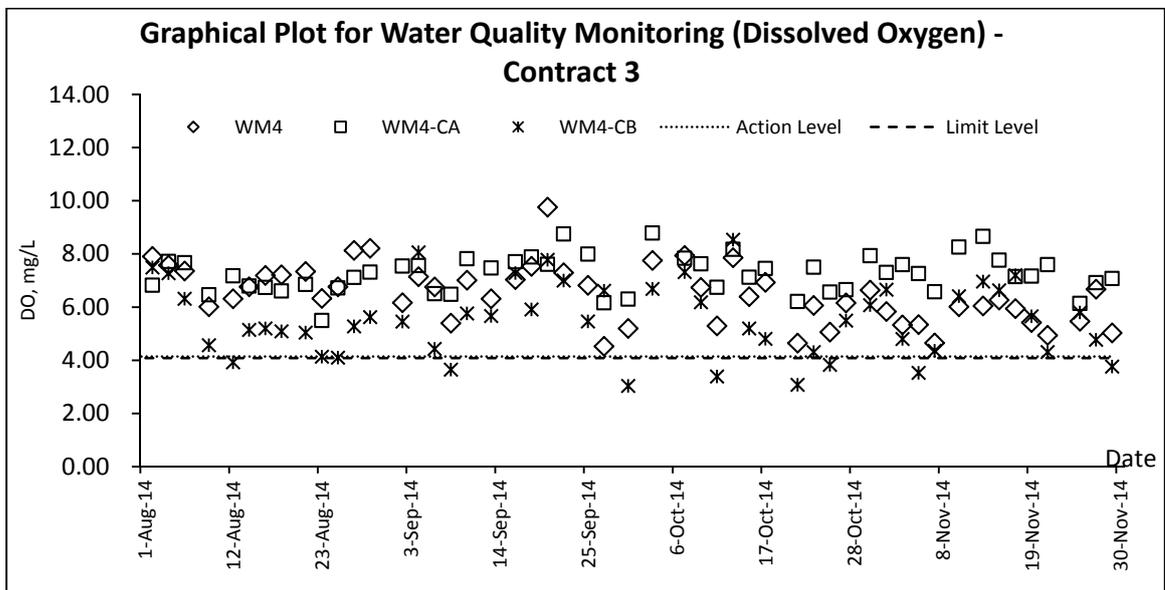
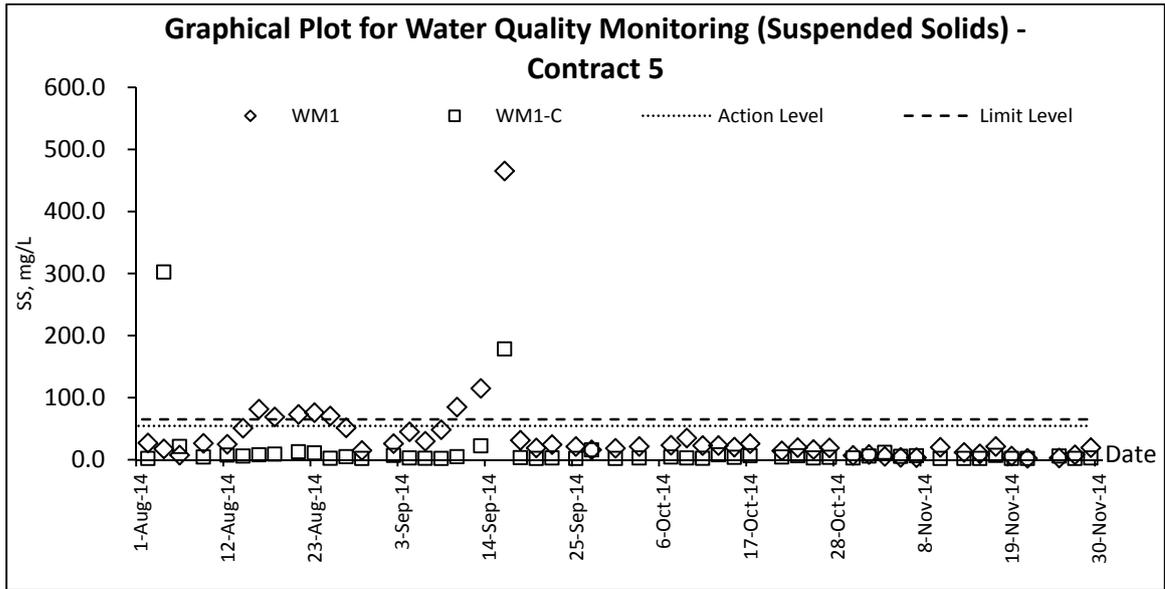


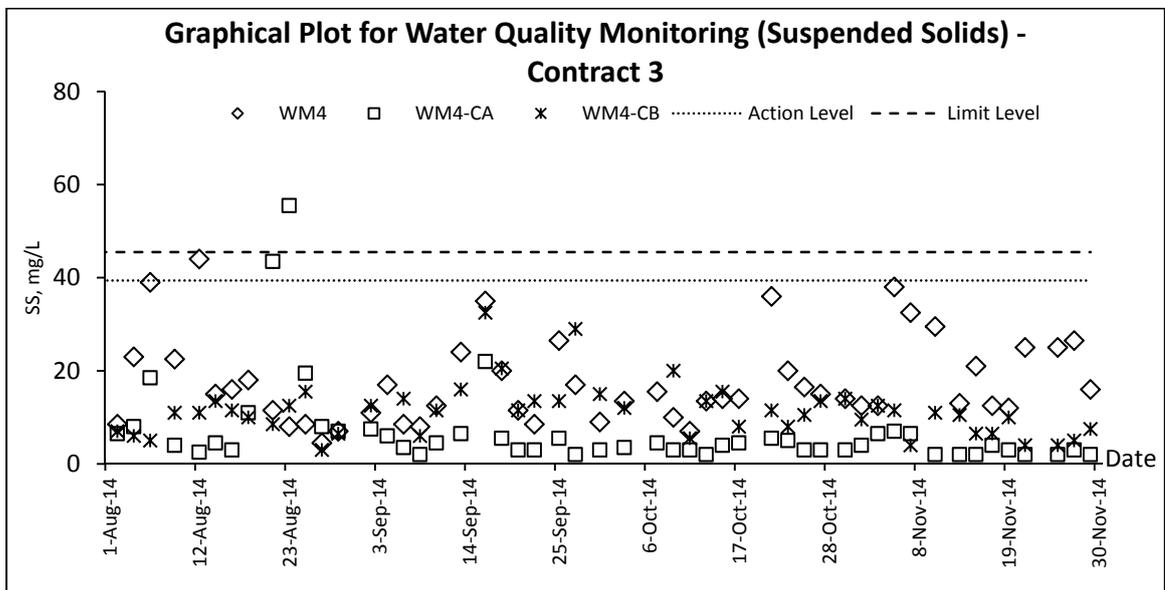
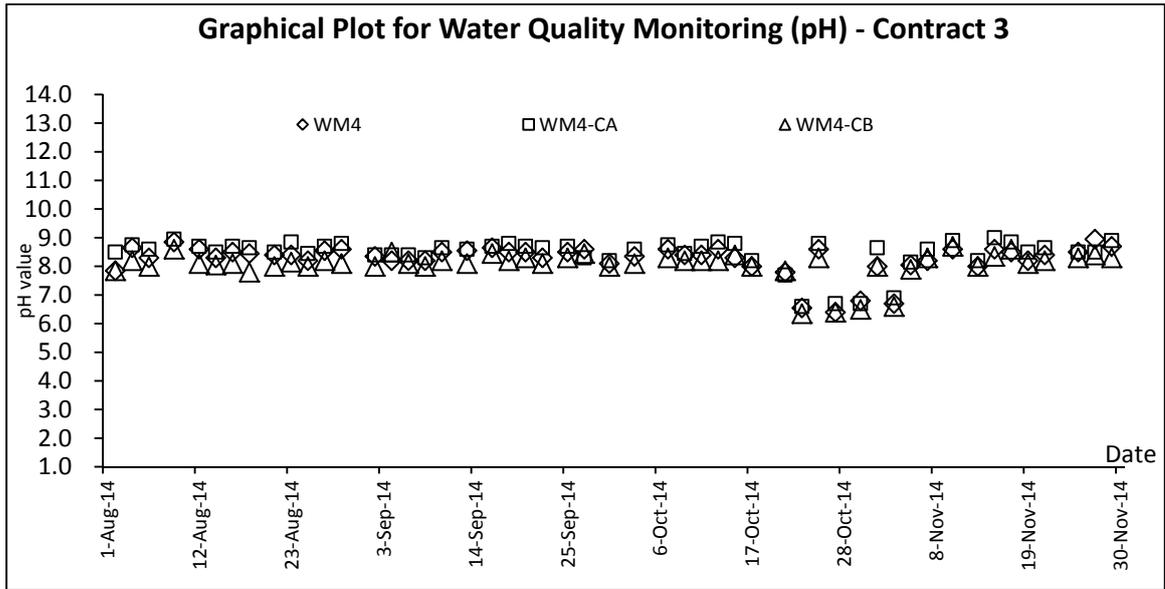




Water Quality







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-Nov-14	Sat	Mainly cloudy. Moderate to fresh easterly winds.	0	25.9	5.7	72	E/SE
2-Nov-14	Sun	Mainly cloudy. Moderate to fresh easterly winds.	Trace	24.4	9.8	70	N/NE
3-Nov-14	Mon	Cloudy with a few rain patches. Moderate to fresh easterly winds.	Trace	20.1	10	58	N
4-Nov-14	Tue	Cloudy with a few rain patches. Moderate to fresh easterly winds.	Trace	21.8	4.5	73	E
5-Nov-14	Wed	Mainly cloudy. Moderate to fresh easterly winds.	Trace	24.7	9.3	70	E
6-Nov-14	Thu	Mainly cloudy. Moderate to fresh easterly winds.	0.1	24.1	4.4	75.7	E/NE
7-Nov-14	Fri	Cloudy with a few rain patches. Moderate to fresh easterly winds.	11.8	21.9	9.5	83.7	E
8-Nov-14	Sat	Mainly cloudy. Visibility relatively low in some areas. Moderate northeasterly winds.	18	19.6	8.2	91	N/NW
9-Nov-14	Sun	Mainly cloudy. Visibility relatively low in some areas. Moderate northeasterly winds.	Trace	20.9	6.1	81	E
10-Nov-14	Mon	Mainly cloudy. Visibility relatively low in some areas. Moderate northeasterly winds.	Trace	22.6	7.4	75.5	E/NE
11-Nov-14	Tue	Mainly cloudy. Moderate north to northeasterly winds.	0	24.3	4.5	75	E
12-Nov-14	Wed	Mainly cloudy. Moderate north to northeasterly winds.	Trace	19.8	8.2	81.2	N
13-Nov-14	Thu	Fine and dry. Moderate north to northeasterly winds, fresh at times.	Trace	19.2	8.4	77	N
14-Nov-14	Fri	Mainly cloudy. Moderate north to northeasterly winds.	Trace	20.5	5	70	N/NW
15-Nov-14	Sat	Fine and dry. Moderate north to northeasterly winds, fresh at times.	0.4	22.6	7.5	66.7	E/NE
16-Nov-14	Sun	Fine and dry. Moderate north to northeasterly winds, fresh at times.	0	21.7	7.2	69	N/NW
17-Nov-14	Mon	Fine and dry. Moderate to fresh north to northeasterly winds.	0	20.8	10.9	63	N
18-Nov-14	Tue	Mainly fine and dry. Moderate northeasterly winds, fresh at times.	Trace	20.3	9.5	62	N
19-Nov-14	Wed	Mainly fine and dry. Moderate northeasterly winds, fresh at times.	Trace	19.7	5.5	65.5	N/NW
20-Nov-14	Thu	Mainly fine. Moderate easterly winds.	0	21.7	6.4	67	E
21-Nov-14	Fri	Mainly fine. Moderate easterly winds.	0	22.8	5.5	68.2	E/SE
22-Nov-14	Sat	Mainly fine. Moderate easterly winds.	0	21.6	6.7	73.5	E/SE
23-Nov-14	Sun	Mainly fine. Moderate easterly winds.	0	23.8	7.5	73.2	E/NE
24-Nov-14	Mon	Mainly fine. Moderate easterly winds.	0	24.2	7	73	E
25-Nov-14	Tue	Fine. Light winds.	0	23.7	5.5	73	W/SW
26-Nov-14	Wed	Cloudy. A few rain patches tomorrow. Fresh easterly winds.	0	21.9	7.5	81.5	E/NE
27-Nov-14	Thu	Mainly cloudy. Sunny intervals in the afternoon. Moderate easterly winds, fresh at times.	0.4	22.8	7.3	76.5	E/SE
28-Nov-14	Fri	Fine. Light winds.	Trace	24.5	6.9	76.5	E/SE
29-Nov-14	Sat	Cloudy. A few rain patches tomorrow. Fresh easterly winds.	0.2	23.9	8.5	79.5	E/SE
30-Nov-14	Sun	Mainly fine. Moderate easterly winds.	0.2	25.5	6.6	81.2	E

Appendix L

Waste Flow Table

Name of Department : CEDD

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

Appendix I - Monthly Summary Waste Flow Table for 2014

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

Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated	Broken Concrete (including rock for recycling into aggregates)	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported C&D Material	Metal	Paper/ Cardboard Packaging	Plastic (bottles/containers, plastic sheets/ foams from package material)	Chemical Waste	Others (e.g. General Refuse etc.)
	[a+b+c+d]	(a)	(b)	(c)	(d)		(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m3)
January	0.0045	0.0000	0.0045	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1773
February	0.9869	0.0000	0.9869	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1102
March	0.1366	0.0000	0.1366	0.0000	0.0000	0.2282	0.0000	0.0000	0.0000	3.2400	0.1825
April	0.2063	0.0000	0.1217	0.0269	0.0577	0.5536	0.0000	0.0000	0.0000	4.2800	0.2069
May	14.5769	0.0000	0.0643	14.4032	0.1094	2.0126	0.0000	0.0000	0.0000	0.0000	0.0887
June	26.0821	0.0000	0.0348	22.1289	3.9183	0.6915	0.0000	0.0000	0.0000	0.0000	1.1851
Half-year total	41.9932	0.0000	1.3487	36.5590	4.0855	3.4859	0.0000	0.0000	0.0000	7.5200	1.9508
July	49.4606	0.0000	0.0069	37.1170	12.3368	0.4385	0.0000	0.0000	0.0000	0.0000	0.0558
August	56.4391	0.0000	0.7325	51.3053	4.4013	0.8477	0.0000	0.0000	0.0000	0.0000	0.0774
September	56.614	0.0000	1.3762	44.492	10.7458	0.5819	0.0000	0.0000	0.0000	0.0000	0.0301
October	81.5270	0.0000	0.1239	67.7092	13.6939	0.2305	0.0000	0.0000	0.0000	0.0000	0.0761
November	81.8833	0.0000	0.0000	81.1527	0.7306	0.0000	0.0000	0.1190	0.0000	1.8900	0.0367
December	0.0000										
Yearly Total	367.9174	0.0000	3.5882	318.3355	45.9938	5.5846	0.0000	0.1190	0.0000	9.4100	2.2269

Remark:

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

Monthly Summary Waste Flow Table for 2014 (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 (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)
Jan	0.409	0.084	0	0	0.409	0.200	0	0	0.010	0	0.110
Feb	1.697	0.356	0.380	0	1.473	0	0.002	0	0	0.019	0.040
Mar	3.954	0.506	1.092	0	2.862	0	0	0	0	0	0.265
Apr	1.600	0.054	0.672	0	0.928	0.200	0	0	0	0.020	0.135
May	2.740	0.450	0.192	0	2.548	0.500	0	0	0	0.020	0.195
Jun	2.215	0.258	0.675	0	1.540	1.075	0	0	0	0.001	0.180
Sub-total	12.615	1.708	3.011	0.000	9.760	1.975	0.002	0.000	0.010	0.060	0.925
Jul	3.596	0.233	0.502	0	3.094	0.747	0	0	0.005	0	0.165
Aug	5.504	0.649	0.732	0	4.772	1.200	0	0	0.005	0.009	0.220
Sep	2.604	0.176	1.176	0	1.428	0.750	0	0	0.005	0	0.085
Oct	6.404	0.090	2.160	0	4.244	1.501	0	0	0.005	0	0.085
Nov	4.295	0	0.645	0	3.650	0	0	0	0.010	0.001	0.110
Dec											
Total	35.018	2.856	8.226	0.000	26.948	6.173	0.002	0.000	0.040	0.070	1.590

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

Name of Department: CEDD

Monthly Summary Waste Flow Table for 2014

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
JAN	0	0	0	0	0	16.571	0	0	0	0	0.85
FEB	0	0	0	0	0	18.672	0	0	0	0	0.005
MAR	0	0	0	0	0	2.968	0	0	0	6	0.01
APRIL	0	0	0	0	0	1.664	0.87	0.051	0	0	0.245
MAY	0	0	0	0	0	19.288	0	0	0	0	0.23
JUN	0	0	0	0	0	33.381	0	0.14	0	0	0
Sub Total	0	0	0	0	0	92.544	0.87	0.191	0	6	1.34
JUL	0	0	0	0	0	33.677	2.01	0.241	0	0	0.11
AUG	0	0	0	0	0	55.082	0	0	0	0	0.03
SEP	0	0	0	0	0	61.674	0	0	0	0	0.015
OCT	0	0	0	0	0	65.327	0	0.274	0	0	0.490
NOV	0	0	0	0	0	75.919	0	0	0	0	0.755
DEC											
Total	0	0	0	0	0	384.22	2.88	0.706	0	6	2.74

Notes:

Name of Department: CEDD

Forecast of Total Quantities of C&D Materials to be Generated from the Contract (see Note 4)										
Total Quantity Generated	Hard Rocks and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metal	Paper / cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
0	0	0	0	0	350	30	4	2	1	4

Notes:

- (1) The performance targets are given in PS clause 6(14) above.
- (2) The waste flow table shall also include C&D materials that are specified in the Contractor to be imported for use at the Site.
- (3) Plastic refer to plastic bottles/containers, plastic sheets/foam from packaging material.
- (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature
 - Hard Rocks and Large Broken Concrete = Cannot be defined at this stage
 - Imported Fill = Estimated by the Contractor = 1 loading = 8m³
 - Metal = Estimated by the Contractor
 - Paper/cardboard packaging = Estimated by the Contractor
 - Plastics = Estimated by the Contractor
 - Chemical Waste = Estimated by the Contractor (Spent lubricating oil, assume density 0.9kg/L)
 - Other, e.g. general refuse = Estimated by the Contractor

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

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

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

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

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

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

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

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

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

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

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

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

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