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.22) – MAY 2015

PREPARED FOR
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT (CEDD)

Date	Reference No.	Prepared By	Certified By
11 June 2015	TCS00670/13/600/R0403v2		
		Nicola Hon (Environmental Consultant)	Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	9 June 2015	First Submission
2	11 June 2015	Amended against the IEC's comments on 9 June 2015

SMEC
Local People. Global Experience.

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

11 June 2015 Our ref: 7076192/L18603/RY/AB/AW/FL/rw

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

By Email & Post

Attention: Mr Simon LEUNG

Dear Sirs

Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary Control Point and Associated Works
Independent Environmental Checker – Investigation
Monthly EM&A Report (No. 22) – May 2015

With reference to the Monthly EM&A Report No. 22 for May 2015 (Version 2) certified by the ET Leader provided to us on 11 June 2015, 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/C.

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

cc	CEDD/BCP	-	Mr Karl KL KWAN / Ms Teresa MA / Mr William CHEUNG / Mr CM OR	by fax: 3547 1659
	AECOM	-	Mr Pat LAM / Mr Perry YAM	by email
	SRJV	-	Mr Edwin AU	by email
	CW	-	Mr Daniel HO	by email
	DHK	-	Mr Raymond CHENG	by email
	AUES	-	Mr TW TAM	by email

EXECUTIVE SUMMARY

ES01 This is the **22nd** monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1 to 31 May 2015** (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**	**35**
Water Quality	Water sampling	**3 (Contract 2&3)**	**13(*)**
		2 (Contract 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 air quality and noise exceedance was registered for the Project. For water quality, a total of eleven (11) Limit Level exceedances were recorded which include 5 exceedances for WM1 and 6 exceedances at WM4. The summary of exceedance in the Reporting Period is shown below.

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	**Investigation Result**	**Corrective Actions**
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	Not project related	**N/A**
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--
Water Quality	DO	0	**2**	**2**	All exceedances were not project related	**N/A**
	Turbidity	0	**4**	**4**	All exceedances were not project related	**N/A**
	SS	0	**5**	**5**	All exceedances were not project related	**N/A**

ENVIRONMENTAL COMPLAINT

ES05 In this Reporting Period, one (1) documented environmental complaint was received and lodged for Contracts 2 regarding muddy water impact on 15 May 2015. Follow up actions have been

undertaking by the Contractor to resolve the deficiencies whereas investigation is ongoing by the ET.

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 **8, 15, 22 and 28 May 2015**. 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 **4, 13, 18 and 26 May 2015**. 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 **7, 14, 21 and 28 May 2015**. No non-compliance was noted.

FUTURE KEY ISSUES

ES11 During raining season, muddy water or other water pollutants from site surface flow to local stream such as Kong Yiu Channel and Ma Wat Channel or public area will be key environment issue. Water quality mitigation measures to prevent surface runoff into nearby water bodies or public areas should paid attention and fully implement.

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

ES13 Since most of construction sites under the Project are located adjacent to villages, the Contractors should fully implement air quality mitigation measures to reduce construction dust emission.

Table of Contents

LIST OF TABLES

LIST OF APPENDICES

1 INTRODUCTION

1.1 PROJECT BACKGROUND

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

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

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

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

1.1.4 Action-United Environmental Services & Consulting has been commissioned as an Independent ET to implement the relevant EM&A program in accordance with the approved EM&A Manual, as well as the associated duties. 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 **22nd** monthly EM&A report presenting the monitoring results and inspection findings for reporting period from **1** to **31 May 2015**.

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*

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 Regulaiton 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 lEC and Contractor(s) or their delegated representatives
- Recommend suitable mitigation measures to the Contractor in the case of exceedance of Action and Limit levels in accordance with the Event and Action Plans
- Liaise with the IEC on all environmental performance matters and timely submit all relevant EM&A proforma for approval by IEC
- Advise the Contractor(s) on environmental improvement, awareness, enhancement measures etc., on site
- Adhere to the procedures for carrying out complaint investigation
- Liaison with the client departments, Engineer/Engineer's Representative, ET, lEC and the Contractor(s) of the concurrent projects as listed under Section 2.3 below regarding the cumulative impact issues.

Independent Environmental Checker (IEC)

2.2.7 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, lEC and the Contractor(s) of the concurrent projects as listed under Section 2.3 below regarding the cumulative impact issues.

2.3 CONCURRENT PROJECTS

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

(a) Regulation of Shenzhen River Stage IV;

(b) Building works and road works by contractors of Architectural Services Department (ArchSD);

(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)

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

Mid-Vent Portal	• Tunnel excavation
North Portal	• Permanent slope formation (soil nailing works) • Conveyor Belt System Construction • South Bound Tunnel Bench excavation • Slab cradle for TBM shifting way • TBM onsite assembly
South Portal	• Temporary Slope Cut with Soil Nails Installation • Northbound and Southbound tunnel excavation and Ventilation Building Formation • Drill and Blast Set Up + Site installation
Admin Building	• Backfilling for surcharge • Drainage works • Site hoarding

Contract 3 (CV/2012/09)

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

- Abutment construction for Bridge E
- Cable detection and trial trenches
- Catch fence erection
- E&M work for new valve control & Telemetry House
- Filling works at Tong Hang East
- Lagging wall for bored pile wall
- Laying storm drains
- Noise barrier construction
- Pier construction
- Pier table construction
- Pile cap works
- Pile works
- Road works at Fanling Highway
- Sewer works at Tai Wo Service Road West (TWSRW)
- Tree felling works
- Utilities duct laying
- Viaduct segment erection

Contract 4 (Contract number to be assigned)

2.4.4 The contract has not yet been awarded.

Contract 5 (CV/2013/03)

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

- Laying additional rising mains at LMH road
- Construction of secondary boundary fencing
- Construction of Depressed Road at BCP3
- Construction of retaining wall No.2a
- Parapet installation at Bridge J
- Construction of chain link fence and trapezoidal channel at BCPA
- Drainage works at existing/proposed LMH Road
- Drainage works (Connection to Box 3) at BCP Area
- Brick laying at footpath of proposed LMH road
- Water works at proposed LMH Road
- Formation works at BCPB Area
- Installation of Underground utilities at proposed and existing LMH road
- Road works (kerb laying) for proposed and existing LMH road
- Bituminous laying at existing LMH road

Contract 6 (CV/2013/08)

2.4.6 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 2, 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	Valid from 25 Mar 2014
		Mid-Vent Portal Waste Producers Number: No. 5213-634-D2524-01	Valid from 25 Mar 2014
		South Portal Waste Producers Number: No. 5213-634-D2526-01	Valid from 9 Apr 2014
3	Water Pollution Control Ordinance - Discharge License	No.WT00018374-2014	Valid from 3 Mar 2014 to 28 Feb 2019
		No.: W5/1I389	Valid from 28 Mar 2014 to 31 Mar 2019
		No.: W5/1I390	Valid from 24 Mar 2014 to 31 Mar 2019 Surrendered, effective 19 June 2014
		No.: W5/1I391	Valid from 28 Mar 2014 to 31 Mar 2019
		No.: W5/1I392	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
5	Construction Noise Permit	GW-RN0693-14	Valid 11 Nov 2014 - 10 May 2015
		GW-RN0092-15	Valid 23 Feb 2015 - 22 May 2015
		GW-RN0091-15	Valid 23 Feb 2015 - 22 May 2015
		GW-RN0778-14	Valid 29 Dec 2014 - 28 Jun 2015
		GW-RN0087-15	Valid 23 Feb 2015 - 22 May 2015
		GW-RN0195-15	Valid 30 Mar 2015 -

Item	Description	License/Permit Status	
			30 May 2015
		GW-RN0279-15	Valid 12 May 2015 - 29 Aug 2015
		GW-RN0305-15	Valid 19 May 2015 - 18 Aug 2015
		GW-RN0304-15	Valid 19 May 2015 - 14 Nov 2015
		GW-RN0298-15	Valid 30 May 2015 - 29 Aug 2015
		GW-RN0299-15	Valid 123 May 2015 - 22 Aug 2015
		GW-RN0315-15	Valid 3 Jun 2015 - 28 Jun 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-RN0095-15 (cancelled on 6 May 15)	Valid on 24 Feb 2015 till 18 Jul 2015
		GW-RN0120-15	Valid on 8 Mar 2015 till 1 Jul 2015
		GW-RN0230-15	Valid on 15 Apr 2015 till 14 Oct 2015
		GW-RN0129-15	Valid on 3 Mar 2015 till 30 May 2015
		GW-RN0270-15	Valid on 6 May 2015 till 18 Jul 2015
		GW-RN0275-15	Valid on 6 May 2015 till 15 Aug 2015
		GW-RN0295-15	Valid on 21 May 2015 till 30 Aug 2015
		GW-RN0326-15	Valid on 29 May 2015 till 29 Aug 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

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

3.3 MONITORING LOCATIONS

3.3.1 The designated monitoring locations as recommended in the *EM&A Manual* are shown in ***Appendix D***. As the access to some of the designated monitoring locations was questionable due to safety reason or denied by the landlords, alternative locations therefore have had proposed. The 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 AM1to 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 Road	Contract 2, Contract 6
NM7	Po Kat Tsai Village	Po Kat Tsai	Contract 2
NM8	Village House, Tong Hang	Fanling	Contract 2 Contract 3
NM9	Village House, Kiu Tau Village	Fanling	Contract 3
NM10	Nam Wa Po Village House No. 80	Fanling	Contract 3

Table 3-4 Impact Monitoring Stations - Water Quality

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
WM1	Downstream of Kong Yiu Channel	833 679	845 421	Alternative location located at upstream 51m of the designated location	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 2 Contract 3
WM4–Control A	Kau Lung Hang Stream	834 028	837 695	Alternative location located at downstream 28m of the designated location	Contract 2 Contract 3
WM4–Control B	Upstream of Ma Wat Channel	833760	837395	Alternative location located at upstream 15m of the designated location	Contract 2 Contract 3

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

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

Wind Data Monitoring Equipment

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

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

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

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

Noise Monitoring

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

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

Table 3-6 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	B&K Type 2238* or Rion NL-31 or Rion NL-52*
Calibrator	B&K Type 4231* or Cesva CB-5*

Equipment	Model
Portable Wind Speed Indicator	Testo Anemometer

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

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

Water Quality Monitoring

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

- a DO level in the range of 0-20 mg/l and 0-200% saturation; and
- a temperature of between 0 and 45 degree Celsius.

3.5.11 A portable pH meter capable of measuring a range between 0.0 and 14.0 should be provided to measure pH under the specified conditions accordingly to the APHA Standard Methods.

3.5.12 The instrument should be portable and weatherproof using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0-1000 NTU.

3.5.13 A portable, battery-operated echo sounder or tape measure will be used for the determination of water depth at each designated monitoring station as appropriate.

3.5.14 A water sampler e.g. Kahlsico Water Sampler, which is a transparent PVC cylinder with capacity not less than 2 litres, will be used for water sampling if water depth over than 0.5m. For sampling from very shallow water depths e.g. <0.5 m, water sample collection will be directly from water surface below 100mm use sampling plastic bottle to avoid inclusion of bottom sediment or humus. Moreover, Teflon/stainless steel bailer or self-made sampling buckets maybe used for water sampling. The equipment used for sampling will be depended the sampling location and depth situations.

3.5.15 Water samples for laboratory measurement of SS will be collected in high density polythene bottles, packed in ice (cooled to 4 ºC without being frozen), and delivered to the laboratory in the same day as the samples were collected.

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

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

Table 3-7 Water Quality Monitoring Equipment

Equipment	Model
Water Depth Detector	Eagle Sonar or tape measures
Water Sampler	A 2-litre transparent PVC cylinder with latex cups at both ends or teflon/stainless steel bailer or self-made sampling bucket
Thermometer & DO meter	YSI Professional Plus* /YSI PRO20 Handheld Dissolved Oxygen Instrument / YSI 550A Multifunctional Meter*

Equipment	Model
pH meter	YSI Professional Plus* / AZ8685 pH pen-style meter*
Turbidimeter	Hach 2100Q*
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-liter plastic cool box with Ice pad

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

3.6 MONITORING METHODOLOGY

1-hour TSP Monitoring

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

(a.) A pump to draw sample aerosol through the optic chamber where TSP is measured;

(b.) A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and

(c.) A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

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

24-hour TSP Monitoring

3.6.3 The equipment used for 24-hour TSP measurement is Tisch Environmental, Inc. Model TE-5170 TSP high volume air sampling system, which complied with *EPA Code of Federal Regulation, Appendix B to Part 50*. The High Volume Air Sampler (HVS) consists of the following:

(a.) An anodized aluminum shelter;

(b.) A 8"x10" stainless steel filter holder;

(c.) A blower motor assembly;

(d.) A continuous flow/pressure recorder;

(e.) A motor speed-voltage control/elapsed time indicator;

(f.) A 7-day mechanical timer, and

(g.) A power supply of 220v/50 Hz

3.6.4 The HVS is operated and calibrated on a regular basis in accordance with the manufacturer's instruction using Tisch Calibration Kit Model TE-5025A. Calibration would carry out in two month interval.

3.6.5 24-hour TSP is collected by the ET on filters of HVS and quantified by a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (ALS), upon receipt of the samples. The ET keep all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% RH (Relative Humidity) and 25^{o}C, for six months prior to disposal.

Noise Monitoring

3.6.6 Noise measurements were taken in terms of the A-weighted equivalent sound pressure level (L_{eq}) measured in decibels dB(A). Supplementary statistical results (L_{10} and L_{90}) were also obtained for reference.

3.6.7 During the monitoring, all noise measurements would be performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (L_{eq}). $Leq_{(30min)}$ in six consecutive $Leq_{(5min)}$ measurements will use as the monitoring parameter for the time period between 0700-1900 hours on weekdays; and also $Leq_{(15min)}$ in three consecutive $Leq_{(5min)}$ measurements would be used as monitoring parameter for other time periods (e.g. during restricted hours), if necessary.

3.6.8 Prior of noise measurement, the accuracy of the sound level meter is checked using an acoustic calibrator generating a known sound pressure level at a known frequency. The checking is performed before and after the noise measurement.

Water Quality

3.6.9 Water quality monitoring is conducted at the designated locations. The sampling produce with the in-situ monitoring are presented as below:

Sampling Procedure

3.6.10 A Digital Global Positioning System (GPS) is used to identify the designated monitoring stations prior to water sampling. A portable, battery-operated echo sounder is used for the determination of water depth at each station. At each station, water sample would be collected from 0.1m below water surface or the water surface to prevent the river bed sediment for stirring.

3.6.11 The sample container will be rinsed with a portion of the water sample. The water sample then will be transferred to the high-density polythene bottles as provided by the laboratory, labeled with a unique sample number and sealed with a screw cap.

3.6.12 Before sampling, general information such as the date and time of sampling, weather condition as well as the personnel responsible for the monitoring would be recorded on the field data sheet.

3.6.13 A 'Willow' 33-liter plastic cool box packed with ice will be used to preserve the water samples prior to arrival at the laboratory for chemical determination. The water temperature of the cool box is maintained at a temperature as close to 4^0C as possible without being frozen. Samples collected are delivered to the laboratory upon collection.

Equipment	Model
Water Depth Detector	Eagle Sonar or tape measures
Water Sampler	A 2-litre transparent PVC cylinder with latex cups at both ends or teflon/stainless steel bailer or self-made sampling bucket
Thermometer & DO meter	YSI Professional Plus* /YSI PRO20 Handheld Dissolved Oxygen Instrument / YSI 550A Multifunctional Meter*
pH meter	YSI Professional Plus* / AZ8685 pH pen-style meter*
Turbidimeter	Hach 2100Q*
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-liter plastic cool box with Ice pad

In-situ Measurement

3.6.14 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 YSI Professional Plus is used for water in-situ measures, which automates the measurements and data logging of temperature, dissolved oxygen, dissolved oxygen saturation, pH value and salinity.

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

Laboratory Analysis

3.6.19 All water samples analyzed Suspended Solids (SS) will be carried out by a local HOKLAS-accredited testing laboratory (ALS Technichem (HK) Pty Ltd HOKLAS registration no. 66). SS determination using *APHA Standard Methods 2540D* as specified in the *EM&A Manual* will start within 48 hours of water sample receipt.

3.7 EQUIPMENT CALIBRATION

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

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

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

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

3.7.5 The calibration certificates of all monitoring equipment used for the impact monitoring program in the Reporting Period and the HOKLAS accredited certificate of laboratory are attached in ***Appendix F***.

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

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

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

Monitoring Station	Action Level (μg /m^3)		Limit Level (μg/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) and65 dB(A) during examination period

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

Table 3-10 Action and Limit Levels for Water Quality

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

Remarks:
(*) *The Proposed **Action Level** of Dissolved Oxygen is adopted to be used 5%-ile of baseline data*
(**) *The Proposed **Action & Limit Level** of Dissolved Oxygen is used 4mg/L*
(#) *The Proposed **Limit Level** of Dissolved Oxygen is adopted to be used 1%-ile of baseline data*

3.8.2 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan which presented in ***Appendix 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 ($\mu g/m^3$)	1-hour TSP ($\mu g/m^3$)				
		Date	Start Time	1st reading	2nd reading	3rd reading
6-May-15	39	5-May-15	10:55	37	39	39
12-May-15	42	8-May-15	11:10	28	28	29
18-May-15	30	14-May-15	10:31	37	38	46
23-May-15	32	20-May-15	10:38	62	55	45
29-May-15	34	26-May-15	14:00	44	43	43
Average (Range)	**35 (30-42)**	Average (Range)		**41 (28 – 62)**		

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

Date	24-hour TSP ($\mu g/m^3$)	1-hour TSP ($\mu g/m^3$)				
		Date	Start Time	1st reading	2nd reading	3rd reading
6-May-15	103	5-May-15	10:43	35	38	41
12-May-15	146	8-May-15	11:08	40	38	50
18-May-15	54	14-May-15	10:13	46	39	45
23-May-15	23	20-May-15	10:24	55	49	37
29-May-15	77	26-May-15	13:29	26	28	27
Average (Range)	**81 (23-146)**	Average (Range)		**40 (26 – 55)**		

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

Date	24-hour TSP ($\mu g/m^3$)	1-hour TSP ($\mu g/m^3$)				
		Date	Start Time	1st reading	2nd reading	3rd reading
6-May-15	55	5-May-15	10:36	34	36	33
12-May-15	47	8-May-15	10:57	27	27	25
18-May-15	41	14-May-15	10:09	44	39	36
23-May-15	20	20-May-15	10:10	56	54	46
29-May-15	64	26-May-15	13:22	32	34	31

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
Average (Range)	**45 (20-64)**	Average (Range)		**37 (25 – 56)**		

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

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
6-May-15	88	6-May-15	10:19	126	105	99
12-May-15	80	12-May-15	10:06	32	28	46
18-May-15	65	18-May-15	10:42	42	45	39
23-May-15	27	23-May-15	11:19	55	40	48
29-May-15	94	29-May-15	11:02	52	52	49
Average (Range)	**71 (27-94)**	Average (Range)		**57 (28 – 126)**		

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

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
6-May-15	46	6-May-15	10:37	66	56	53
12-May-15	44	12-May-15	10:23	21	21	30
18-May-15	40	18-May-15	11:01	36	31	30
23-May-15	18	23-May-15	11:37	25	31	58
29-May-15	41	29-May-15	13:21	50	51	52
Average (Range)	**38 (18-46)**	Average (Range)		**41 (21 – 66)**		

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

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
6-May-15	57	5-May-15	10:19	25	22	26
12-May-15	50	8-May-15	10:24	14	12	13
18-May-15	99 #	14-May-15	13:08	32	26	33
23-May-15	26	20-May-15	13:12	109	96	100
29-May-15	41	26-May-15	13:01	41	48	69
Average (Range)	**44 (26-57)**	Average (Range)		**44 (12 - 109)**		

Remark: 24-hour TSP monitoring was operated for 4 hours only due to power failure and this result is invalidated.

4.2.2 In this Reporting Period, HVS for 24-hour TSP monitoring at Location AM9b was disconnected during operation on 18 May 2015. The 24-hour TSP monitoring only ran for approximately 4 hours and the result was accounted as invalidated. Since the electric wire of HVS was damaged, made-up sampling could not be arranged during the week.

4.2.3 As shown in ***Tables 4-1 to 4-6***, all the 1-hour TSP and 24-hour TSP monitoring results were below the Action/Limit Levels. No Notification of Exceedance (NOE) was issued in this Reporting Period.

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

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 **35** 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 ($L_{eq30min}$), dB(A)									
Date	**NM1**	**NM2**	**NM8**	**NM9**	**NM10(*)**	**Date**	**NM5**	**NM6**	**NM7**
5-May-15	52	60	59	60	65	6-May-15	52	60	67
14-May-15	59	60	58	57	60	12-May-15	60	60	64
20-May-15	60	60	59	60	62	18-May-15	64	60	63
26-May-15	53	57	67	61	67	23-May-15	56	62	61
						29-May-15	56	63	65
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 the designated monitoring locations NM1, NM2, NM5, NM6, NM7, NM8, NM9 and NM10, were below 75dB(A). Furthermore, there was no noise complaints (Action Level exceedance) received by the RE, Contractors or CEDD in the Reporting Period. Therefore, no Action or Limit Level exceedance was triggered and no corrective action was required.

6 WATER QUALITY MONITORING

6.1 GENERAL

6.1.1 In the Reporting Period, construction works under the project has been commenced in Contracts 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 –South Portal of Contract 2 and 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, there were **thirteen (13)** sampling days of water quality monitoring conducted at the designated water monitoring location.

6.2.2 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 Contracts 2 and 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
2-May-15	5.98	4.11	2.30	22.15	4.33	5.34	29.00	4.00	8.00
5-May-15	4.24	6.80	3.08	12.40	3.03	10.30	24.50	5.00	8.00
7-May-15	4.17	5.31	3.88	20.95	11.55	5.49	22.00	8.00	5.50
9-May-15	5.57	6.08	4.48	24.10	17.45	21.00	19.00	8.50	11.00
12-May-15	**3.54**	5.60	2.84	18.30	8.53	15.65	12.00	3.00	12.00
14-May-15	4.60	6.30	3.76	11.40	3.12	6.21	11.00	4.00	5.50
16-May-15	**3.77**	5.06	3.00	12.35	4.40	12.15	13.50	2.50	14.50
18-May-15	4.16	5.52	3.74	17.10	4.32	11.55	13.50	2.50	10.50
20-May-15	7.63	5.12	4.99	**402.00**	263.90	200.65	**314.50**	254.50	131.50
23-May-15	6.40	6.96	7.25	**284.00**	92.50	186.50	**236.00**	95.50	111.50
26-May-15	7.01	7.59	6.40	33.40	10.55	67.65	24.00	6.00	46.00
28-May-15	6.37	7.08	4.71	24.75	5.47	11.85	13.50	3.00	7.50
30-May-15	7.24	7.53	7.22	24.70	5.02	10.85	22.00	3.00	8.00

Remark:

i. bold and underlined indicated Limit Level exceedance.

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
2-May-15#	4.82	3.65	78.9	64.2	54.5	44.5
5-May-15#	6.13	6.62	111.5	86.8	100.0	51.5
7-May-15#	6.47	5.19	193.5	589.5	110.5	352.0
9-May-15#	4.74	4.06	63.7	48.4	24.5	21.5
12-May-15	6.79	6.04	**>999**	34.2	**266.0**	18.5
14-May-15#	5.74	5.67	132.5	20.4	78.0	14.5
16-May-15#	5.58	4.73	344.5	59.2	169.0	57.0
18-May-15#	3.12	5.15	283.0	35.9	135.5	23.5

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-Control	WM1	WM1-Control	WM1	WM1-Control
20-May-15#	5.21	4.33	>999	32.7	378.5	35.5
23-May-15	4.53	4.69	>999	>999	**1530.0**	794.0
26-May-15	6.81	6.58	**969.5**	260.5	**479.5**	139.5
28-May-15#	6.68	6.20	77.7	9.6	114.5	4.0
30-May-15#	6.82	5.34	689.5	26.1	483.5	17.0

Remark:

ii. bold and underlined indicated Limit Level exceedance.

 # water sampling was not able to carry out due to shallow water and water monitoring was conducted at box culvert 2 downstream for reference

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	**2**	0	**3**	0	**5**
WM4	0	**2**	0	**2**	0	**2**	0	**6**
No of Exceedance	0	**2**	0	**4**	**0**	**5**	0	**11**

6.2.3 During water monitoring on 2, 5, 7, 9, 14, 16, 18, 20, 28 and 30 May 2015, very shallow water was observed at the proposed water monitoring location and water sampling at WM1 was unable to carry out. Water sampling was then carried out near the box culvert 2 at close downstream and the data is served as reference only.

6.2.4 In this Reporting Period, there were two (2) and three (3) exceedances of turbidity and suspended solids recorded at WM1 respectively. For WM4, a total of six (6) Limit Level exceedances were recorded, namely two (2) Limit Level exceedances of DO, two (2) Limit Level exceedances of turbidity and two (2) Limit Level exceedances of suspended solids.

6.2.5 NOE was issued to relevant parties upon confirmation of the monitoring result. The investigation for the cause of exceedance is presented in below.

Investigation Result for turbidity and SS Exceedance at WM1 on 12, 23 and 26 May 2015

6.2.6 According to the site information provided by the Contractor, formation work at BCP and construction of Depressed Road at BCP3 were conducted on 12 May 2015 whereas no construction works were carried out under Contract 5 on 23 and 26 May 2015 due to inclement weather.

6.2.7 During the water monitoring on 12, 23 and 26 May 2015, muddy water was observed throughout the channel due to heavy rain. According to the weather record form the Hong Kong Observatory, amber/ red rainstorm signal and continuous heavy rainfall were recorded on 12, 23 and 26 May 2015. It was considered that the continuous heavy rainstorm caused high water flow in the channel and stirred up the sediment at river bed, which highly deteriorated the water quality in the channel.

6.2.8 Site inspection was carried out by the ET on 14 May and 4 June to inspect the water monitoring area. No muddy water observed near WM1 which revealed that the water quality in the channel was returned to normal after rainstorm. It was concluded that the turbidity and SS exceedances on 12, 23 and 26 May 2015 were due to the rainstorm and not related to the works under the project.

Investigation Result for DO Exceedance at WM4 on 12 and 16 May 2015 (Contract 2)

6.2.9 According to the site information provided from the Contractor of C2 (DHK), construction activities carried out at South Portal on 12 and 16 May 2015 included tunnel excavation, spoil transportation and slope stabilization and all works were far from the river. There was discharge made on 16 May 2015 and visual test for the water in the final sedimentation tank was conducted by DHK on 16 May 2015 and the result was satisfactory.

6.2.10 Site inspection at South Portal was conducted by the ET on 15 May 2015, it was observed that the wastewater generated from works was treated by the wastewater treatment system and the treated water was recycled for further use such as wheel washing. The water quality stored in the final sedimentation was visually in good condition and no adverse impact on water quality was observed.

6.2.11 According to the photo record provided by the other party on 12 and 16 May 2015, muddy water flowed from outside site boundary was observed. The muddy water may deteriorate the existing stream water and affecting the water quality at the downstream. Moreover, lower DO levels were recorded at upstream control station WM4-CB on 12 and 16 May 2015 as well. It is considered that the exceedances were likely due to natural variation and not related to the works under Contract 2.

Investigation Result for DO Exceedance at WM4 on 12 and 16 May 2015 (Contract 3)

6.2.12 According to the site diaries provided by the Contractor (Chun Wo), construction works carried out on 12 and 16 May 2015 included welding waling, formwork erection, rebar fixing, installation of sheep pile and concreting. The abovementioned works were carried out away from the watercourse and comprised none of DO depleting characteristics.

6.2.13 Inspection of the wastewater treatment facilities and the surrounding environment was conducted by the Contractor on 12 and 16 May 2015. Water sample was collected at the discharge point for visual test in order to check the performance of discharge. According to the inspection record, muddy water flowed from outside site boundary was observed near WWTS NO.9. The external muddy water may deteriorate the existing stream water and affecting the water quality at the downstream. Such incident was observed during weekly site inspection by the RE, Contractor, IEC and ET as well.

6.2.14 It was also noted that lower DO levels were recorded at upstream control station WM4-CB on 12 and 16 May 2015. Therefore, it is considered that the exceedances were likely due to natural variation and not related to the works under Contract 3.

Investigation Result for turbidity and SS Exceedance at WM4 on 20 and 23 May 2015 (Contract 2)

6.2.15 According to the site information provided from the Contractor of C2 (DHK), construction activities carried out on 20 and 23 May 2015 at South Portal included tunnel excavation, spoil transportation and slope stabilization and all works were far from the Ma Wat River.

6.2.16 During the course of water monitoring, muddy water was observed throughout the channel. According to the weather record from HKO, amber rainstorm signal was hoisted during the water monitoring. It was considered that the continuous heavy rainstorm caused high water flow in channel and stirred up the sediment at river bed which deteriorated the water quality in the channel.

6.2.17 According to the photo record provided by the other party on 20 and 23 May 2015, muddy water flowed from upstream was observed at several upstream locations under the influence of rainfall. Moreover, it was also noted that high turbidity and SS levels were recorded at upstream control station WM4-CA andWM4-CB. It was considered that the exceedances on 20 and 23 May 2015 were a single incident due to rainstorm.

Investigation Result for turbidity and SS Exceedance at WM4 on 20 and 23 May 2015 (Contract 3)

6.2.18 According to the site diary provided by the Contractor, construction works carried out on 20 and 23 May 2015 included excavation, erection of formwork, cutting, welding, installation of sheetpile and erection of falsework. The works were carried out away from the watercourse and the wastewater generated from the site was treated by the onsite wastewater treatment facilities before discharge.

6.2.19 During the course of water monitoring on 20 and 23 May 2015, there was red or amber rainstorm signal in hoisted and muddy water was observed throughout the Ma Wat River. It was considered that the continuous heavy rainstorm caused vigorous water flow in the river and stirred up the sediment at river bed which deteriorated the water quality in the river course.

6.2.20 Moreover, muddy water flowed from upstream was observed at several upstream location under the influence of rainfall. High turbidity and SS levels were also recorded at upstream control station WM4-CA andWM4-CB. In view of the subsequent monitoring activities and results during non-rainy day in the week after, no muddy water was observed and no exceedance was triggered. It was considered that the exceedances on 20 and 23 May 2015 were a single incident due to rainstorm.

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)	**41.7957**	--	**1.357**	--	0	--	**43.1527**
Reused in this Project (Inert) (in '000 m^3)	**8.7663**	--	**0.108**	--	0	--	**8.8743**
Reused in other Projects (Inert) (in '000 m^3)	**32.6095**	C5	0	--	0	--	**32.6095**
Disposal as Public Fill (Inert) (in '000 m^3)	**0.4199**	Tuen Mun 38	**2.249**	Tuen Mun 38	0	--	**2.6689**

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 ('000kg) #	0	-	0	Licensed collector	0	--	0
Recycled Paper / Cardboard Packing ('000kg) #	**0.1300**	Licensed collector	0	-	0	--	**0.1300**
Recycled Plastic ('000kg) #	0	-	**0.012**	-	0	--	**0.012 ('000kg)**
Chemical Wastes ('000kg) #	**2.6400**	Licensed collector	0	-	0	--	**2.6400**
General Refuses ('000m^3)	**0.0511**	NENT	**0.065**	NENT	0	--	**0.1161**

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

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 **8, 15, 22 and 28 May 2015**. 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
8 May 2015	• Soil and mud trails was observed at the site exit. The contractor should clean the trace and make sure all the vehicles leaving from site are cleaned. (Admin Building) • All wheel washing activities should be undertaken within the site area. (Mid-Vent)	• Soil and mud trails at the site exit was cleaned. • Not required for reminder
15 May 2015	• C&D waste and stagnant water cumulated on site was observed. The contractor should tidy up the works area. (South Portal)	• The captioned area was delicated as the temporary litter basin. Regular removal of refuse had been arranged.
22 May 2015	• Earth bund should be provided to divert the muddy surface runoff to the treatment facilities. (North Portal) • Turbid water discharged from site was observed. The Contractor should treat the water as compled with the license requirement before discharge. (Admin Building)	• Sand bags had been provided to divert muddy runoff to the treatment facilities • Installation of water treatment is ongoing.
28 May 2015	• Stagnant water cumulated on site after the rainstorm should be clean to prevent mosquito breeding. (South Portal) • Sand and mud trails were observed at the site exit. The contractor should clean the trails and provide proper wheel washing for vehicles prior to leaving the site. (Admin Building)	• To be stagnant water was removed from the drip tray. • All wheels of all vehicles leaving the site were washed throughly.

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 **4, 3, 18 and 26 May 2015**. 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
4 May 2015	• The Contractor was reminded to fill the lifting eye of the concrete block with sand to prevent cumulate of rain water • The Contractor was reminded to install bund or barrier at the edge of the slope to prevent surface runoff.	• The lifting eyes have been filled with sand. • The slope next to the river has been covered with tarpaulin sheet.
13 May 2015	• A retained tree without protection was observed at SA12, the Contractor should provide proper protective fence for the retained tree. • The Contractor was reminded that washing of concrete truck should be carried out away from the river and trees.	• Protection fence has been provided for the retained tree. • Not required for reminder
18 May 2015	• Broken water barrier was observed at Tai Wo Service Road West, the Contractor should replace the broken water barrier to prevent stagnant water.	• The broken water barrier has been placed.
26 May 2015	• The Contractor was reminded to remove stagnant water after rain.	• Not required for reminder

8.2.5 Furthermore, the Contractor of Contract 3 was reminded to provide water spraying during dusty works, such as breaking and excavation.

The Contract 5

8.2.6 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 **7, 14, 21 and 28 May 2015**. No non-compliance was noted.

8.2.7 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
7 May 2015	• As a reminder, vehicle should be washed before leaving the site. And vehicle should only leave the site at proper exit with washing facility.	• Not required for reminder
14 May 2015	No environmental issue was observed during the site inspection.	N/A
21 May 2015	No environmental issue was observed during the site inspection.	N/A
28 May 2015	No environmental issue was observed during the site inspection.	N/A

8.2.8 Overall, general housekeeping such as daily site tidiness and cleaniness should be maintained for all Contracts. Furthermore, the Contractors were reminded to implement Waste Management Plan of the Project.

Other Contracts

8.2.9 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, one (1) documented environmental complaint was received and lodged for Contracts 2. Follow up actions have been undertaking by the Contractor to resolve the deficiencies The details of complaint are listed below:-

- 15 May 2015 - A complaint was received from the EPD on 15 May 2015. The complainant complained that muddy water was generated and discharged from a construction site near Po Kat Tsai. The muddy water seriously polluted the water environment and complainant unable to use the river water to irrigate their cropping. This situation has been happening a month ago and complainant requested the related department to follow up.

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 will be submitted to all relevant parties.

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 – 30 Apr 2015	Contract 2	0	**11**	• **(4) Water Quality** • **(5) Construction Dust** • **(2) Noise**
06 Nov 2013 – 30 Apr 2015	Contract 3	0	**3**	• **(1) Construction Dust** • **(2) Water quality**
16 Aug 2013 – 30 Apr 2015	Contract 5	0	**2**	• **(2) Construction Dust**
1 – 31 May 2015	Contract 2	**1**	**12**	• **(5) Water Quality** • **(5) Construction Dust** • **(2) Noise**
	Contract 3	0	**3**	• **(1) Construction Dust** • **(2) Water quality**
	Contract 5	0	**2**	• **(2) Construction Dust**

Table 9-2 Statistical Summary of Environmental Summons

Reporting Period	Contract No	Environmental Summons Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 – 30 Apr 2015	Contract 2	0	0	NA
06 Nov 2013 – 30 Apr 2015	Contract 3	0	0	NA
16 Aug 2013 – 30 Apr 2015	Contract 5	0	0	NA
1 – 31 May 2015	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 – 30 Apr 2015	Contract 2	0	0	NA
06 Nov 2013 – 30 Apr 2015	Contract 3	0	0	NA
16 Aug 2013 – 30 Apr 2015	Contract 5	0	0	NA
1 – 31 May 2015	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	• Wastewater to be treated by the wastewater treatment facilities i.e. sedimentation tank or AquaSed before discharge.
Air Quality	• 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	• Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. • Keep good maintenance of plants • Place noisy plants away from residence or school • Provide noise barriers or hoarding to enclose the noisy plants or works • Shut down the plants when not in used.
Waste and Chemical Management	• On-site sorting prior to disposal • Follow requirements and procedures of the “Trip-ticket System” • Predict required quantity of concrete accurately • Collect the unused fresh concrete at designated locations in the sites for subsequent disposal
General	• The site was generally kept tidy and clean.

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

Mid-Vent Portal
- Tunnel excavation

North Portal
- Permanent slope formation
- South Bound Tunnel Bench Excavation
- South Bound Invert grouting
- TBM onsite assembly
- Conveyor belt and associated equipment installation for operation of TBM

South Portal
- Northbound and Southbound excavation and Ventilation Building Formation
- Southbound foundation works

Admin Building
- Backfilling for surcharge
- Demolition of existing building

Contract 3

- Cable detection and trial trenches
- Catch fence erection
- Decking construction for Bridge E
- E&M work for new valve control & Telemetry House
- Filling works at Tong Hang East
- Lagging wall for bored pile wall
- Laying storm drains
- Noise barrier construction
- Pier construction
- Pier table construction
- Pile cap works
- Portal beam erection
- Pre-drilling works and piling works for viaduct
- Retaining wall construction
- Road works at Fanling Highway
- Sewer works at Tai Wo Service Road West (TWSRW)
- Tree felling works
- Utilities duct laying
- Viaduct segment erection

Contract 5

- Laying of additional rising main at LMH road
- Bituminous laying at proposed and existing LMH road.
- Construction of secondary boundary fencing
- Construction of retaining wall no. 2a
- Brick laying at footpath of proposed LMH road
- Road works (kerb laying) for proposed LMH road and existing LMH road
- Formation works at BCP area
- Installation of precast parapet and vehicular railing at Bridge J
- Construction of Depressed Road at BCP3
- Filling work for ArchSD permanent office
- Drainage works at proposed and exiting LMH Road
- Water works at proposed LMH Road
- Irrigation system at proposed and existing LMH Road
- Drainage works at BCP area
- Installation of Underground utilities at proposed and 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 Contract 4 and Contract 6 have not yet commenced and no environmental issue is presented.

11 CONCLUSIONS AND RECOMMENDATIONS

11.1 CONCLUSIONS

11.1.1 This is **22nd** monthly EM&A report presenting the monitoring results and inspection findings for the Reporting Period from **1** to **31 May 2015**.

11.1.2 For air quality monitoring, no 1-hour and 24-hour TSP monitoring results triggered the Action or Limit Levels were recorded. No NOEs or the associated corrective actions were therefore issued.

11.1.3 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, there were two (2) and three (3) exceedances of turbidity and suspended solids recorded at WM1 respectively. For WM4, a total of six (6) Limit Level exceedances were recorded, namely two (2) Limit Level exceedances of DO, two (2) Limit Level exceedances of turbidity and two (2) Limit Level exceedances of suspended solids. The investigation for the cause of exceedance was completed and submitted to relevant parties.

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 One (1) documented environmental complaint was received and lodged for Contracts 2 regarding muddy water impact on 15 May 2015. Follow up actions have been undertaking by the Contractor to resolve the deficiencies whereas investigation is ongoing by the ET.

11.1.7 During the Reporting Period, four (4), four (4) and five (5) events of joint site inspection by the RE, IEC, ET with the relevant 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.

11.2 RECOMMENDATIONS

11.2.1 During wet season, muddy water or other water pollutants from site surface runoff into Kong Yiu Channel and Ma Wat Channel will be key environment issue. Water quality mitigation measures to prevent surface runoff into nearby water bodies and public areas should be paid on special attention. The Contractors should fully implement the water quality mitigation measures.

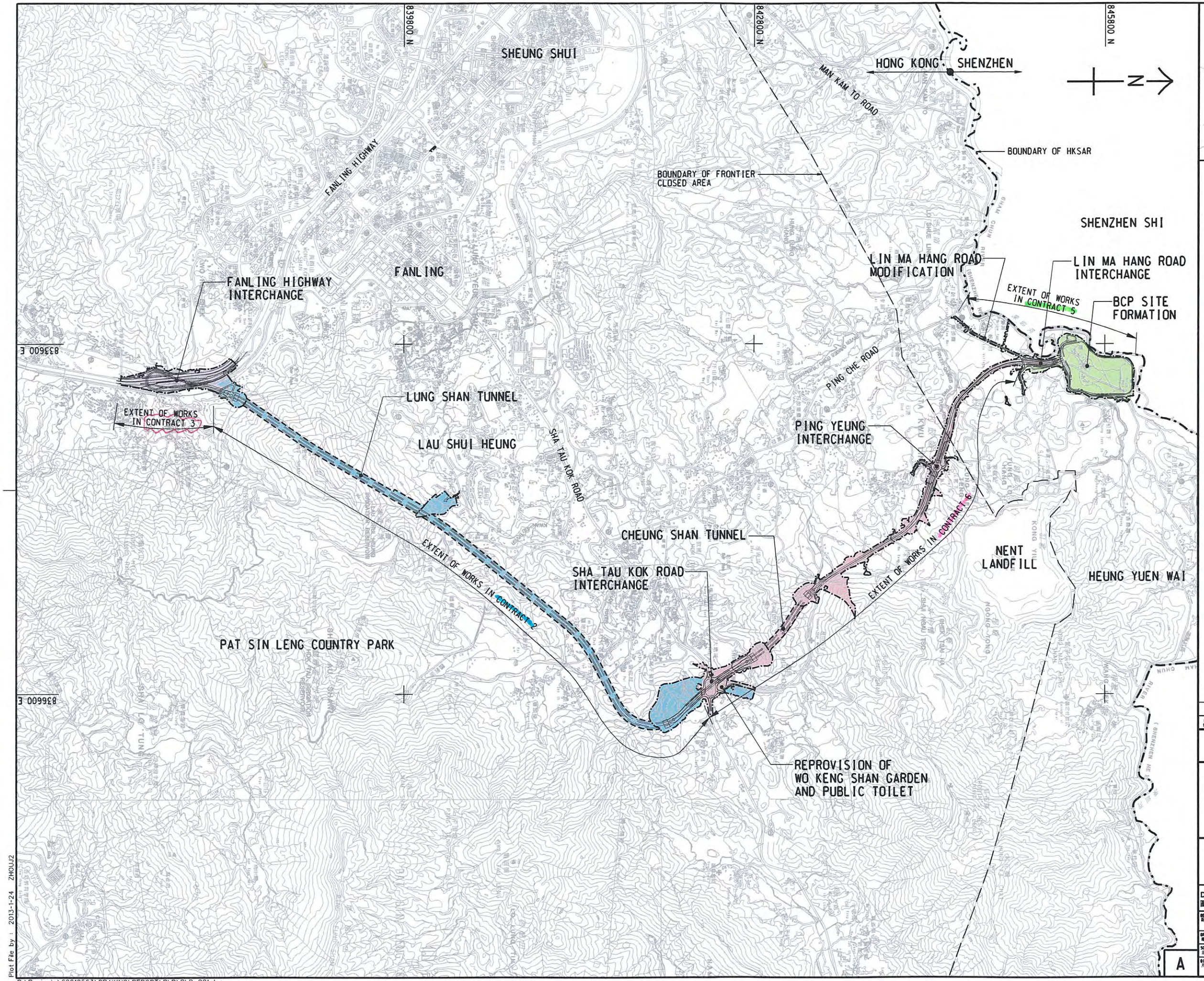
11.2.2 Construction noise should be a key environmental impact during the works. The noise mitigation measures such as use of quiet plants or temporary noise barrier installation at the construction noise predominate area should be implemented as accordance with the EM&A requirement.

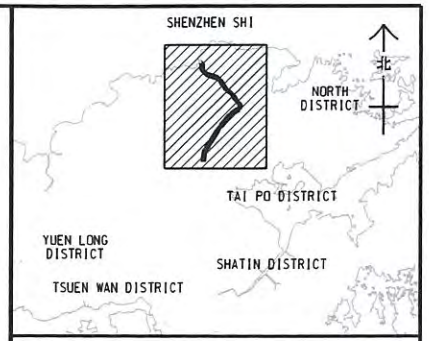
11.2.3 Since most of construction sites under the Project are adjacent to villages, the contractors should be paid attention on the construction dust emission. The Contractor should fully implement the construction dust mitigation measures properly.

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





LOCATION PLAN
SCALE 1 : 30000

LEGEND:

- SITE BOUNDARY
- UNDERGROUND WORKS SITE BOUNDARY

REV. 修訂	DESCRIPTION 內容摘要	BY 由	CHECKED 審核	DATE 日期

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

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

PROJECT LAYOUT PLAN

AECOM

DRG.NO. 圖紙編號 60212563/PLP/001

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

A

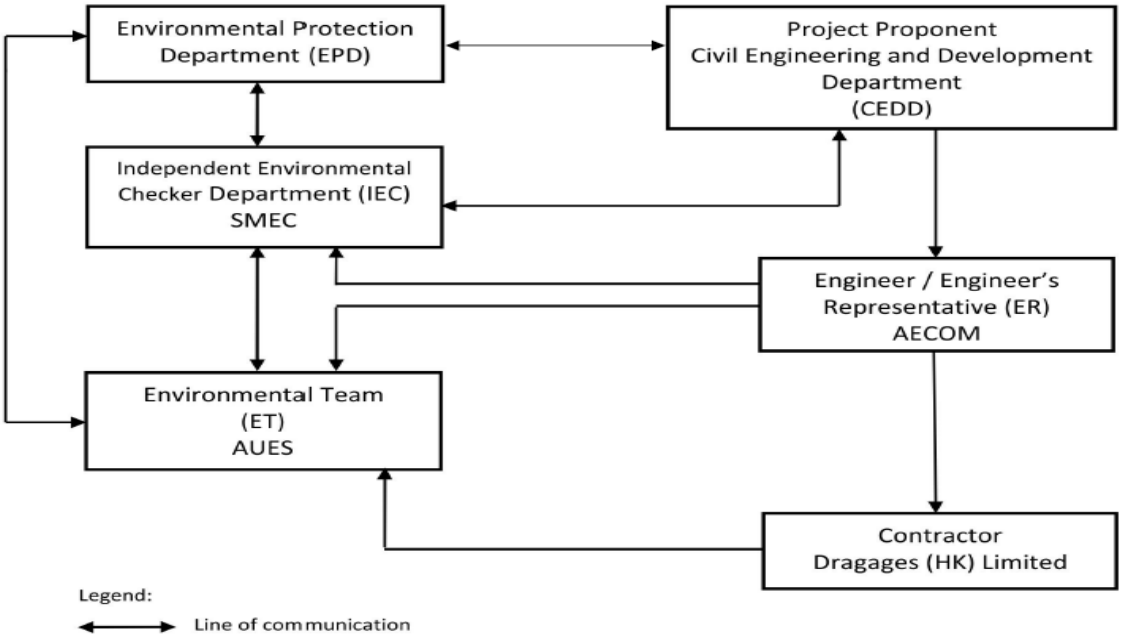
Plot File by : 2013-1-24 ZHOUJ2

P:\Projects\60212563\DRAWING\REPORT\PLP\PLP_001.dgn

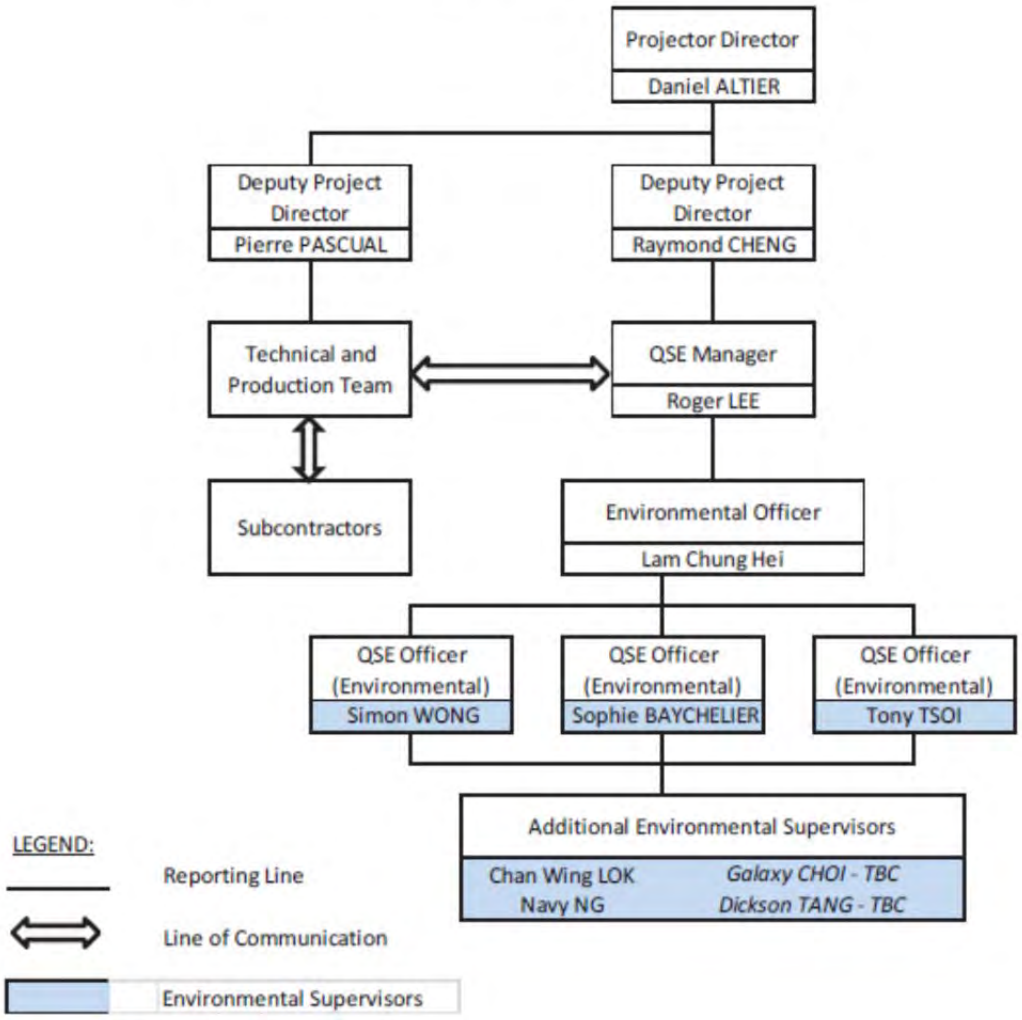
Appendix B

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 Officer	Lam Chung Hei	2171 3004	2171 3299
DHK	QSE Officer (Environmental)	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:

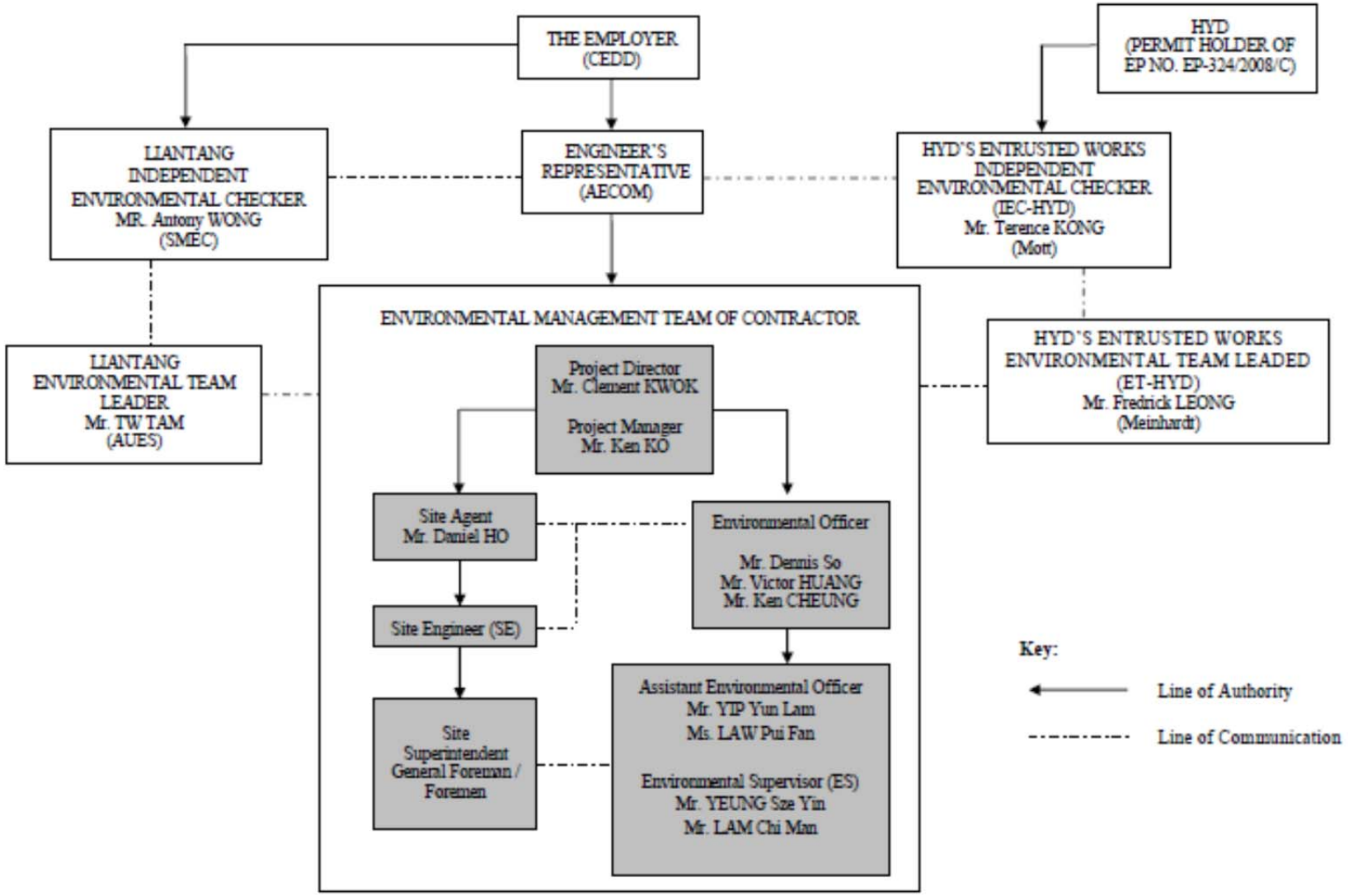
CEDD (Employer) – Civil Engineering and Development Department

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	Victor Huang Ken Cheung Dennis So	2638 6115	2638 7077
Chun Wo	Assistant Environmental Officer	Yip Yun Lam Law Pui Fan	2638 6125	2638 7077
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

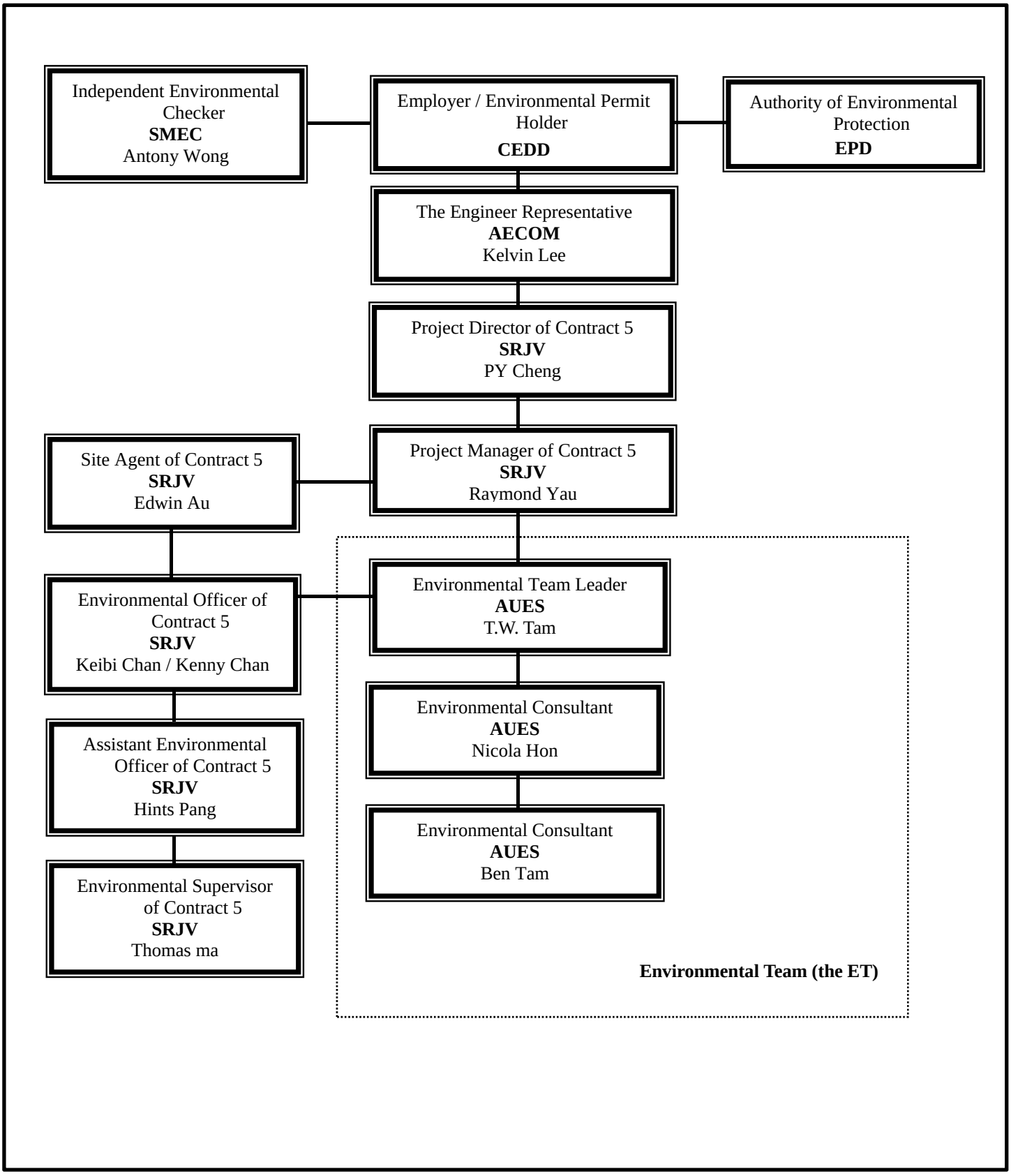
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

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

SMEC (IEC) – SMEC Asia Limited

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



Environmental Management Organization – CV/2013/03

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

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
AECOM	Engineer's Representative	Kelvin Lee	2674 2273	2674 7732
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
SRJV	Project Director	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	Thomas Ma	-	2403 1162
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

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

SMEC (IEC) – SMEC Asia Limited

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

Appendix C

3-month rolling construction program

Contract 2

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
Total		1041	20-Jan-14	10-Jul-17
HKLTH Works Programme update 20-May-2015 [wpd]		1041	20-Jan-14	10-Jul-17
2 General		970	17-Apr-14	10-Jul-17
Geotechnical Interpretative Report 2nd Revision		38	09-Dec-14	25-Feb-15
DDA Submission		38	09-Dec-14	25-Feb-15
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
Noise Barriers		45	03-Jul-15	28-Aug-15
DDA Submission		45	03-Jul-15	28-Aug-15
CONTDS1090	Preparation of DDA for formal submission to ER/ICE/IP	45	03-Jul-15	28-Aug-15
Project Wide E&M		970	17-Apr-14	10-Jul-17
E&M Design Works for Civil Design Interface		180	29-Aug-14	18-Feb-15
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
E&M Design & Engineering Works		460	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	CMCS 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
Shop Drawing & Builder's Drawing Submission		179	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		509	01-Aug-14	17-Mar-16
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.2260	ECS System Submission and Approval by the Engineer	263	02-May-15	17-Mar-16
Manufacturing & Delivery of Major Equipment		649	02-Mar-15	10-Jul-17
PD.FS.MD	Manufacturing and Delivery of FS System	398	19-May-15	17-Sep-16
PD.PD.MD	Manufacturing and Delivery of P&D System	409	28-Mar-15	15-Aug-16
PD.PQ.1040	Manufacturing and Delivery of ELV/CMCS/LAN/TEL System	588	02-Mar-15	23-Feb-17
PD.PQ.1070	Manufacturing and Delivery of Tunnel Ventilation System	581	29-Jun-15	14-Jun-17
PD.PQ.1410	Manufacturing and Delivery of Electrical Services System	649	02-May-15	10-Jul-17
3 South Portal Area		390	13-Oct-14	09-Jan-16
3.1 South Portal Subcontract & Procurement		217	29-Jan-15	09-Jan-16
SPS&P0060	Subcontract : Ventilation Building Foundation Works	60	29-Jan-15	16-Apr-15
SPS&P0070	Subcontract : Retaining Wall Structure Works	60	17-Apr-15	29-Jun-15
SPS&P0080	Subcontract : Ventilation Building Structure Works	60	30-Jun-15	08-Sep-15
SPS&P0090	Subcontract : Tunnel Lining Works	60	13-Jul-15	19-Sep-15
SPS&P0100	Subcontract : Tunnel Lining Formworks (Design, Fabrication, Delivery, & On-Site Assembly)	150	13-Jul-15	09-Jan-16
3.2 South Portal Design Submission		282	15-Dec-14	22-Aug-15

REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	Monthly Report No.17	20/05/2015	RAN	RBS/SJO	DAL

MAIN CONTRACTOR: 香寶嘉 Dragages HongKong — A member of the Bouygues Construction group

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

THE ENGINEER: AECOM

CONTRACTOR'S DESIGNER: ATKINS

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

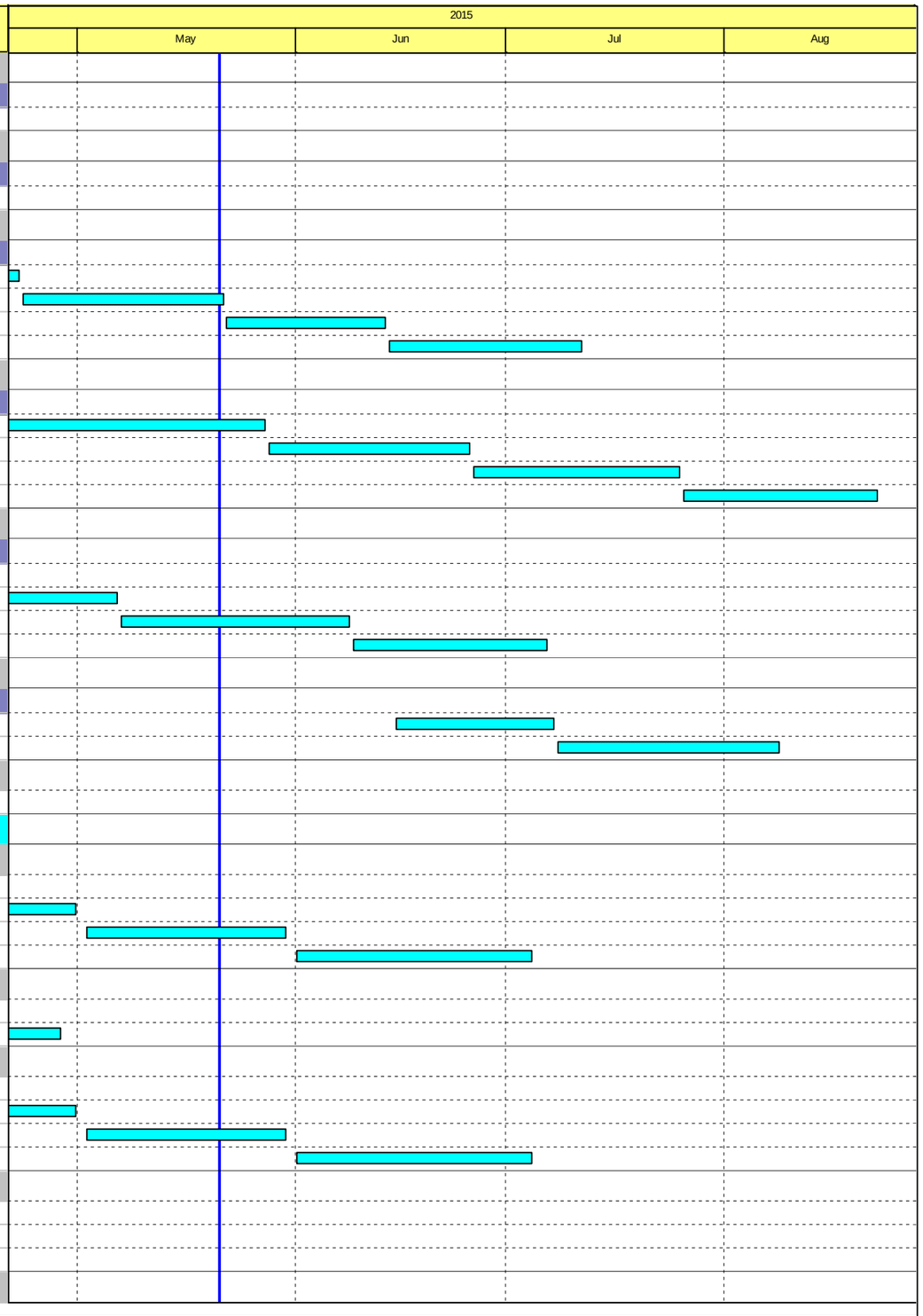
TITLE: Monthly Report No.17 3-Months Rolling Programme (Approved Works Programme Rev. D)

DOCUMENT NO.: LTH/DHK/PGR/PW/PLP/00052/A

DOC. STATUS	CREATION DATE	REVISION
FOR INFO.	20/05/2015	A

PAPER SIZE	SCALE	PAGE
A3	N/A	1 of 8

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
South Portal: Ventilation Buildings - Foundation Design		28	01-Jan-15	28-Jan-15
DDA Submission		28	01-Jan-15	28-Jan-15
DSN07990	ER/IP's Approval	28	01-Jan-15	28-Jan-15
South Portal: Temp Works For D&B Tunneling		28	28-Dec-14	24-Jan-15
DDA Submission		28	28-Dec-14	24-Jan-15
DSN010320	ER/IP's Approval	28	28-Dec-14	24-Jan-15
South Tunnel Permanent Lining		138	18-Feb-15	11-Jul-15
DDA Submission		138	18-Feb-15	11-Jul-15
STPL1023520	Preparation for formal submission to ER/ICE/IP	48	18-Feb-15	22-Apr-15
STPL1023570	IPs'/ ER's Review	24	23-Apr-15	21-May-15
STPL1023590	Preparation for resubmission to ER/ICE/IP with ICE Certification	19	22-May-15	13-Jun-15
STPL1023690	ER/IP's Approval	28	14-Jun-15	11-Jul-15
South Tunnel Internal Structures		227	30-Mar-15	22-Aug-15
DDA Submission		227	30-Mar-15	22-Aug-15
STIS1L1023520	Preparation for formal submission to ER/ICE/IP	45	30-Mar-15	27-May-15
STIS1L1023570	IPs'/ ER's Review	24	28-May-15	25-Jun-15
STIS1L1023590	Preparation for resubmission to ER/ICE/IP with ICE Certification	25	26-Jun-15	25-Jul-15
STIS1L1023690	ER/IP's Approval	28	26-Jul-15	22-Aug-15
Cross Passages -Temp Works D&B Tunnel - Soft Ground		179	27-Jan-15	06-Jul-15
DDA Submission		179	27-Jan-15	06-Jul-15
DSN26930	Preparation for formal submission to ER/ICE/IP	50	27-Jan-15	28-Mar-15
DSN26980	IPs'/ ER's Review	28	30-Mar-15	06-May-15
DSN27000	Preparation for resubmission to ER/ICE/IP with ICE Certification	27	07-May-15	08-Jun-15
DSN27100	ER/IP's Approval	28	09-Jun-15	06-Jul-15
Cross Passages -Temp Works D&B Tunnel - Rock		29	15-Jun-15	08-Aug-15
DDA Submission		29	15-Jun-15	08-Aug-15
FL326930	Preparation for formal submission to ER/ICE/IP	18	15-Jun-15	07-Jul-15
FL326980	IPs'/ ER's Review	28	08-Jul-15	08-Aug-15
CIA- South Portal & South D&B Tunnels inc Mid Vent Junction & CP		21	15-Dec-14	04-Jan-15
SC01175	*Final CIA Report (14d)	21	15-Dec-14	04-Jan-15
3.3 South Portal Method Statement Submission		223	13-Oct-14	04-Jul-15
South Portal: Tunnel Mechanical Excavation		124	24-Jan-15	04-Jul-15
FL2022093	Prepare Method Statement	48	24-Jan-15	24-Mar-15
FL2022094	Engineer's Comment	28	25-Mar-15	30-Apr-15
FL2022095	Re-submission Method Statement	24	02-May-15	30-May-15
FL2022096	Engineer's Approval	28	01-Jun-15	04-Jul-15
South Tunnels: Blasting Method Statement		135	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		193	24-Jan-15	04-Jul-15
A25485	Prepare Method Statement	48	24-Jan-15	24-Mar-15
A25486	Engineer's Comment	28	25-Mar-15	30-Apr-15
A25487	Re-submission Method Statement	24	02-May-15	30-May-15
A25488	Engineer's Approval	28	01-Jun-15	04-Jul-15
South Portal: Pilecap, Footings & Tie beams		80	22-Dec-14	31-Mar-15
A2340	Engineer's Comment	28	22-Dec-14	26-Jan-15
A2350	Re-submission Method Statement	24	27-Jan-15	26-Feb-15
A2360	Engineer's Approval	28	27-Feb-15	31-Mar-15
South Portal: Permanent Retaining Walls		132	08-Dec-14	18-May-15



REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	Monthly Report No.17	20/05/2015	RAN	RBS/SJO	DAL

MAIN CONTRACTOR: 香寶嘉港 Dragages HongKong — A member of the Bouygues Construction group

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

THE ENGINEER: AECOM

CONTRACTOR'S DESIGNER: ATKINS

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

TITLE: Monthly Report No.17 3-Months Rolling Programme (Approved Works Programme Rev. D)

DOCUMENT NO.: LTH/DHK/PGR/PW/PLP/00052/A

DOC. STATUS	CREATION DATE	REVISION
FOR INFO.	20/05/2015	A

PAPER SIZE	SCALE	PAGE
A3	N/A	2 of 8

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
A25481	Prepare Method Statement	48	08-Dec-14	04-Feb-15
A25482	Engineer's Comment	28	05-Feb-15	12-Mar-15
A25483	Re-submission Method Statement	24	13-Mar-15	14-Apr-15
A25484	Engineer'sApproval	28	15-Apr-15	18-May-15
3.5 South Portal Works		296	18-Oct-14	04-Sep-15
South Portal: CLP Substation		170	18-Oct-14	28-Feb-15
SCLP2060	Sub-station Construction + CLP Installation	106	18-Oct-14	28-Feb-15
SCLP2090	Energization	1	28-Feb-15	28-Feb-15
South Portal: Slopeworks		107	05-Nov-14	06-Jul-15
SV2690	Permanent Cut Slope (+68.0 to apprx +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
SV2701dwp	Temporary Slope Cut below +45.0mPD (soft) w/Soil Nails	48	16-Mar-15	18-May-15
SV2702dwp	Temporary Soil Nails between +44.6mPd to +26.7mPD	71	16-Feb-15	23-May-15
SV2710	Rock Excavation to Vent. Bldg. Formation	36	19-May-15	06-Jul-15
South Portal: Foundation & Substructure		87	29-Jun-15	04-Sep-15
SV2180	South Bound Foundation	54	29-Jun-15	04-Sep-15
SV2210	N/B Bored Piles 4nos & Pile Test	48	07-Jul-15	04-Sep-15
South Tunnels: Southbound Tunnel		101	06-May-15	04-Sep-15
DB6300	D&B Setup / Site Installation	101	06-May-15	04-Sep-15
4 Middle Portal Area		383	26-Sep-14	10-Oct-15
4.1 Middle Portal Subcontract & Procurement		211	05-Feb-15	22-Sep-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
MPS&P0070	Subcontract : Ventilation Building Structure Works	60	02-May-15	14-Jul-15
MPS&P0080	Subcontract : Ventilation Building ABWF Works	60	15-Jul-15	22-Sep-15
4.2 Middle Portal Design Submission		288	03-Dec-14	29-Aug-15
Mid Vent Building - Foundation		26	12-Dec-14	11-Feb-15
DDA Submission		26	12-Dec-14	11-Feb-15
DSN29064	Preparation for resubmission to ER/ICE/IP with ICE Certification	26	12-Dec-14	14-Jan-15
DSN29065	ER/IP'sApproval	28	15-Jan-15	11-Feb-15
Mid Vent Adit Permanent Lining		28	03-Dec-14	04-Feb-15
DDA Submission		28	03-Dec-14	04-Feb-15
DSN29076	Preparation for resubmission to ER/ICE/IP with ICE Certification	28	03-Dec-14	07-Jan-15
DSN29077	ER/IP'sApproval	28	08-Jan-15	04-Feb-15
Mid Vent Adit Internal Structure		67	16-Apr-15	28-Aug-15
DDA Submission		67	16-Apr-15	28-Aug-15
DSN29082	Preparation for formal submission to ER/ICE/IP	49	16-Apr-15	13-Jun-15
DSN29083	IPs'/ ER's Review	28	15-Jun-15	18-Jul-15
DSN29084	Preparation for resubmission to ER/ICE/IP with ICE Certification	35	20-Jul-15	28-Aug-15
Mid Vent Adit/Junction - Temp Works For D&B Tunnelling		53	29-Dec-14	28-Feb-15
DDA Submission		53	29-Dec-14	28-Feb-15
DSN29088	Preparation for resubmission to ER/ICE/IP with ICE Certification	29	29-Dec-14	31-Jan-15
DSN29089	ER/IP'sApproval	28	01-Feb-15	28-Feb-15
Mid Vent Adit/Junction Permanent Lining & Backfill		174	23-Feb-15	28-Jul-15
DDA Submission		174	23-Feb-15	28-Jul-15
DSN29094	Preparation for formal submission to ER/ICE/IP	49	23-Feb-15	24-Apr-15
DSN29095	IPs'/ ER's Review	28	25-Apr-15	29-May-15
DSN29096	Preparation for resubmission to ER/ICE/IP with ICE Certification	26	30-May-15	30-Jun-15

REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	Monthly Report No.17	20/05/2015	RAN	RBS/SJO	DAL

MAIN CONTRACTOR: 香寶嘉 Dragages HongKong — A member of the Bouygues Construction group

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

THE ENGINEER: AECOM

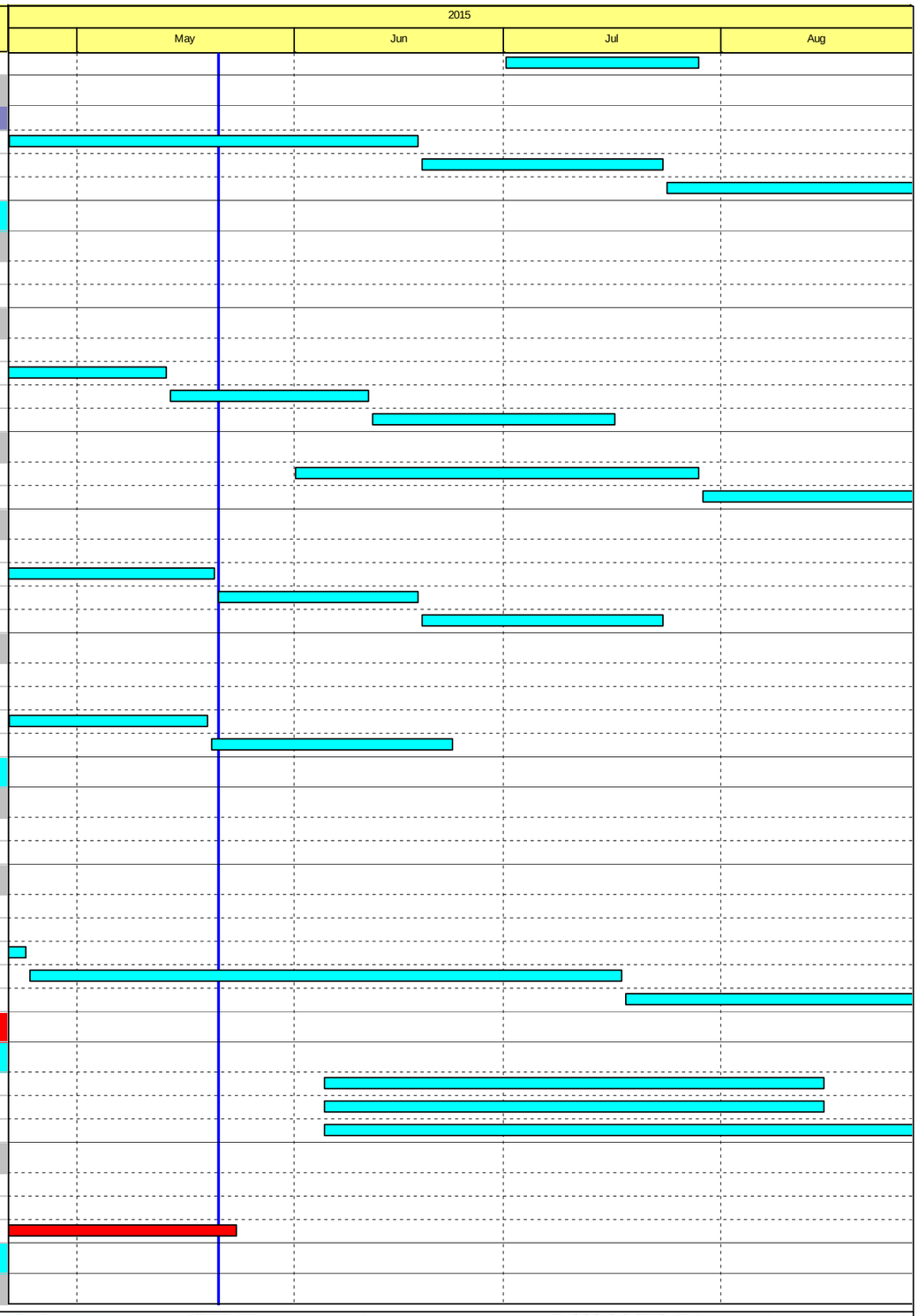
CONTRACTOR'S DESIGNER: ATKINS

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

TITLE: Monthly Report No.17 3-Months Rolling Programme (Approved Works Programme Rev. D)

DOCUMENT NO.		
LTH/DHK/PGR/PW/PLP/00052/A		
DOC. STATUS	CREATION DATE	REVISION
FOR INFO.	20/05/2015	A
PAPER SIZE	SCALE	PAGE
A3	N/A	3 of 8

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
DSN29097	ER/IP's Approval	28	01-Jul-15	28-Jul-15
Mid Vent Junction Internal Structure		109	21-Apr-15	29-Aug-15
DDA Submission		109	21-Apr-15	29-Aug-15
DSN29102	Preparation for formal submission to ER/ICE/IP	49	21-Apr-15	18-Jun-15
DSN29103	IPs'/ ER's Review	28	19-Jun-15	23-Jul-15
DSN29104	Preparation for resubmission to ER/ICE/IP with ICE Certification	32	24-Jul-15	29-Aug-15
4.3 Middle Portal Method Statement Submission		311	14-Oct-14	29-Aug-15
Cavern Blasting Method Statement		267	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 Ventilation Adit Lining Works		168	05-Feb-15	16-Jul-15
A25513	Prepare Method Statement	48	05-Feb-15	09-Apr-15
A25514	Engineer's Comment	28	10-Apr-15	13-May-15
A25515	Re-submission Method Statement	24	14-May-15	11-Jun-15
A25516	Engineer's Approval	28	12-Jun-15	16-Jul-15
Cavern Permanent Lining		56	01-Jun-15	29-Aug-15
A25521	Prepare Method Statement	48	01-Jun-15	28-Jul-15
A25522	Engineer's Comment	28	29-Jul-15	29-Aug-15
Mid Vent Bldg. Foundation		128	12-Feb-15	23-Jul-15
A25509	Prepare Method Statement	48	12-Feb-15	16-Apr-15
A25510	Engineer's Comment	28	17-Apr-15	20-May-15
A25511	Re-submission Method Statement	24	21-May-15	18-Jun-15
A25512	Engineer's Approval	28	19-Jun-15	23-Jul-15
Mid Vent Building Construction		128	14-Jan-15	23-Jun-15
FL5900	Prepare Method Statement for Mid Vent Building Construction	48	14-Jan-15	13-Mar-15
FL5910	Engineer's Comment	28	14-Mar-15	20-Apr-15
FL5920	Re-submission Method Statement for Mid Vent Building Construction	24	21-Apr-15	19-May-15
FL5930	Engineer's Approval	28	20-May-15	23-Jun-15
4.5 Middle Portal Works		282	26-Sep-14	10-Oct-15
Middle Portal: CLP Substation		222	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
Adit Construction - Mid Portal		269	14-Oct-14	10-Oct-15
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
MV2490dwp4	D&B Full Face Ch70>Ch133; 63m	41	06-Mar-15	23-Apr-15
MV2490dwp5	D&B Full Face Ch133>Ch302 169m	70	24-Apr-15	17-Jul-15
MV2530	Cavern Excavation Ch302>Ch371	70	18-Jul-15	10-Oct-15
5 North Portal Area		680	20-Jan-14	02-Dec-15
5.1 North Portal Subcontract & Procurement		680	20-Jan-14	02-Dec-15
NPS&P0070	Subcontract : Tunnel Lining Works	60	05-Jun-15	15-Aug-15
NPS&P0080	Subcontract : Tunnel Concreting Works	60	05-Jun-15	15-Aug-15
NPS&P0090	Subcontract : Tunnel Lining Formworks (Design, Fabrication, Delivery, & On-Site Assembly)	150	05-Jun-15	02-Dec-15
North Portal: TBM Procurement & Delivery		395	20-Jan-14	23-May-15
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
N21410a	Precast Segment Fabrication (1.6m Ring) - Temporary Segments	190	30-Sep-14	23-May-15
5.2 North Portal Design Submission		336	25-Nov-14	15-Sep-15
North Tunnel Curved Section Southbound Temp Support For Enlargement		221	25-Nov-14	06-May-15



REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	Monthly Report No.17	20/05/2015	RAN	RBS/SJO	DAL

MAIN CONTRACTOR
香寶嘉 港 Dragages HongKong
A member of the Bouygues Construction group

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

THE ENGINEER
AECOM

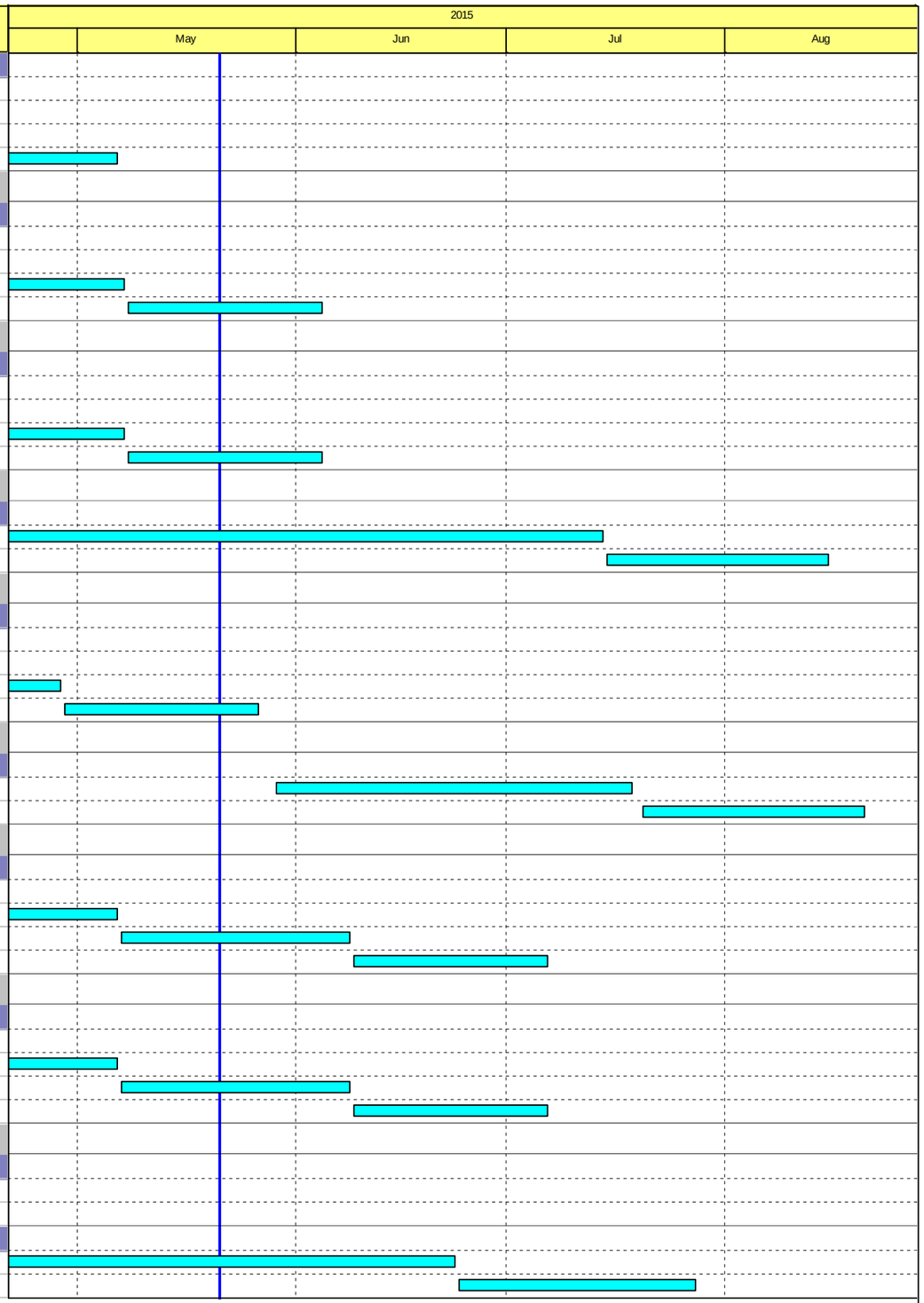
CONTRACTOR'S DESIGNER
ATKINS

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

TITLE
Monthly Report No.17 3-Months Rolling Programme
(Approved Works Programme Rev. D)

DOCUMENT NO.		
LTH/DHK/PGR/PW/PLP/00052/A		
DOC. STATUS	CREATION DATE	REVISION
FOR INFO.	20/05/2015	A
PAPER SIZE	SCALE	PAGE
A3	N/A	4 of 8

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
DDA Submission		221	25-Nov-14	06-May-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
FL2022147	Preparation for resubmission to ER/ICE/IP with ICE Certification	22	10-Mar-15	08-Apr-15
FL2022148	ER/IP's Approval	28	09-Apr-15	06-May-15
Bored Tunnel OHVD Slab		236	13-Jan-15	04-Jun-15
DDA Submission		236	13-Jan-15	04-Jun-15
FL2022165	Preparation for formal submission to ER/ICE/IP	42	13-Jan-15	05-Mar-15
FL2022166	IPs'/ ER's Review	28	06-Mar-15	11-Apr-15
FL2022167	Preparation for resubmission to ER/ICE/IP with ICE Certification	21	13-Apr-15	07-May-15
FL2022168	ER/IP's Approval	28	08-May-15	04-Jun-15
Bored Tunnel Internal Structure (except OHVD Slab)		164	13-Jan-15	04-Jun-15
DDA Submission		164	13-Jan-15	04-Jun-15
FL2022173	Preparation for formal submission to ER/ICE/IP	42	13-Jan-15	05-Mar-15
FL2022174	IPs'/ ER's Review	28	06-Mar-15	11-Apr-15
FL2022175	Preparation for resubmission to ER/ICE/IP with ICE Certification	21	13-Apr-15	07-May-15
FL2022176	ER/IP's Approval	28	08-May-15	04-Jun-15
Bored Tunnel/ D&B Tunnel Transition - Headwall Structure (N/B & S/B)		123	17-Mar-15	15-Aug-15
DDA Submission		123	17-Mar-15	15-Aug-15
FL2022181	Preparation for formal submission to ER/ICE/IP	95	17-Mar-15	14-Jul-15
FL2022182	IPs'/ ER's Review	28	15-Jul-15	15-Aug-15
Northbound TBM Dismantling Cavern Temporary Works		114	03-Jan-15	26-May-15
DDA Submission		114	03-Jan-15	26-May-15
FL2022185	Preparation for formal submission to ER/ICE/IP	42	03-Jan-15	24-Feb-15
FL2022186	IPs'/ ER's Review	28	25-Feb-15	28-Mar-15
FL2022187	Preparation for resubmission to ER/ICE/IP with ICE Certification	22	30-Mar-15	28-Apr-15
FL2022188	ER/IP's Approval	28	29-Apr-15	26-May-15
North Tunnel Curved Section Cross Passages - Temp Works		70	29-May-15	20-Aug-15
DDA Submission		70	29-May-15	20-Aug-15
FL2022189	Preparation for formal submission to ER/ICE/IP	42	29-May-15	18-Jul-15
FL2022190	IPs'/ ER's Review	28	20-Jul-15	20-Aug-15
Bored Tunnel Cross Passages Temp Works (Soft Ground)		194	27-Jan-15	06-Jul-15
DDA Submission		194	27-Jan-15	06-Jul-15
FL2022197	Preparation for formal submission to ER/ICE/IP	50	27-Jan-15	28-Mar-15
FL2022198	IPs'/ ER's Review	28	30-Mar-15	06-May-15
FL2022199	Preparation for resubmission to ER/ICE/IP with ICE Certification	27	07-May-15	08-Jun-15
FL2022200	ER/IP's Approval	28	09-Jun-15	06-Jul-15
Bored Tunnel Cross Passages Temp Works (Rock)		184	27-Jan-15	06-Jul-15
DDA Submission		184	27-Jan-15	06-Jul-15
FL2022201	Preparation for formal submission to ER/ICE/IP	50	27-Jan-15	28-Mar-15
FL2022202	IPs'/ ER's Review	28	30-Mar-15	06-May-15
FL2022203	Preparation for resubmission to ER/ICE/IP with ICE Certification	27	07-May-15	08-Jun-15
FL2022204	ER/IP's Approval	28	09-Jun-15	06-Jul-15
Bored Tunnel Cross Passages Permanent Lining (Soft Ground)		165	20-Dec-14	15-Sep-15
AIP Submission		36	20-Dec-14	03-Feb-15
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
DDA Submission		138	24-Mar-15	15-Sep-15
FL2022209	Preparation for formal submission to ER/ICE/IP	72	24-Mar-15	23-Jun-15
FL2022210	IPs'/ ER's Review	28	24-Jun-15	27-Jul-15



REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	Monthly Report No.17	20/05/2015	RAN	RBS/SJO	DAL

MAIN CONTRACTOR
香寶嘉港 Dragages HongKong
A member of the Bouygues Construction group

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

THE ENGINEER
AECOM

CONTRACTOR'S DESIGNER
ATKINS

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

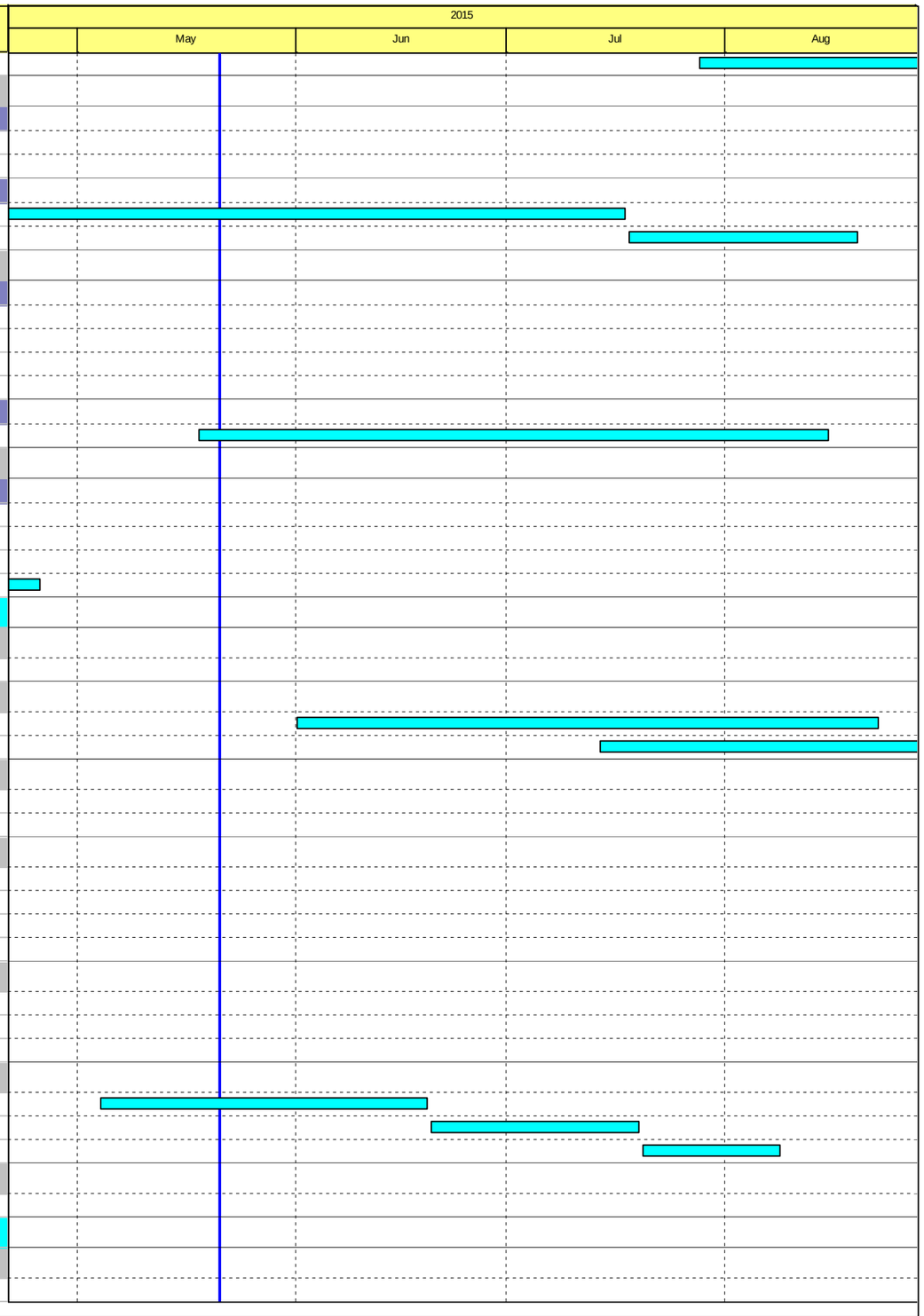
TITLE
Monthly Report No.17 3-Months Rolling Programme
(Approved Works Programme Rev. D)

DOCUMENT NO.
LTH/DHK/PGR/PW/PLP/00052/A

DOC. STATUS	CREATION DATE	REVISION
FOR INFO.	20/05/2015	A

PAPER SIZE	SCALE	PAGE
A3	N/A	5 of 8

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
FL2022211	Preparation for resubmission to ER/ICE/IP with ICE Certification	43	28-Jul-15	15-Sep-15
Bored Tunnel Cross Passages Permanent Lining (Rock)		150	20-Dec-14	19-Aug-15
AIP Submission		36	20-Dec-14	03-Feb-15
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
DDA Submission		150	24-Mar-15	19-Aug-15
FL2022217	Preparation for formal submission to ER/ICE/IP	92	24-Mar-15	17-Jul-15
FL2022218	IPs'/ ER's Review	28	18-Jul-15	19-Aug-15
Bored Tunnel Cross Passages Internal Structures		316	27-Nov-14	15-Aug-15
AIP Submission		214	27-Nov-14	16-Apr-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
FL2022223	Preparation for resubmission to ER/ICE/IP with ICE Certification	21	24-Feb-15	19-Mar-15
FL2022224	ER/IP's Approval	28	20-Mar-15	16-Apr-15
DDA Submission		75	18-May-15	15-Aug-15
FL2022225	Preparation for formal submission to ER/ICE/IP	75	18-May-15	15-Aug-15
Temp Gallery for TBM Segment Del in Curved Section		214	03-Dec-14	25-Apr-15
DDA Submission		214	03-Dec-14	25-Apr-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
FL2022231	Preparation for resubmission to ER/ICE/IP with ICE Certification	24	02-Mar-15	28-Mar-15
FL2022232	ER/IP's Approval	28	29-Mar-15	25-Apr-15
5.3 North Portal Method Statement Submission		230	13-Nov-14	21-Sep-15
North Tunnel (D&B Section) Blasting Method Statement		60	13-Nov-14	24-Jan-15
FL2022110	Engineer's/IP's Review & Approval	60	13-Nov-14	24-Jan-15
North Tunnel (Cross Passages) Blasting Method Statement		95	01-Jun-15	21-Sep-15
FL2022111	Preparation and Submission of Blasting Method Statement	70	01-Jun-15	22-Aug-15
FL2022112	Engineer's/IP's Review & Approval	60	14-Jul-15	21-Sep-15
MS for TBM On-Site Assembly		43	23-Dec-14	14-Feb-15
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		222	02-Dec-14	13-Apr-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
FL2022064	ER's Approval for Method Statement	30	15-Mar-15	13-Apr-15
MS forTBM Excavation		66	01-Jan-15	26-Mar-15
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
FL2890	ER's Approval for Method Statement	30	25-Feb-15	26-Mar-15
North Portal: MS for Cross Passage Ground Treatment		97	04-May-15	08-Aug-15
FL2022065	Prepare & Submit Method Statement	40	04-May-15	19-Jun-15
FL2022066	ER's Comment for Method Statement	30	20-Jun-15	19-Jul-15
FL2022067	Prepare & Re-submit Method Statement	18	20-Jul-15	08-Aug-15
North Portal: WSD Tunnel Instrumentation		30	07-Dec-14	05-Jan-15
FL2022494	ER's Approval for Method Statement	30	07-Dec-14	05-Jan-15
5.5 North Portal Works		399	07-Oct-14	03-Oct-15
CLP Substation		151	07-Oct-14	14-Feb-15
N21060	Sub-station Construction	110	07-Oct-14	14-Feb-15



REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	Monthly Report No.17	20/05/2015	RAN	RBS/SJO	DAL

MAIN CONTRACTOR: 香寶嘉 港 Dragages HongKong — A member of the Bouygues Construction group

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

THE ENGINEER: AECOM

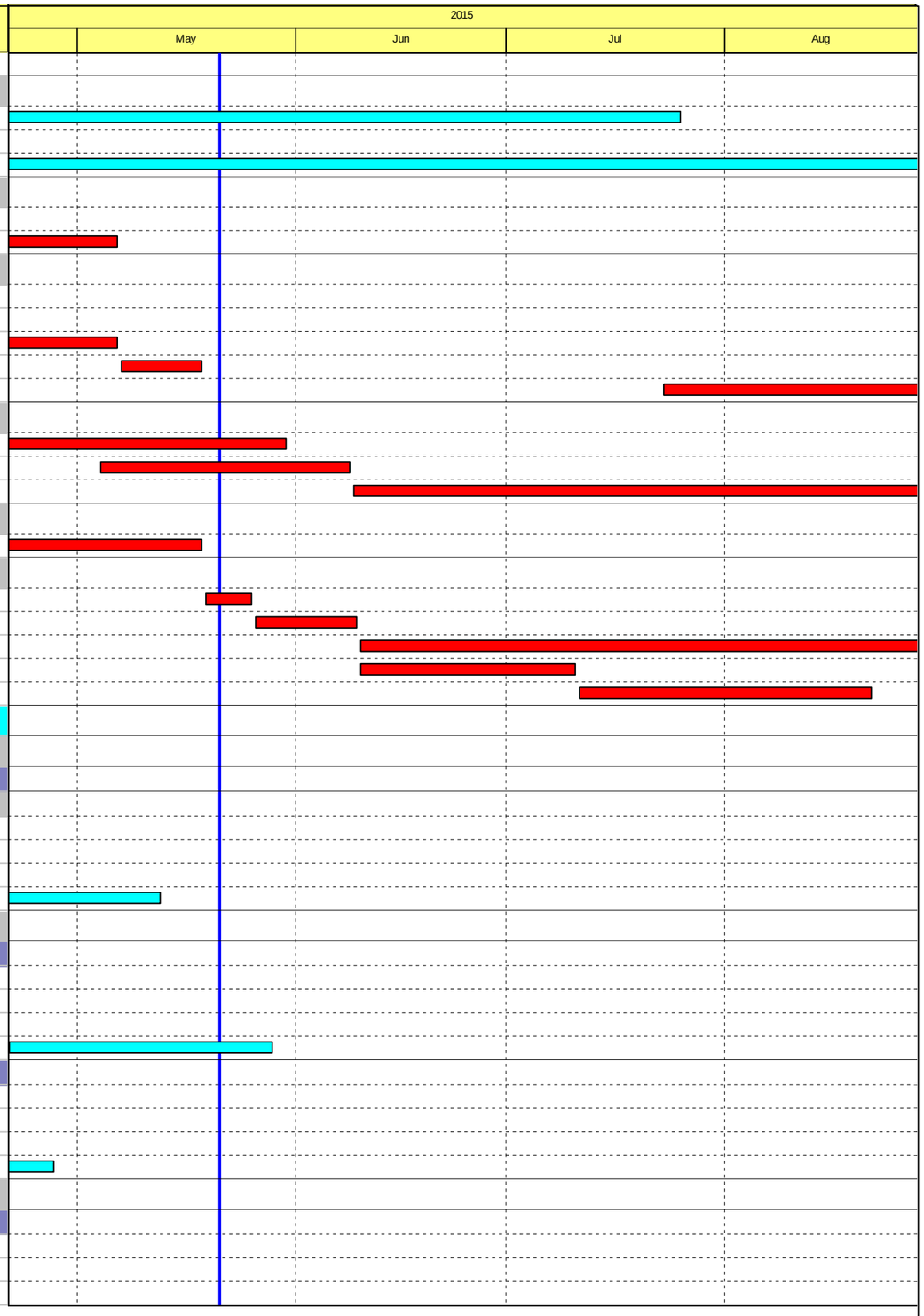
CONTRACTOR'S DESIGNER: ATKINS

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

TITLE: Monthly Report No.17 3-Months Rolling Programme (Approved Works Programme Rev. D)

DOCUMENT NO.		
LTH/DHK/PGR/PW/PLP/00052/A		
DOC. STATUS	CREATION DATE	REVISION
FOR INFO.	20/05/2015	A
PAPER SIZE	SCALE	PAGE
A3	N/A	6 of 8

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
N21090	Energization	1	14-Feb-15	14-Feb-15
North Portal: Site Formation		366	23-Oct-14	30-Sep-15
N20505	Permanent Slope Formation (Remaining)	200	08-Nov-14	25-Jul-15
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
North Portal: Site Installation for TBM		122	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		325	06-Dec-14	03-Oct-15
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
DB6370e	Bench Excavation (Ch6,450>Ch6,355) (95m) [P21: 4850 to 4755]	48	10-Mar-15	06-May-15
DB6372	RC Slab Cradle for TBM Shifting way	10	07-May-15	18-May-15
TD0910	SB - Invert Grouting	60	23-Jul-15	03-Oct-15
Northbound Tunnel (Mined Excavation)		152	02-Mar-15	31-Aug-15
DB6400a	Top Heading Canopies (Ch6446>Ch6410); 36m; [P20: 4824 to 4788]	76	02-Mar-15	30-May-15
DB6400a1	Blast door installation + Noise Measurement and 24Hr permit approval	30	04-May-15	08-Jun-15
DB6400a2	Top Heading Canopies (Ch6410>Ch6350); 60m; [P20: 4788 to 4728]	70	09-Jun-15	31-Aug-15
TBM On-Site Assembly		65	02-Mar-15	18-May-15
TD0990	TBM On-site Assembly and T&C	65	02-Mar-15	18-May-15
Southbound Tunnel (TBM Tunneling)		119	19-May-15	16-Sep-15
TD0995	TBM Sliding to Face	6	19-May-15	25-May-15
TD0995a	Erection of Thrust Frame / Preparation to Start TBM Launch	12	26-May-15	09-Jun-15
TD1000a	TBM DT (Ch6,355>Ch6,077) 278m	82	10-Jun-15	16-Sep-15
TD1000a10	TBM DT (Ch6,355>Ch6,268) 87m	26	10-Jun-15	10-Jul-15
TD1000a20	TBM DT (Ch6,268>Ch6,148) 120m - WSD Restriction Zone	35	11-Jul-15	21-Aug-15
5.6 Administration Building:		227	20-Dec-14	15-Aug-15
5.62 Administration Building: Design Submission		174	20-Dec-14	12-May-15
Admin. Building - Foundation Design		174	20-Dec-14	12-May-15
DDA Submission		174	20-Dec-14	12-May-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
DSN29109	Preparation for resubmission to ER/ICE/IP with ICE Certification	21	11-Mar-15	08-Apr-15
DSN29110	ER/IP's Approval	28	09-Apr-15	12-May-15
5.63 Administration Building: Method Statement Submission		203	09-Jan-15	28-May-15
Method Statement for Admin.Building Construction		108	14-Jan-15	28-May-15
A1990	Prepare Method Statement for Adminstration Building Construction	24	14-Jan-15	10-Feb-15
A2000	ER's Comment	28	11-Feb-15	18-Mar-15
AD2190	Re-submission Method Statement for Building Construction	24	19-Mar-15	20-Apr-15
AD2200	ER's Approval	28	21-Apr-15	28-May-15
MS for Adminstration Building: Demolition		120	09-Jan-15	27-Apr-15
SV2905	Prepare & Submit Demolition Plan & Method Statement	24	09-Jan-15	05-Feb-15
SV2910	ER's Comment for Demolition Plan & Method Statement	30	06-Feb-15	07-Mar-15
SV2915	Prepare & Re-submit Demolition Plan & Method Statement	18	09-Mar-15	28-Mar-15
SV2920	ER's Approval for Demolition & Method Statement	30	29-Mar-15	27-Apr-15
5.64 Administration Building: General Submission		55	02-Jan-15	09-Mar-15
Adminstration Building: Egress/Ingress		55	02-Jan-15	09-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



REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	Monthly Report No.17	20/05/2015	RAN	RBS/SJO	DAL

MAIN CONTRACTOR: 香寶嘉港 Dragages HongKong — A member of the Bouygues Construction group

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

THE ENGINEER: AECOM

CONTRACTOR'S DESIGNER: ATKINS

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

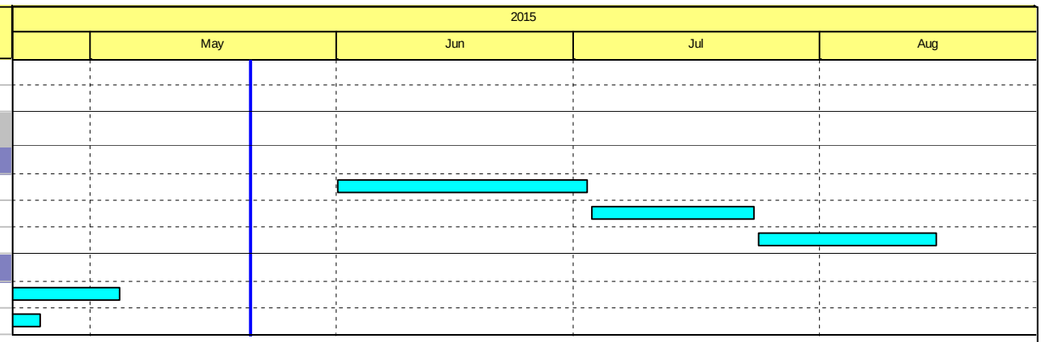
TITLE: Monthly Report No.17 3-Months Rolling Programme (Approved Works Programme Rev. D)

DOCUMENT NO.: LTH/DHK/PGR/PW/PLP/00052/A

DOC. STATUS	CREATION DATE	REVISION
FOR INFO.	20/05/2015	A

PAPER SIZE	SCALE	PAGE
A3	N/A	7 of 8

Activity ID	Activity Name	Working Duration	BL Project Start	BL Project Finish
N21305	TTMS Reviewed & Comment	12	13-Feb-15	02-Mar-15
N21315	Notification to RMO	6	03-Mar-15	09-Mar-15
5.65 Administration Building: Works		111	10-Mar-15	15-Aug-15
Administration Building:Demolition		64	01-Jun-15	15-Aug-15
SV2925	Precautionary Measures	24	01-Jun-15	02-Jul-15
SV2940	Demolish Existing Building (AB1 - GLL T11742)	18	03-Jul-15	23-Jul-15
SV2945	Demolish Existing Building (AB3 - GLL 36508)	18	24-Jul-15	15-Aug-15
Administration Building: Site Formation		37	10-Mar-15	04-May-15
AD2000	Site Hoarding	24	31-Mar-15	04-May-15
AD2050	U/U Diversion & Drainage Diversion (if required)	36	10-Mar-15	24-Apr-15



REV	DESCRIPTION	DATE	PREPARED	CHECKED	APPROVED
A	Monthly Report No.17	20/05/2015	RAN	RBS/SJO	DAL

MAIN CONTRACTOR: 香港寶嘉 Dragages HongKong — A member of the Bouygues Construction group

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

THE ENGINEER: AECOM

CONTRACTOR'S DESIGNER: ATKINS

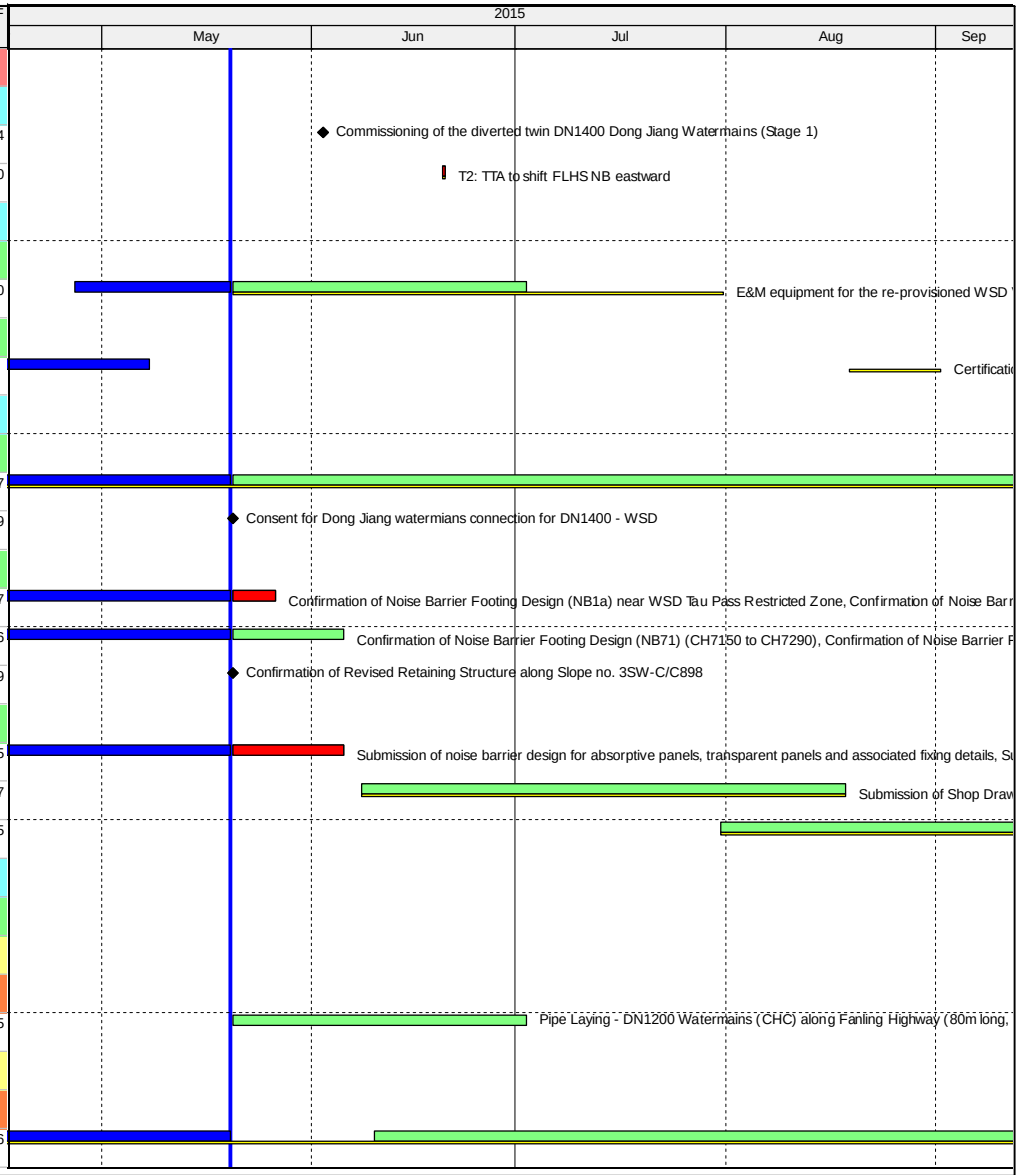
PROJECT: Contract No. CV/2012/08 Liantang/Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 2

TITLE: Monthly Report No.17 3-Months Rolling Programme (Approved Works Programme Rev. D)

DOCUMENT NO.		
LTH/DHK/PGR/PW/PLP/00052/A		
DOC. STATUS	CREATION DATE	REVISION
FOR INFO.	20/05/2015	A
PAPER SIZE	SCALE	PAGE
A3	N/A	8 of 8

Contract 3

Activity ID	Activity Name	OD	RD	Start	Finish	TF
3-Month Rolling Programme 2015-05-21						
Major Milestones and Events						
MS-0220	Commissioning of the diverted twin DN1400 Dong Jiang Watermains (Stage 1)	0	0		02-Jun-15	264
MS-2000B	T2: TTA to shift FLHS NB eastward	1	1	20-Jun-15	20-Jun-15	-20
Major Procurement & Delivery						
Water Supply Pipeworks						
MM-1060	E&M equipment for the re-provisioned WSD Valve Control House	60	35	27-Apr-15 A	02-Jul-15	0
Precast Bridge Segment Lifting Frames and Precast Yard						
MM-2050	Certification of lifting frame	12	0	17-Apr-15 A	08-May-15 A	
Design and Submissions						
Statutory Approval						
PRE-1050	Submission & approval of CDIA report for construction of temporary platform for segment erection works	185	137	27-Nov-14 A	02-Nov-15	27
PRE-1210	Consent for Dong Jiang watermians connection for DN1400 - WSD	0	0		20-May-15	1259
Design Confirmation						
PRE-1220	Confirmation of Noise Barrier Footing Design (NB1a) near WSD Tau Pass Restricted Zone	45	5	09-Apr-14 A	26-May-15	-17
PRE-1500	Confirmation of Noise Barrier Footing Design (NB71) (CH7150 to CH7290)	70	14	17-Apr-14 A	05-Jun-15	36
PRE-1510	Confirmation of Revised Retaining Structure along Slope no. 3SW-C/C898	0	0		20-May-15*	99
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	14	11-Mar-14 A	05-Jun-15	-15
PRE-2050	Submission of Shop Drawing for fabrication of Kiu Tau Footbridge Steelworks	60	60	08-Jun-15	18-Aug-15	97
PRE-2030	Submission of E&M design for lighting of Kiu Tau Footbridge	60	60	31-Jul-15	10-Oct-15	245
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-1130*	Pipe Laying - DN1200 Watermains (CHC) along Fanling Highway (80m long, 4m depth)	182	35	20-Feb-14 A	02-Jul-15	255
Fanling Highway Zone 2 between CH7130 and CH7290						
At-Grade Roadworks (160m)						
FHW-2110B	Noise Barrier NB71 - Footing adjacent to SB lane (96m) (affected due to design change)	341	127	26-Jul-14 A	10-Nov-15	36



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

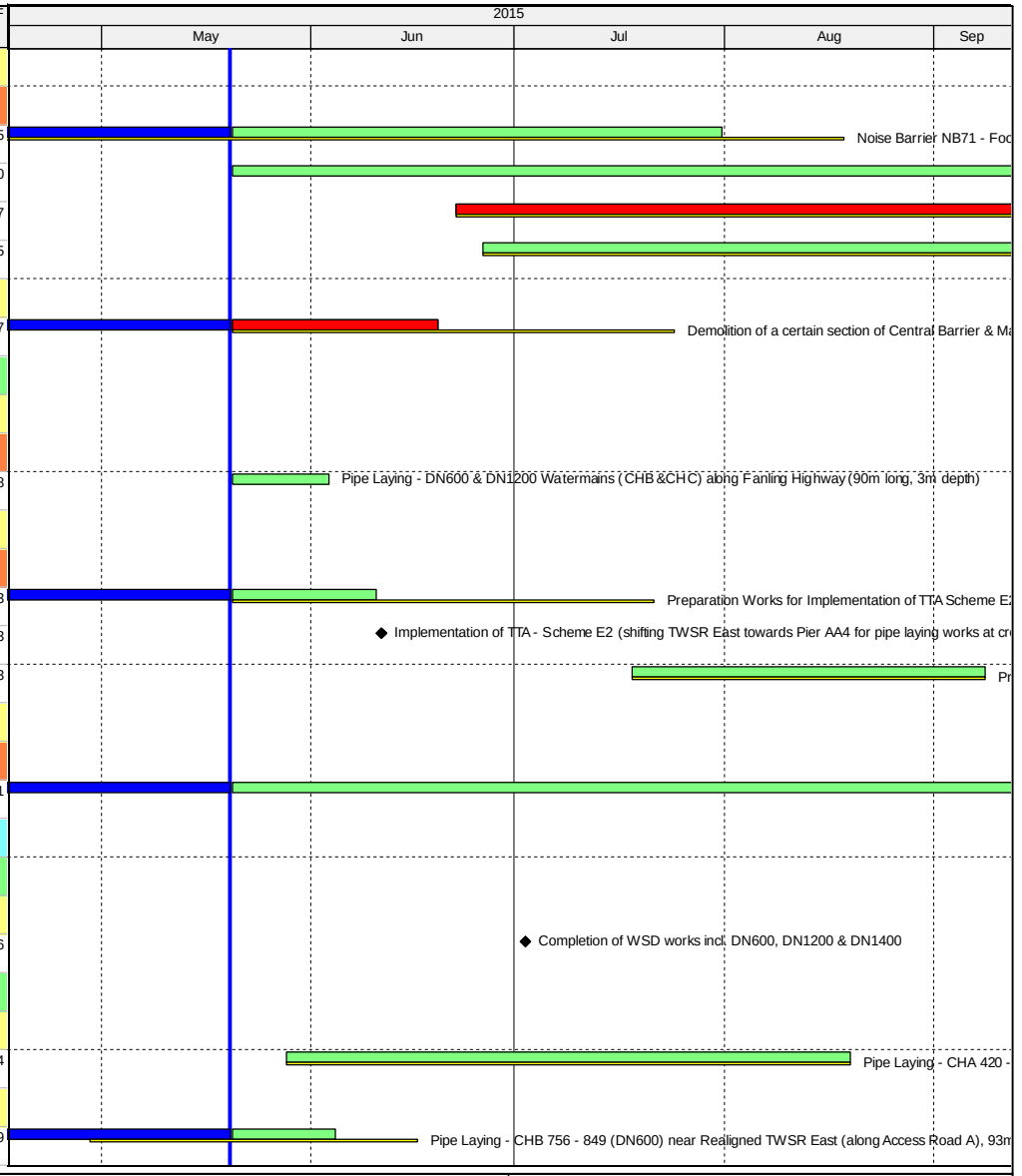
Actual Work
Remaining Work
Summary Bar
Critical Remaining Work
Milestone
Project Baseline Bar

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 2015-05-20

Date	Revision	Checked	Approved
20-May-15	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
	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	324	60	23-May-14 A	31-Jul-15	155
FHW-3150*	Pipe Laying - DN600, DN1200 Watermains (CHB &CHC) along Fanling Highway (90m long, 3m depth)	150	120	07-Jun-14 A	12-Oct-15	170
FHW-3210	Noise Barrier NB69 - Mini-Piling adjacent to NB lane (CSD: 32nos)	74	74	22-Jun-15	16-Sep-15	-17
FHW-3160	Road Formation, Kerb and Pavement (Eastern Side: FLH SB Slow lane and hard should)	90	90	26-Jun-15	12-Oct-15	155
	Miscellaneous Works for Facilitating Traffic Diversion of Fanling Highway					
FHW-M-1040	Demolition of a certain section of Central Barrier & Make Good of Road Pavement for further Traffic Diversion	54	26	23-Mar-15 A	19-Jun-15	-17
	Fanling Highway North Portion between CH7470 and CH7925					
	Fanling Highway Zone 4 between CH7380 and CH7470					
	At-Grade Roadworks (90m)					
FHW-4130*	Pipe Laying - DN600 & DN1200 Watermains (CHB &CHC) along Fanling Highway (90m long, 3m depth)	60	12	27-Nov-14 A	03-Jun-15	278
	Fanling Highway Zone 5 between CH7470 and CH7600 (Provision of Kiu Tau Footbridge)					
	At-Grade Road Works (130m)					
FHW-5120A	Preparation Works for Implementation of TTA Scheme E2	51	18	11-Apr-15 A	10-Jun-15	3
FHW-5120B	Implementation of TTA - Scheme E2 (shifting TWSR East towards Pier AA4 for pipe laying works at crossing)	0	0	11-Jun-15		3
FHW-5120C	Preparation Works for Implementation of TTA Scheme E3	45	45	18-Jul-15	08-Sep-15	3
	Fanling Highway Zone 7 between CH7660 and CH7925					
	At-Grade Roadworks (265m)					
FHW-7100	Site Formation, Preparation Works & Tree Transplant	127	140	30-Aug-13 A	05-Nov-15	1
	Section II - Remainder of the Works (KD-3)					
	At Grade Link Road at Fanling Highway Interchange					
	Link Road 3 (near Abutment AD1)					
FHI-LR3-3000	Completion of WSD works incl. DN600, DN1200 & DN1400	0	0		02-Jul-15	626
	WSD Works					
	DN450 Fire Mains (CHA)					
WA-1050	Pipe Laying - CHA 420 - 520 (DN450) near Realigned TWSR West (Re-TWSRW: CH530 - 640), 100m long & 2m depth	70	70	28-May-15	19-Aug-15	14
	DN600 Water Mains (CHB)					
WB-1090	Pipe Laying - CHB 756 - 849 (DN600) near Realigned TWSR East (along Access Road A), 93m long & GL	40	13	03-Mar-15 A	04-Jun-15	19



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

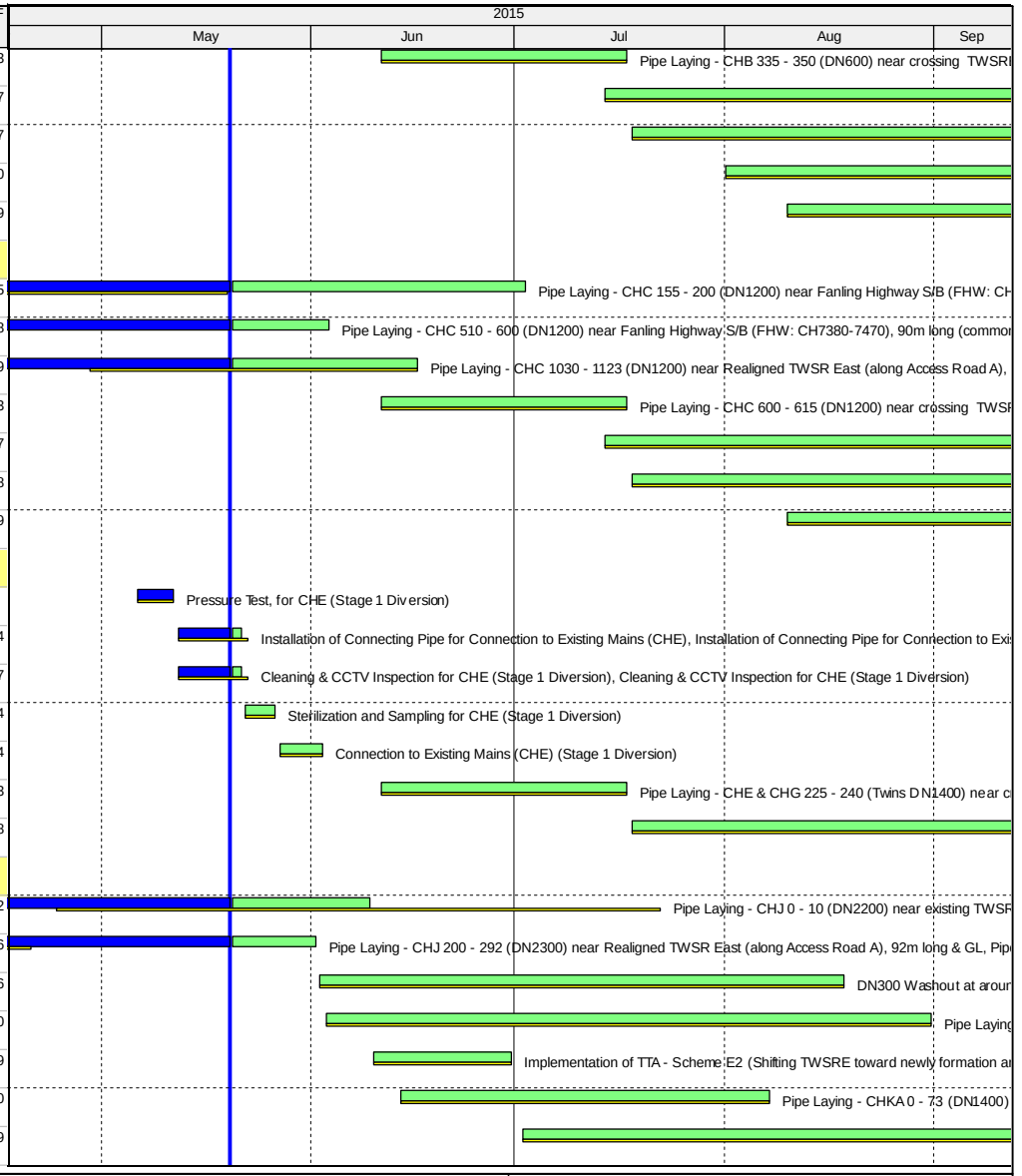
Actual Work
Remaining Work
Summary Bar
Critical Remaining Work
Milestone
Project Baseline Bar

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 2015-05-20

Date	Revision	Checked	Approved
20-May-15	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
WB-1030A	Pipe Laying - CHB 335 - 350 (DN600) near crossing TWSRE 15m long & 3m depth	30	30	11-Jun-15	17-Jul-15	3
WB-1070	Pipe Laying - CHB 635 - 700 (DN600) near Realigned TWSR East (TWSRE: CH380-456), 65m long & GL	78	78	14-Jul-15	14-Oct-15	17
WB-1030C	Pipe Laying - CHB 350 - 450 (DN600) from Portal AB7/AD9/AC12 to Portal AB8	85	85	18-Jul-15	28-Oct-15	627
WB-1010	Pipe Laying - CHB 153 - 245 (DN600) near Fanling Highway S/B (FHW: CH7290-7380), 92m long (common trench with NB)	60	60	01-Aug-15	12-Oct-15	170
WB-1080	Pipe Laying - CHB 700 - 756 (DN600) near Realigned TWSR East (along Roundabout), 56m long & GL	66	66	10-Aug-15	28-Oct-15	9
DN1200 Water Mains (CHC)						
WC-1050A	Pipe Laying - CHC 155 - 200 (DN1200) near Fanling Highway S/B (FHW: CH6935-7130), 45m long, 4m depth	120	35	15-Oct-14 A	02-Jul-15	255
WC-1080	Pipe Laying - CHC 510 - 600 (DN1200) near Fanling Highway S/B (FHW: CH7380-7470), 90m long (common trench with NB)	60	12	27-Nov-14 A	03-Jun-15	278
WC-1150	Pipe Laying - CHC 1030 - 1123 (DN1200) near Realigned TWSR East (along Access Road A), 93m long & GL	40	23	03-Mar-15 A	16-Jun-15	9
WC-1090A	Pipe Laying - CHC 600 - 615 (DN1200) near crossing TWSRE 15m long & 3m depth	30	30	11-Jun-15	17-Jul-15	3
WC-1130	Pipe Laying - CHC 910 - 980 (DN1200) near Realigned TWSR East (TWSRE: CH380-456), 70m long & GL	78	78	14-Jul-15	14-Oct-15	17
WC-1090C	Pipe Laying - CHC 615 - 720 (DN1200) from Portal AB7/AD9/AC12 to Portal AB8	85	85	18-Jul-15	28-Oct-15	268
WC-1140	Pipe Laying - CHC 980 - 1030 (DN1200) near Realigned TWSR East (along Roundabout), 50m long & GL	66	66	10-Aug-15	28-Oct-15	9
Twin DN1400 Water Mains (CHE & CHG)						
WE-2000A	Pressure Test, for CHE (Stage 1 Diversion)	5	0	06-May-15 A	11-May-15 A	
WE-2020A	Installation of Connecting Pipe for Connection to Existing Mains (CHE)	10	2	12-May-15 A	21-May-15	264
WE-2010A	Cleaning & CCTV Inspection for CHE (Stage 1 Diversion)	10	2	12-May-15 A	21-May-15	1257
WE-2030A	Sterilization and Sampling for CHE (Stage 1 Diversion)	3	3	22-May-15	26-May-15	264
WE-2050A	Connection to Existing Mains (CHE) (Stage 1 Diversion)	6	6	27-May-15	02-Jun-15	264
WE-1030	Pipe Laying - CHE & CHG 225 - 240 (Twins DN1400) near crossing TWSRE 15m long & 3m depth	30	30	11-Jun-15	17-Jul-15	3
WE-1050	Pipe Laying - CHE & CHG (Twins DN1400) from Portal AB7/AD9/AC12 to Portal AB8	85	85	18-Jul-15	28-Oct-15	98
DN2300 Water Mains and Leakage Collection System (CHJ & CHKA/CHK)						
WJ-1010A	Pipe Laying - CHJ 0 - 10 (DN2200) near existing TWSR East, 10m long & 6m depth	90	21	13-Oct-14 A	09-Jun-15	12
WJ-1050	Pipe Laying - CHJ 200 - 292 (DN2300) near Realigned TWSR East (along Access Road A), 92m long & GL	68	10	02-Jan-15 A	01-Jun-15	46
WJ-1100	DN300 Washout at around CHJ 268	65	65	02-Jun-15	18-Aug-15	46
WJ-1010C	Pipe Laying - CHJ 50 - 100 (DN2200) near existing TWSR East, 50m long & 6m depth	75	75	03-Jun-15	31-Aug-15	0
WJ-1000	Implementation of TTA - Scheme E2 (Shifting TWSRE toward newly formation area beside Fanling Highway)	17	17	10-Jun-15	30-Jun-15	9
WJ-1020B	Pipe Laying - CHKA 0 - 73 (DN1400) near Realigned TWSR East, 73m long & 4m depth	55	55	14-Jun-15	07-Aug-15	0
WJ-1010B	Pipe Laying - CHJ 10 - 50 (DN2200) crossing existing TWSR East, 40m long & 6m depth	78	78	02-Jul-15	02-Oct-15	9



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

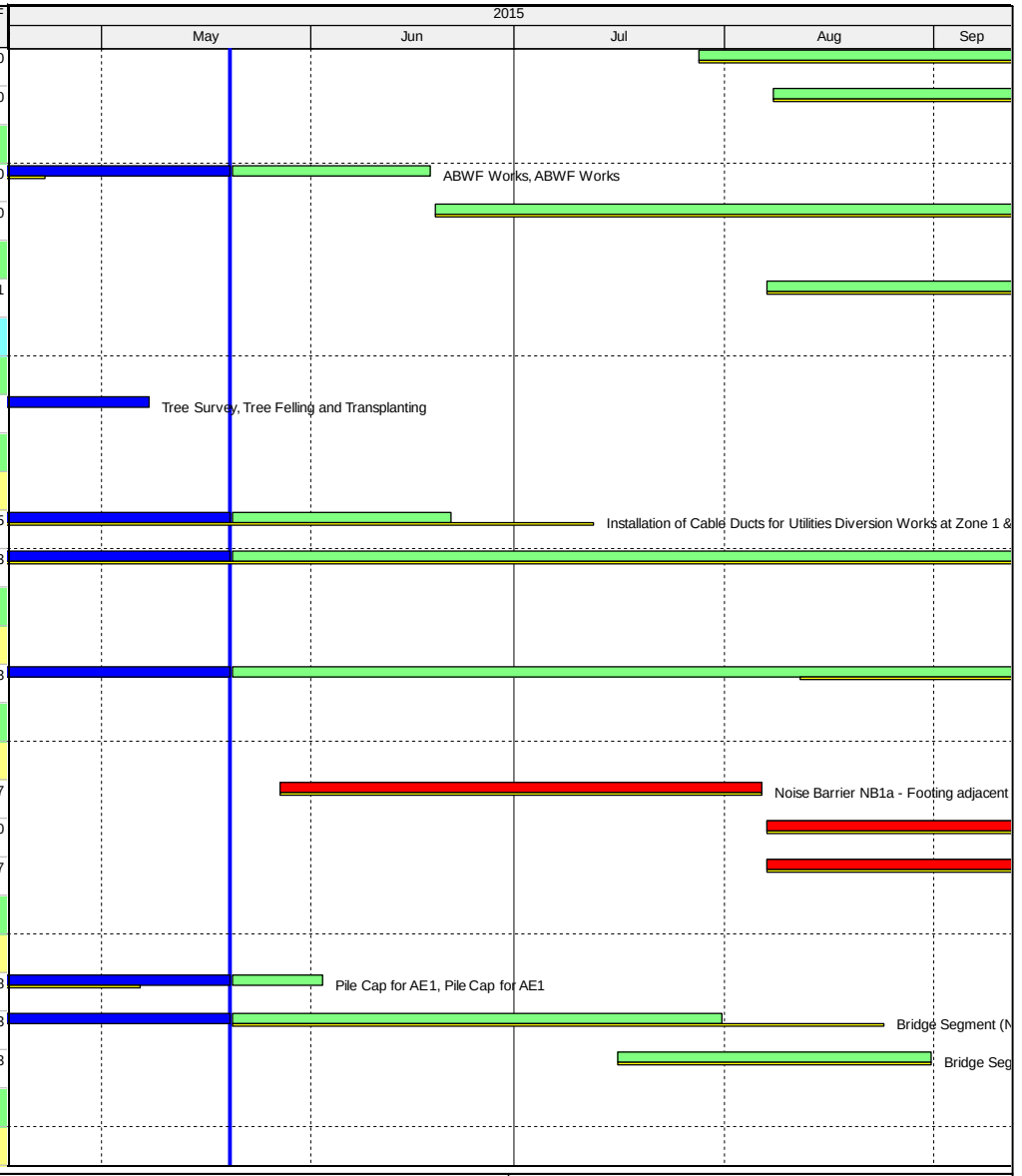
Actual Work
Remaining Work
Summary Bar
Critical Remaining Work
Milestone
Project Baseline Bar

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 2015-05-20

Date	Revision	Checked	Approved
20-May-15	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
WJ-1110	DN300 Washout at CHJ 155	65	65	28-Jul-15	13-Oct-15	0
WJ-1020A	Pipe Laying - CHK 0 - 80 (DN1400) near RealignedTWSR East, 80m long & 4m depth	55	55	08-Aug-15	13-Oct-15	0
Kau Lung Hang Valve Control & Telemetry House Reprovision						
VCTH-1040	ABWF Works	70	25	06-Jan-15 A	18-Jun-15	0
VCTH-1010	BS and E&M Works	90	90	19-Jun-15	06-Oct-15	0
Existing Nam Wa Po Trunk Sewage Pumping Station (PST3)						
PS-1000	Demolition of Existing Boundary Wall of Pumping Station (PST3)	50	50	07-Aug-15*	06-Oct-15	591
Stage 1A - Realignment of Tai Wo Service Road West (KD-7)						
Preliminary Works						
TWSRW-1100	Tree Survey, Tree Felling and Transplanting	81	0	16-Oct-13 A	08-May-15 A	
TWSRW Zone 1 betweeen CH100 and CH155						
At-Grade Roadworks						
TWSRW-1150	Installation of Cable Ducts for Utilities Diversion Works at Zone 1 & Zone 2 (Approx. 100m) (by utilities undertakers)	167	33	22-Oct-14 A	21-Jun-15	205
TWSRW-1160	Road Formation, Road Drainage, Kerb, Planter & Pavement	286	166	15-Nov-14 A	05-Dec-15	33
TWSRW Zone 2 betweeen CH155 and CH280						
At-Grade Roadworks						
TWSRW-2120	Road Formation, Road Drainage, Kerb, Planter and Pavement	165	166	16-Oct-14 A	05-Dec-15	33
TWSRW Zone 3 betweeen CH280 and CH315						
At-Grade Roadworks						
TWSRW-3100	Noise Barrier NB1a - Footing adjacent Realigned TWSR West	60	60	27-May-15	06-Aug-15	-17
TWSRW-3110	Installation of Cable Ducts for Utilities Diversion Works at Zone 2 (Approx. 120m) (by utilities undertakers)	130	130	07-Aug-15*	14-Dec-15	-20
TWSRW-3120	Road Formation, Road Drainage, Kerb, Planter and Pavement	151	151	07-Aug-15	05-Feb-16	-17
TWSRW Zone 4 betweeen CH315 and CH376						
Construction of Bridge E						
TWSRW-4050A	Pile Cap for AE1	55	11	11-Feb-15 A	02-Jun-15	48
TWSRW-4070	Bridge Segment (North Bay & Middle Bay)	80	60	01-Apr-15 A	31-Jul-15	13
TWSRW-4080	Bridge Segment (South Bay)	40	40	16-Jul-15	31-Aug-15	13
TWSRW Zone 5 betweeen CH376 and CH520						
Construction of Retaining Structures						



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

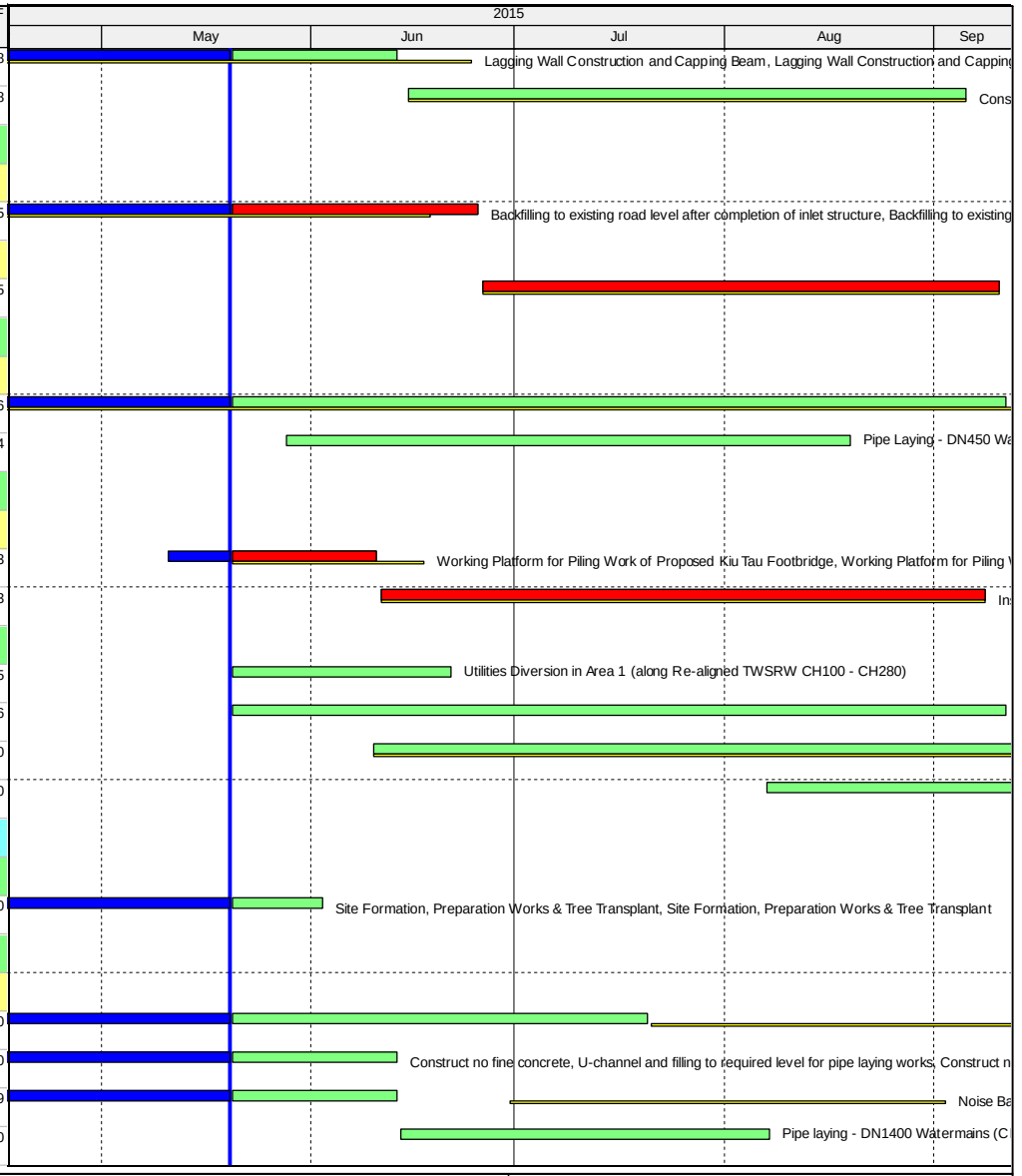
Actual Work
Remaining Work
Summary Bar
Critical Remaining Work
Milestone
Project Baseline Bar

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 2015-05-20

Date	Revision	Checked	Approved
20-May-15	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
TWSRW-5090	Lagging Wall Construction and Capping Beam	160	21	06-Nov-14 A	13-Jun-15	8
TWSRW-5070	Construction of Mass Concrete Wall (FL/RW4)	70	70	15-Jun-15	05-Sep-15	8
TWSRW Zone 6 betweeen CH520 and CH530						
Box Culvert Extension - BC01						
TWSRW-6080	Backfilling to existing road level after completion of inlet structure	72	30	20-Mar-15 A	25-Jun-15	-5
At-Grade Roadworks						
TWSRW-6110	Slope Upgrading Works for unregistered feature beside Slope 3SW-D/C80 (to be Covered by VO. 68)	65	65	26-Jun-15	10-Sep-15	-5
TWSRW Zone 7 betweeen CH530 and CH640						
At-Grade Roadworks						
TWSRW-7140	Installation of Cable Ducts for Utilities Diversion Works at Area 4 (Approx. 150m) (by utilities undertakers)	233	115	28-Jan-15 A	11-Sep-15	16
TWSRW-7120*	Pipe Laying - DN450 Watermains (CHA)	70	70	28-May-15	19-Aug-15	14
TWSRW Zone 8 betweeen CH640 and CH695						
Kiu Tau Footbridge Reprovision (West)						
TWSRW-8010A	Working Platform for Piling Work of Proposed Kiu Tau Footbridge	24	18	11-May-15 A	10-Jun-15	-43
TWSRW-8010B	Installation of Socket H-Pile for Proposed Kiu Tau Footbridge (13 nos of Pile)	75	75	11-Jun-15	08-Sep-15	-43
Remainder of the Works						
TWSRW-9010*	Utilities Diversion in Area 1 (along Re-aligned TWSRW CH100 - CH280)	167	33	22-Oct-14 A	21-Jun-15	205
TWSRW-9040*	Utilities Diversion in Area 4 (along Re-aligned TWSRW CH530 - CH640)	233	115	28-Jan-15 A	11-Sep-15	16
TWSRW-9030	Utilities Diversion in Area 3 (along existing TWSRW, Approx. 150m) (by utilities undertakers)	217	217	10-Jun-15*	12-Jan-16	0
TWSRW-9020*	Utilities Diversion in Area 2 (along Re-aligned TWSRW CH 280 - CH315)	130	130	07-Aug-15	14-Dec-15	-20
Stage N4A & N4B - Realignment of Tai Wo Service Road East (KD-13 & KD-14)						
Preliminary Works						
TWSRE-4000	Site Formation, Preparation Works & Tree Transplant	65	11	15-Apr-14 A	02-Jun-15	0
TWSRE Zone 1 between CH100 and CH270						
At-Grade Roadworks						
TWSRE-1120	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (96m)	110	50	29-Dec-14 A	20-Jul-15	0
TWSRE-1150	Construct no fine concrete, U-channel and filling to required level for pipe laying works	30	21	06-Jan-15 A	13-Jun-15	0
TWSRE-1110	Noise Barrier NB3 - PC01 & PC02 Pile Cap Construction	55	21	19-Jan-15 A	13-Jun-15	29
TWSRE-1140*	Pipe laying - DN1400 Watermains (CHKA) along Realigned TWSR East	55	55	14-Jun-15	07-Aug-15	0



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

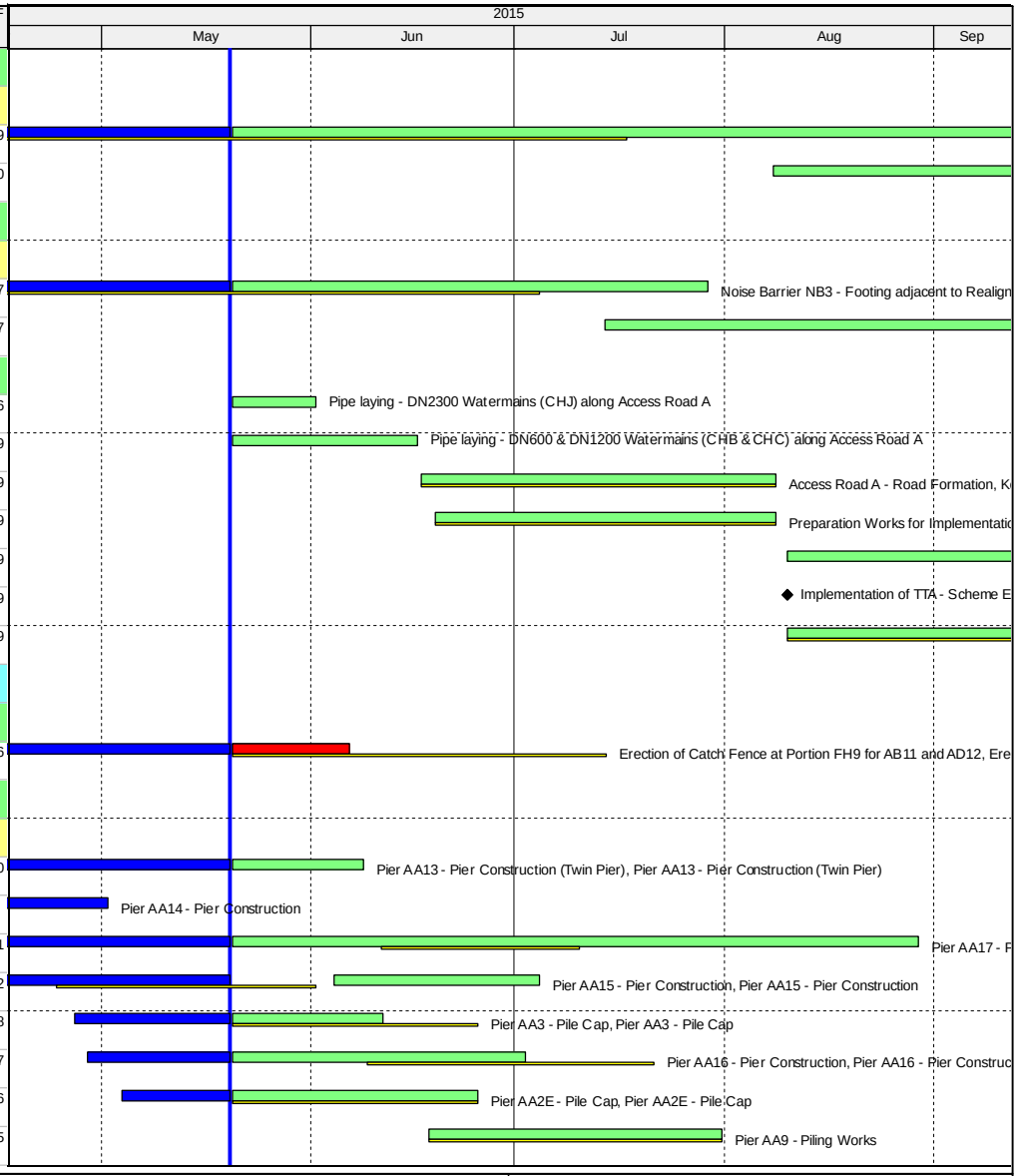
Actual Work
Remaining Work
Summary Bar
Critical Remaining Work
Milestone
Project Baseline Bar

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 2015-05-20

Date	Revision	Checked	Approved
20-May-15	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
	TWSRE Zone 2 between CH270 and CH380					
	At-Grade Roadworks					
TWSRE-2010	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (48m)	110	100	03-Mar-15 A	16-Sep-15	89
TWSRE-2030B*	Pipe laying - DN1400 Watermains (CHK) along Realigned TWSR East	55	55	08-Aug-15	13-Oct-15	0
	TWSRE Zone 3 between CH380 and CH456					
	At-Grade Roadworks					
TWSRE-3010	Noise Barrier NB3 - Footing adjacent to Realigned TWSR East (62m)	85	58	19-Mar-15 A	29-Jul-15	17
TWSRE-3020A*	Pipe Laying - DN600 & DN1200 Watermains (CHB & CHC) along Realigned TWSR East	78	78	14-Jul-15	14-Oct-15	17
	Roundabout A, Slip Road and Access Road					
TWSRE-4050A*	Pipe laying - DN2300 Watermains (CHJ) along Access Road A	68	10	02-Jan-15 A	01-Jun-15	46
TWSRE-4040A*	Pipe laying - DN600 & DN1200 Watermains (CHB & CHC) along Access Road A	58	23	03-Mar-15 A	16-Jun-15	9
TWSRE-4060B	Access Road A - Road Formation, Kerb, Planter and Pavement	44	44	17-Jun-15	08-Aug-15	9
TWSRE-4080	Preparation Works for Implementation of TTA Scheme E1	42	42	19-Jun-15	08-Aug-15	9
TWSRE-4040B*	Pipe laying - DN600 & DN1200 Watermains (CHB & CHC) along Roundabout A	66	66	10-Aug-15	28-Oct-15	9
TWSRE-4090	Implementation of TTA - Scheme E1	0	0	10-Aug-15		9
TWSRE-4030B	Slip Road Y (CH100-CH230) - Road Formation, Remaining Road Drainage, Kerb, Planter and Pavement	60	60	10-Aug-15	20-Oct-15	9
	Stage 1C - Viaduct Structure & TCSS Civil Provisions (KD-9)					
	Preliminaries					
B-4050	Erection of Catch Fence at Portion FH9 for AB11 and AD12	45	15	13-Apr-15 A	06-Jun-15	-26
	Foundation & Pier Construction					
	Bridge A					
BA-13-1030	Pier AA13 - Pier Construction (Twin Pier)	38	16	06-Nov-14 A	08-Jun-15	0
BA-14-1030	Pier AA14 - Pier Construction	31	0	20-Nov-14 A	02-May-15 A	
BA-17-1030	Pier AA17 - Pier Construction	24	85	05-Feb-15 A	29-Aug-15	1
BA-15-1030	Pier AA15 - Pier Construction	31	25	14-Feb-15 A	04-Jul-15	2
BA-03-1020	Pier AA3 - Pile Cap	30	19	27-Apr-15 A	11-Jun-15	138
BA-16-1030	Pier AA16 - Pier Construction	35	35	29-Apr-15 A	02-Jul-15	27
BA-02-1020A	Pier AA2E - Pile Cap	30	30	04-May-15 A	25-Jun-15	86
BA-09-1000	Pier AA9 - Piling Works	36	36	18-Jun-15	31-Jul-15	95



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

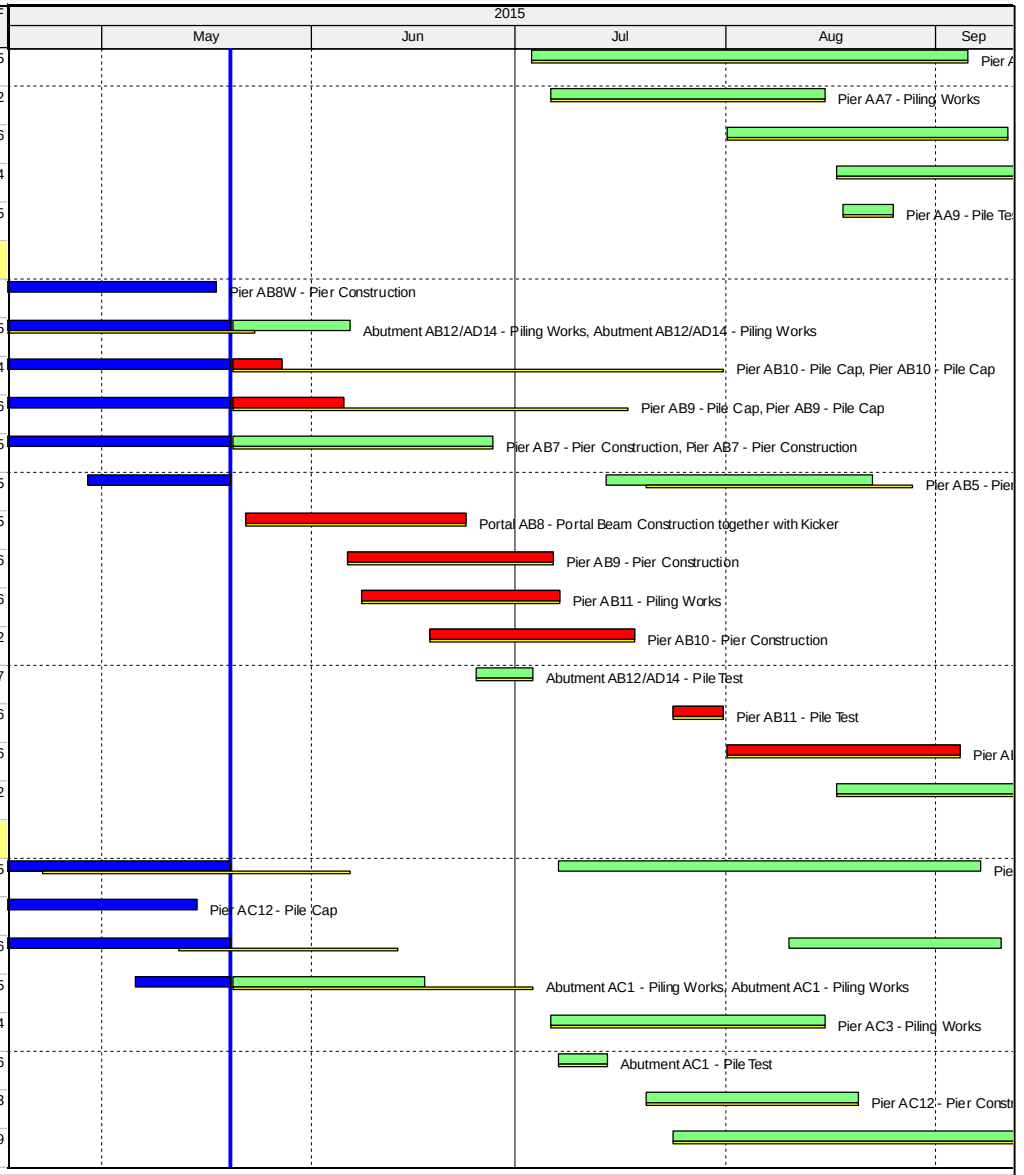
- Actual Work
- Remaining Work
- Summary Bar
- Critical Remaining Work
- Milestone
- Project Baseline Bar

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 2015-05-20

Date	Revision	Checked	Approved
20-May-15	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
BA-18-1030	Pier AA18 - Pier Construction	56	56	03-Jul-15	05-Sep-15	95
BA-07-1000	Pier AA7 - Piling Works	36	36	06-Jul-15	15-Aug-15	22
BA-10-1000	Pier AA10 - Piling Works	36	36	01-Aug-15	11-Sep-15	126
BA-11-1000	Pier AA11 - Piling Works	36	36	17-Aug-15	26-Sep-15	64
BA-09-1010	Pier AA9 - Pile Test	7	7	18-Aug-15	25-Aug-15	95
Bridge B						
BB-08-1030	Pier AB8W - Pier Construction	24	0	15-Dec-14 A	18-May-15 A	
BB-12-1000A	Abutment AB12/AD14 - Piling Works	70	15	06-Feb-15 A	06-Jun-15	65
BB-10-1020	Pier AB10 - Pile Cap	60	6	23-Mar-15 A	27-May-15	-14
BB-09-1020	Pier AB9 - Pile Cap	48	14	26-Mar-15 A	05-Jun-15	-36
BB-07-1030	Pier AB7 - Pier Construction	32	32	09-Apr-15 A	27-Jun-15	105
BB-05-1030	Pier AB5 - Pier Construction	35	35	29-Apr-15 A	22-Aug-15	75
BB-08-1050	Portal AB8 - Portal Beam Construction together with Kicker	26	26	22-May-15	23-Jun-15	-25
BB-09-1030	Pier AB9 - Pier Construction	24	24	06-Jun-15	06-Jul-15	-36
BB-11-1000	Pier AB11 - Piling Works	24	24	08-Jun-15	07-Jul-15	-26
BB-10-1030	Pier AB10 - Pier Construction	25	25	18-Jun-15	18-Jul-15	-32
BB-12-1010	Abutment AB12/AD14 - Pile Test	7	7	25-Jun-15	03-Jul-15	217
BB-11-1010	Pier AB11 - Pile Test	7	7	24-Jul-15	31-Jul-15	-26
BB-11-1020	Pier AB11 - Pile Cap	30	30	01-Aug-15	04-Sep-15	-26
BB-03-1000	Pier AB3 - Piling Works	36	36	17-Aug-15	26-Sep-15	72
Bridge C						
BC-05-1030	Pier AC5 - Pier Construction (Twin Pier)	38	54	22-Dec-14 A	07-Sep-15	35
BC-12-1020	Pier AC12 - Pile Cap	30	0	26-Jan-15 A	15-May-15 A	
BC-09-1030	Pier AC9 - Pier Construction	28	28	02-Mar-15 A	10-Sep-15	6
BC-01-1000	Abutment AC1 - Piling Works	36	24	06-May-15 A	17-Jun-15	95
BC-03-1000	Pier AC3 - Piling Works	36	36	06-Jul-15	15-Aug-15	64
BC-01-1010	Abutment AC1 - Pile Test	7	7	07-Jul-15	14-Jul-15	326
BC-12-1030	Pier AC12 - Pier Construction	28	28	20-Jul-15	20-Aug-15	33
BC-11-1030	Pier AC11 - Pier Construction (Twin Pier)	55	55	24-Jul-15*	25-Sep-15	19



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

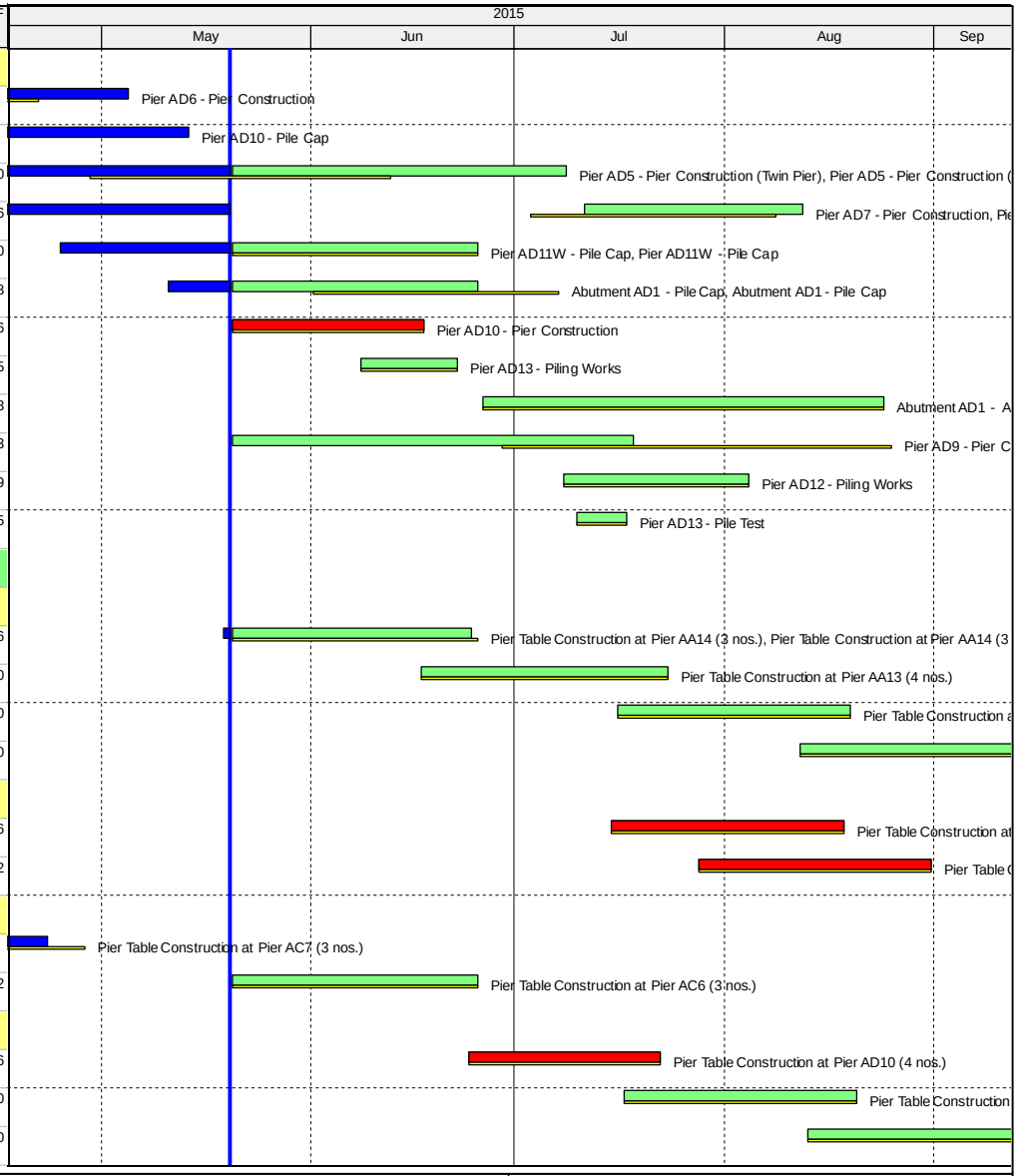
Actual Work
Remaining Work
Summary Bar
Critical Remaining Work
Milestone
Project Baseline Bar

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 2015-05-20

Date	Revision	Checked	Approved
20-May-15	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
	Bridge D					
BD-06-1030	Pier AD6 - Pier Construction	24	0	02-Jan-15 A	05-May-15 A	
BD-10-1020	Pier AD10 - Pile Cap	30	0	26-Jan-15 A	14-May-15 A	
BD-05-1030	Pier AD5 - Pier Construction (Twin Pier)	37	40	29-Jan-15 A	08-Jul-15	0
BD-07-1030	Pier AD7 - Pier Construction	32	28	04-Feb-15 A	12-Aug-15	6
BD-11-1020B	Pier AD11W - Pile Cap	30	30	25-Apr-15 A	25-Jun-15	290
BD-01-1020	Abutment AD1 - Pile Cap	30	30	11-May-15 A	25-Jun-15	358
BD-10-1030	Pier AD10 - Pier Construction	24	24	20-May-15	17-Jun-15	-36
BD-13-1000	Pier AD13 - Piling Works	12	12	08-Jun-15	22-Jun-15	65
BD-01-1030	Abutment AD1 - Abutment Construction	50	50	26-Jun-15	24-Aug-15	358
BD-09-1030	Pier AD9 - Pier Construction	49	49	29-Jun-15 A	18-Jul-15	33
BD-12-1000	Pier AD12 - Piling Works	24	24	08-Jul-15	04-Aug-15	59
BD-13-1010	Pier AD13 - Pile Test	7	7	10-Jul-15	17-Jul-15	65
	Pier Table Construction					
	Bridge A					
PA-1140	Pier Table Construction at Pier AA14 (3 nos.)	30	29	19-May-15 A	24-Jun-15	16
PA-1130	Pier Table Construction at Pier AA13 (4 nos.)	30	30	17-Jun-15	23-Jul-15	0
PA-1150	Pier Table Construction at Pier AA15 (3 nos.)	30	30	16-Jul-15	19-Aug-15	0
PA-1160	Pier Table Construction at Pier AA16 (3 nos.)	30	30	12-Aug-15	15-Sep-15	0
	Bridge B					
PB-1090	Pier Table Construction at Pier AB9 (4 nos.)	30	30	15-Jul-15	18-Aug-15	-36
PB-1100	Pier Table Construction at Pier AB10 (4 nos.)	30	30	28-Jul-15	31-Aug-15	-32
	Bridge C					
PC-1070	Pier Table Construction at Pier AC7 (3 nos.)	30	0	10-Mar-15 A	23-Apr-15 A	
PC-1060	Pier Table Construction at Pier AC6 (3 nos.)	30	30	20-May-15	25-Jun-15	2
	Bridge D					
PD-1100	Pier Table Construction at Pier AD10 (4 nos.)	24	24	24-Jun-15	22-Jul-15	-36
PD-1050	Pier Table Construction at Pier AD5 (4 nos.)	30	30	17-Jul-15	20-Aug-15	0
PD-1060	Pier Table Construction at Pier AD6 (3 nos.)	30	30	13-Aug-15	16-Sep-15	0



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

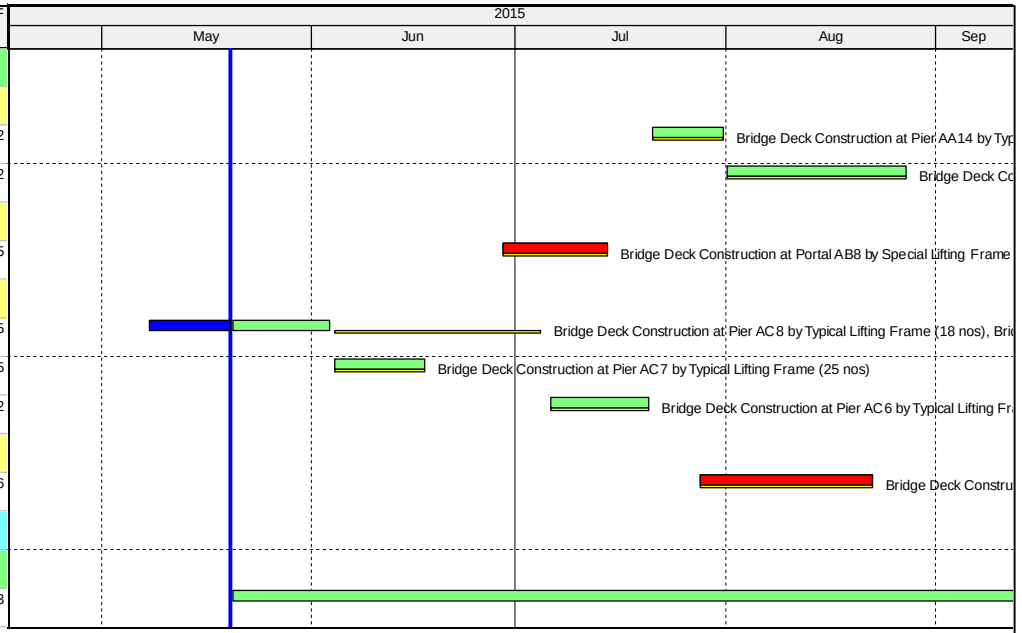
- Actual Work
- Remaining Work
- Summary Bar
- Critical Remaining Work
- Milestone
- Project Baseline Bar

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 2015-05-20

Date	Revision	Checked	Approved
20-May-15	Rev.0	SL	

Activity ID	Activity Name	OD	RD	Start	Finish	TF
	Viaduct Bridge Segement Erection					
	Bridge A					
EA-1140	Bridge Deck Construction at Pier AA14 by Typical Lifting Frame (17 nos)	10	10	21-Jul-15	31-Jul-15	2
EA-1130	Bridge Deck Construction at Pier AA13 by Typical Lifting Frame (23 nos)	23	23	01-Aug-15	27-Aug-15	2
	Bridge B					
EB-1080	Bridge Deck Construction at Portal AB8 by Special Lifting Frame (26 nos)	13	13	29-Jun-15	14-Jul-15	-25
	Bridge C					
EC-1080	Bridge Deck Construction at Pier AC8 by Typical Lifting Frame (18 nos)	25	12	08-May-15 A	03-Jun-15	15
EC-1070	Bridge Deck Construction at Pier AC7 by Typical Lifting Frame (25 nos)	12	12	04-Jun-15	17-Jun-15	15
EC-1060	Bridge Deck Construction at Pier AC6 by Typical Lifting Frame (15 nos)	13	13	06-Jul-15	20-Jul-15	2
	Bridge D					
ED-1100	Bridge Deck Construction at Portal AD10 by Special Lifting Frame (56 nos)	23	23	28-Jul-15	22-Aug-15	-36
	Section VI - Works in Portion FH9 (KD-6A)					
	Major Works					
S6-2000	Construction of Abutment AB12/AD14 (including Piling, Pile Cap & Abutment construction)	276	290	06-Feb-15 A	16-May-16	123



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

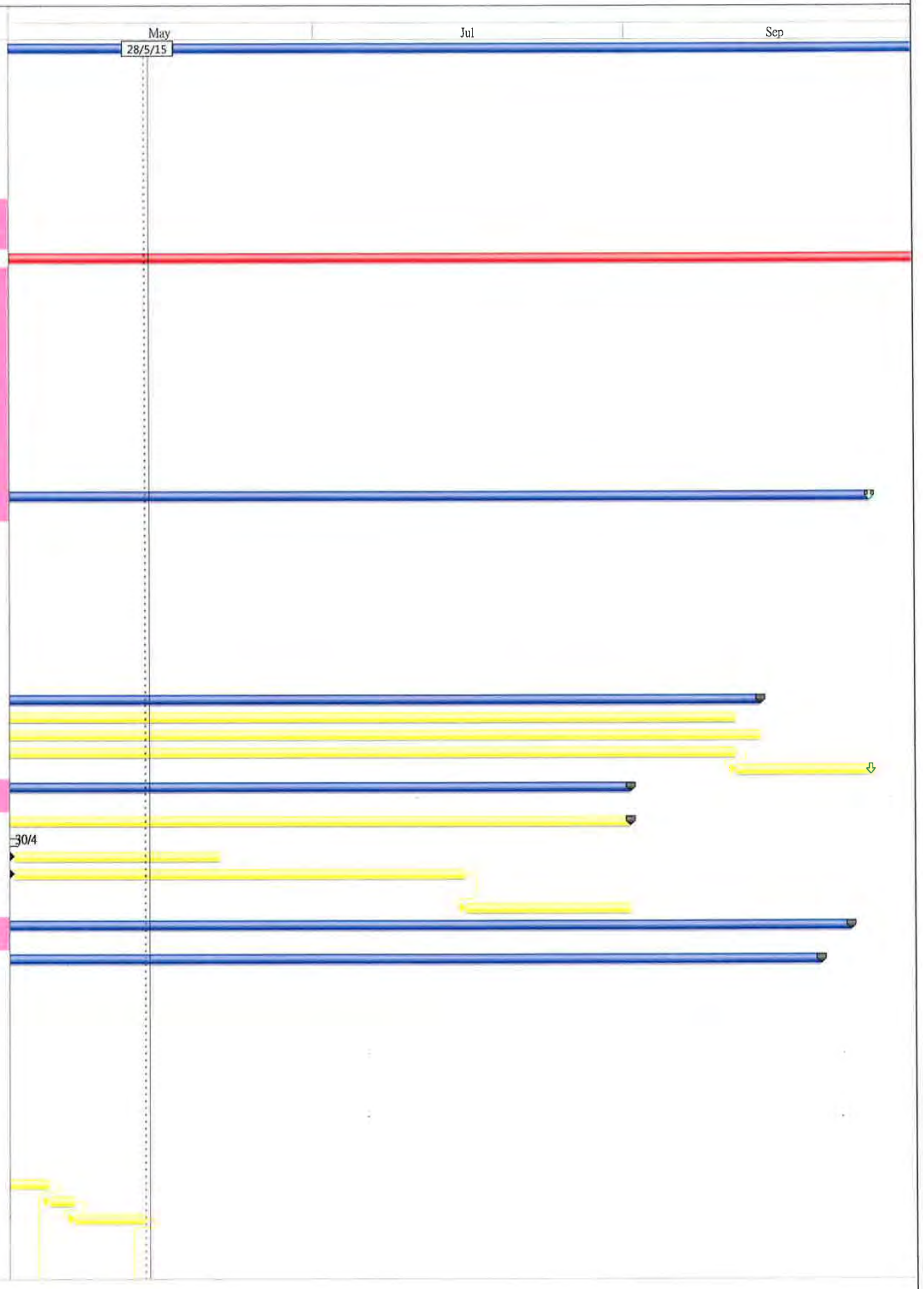
CEDD Contract No. CV/2012/09
Liantang / Heung Yuen Wai BCP - Site Formation & Infrastructure Works, Contract 3
3-Month Rolling Programme

3-Month Rolling Programme updated to 2015-05-20

Date	Revision	Checked	Approved
20-May-15	Rev.0	SL	

Contract 5

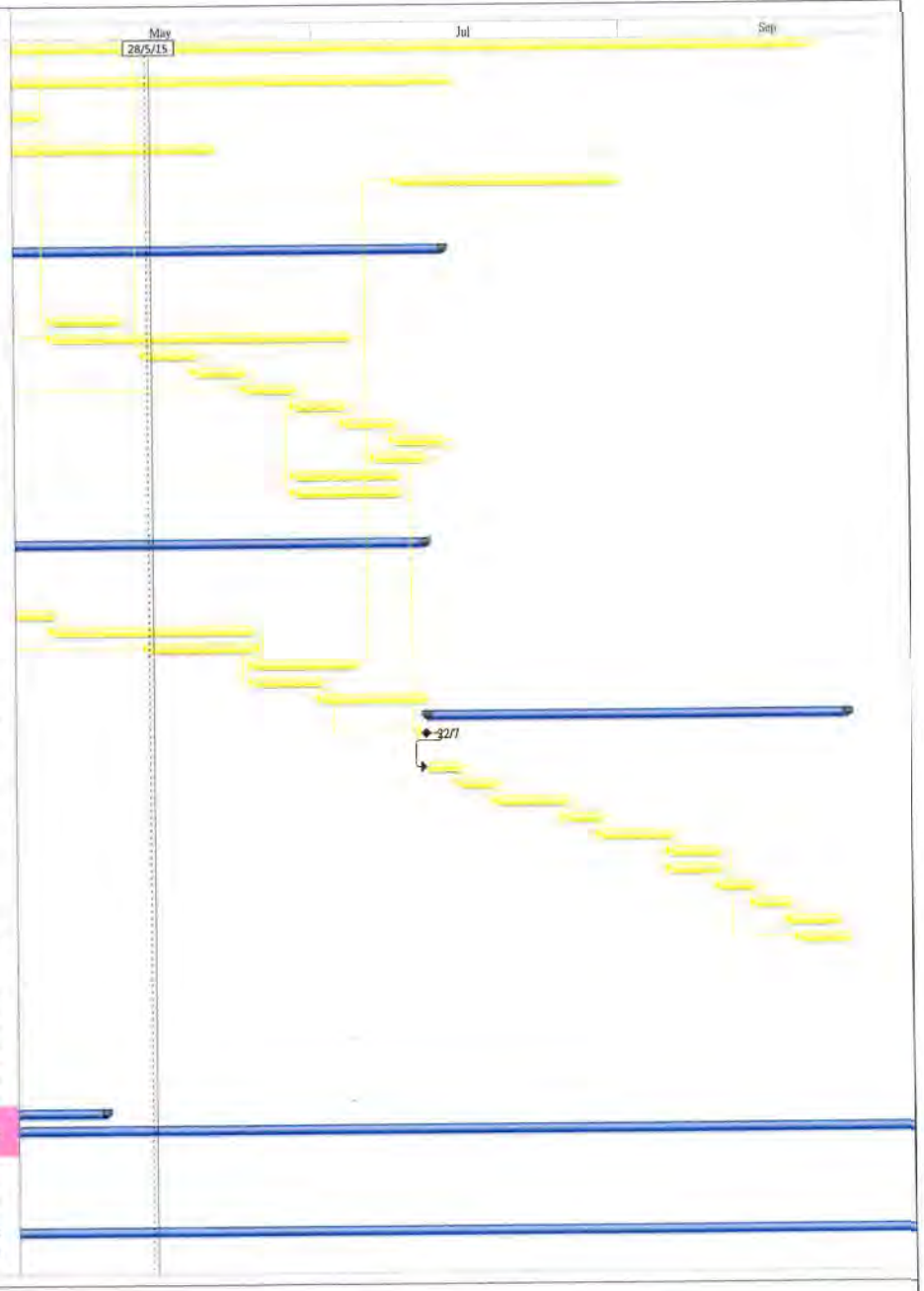
ID	WBS	Task Name	Duration	Start	Finish
1	1	Key Dates	1110 days	Thu 28/3/13	Sun 10/4/16
47	2	Preliminaries and Statuary / Contractual Submissions	424 days	Thu 11/4/13	Mon 9/6/14
48	2.1	Site Establishment	399 days	Thu 11/4/13	Thu 15/5/14
53	2.2	Applications to Government Department	89 days	Fri 12/4/13	Tue 9/7/13
58	2.3	Temporary Traffic Arrangement (TTA) Scheme for temp. LMH Rd	131 days	Fri 12/4/13	Tue 20/8/13
63	2.4	Liaison with Utility Undertakers	363 days	Fri 12/4/13	Wed 9/4/14
66	2.5	Environmental Baseline & Impact Monitoring	132 days	Thu 11/4/13	Wed 21/8/13
77	2.6	General Site Clearance	424 days	Fri 12/4/13	Mon 9/6/14
78	3	Stage of the Works	180 days	Thu 11/4/13	Mon 7/10/13
79	3.1	Stage I of the Works - Temporary vehicular bridge B and temporary Lin Ma Hang Road	179 days	Fri 12/4/13	Mon 7/10/13
90	3.2	Stage II of the Works - Temporary ArchSD Depot (LMH2)	78 days	Thu 11/4/13	Thu 27/6/13
94	4	Section of the Works	1382 days	Fri 12/4/13	Sun 22/1/17
95	4.1	Section I of the Works - Ground Investigation field works (Drg. 7101A-7111A)	251 days	Thu 30/5/13	Tue 4/2/14
100	4.2	Section II of the Works - All laboratory tests for Section I	188 days	Sat 31/8/13	Thu 6/3/14
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	Sun 12/5/13	Thu 8/8/13
111	4.4	Section IV of the Works - Village house within portion RS4 - EOT3 completion 15/5/2014	399 days	Fri 12/4/13	Thu 15/5/14
123	4.5	Section V of the Works-All works within portion RS4 exclude Section IV - EOT8 completion 28/4/2015	747 days	Fri 12/4/13	Tue 28/4/15
140	4.6	Section VII of the Works - All works within Area CRD	249 days	Mon 9/9/13	Thu 15/5/14
177	4.7	Section VIII of the Works - All works within Area BCPA - EOT6 completion 2/1/2015	571 days	Tue 11/6/13	Fri 2/1/15
211	4.8	Section IX of the Works - All works within Area BCPB - EOT07 completion 19 October 2015	669 days	Fri 20/12/13	Mon 19/10/15
212	4.8.1	Claim No. 009 - Delays due to Delayed Possession of Portion BCP4 of the Site - Orginal 7/3/2014 and possessed on 25/9/2014	0 days	Fri 26/9/14	Fri 26/9/14
213	4.8.2	Submission for demolition of existing building structures	37 days	Fri 20/12/13	Sat 25/1/14
214	4.8.3	Approval of submission for demolish existing building structures	41 days	Sun 26/1/14	Fri 7/3/14
215	*4.8.4*	*Demolition of existing building structures UPON instruction (included Asbestos Investigation, Report & Asbestos Abatement Plan)*	*76 days*	*Fri 3/10/14*	*Wed 17/12/14*
216	4.8.5	Tree felling/removal works and tree transplanting works at BCP4 (include tree survey etc)	139 days	Fri 26/9/14	Wed 11/2/15
217	4.8.6	Claim No. 007 - Delay due to Non-Possession of Parts of Portion BCP3 due to Resistant by Local Resident (NOT YET)	0 days	Wed 14/1/15	Wed 14/1/15
218	4.8.7	Site formation works	330 days	Sun 2/11/14	Sun 27/9/15
219	*4.8.7.1*	*site formation works (surrounding areas B1-3,B5-6, B9)*	*200 days*	*Sat 7/3/15*	*Tue 22/9/15*
220	*4.8.7.2*	*site formation works (area BCP4 - B4,7,8,10-B17)*	*330 days*	*Sun 2/11/14*	*Sun 27/9/15*
221	*4.8.7.3*	*site formation works (B18-B22)*	*200 days*	*Sat 7/3/15*	*Tue 22/9/15*
222	*4.8.8*	*chain link fence (Drg.1002C, 1032B, 1033B)*	*27 days*	*Wed 23/9/15*	*Mon 19/10/15*
223	4.9	Section X of the Works - All works within Area BCPC - (Outstanding Works for SBF)	454 days	Thu 5/6/14	Tue 1/9/15
234	4.9.7	VO for Secondary Boundary Fencing extend to BCPC (not yet)	125 days	Thu 30/4/15	Tue 1/9/15
235	4.9.7.1	Handing over from CLP for the extended area	0 days	Thu 30/4/15	Thu 30/4/15
236	*4.9.7.2*	*Construction of Retaining Wall 2A*	*41 days*	*Sat 2/5/15*	*Thu 11/6/15*
237	4.9.7.3	Construction of soil cement / general fill slope adjacent to CLP Substation	90 days	Sat 2/5/15	Thu 30/7/15
238	*4.9.7.4*	*Secondary Boundary Fencing ChA+125 to ChA+250 (Bay 17 to 32)*	*33 days*	*Fri 31/7/15*	*Tue 1/9/15*
239	4.10	Section XI of the Works - All works within Area BCPD	459 days	Mon 14/7/14	Thu 15/10/15
240	4.10.1	South West Works for additional 132kV (at Areas D1 & D2) at BCPD	421 days	Fri 15/8/14	Fri 9/10/15
241	4.10.1.1	fill platform for CLP (132kV) from +12.8 to +15.3	47 days	Fri 15/8/14	Tue 30/9/14
242	4.10.1.2	UU for erection of overhead post & termination of electricity by CLP(132kV)(Area D2)	28 days	Tue 14/10/14	Mon 10/11/14
243	*4.10.1.3*	*Claim No. 007 - Delay due to Non-Possession of Parts of Portion BCP3 due to Resistant by Local Resident - confirmed to possess on 14/1/2015*	*1 day*	*Wed 14/1/15*	*Wed 14/1/15*
244	4.10.1.4	site clearance, take initial survey	10 days	Thu 15/1/15	Sat 24/1/15
245	4.10.1.5	tree felling / transplant	14 days	Sun 25/1/15	Sat 7/2/15
246	4.10.1.6	assume filling partly areas D1 & D2 to +13.5 for drain	20 days	Sun 8/2/15	Fri 27/2/15
247	4.10.1.7	DN2100 to Box Culvert No. 3 (assume cut from +10)	30 days	Sat 28/2/15	Sun 29/3/15
248	4.10.1.8	lay sewer FHM513, 514, 515, SMH9937 (backfill with laying of irrigation pipe)	20 days	Mon 30/3/15	Sat 18/4/15
249	4.10.1.9	lay sewer STP-FMH520-515	20 days	Sun 19/4/15	Fri 8/5/15
250	4.10.1.10	fill trench from laid sewer to drainage formation	5 days	Sat 9/5/15	Wed 13/5/15
251	4.10.1.11	lay drainage SMH9961 to 9966 & 9936 to 9937	14 days	Thu 14/5/15	Wed 27/5/15
252	4.10.1.12	filling of areas D1 & D2 to +15.3 with D2 soil cement slope	14 days	Mon 30/3/15	Sun 12/4/15
253	4.10.1.13	Confirmation of Alignment for Secondary Boundary Fencing	35 days	Mon 29/12/14	Sun 1/2/15



Revision 1
Thu 28/5/15

Task | Split | Milestone | Summary | Project Summary | Critical | Critical Split | Progress | Deadline

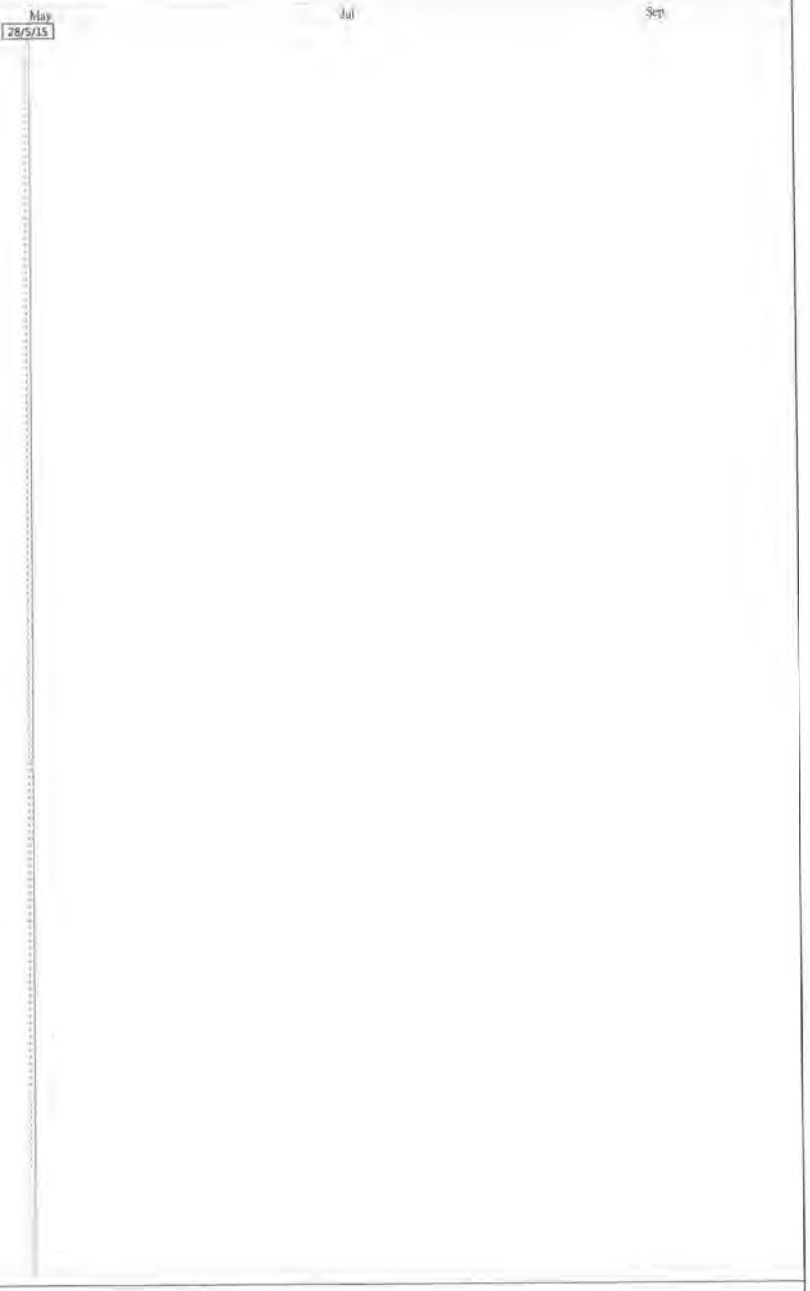
ID	WBS	Task Name	Duration	Start	Finish
254	4.10.12	Secondary Boundary Fencing Ch0 to Ch709 (Bay 1 to 93)	250 days	Mon 2/2/15	Fri 9/10/15
255	4.10.1.15	Secondary Boundary Fencing Ch709 to Ch1234 (Bay 94 to 158)	177 days	Mon 2/2/15	Tue 28/7/15
256	4.10.1.16	Secondary Boundary Fencing Ch1234 to Ch1436 (Bay 159 to 184)	70 days	Thu 26/2/15	Wed 6/5/15
257	4.10.1.17	Secondary Boundary Fencing ChA0 to ChA125 (Bay 1 to 16)	45 days	Mon 27/4/15	Wed 10/6/15
258	4.10.1.18	Secondary Boundary Fencing Ch1436 to Ch1520 (Bay 185 to 197)	45 days	Sat 18/7/15	Mon 31/8/15
259	4.10.1.19	irrigation system at west D1 & D2	7 days	Mon 13/4/15	Sun 19/4/15
260	4.10.1.20	additional 132kV (at Areas D1 & D2)	7 days	Mon 20/4/15	Sun 26/4/15
261	**4.10.2**	**South West Works for Areas D1 & D2**	**297 days**	**Fri 3/10/14**	**Sun 26/7/15**
262	4.10.2.1	site clearance, take initial survey	10 days	Fri 3/10/14	Sun 12/10/14
263	4.10.2.2	tree felling / transplant	25 days	Mon 13/10/14	Thu 6/11/14
264	4.10.2.3	fill trench to formation for Plug-FMH501-502-STP (approx. to +11)	7 days	Fri 7/11/14	Thu 13/11/14
265	4.10.2.4	lay sewer Plug-FMH501-502-STP	14 days	Sat 9/5/15	Fri 22/5/15
266	4.10.2.5	complete filling for Areas D1 & D2 to formation area	60 days	Sat 9/5/15	Tue 7/7/15
267	4.10.2.6	lay sewer STP-FMH511-512-513	10 days	Thu 28/5/15	Sat 6/6/15
268	4.10.2.7	lay drainage SMH9941 to 9943-9931	10 days	Sun 7/6/15	Tue 16/6/15
269	4.10.2.8	lay drainage SMH9952 to 9953-9942	10 days	Wed 17/6/15	Fri 26/6/15
270	4.10.2.9	lay drainage SMH9937 to 9930	10 days	Sat 27/6/15	Mon 6/7/15
271	4.10.2.10	lay drainage SMH9702A to 9935	10 days	Tue 7/7/15	Thu 16/7/15
272	4.10.2.11	lay drainage CP25-SMH9701A-9902-9702A	10 days	Fri 17/7/15	Sun 26/7/15
273	4.10.2.12	lay drainage SMH9922 to 9930	10 days	Mon 13/7/15	Wed 22/7/15
274	4.10.2.13	water pipe DN250 CHL 150 to 335.749	21 days	Sat 27/6/15	Fri 17/7/15
275	4.10.2.14	rising main CHC	21 days	Sat 27/6/15	Fri 17/7/15
276	**4.10.3**	**Claim No. 007 - Delay due to Non-Possession of Parts of Portion BCP3 due to Resistant by Local Resident**	**0 days**	**Wed 14/1/15**	**Wed 14/1/15**
277	**4.10.4**	**South West Work for Construction of Depressed Road**	**165 days**	**Sun 8/2/15**	**Wed 22/7/15**
278	4.10.4.1	UU for 11kV & LV lay ducts across & underneath underpass	1 day	Mon 2/3/15	Mon 2/3/15
279	4.10.4.2	structural work for Bay 16015-16012	40 days	Sun 8/2/15	Thu 19/3/15
280	4.10.4.3	structural work for Bay 16011-16008	40 days	Thu 5/3/15	Mon 13/4/15
281	4.10.4.4	structural work for Bay 16007-16004	40 days	Mon 30/3/15	Fri 8/5/15
282	4.10.4.5	structural work for Bay 16003-16001	40 days	Sat 9/5/15	Wed 17/6/15
283	4.10.4.6	drainage work inside depressed road (Bay 16015-16008)	21 days	Thu 28/5/15	Wed 17/6/15
284	4.10.4.7	drainage work inside depressed road (Bay 16007-16001)	21 days	Thu 18/6/15	Wed 8/7/15
285	4.10.4.8	backfill western side of depressed road	14 days	Thu 18/6/15	Wed 1/7/15
286	4.10.4.9	irrigation system next to depressed road	21 days	Thu 2/7/15	Wed 22/7/15
287	**4.10.5**	**South West Work for Access Road**	**85 days**	**Wed 22/7/15**	**Thu 15/10/15**
288	4.10.5.1	completion of drainage SMH9922 to 9930, water pipe & rising main & backfill western side of depressed road	0 days	Wed 22/7/15	Wed 22/7/15
289	***4.10.5.2***	***UU for 132kV, 11kV & LV***	***7 days***	***Thu 23/7/15***	***Wed 29/7/15***
290	***4.10.5.3***	***UU for PCCW***	***7 days***	***Thu 30/7/15***	***Wed 5/8/15***
291	*4.10.5.4*	*backfill to road formation with SRT98%*	*14 days*	*Thu 6/8/15*	*Wed 19/8/15*
292	*4.10.5.5*	*sub-base laying*	*7 days*	*Thu 20/8/15*	*Wed 26/8/15*
293	*4.10.5.6*	*kerb bedding, laying & backing before bituminous material*	*14 days*	*Thu 27/8/15*	*Wed 9/9/15*
294	***4.10.5.7***	***AC - lay DBM & base course***	***10 days***	***Thu 10/9/15***	***Sat 19/9/15***
295	*4.10.5.8*	*backfill footpath formation*	*10 days*	*Thu 10/9/15*	*Sat 19/9/15*
296	*4.10.5.9*	*street lighting ducts, drawpits & controller*	*7 days*	*Sun 20/9/15*	*Sat 26/9/15*
297	***4.10.5.10***	***UU for CLP (lighting)***	***7 days***	***Sun 27/9/15***	***Sat 3/10/15***
298	*4.10.5.11*	*footpath paving*	*10 days*	*Sun 4/10/15*	*Tue 13/10/15*
299	***4.10.5.12***	***AC - lay wearing course***	***10 days***	***Tue 6/10/15***	***Thu 15/10/15***
300	**4.10.6**	**Claim No. 013 - VO No. 028 - Site Possession from DC/2011/06 (Portion B) (from Area D3 to D10)**	**0 days**	**Tue 12/8/14**	**Tue 12/8/14**
301	**4.10.7**	**Works at Areas D4 to D9 (shown in Section VIII)**	**218 days**	**Mon 14/7/14**	**Mon 16/2/15**
302	4.10.7.1	Retaining Wall BCP/RW2B	92 days	Mon 14/7/14	Mon 13/10/14
317	4.10.7.2	install 150UPVC perforated pipe behind retaining wall	4 days	Fri 17/10/14	Mon 20/10/14
318	4.10.7.3	install geotextile filter & backfill D4, B6 & A4 to +15.0	28 days	Tue 21/10/14	Mon 17/11/14
319	4.10.7.4	site formation work for Areas D4 to D6	45 days	Tue 4/11/14	Thu 18/12/14
320	4.10.7.5	soil cement slopes for Areas D4 to D6	21 days	Fri 5/12/14	Thu 25/12/14
321	4.10.7.6	site formation work for Areas D7 to D9	60 days	Fri 19/12/14	Mon 16/2/15
322	4.11	Section XII of the Works - All works within Area LMH (Outstanding Works)	635 days	Thu 22/8/13	Mon 18/5/15
491	4.12	Section XIII of the Works - Works not covered in any other Sections	854 days	Thu 22/8/13	Wed 23/12/15
492	4.12.1	Submissions	70 days	Thu 22/8/13	Wed 30/10/13
493	4.12.2	Approval of Submissions	68 days	Mon 16/9/13	Fri 22/11/13
494	**4.12.3**	**Temporary Traffic Arrangement (TTA) Scheme for Works at existing LMH Rd**	**92 days**	**Fri 23/8/13**	**Fri 22/11/13**
498	**4.12.4**	**Lin Ma Hang Road Widening Section**	**791 days**	**Thu 24/10/13**	**Wed 23/12/15**
499	**4.12.4.1**	**VO FOR RENEWAL OF RISING MAIN (Order confirmed via Email on 31/12/2014)**	**0 days**	**Wed 31/12/14**	**Wed 31/12/14**



Revision 1
Thu 28/5/15

Task | Milestone | Project Summary | Critical Split | Deadline
Split | Summary | Critical | Progress

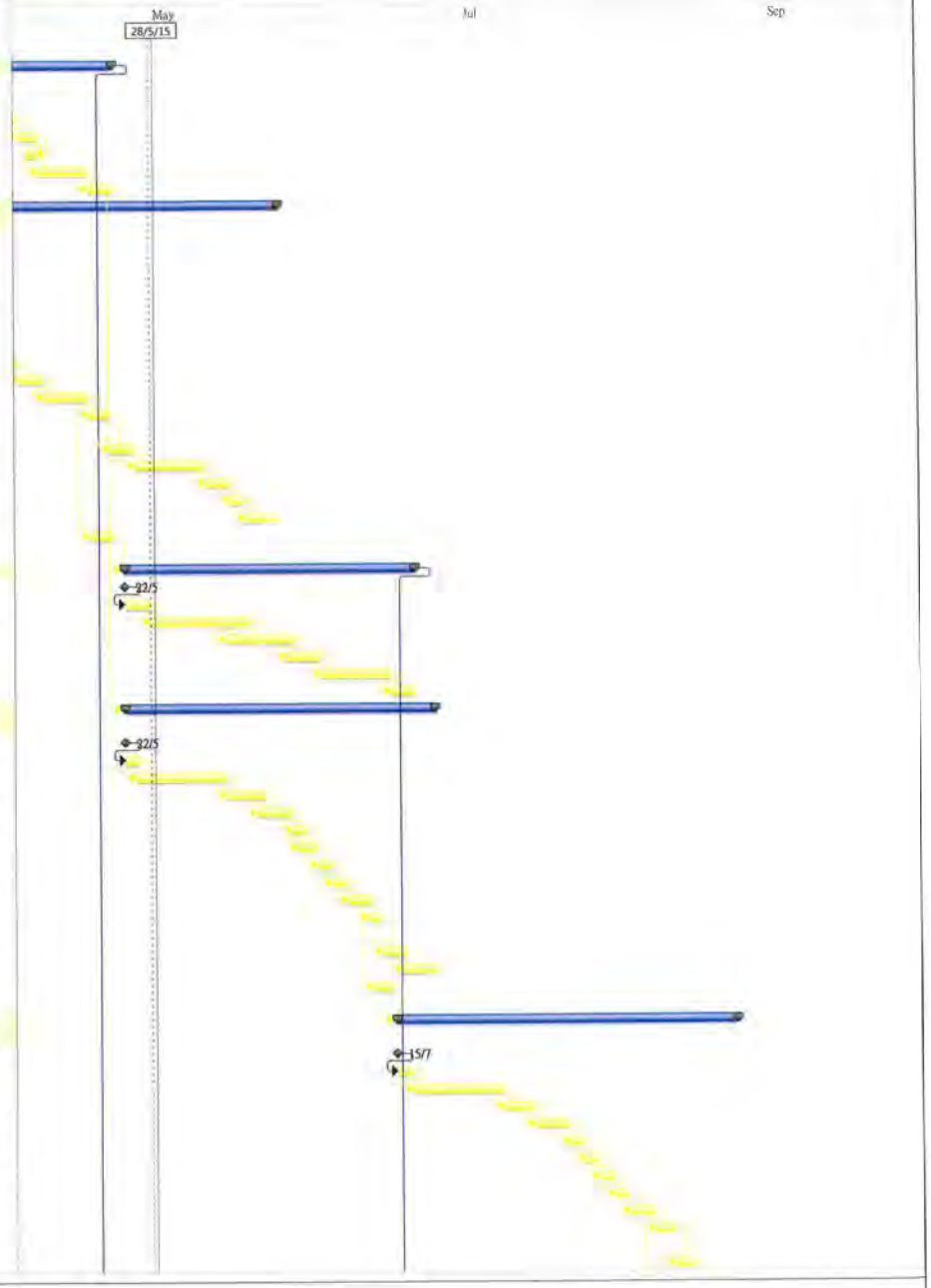
ID	WBS	Task Name	Duration	Start	Finish
500	4.12.4.2	place order for HDPE pipes	0 days	Tue 6/1/15	Tue 6/1/15
501	4.12.4.3	arrival of HDPE pipes	80 days	Tue 6/1/15	Thu 26/3/15
502	4.12.4.4	RECEIVE VO 053 ADDITIONAL CROSS ROAD DUCTS FOR EXISTING IRRIGATION PIPES	0 days	Tue 7/10/14	Tue 7/10/14
503	4.12.4.5	RECEIVE VO 062 CABLE DUCTS LAYING FOR PUBLIC LIGHTING SYSTEM AT LIN MA HANG ROAD	0 days	Tue 14/10/14	Tue 14/10/14
504	4.12.4.6	1 Works from chainage 190 to chainage 380 (west side carriageway & footpath)	231 days	Sun 24/8/14	Sat 11/4/15
505	4.12.4.6.1	TTA for ch 310-380(west)	0 days	Sun 24/8/14	Sun 24/8/14
506	4.12.4.6.2	earthwork to lay drainage & waterwork	21 days	Sun 24/8/14	Sat 13/9/14
507	4.12.4.6.3	drainage & waterwork + backfill for CLP	45 days	Sun 14/9/14	Tue 28/10/14
508	4.12.4.6.4	VO053 - crossing no. 1(whole), 2 (west)	18 days	Wed 29/10/14	Sat 15/11/14
509	4.12.4.6.5	UU for ch 190-380 (132kV,11kV,LV)	19 days	Sun 16/11/14	Thu 4/12/14
510	4.12.4.6.6	filling works to formation of road (include SRT98%)	7 days	Fri 5/12/14	Thu 11/12/14
511	4.12.4.6.7	street lighting drawpits & crossroads	7 days	Fri 12/12/14	Thu 18/12/14
512	4.12.4.6.8	kerb bedding, laying & backing before bituminous material	9 days	Fri 19/12/14	Sat 27/12/14
513	4.12.4.6.9	filling works to formation of footpath	4 days	Sun 28/12/14	Wed 31/12/14
514	4.12.4.6.10	UU for CLP (lighting)	5 days	Thu 1/1/15	Mon 5/1/15
515	4.12.4.6.11	UU for ch 190-380 (PCCW)	7 days	Tue 6/1/15	Mon 12/1/15
516	4.12.4.6.12	irrigation system	7 days	Tue 13/1/15	Mon 19/1/15
517	4.12.4.6.13	preparation works to formation of footpath	3 days	Mon 19/1/15	Wed 21/1/15
518	4.12.4.6.14	footpath paving	9 days	Thu 22/1/15	Fri 30/1/15
519	4.12.4.6.15	VO for renewal of rising main	6 days	Fri 27/3/15	Wed 1/4/15
520	4.12.4.6.16	sub-base laying for road	5 days	Thu 2/4/15	Mon 6/4/15
521	4.12.4.6.17	AC - lay DBM & base course	5 days	Tue 7/4/15	Sat 11/4/15
522	4.12.4.7	1 Works from chainage 380 to chainage 580 (west side carriageway & footpath)	402 days	Fri 22/11/13	Mon 29/12/14
523	4.12.4.7.1	TTA for ch 380-580(west)	0 days	Fri 22/11/13	Fri 22/11/13
524	4.12.4.7.2	watermain (include issue of alignment and laying)	120 days	Sat 23/11/13	Sat 22/3/14
525	4.12.4.7.3	drainage (pipe, manholes & gullies)	155 days	Sun 23/3/14	Sun 24/8/14
526	4.12.4.7.4	Received Variation Order Nos. 040 & 042	0 days	Mon 28/4/14	Mon 28/4/14
527	4.12.4.7.5	construct DN450mm pipe with concrete surround	28 days	Mon 12/5/14	Sun 8/6/14
528	4.12.4.7.5.1	low stream pipe & catchpit at western side	28 days	Mon 12/5/14	Sun 8/6/14
529	4.12.4.7.6	construct 1900x950 box culvert with manholes SMH8052A & B	49 days	Mon 9/6/14	Sun 27/7/14
530	4.12.4.7.6.1	support existing DN150mm sewer pipe & watermain	7 days	Mon 9/6/14	Sun 15/6/14
531	4.12.4.7.6.2	construct box culvert	14 days	Mon 16/6/14	Sun 29/6/14
532	4.12.4.7.6.3	construct manholes	28 days	Mon 30/6/14	Sun 27/7/14
533	4.12.4.7.7	found existing cables affected construction of gullies & discuss with CLP	18 days	Sat 26/7/14	Tue 12/8/14
534	4.12.4.7.8	complete preparation work & fill footpath for 132kV, 11kV & LV	8 days	Wed 13/8/14	Wed 20/8/14
535	4.12.4.7.9	UU - 132kV+11kV & LV	35 days	Thu 21/8/14	Wed 24/9/14
536	4.12.4.7.10	temporary connection of cables	3 days	Thu 25/9/14	Sat 27/9/14
537	4.12.4.7.11	960x650 box culvert (low stream & west catchpit)	7 days	Sun 28/9/14	Sat 4/10/14
539	4.12.4.7.12	construct outstanding drainage & gullies	7 days	Wed 1/10/14	Tue 7/10/14
540	4.12.4.7.13	filling work to formation of road (include SRT98%)	5 days	Wed 8/10/14	Sun 12/10/14
541	4.12.4.7.14	VO053 - crossing no. 3, 4 (west)	10 days	Mon 13/10/14	Wed 22/10/14
542	4.12.4.7.15	complete filling work to formation of road (include SRT98%)	5 days	Thu 23/10/14	Mon 27/10/14
543	4.12.4.7.16	street lighting drawpits & crossing at ch 523	4 days	Mon 27/10/14	Thu 30/10/14
544	4.20.4.2.19	UU for CLP (lighting)	5 days	Fri 31/10/14	Tue 4/11/14
545	4.12.4.7.18	sub-base laying for road	4 days	Wed 5/11/14	Sat 8/11/14
546	4.12.4.7.19	kerb bedding, laying & backing before bituminous material	12 days	Sat 8/11/14	Wed 19/11/14
547	4.12.4.7.20	filling works to formation of footpath	5 days	Thu 20/11/14	Mon 24/11/14
548	4.12.4.7.21	UU for ch 380-580 (PCCW)	14 days	Tue 25/11/14	Mon 8/12/14
549	4.12.4.7.22	irrigation system	4 days	Tue 9/12/14	Fri 12/12/14
550	4.12.4.7.23	preparation works to formation of footpath	3 days	Sat 13/12/14	Mon 15/12/14
551	4.12.4.7.24	footpath paving	14 days	Tue 16/12/14	Mon 29/12/14
552	4.12.4.7.25	AC - lay DBM & base course	5 days	Thu 20/11/14	Mon 24/11/14
553	4.12.4.8	2 Works from ch 380-580 (east side carriageway)	153 days	Wed 26/11/14	Tue 28/4/15
554	4.12.4.8.1	TTA for ch 380-580 (east)	0 days	Wed 26/11/14	Wed 26/11/14
555	4.12.4.8.2	remove existing pavement	4 days	Thu 27/11/14	Sun 30/11/14
556	4.12.4.8.3	middle stream box culvert 960x650	14 days	Mon 1/12/14	Sun 14/12/14
557	4.12.4.8.4	middle stream DN450mm pipe	12 days	Mon 8/12/14	Fri 19/12/14
558	4.12.4.8.5	VO053 - crossing no. 2, 3, 4, 5 (east)	20 days	Sat 20/12/14	Thu 8/1/15
559	4.12.4.8.6	street light crossing at ch 523	4 days	Fri 9/1/15	Mon 12/1/15
560	4.12.4.8.7	VO for renewal of rising main	18 days	Fri 27/3/15	Mon 13/4/15



Revision 1
Thu 28/5/15

Task | Milestone | Project Summary | Critical Split | Deadline
Split | Summary | Critical | Progress

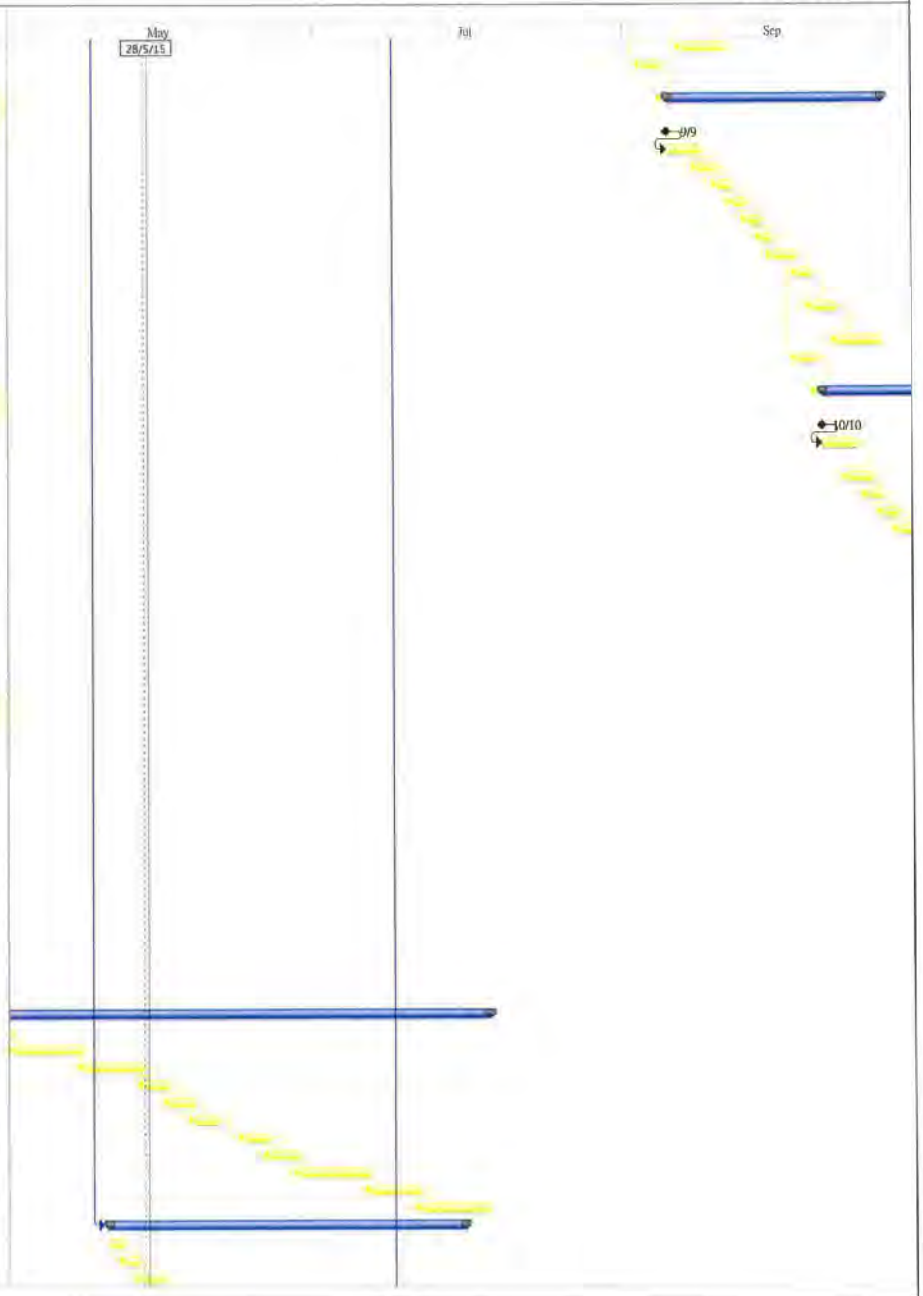
ID	WBS	Task Name	Duration	Start	Finish
561	*4.12.4.8.8*	sub-base & cast kerbing	*10 days*	*Tue 14/4/15*	*Thu 23/4/15*
562	***4.12.4.8.9***	***AC - lay DBM & base course***	***5 days***	***Fri 24/4/15***	**Tue 28/4/15**
563	**4.12.4.9**	**3 Works from ch 190-380 (east side carriageway)**	**37 days**	**Mon 13/4/15**	**Wed 20/5/15**
564	4.12.4.9.1	TTA for ch 190-380 (east)	0 days	**Mon 13/4/15**	Mon 13/4/15
565	*4.12.4.9.2*	remove existing pavement	*4 days*	*Tue 14/4/15*	*Fri 17/4/15*
566	*4.12.4.9.3*	VO for renewal of rising main	*14 days*	*Sat 18/4/15*	*Fri 1/5/15*
567	*4.12.4.9.4*	street light crossings at ch 287, 350	*4 days*	*Sat 2/5/15*	*Tue 5/5/15*
568	*4.12.4.9.5*	PCCW crossings at ch 350	2 days	*Mon 4/5/15*	*Tue 5/5/15*
569	*4.12.4.9.6*	sub-base & cast kerbing	*10 days*	*Wed 6/5/15*	*Fri 15/5/15*
570	*4.12.4.9.7*	AC - lay DBM & base course	*5 days*	*Sat 16/5/15*	**Wed 20/5/15**
571	**4.12.4.10**	**2,3,7 Works from chainage 580 to chainage 785 (west side carriageway & footpath)**	**261 days**	**Sun 5/10/14**	**Mon 22/6/15**
572	**4.12.4.10.1**	**UU for ch 580-785 (132kV,11kV,LV)**	**21 days**	**Sun 5/10/14**	**Sat 25/10/14**
573	4.12.4.10.2	TTA for ch 580-785(west)	0 days	**Wed 26/11/14**	Wed 26/11/14
574	*4.12.4.10.3*	*earthwork to lay drainage & waterwork*	*10 days*	*Thu 27/11/14*	*Sat 6/12/14*
575	*4.12.4.10.4*	*drainage & waterwork*	*120 days*	*Sun 7/12/14*	*Sun 5/4/15*
576	***4.12.4.10.5***	***VO053 - crossing no. 5, 6, 7&8 & Ducts along ch613-700 (west)***	***14 days***	***Mon 6/4/15***	***Sun 19/4/15***
577	*4.12.4.10.6*	*filling works to formation of road (include SRT98%)*	*7 days*	*Mon 20/4/15*	*Sun 26/4/15*
578	*4.12.4.10.7*	*street lighting drawpits & crossings ch760,785*	*5 days*	*Mon 27/4/15*	*Fri 1/5/15*
579	*4.12.4.10.8*	*sub-base laying for road*	*5 days*	*Sat 2/5/15*	*Wed 6/5/15*
580	*4.12.4.10.9*	*kerb bedding, laying & backing before bituminous material*	*9 days*	*Thu 7/5/15*	*Fri 15/5/15*
581	*4.12.4.10.10*	*filling works to formation of footpath*	*4 days*	*Sat 16/5/15*	*Tue 19/5/15*
582	***4.20.4.5.11***	***UU for CLP (lighting)***	***5 days***	***Wed 20/5/15***	***Sun 24/5/15***
583	***4.12.4.10.12***	***UU for ch 580-785 (PCCW)***	***14 days***	***Mon 25/5/15***	***Sun 7/6/15***
584	*4.12.4.10.13*	*irrigation system*	*5 days*	*Mon 8/6/15*	*Fri 12/6/15*
585	*4.12.4.10.14*	*preparation works to formation of footpath*	*3 days*	*Sat 13/6/15*	*Mon 15/6/15*
586	*4.12.4.10.15*	*footpath paving*	*7 days*	*Tue 16/6/15*	*Mon 22/6/15*
587	***4.12.4.10.16***	***AC - lay DBM & base course***	***5 days***	***Sat 16/5/15***	**Wed 20/5/15**
588	**4.12.4.11**	**4,5,6 Works from ch 580-785 (east side carriageway)**	**58 days**	**Fri 22/5/15**	**Sun 19/7/15**
589	4.12.4.11.1	TTA for ch 580-785 (east)	0 days	**Fri 22/5/15**	Fri 22/5/15
590	4.12.4.11.2	remove existing pavement	5 days	Sat 23/5/15	Wed 27/5/15
591	**4.12.4.11.3**	**VO for renewal of rising main**	**20 days**	**Thu 28/5/15**	**Tue 16/6/15**
592	**4.12.4.11.4**	**VO053 - crossing no. 5, 6, 7&8 (east)**	**14 days**	**Fri 12/6/15**	**Thu 25/6/15**
593	4.12.4.11.5	street lighting crossings at ch 760, 785	7 days	Wed 24/6/15	Tue 30/6/15
594	4.12.4.11.6	sub-base & cast kerbing	14 days	Wed 1/7/15	Tue 14/7/15
595	**4.12.4.11.7**	**AC - lay DBM & base course**	**5 days**	**Wed 15/7/15**	**Sun 19/7/15**
596	**4.12.4.12**	**5 Works from chainage 125 to chainage 190 (west side carriageway & footpath)**	**62 days**	**Fri 22/5/15**	**Thu 23/7/15**
597	4.12.4.12.1	TTA for ch 125-190 (west)	0 days	**Fri 22/5/15**	Fri 22/5/15
598	*4.12.4.12.2*	*earthwork to lay drainage & waterwork*	*3 days*	*Sat 23/5/15*	*Mon 25/5/15*
599	*4.12.4.12.3*	*drainage & waterwork + backfill for CLP*	*18 days*	*Mon 25/5/15*	*Thu 11/6/15*
600	***4.12.4.12.4***	***UU for ch 125-190 (132kV,11kV,LV)***	***8 days***	***Fri 12/6/15***	***Fri 19/6/15***
601	*4.12.4.12.5*	*filling works to formation of road (include SRT98%)*	*7 days*	*Thu 18/6/15*	*Wed 24/6/15*
602	*4.12.4.12.6*	*street lighting drawpits & crossing at ch 154*	*3 days*	*Thu 25/6/15*	*Sat 27/6/15*
603	*4.12.4.12.7*	*irrigation system*	*4 days*	*Fri 26/6/15*	*Mon 29/6/15*
604	***4.12.4.12.8***	***UU for CLP (lighting)***	***3 days***	***Tue 30/6/15***	***Thu 2/7/15***
605	*4.12.4.12.9*	*sub-base laying*	*3 days*	*Fri 3/7/15*	*Sun 5/7/15*
606	*4.12.4.12.10*	*kerb bedding, laying & backing before bituminous material*	*5 days*	*Mon 6/7/15*	*Fri 10/7/15*
607	*4.12.4.12.11*	*filling works to formation of footpath*	*3 days*	*Fri 10/7/15*	*Sun 12/7/15*
608	***4.12.4.12.12***	***UU for ch 125-190 (PCCW)***	***5 days***	***Mon 13/7/15***	***Fri 17/7/15***
609	*4.12.4.12.13*	*footpath paving*	*7 days*	*Fri 17/7/15*	*Thu 23/7/15*
610	***4.12.4.12.14***	***AC - lay DBM & base course***	***4 days***	***Sat 11/7/15***	**Tue 14/7/15**
611	**4.12.4.13**	**7 Works from chainage 80 to chainage 125 (west side carriageway & footpath)**	**68 days**	**Wed 15/7/15**	**Mon 21/9/15**
612	4.12.4.13.1	TTA for ch 80-125(west)	0 days	**Wed 15/7/15**	Wed 15/7/15
613	*4.12.4.13.2*	*earthwork to lay drainage & waterwork*	*3 days*	Thu 16/7/15	Sat 18/7/15
614	*4.12.4.13.3*	*drainage & waterwork + backfill for CLP*	*18 days*	Sun 19/7/15	Wed 5/8/15
615	***4.12.4.13.4***	***UU for ch 80-190 (132kV,11kV,LV)***	***6 days***	**Thu 6/8/15**	**Tue 11/8/15**
616	*4.12.4.13.5*	*filling works to formation of road (include SRT98%)*	*7 days*	Wed 12/8/15	Tue 18/8/15
617	*4.12.4.13.6*	*street lighting drawpits & crossing at ch 98*	*3 days*	Wed 19/8/15	Fri 21/8/15
618	*4.12.4.13.7*	*irrigation system*	*3 days*	Sat 22/8/15	Mon 24/8/15
619	***4.12.4.13.8***	***UU for CLP (lighting)***	***3 days***	**Tue 25/8/15**	**Thu 27/8/15**
620	*4.12.4.13.9*	*sub-base laying*	*3 days*	Fri 28/8/15	Sun 30/8/15
621	*4.12.4.13.10*	*kerb bedding, laying & backing before bituminous material*	*5 days*	Mon 31/8/15	Fri 4/9/15
622	*4.12.4.13.11*	*filling works to formation of footpath*	*4 days*	Sat 5/9/15	Tue 8/9/15
623	***4.12.4.13.12***	***UU for ch 80-190 (PCCW)***	***4 days***	**Wed 9/9/15**	**Sat 12/9/15**



Revision 1
Thu 28/5/15

Task | Milestone | Project Summary | Critical Split | Deadline
Split | Summary | Critical | Progress

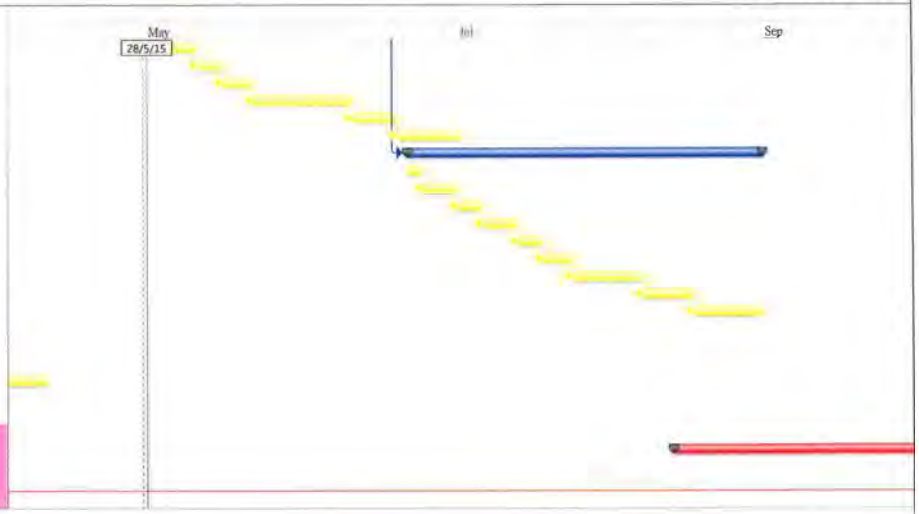
ID	WBS	Task Name	Duration	Start	Finish
624	*4.12.4.13.13*	*footpath paving*	*9 days*	Sun 13/9/15	Mon 21/9/15
625	***4.12.4.13.14***	***AC - lay DBM & base course***	***4 days***	**Sat 5/9/15**	**Tue 8/9/15**
626	**4.12.4.14**	**4 Works from chainage 125 to chainage 190 (east side carriageway & footpath)**	**43 days**	**Wed 9/9/15**	**Thu 22/10/15**
627	4.12.4.14.1	TTA for ch 125-190 (east)	0 days	**Wed 9/9/15**	Wed 9/9/15
628	***4.12.4.14.2***	***VO for renewal of rising main***	***7 days***	**Thu 10/9/15**	**Wed 16/9/15**
629	*4.12.4.14.3*	*filling works to formation of road (include SRT98%)*	*4 days*	Wed 16/9/15	Sat 19/9/15
630	*4.12.4.14.4*	*street lighting drawpits & crossing at ch 154*	*3 days*	Sun 20/9/15	Tue 22/9/15
631	*4.12.4.14.5*	*irrigation system*	*3 days*	Wed 23/9/15	Fri 25/9/15
632	***4.12.4.14.6***	***UU for CLP (lighting)***	***3 days***	**Sat 26/9/15**	**Mon 28/9/15**
633	*4.12.4.14.7*	*sub-base laying*	*2 days*	Tue 29/9/15	Wed 30/9/15
634	*4.12.4.14.8*	*kerb bedding, laying & backing before bituminous material*	*5 days*	Thu 1/10/15	Mon 5/10/15
635	*4.12.4.14.9*	*filling works to formation of footpath*	*3 days*	Tue 6/10/15	Thu 8/10/15
636	***4.12.4.14.10***	***UU for ch 125-200 (PCCW/HGC)***	***5 days***	**Fri 9/10/15**	**Tue 13/10/15**
637	*4.12.4.14.11*	*footpath paving*	*9 days*	Wed 14/10/15	Thu 22/10/15
638	***4.12.4.14.12***	***AC - lay DBM & base course***	***4 days***	**Tue 6/10/15**	**Fri 9/10/15**
639	**4.12.4.15**	**6 Works from chainage 80 to chainage 125 (east side carriageway & footpath)**	**40 days**	**Sat 10/10/15**	**Thu 19/11/15**
640	4.12.4.15.1	TTA for ch 80-125 (east)	0 days	**Sat 10/10/15**	Sat 10/10/15
641	***4.12.4.15.2***	***VO for renewal of rising main***	***7 days***	**Sun 11/10/15**	**Sat 17/10/15**
642	*4.12.4.15.3*	*filling works to formation of road (include SRT98%)*	*5 days*	Fri 16/10/15	Tue 20/10/15
643	*4.12.4.15.4*	*street lighting drawpits & crossing at ch 98*	*3 days*	Tue 20/10/15	Thu 22/10/15
644	*4.12.4.15.5*	*irrigation system*	*3 days*	Fri 23/10/15	Sun 25/10/15
645	***4.12.4.15.6***	***UU for CLP (lighting)***	***3 days***	**Mon 26/10/15**	**Wed 28/10/15**
646	*4.12.4.15.7*	*sub-base laying*	*3 days*	Thu 29/10/15	Sat 31/10/15
647	*4.12.4.15.8*	*kerb bedding, laying & backing before bituminous material*	*5 days*	Sun 1/11/15	Thu 5/11/15
648	*4.12.4.15.9*	*filling works to formation of footpath*	*3 days*	Fri 6/11/15	Sun 8/11/15
649	***4.12.4.15.10***	***UU for ch 80-125 (PCCW/HGC)***	***4 days***	**Mon 9/11/15**	**Thu 12/11/15**
650	*4.12.4.15.11*	*footpath paving*	*7 days*	Fri 13/11/15	Thu 19/11/15
651	***4.12.4.15.12***	***AC - lay DBM & base course***	***3 days***	**Fri 6/11/15**	**Sun 8/11/15**
652	**4.12.4.16**	**Rising manholes & drawpit covers & Lay wearing course (with TTA)**	**44 days**	**Tue 10/11/15**	**Wed 23/12/15**
653	*4.12.4.16.1*	*Chainage 80 to Chainage 180 (west side)*	4 days	Tue 10/11/15	Fri 13/11/15
654	***4.12.4.16.2***	*Chainage 80 to Chainage 180 (east side)*	2 days	Sat 14/11/15	Sun 15/11/15
655	*4.12.4.16.3*	*Chainage 180 to Chainage 280 (west side)*	4 days	Mon 16/11/15	Thu 19/11/15
656	*4.12.4.16.4*	*Chainage 180 to Chainage 280 (east side)*	4 days	Fri 20/11/15	Mon 23/11/15
657	*4.12.4.16.5*	*Chainage 280 to Chainage 380 (west side)*	4 days	Tue 24/11/15	Fri 27/11/15
658	***4.12.4.16.6***	*Chainage 280 to Chainage 380 (east side)*	2 days	Sat 28/11/15	Sun 29/11/15
659	*4.12.4.16.7*	*Chainage 380 to Chainage 480 (west side)*	4 days	Mon 30/11/15	Thu 3/12/15
660	*4.12.4.16.8*	*Chainage 380 to Chainage 480 (east side)*	2 days	Fri 4/12/15	Sat 5/12/15
661	*4.12.4.16.9*	*Chainage 480 to Chainage 580 (west side)*	4 days	Sun 6/12/15	Wed 9/12/15
662	***4.12.4.16.10***	*Chainage 480 to Chainage 580 (east side)*	2 days	Thu 10/12/15	Fri 11/12/15
663	*4.12.4.16.11*	*Chainage 580 to Chainage 680 (west side)*	4 days	Sat 12/12/15	Tue 15/12/15
664	***4.12.4.16.12***	*Chainage 580 to Chainage 680 (east side)*	2 days	Wed 16/12/15	Thu 17/12/15
665	*4.12.4.16.13*	*Chainage 680 to Chainage 785 (west side)*	4 days	Fri 18/12/15	Mon 21/12/15
666	***4.12.4.16.14***	*Chainage 680 to Chainage 785 (east side)*	2 days	Tue 22/12/15	Wed 23/12/15
667	**4.12.4.17**	**Eastern Footpath from ch 380-580)**	**98 days**	**Wed 29/4/15**	**Tue 4/8/15**
668	*4.12.4.17.1*	*remove existing pavement*	*5 days*	Wed 29/4/15	Fri 1/5/15
669	*4.12.4.17.2*	*upper stream box culvert 960x650*	*14 days*	Sat 2/5/15	Fri 15/5/15
670	*4.12.4.17.3*	*upper stream DN450mm pipe*	*12 days*	Sat 16/5/15	Wed 27/5/15
671	***4.12.4.17.4***	***VO053 - crossing no. 2, 3, 4, 5 (east footpath)***	***5 days***	**Thu 28/5/15**	**Mon 1/6/15**
672	*4.12.4.17.5*	*filling works to formation of footpath*	*5 days*	Tue 2/6/15	Sat 6/6/15
673	*4.12.4.17.6*	*street light crossing at ch523*	*5 days*	Sun 7/6/15	Thu 11/6/15
674	***4.12.4.17.7***	***UU for CLP (lighting)***	***5 days***	**Wed 17/6/15**	**Sun 21/6/15**
675	*4.12.4.17.8*	*sub-base & edging*	*6 days*	Mon 22/6/15	Sat 27/6/15
676	***4.12.4.17.9***	***UU for ch 380-580 (PCCW/HGC)***	***14 days***	**Sun 28/6/15**	**Sat 11/7/15**
677	*4.12.4.17.10*	*construct edging*	*10 days*	Sun 12/7/15	Tue 21/7/15
678	*4.12.4.17.11*	*footpath paving*	*14 days*	Wed 22/7/15	Tue 4/8/15
679	**4.12.4.18**	**Eastern Footpath from ch 190-380)**	**71 days**	**Thu 21/5/15**	**Thu 30/7/15**
680	*4.12.4.18.1*	*remove existing pavement*	*3 days*	Thu 21/5/15	Sat 23/5/15
681	***4.12.4.18.2***	***VO053 - crossing no. 2 (east footpath)***	***3 days***	**Sun 24/5/15**	**Tue 26/5/15**
682	*4.12.4.18.3*	*filling works to formation of footpath*	*5 days*	Wed 27/5/15	Sun 31/5/15



Revision 1
Thu 28/5/15

Task | Split | Milestone | Summary | Project Summary | Critical | Critical Split | Progress | Deadline

ID	WBS	Task Name	Duration	Start	Finish
683	*4.12.4.18.4*	*street light crossings at ch287,350*	*7 days*	Mon 1/6/15	Sun 7/6/15
684	***4.12.4.18.5***	***UU for CLP (lighting)***	***5 days***	**Mon 8/6/15**	**Fri 12/6/15**
685	*4.12.4.18.6*	*sub-base & edging*	*6 days*	Sat 13/6/15	Thu 18/6/15
686	***4.12.4.18.7***	***UU for ch 190-380 (PCCW/HGC)***	***20 days***	**Fri 19/6/15**	**Wed 8/7/15**
687	*4.12.4.17.10*	*construct edging*	*9 days*	Thu 9/7/15	Fri 17/7/15
688	*4.12.4.17.11*	*footpath paving*	*13 days*	Sat 18/7/15	Thu 30/7/15
689	**4.12.4.19**	**Eastern Footpath from ch 580-785)**	**71 days**	**Mon 20/7/15**	**Mon 28/9/15**
690	*4.12.4.19.1*	*remove existing pavement*	*3 days*	*Mon 20/7/15*	*Wed 22/7/15*
691	***4.12.4.19.2***	***VO053 - crossing no. 5, 6, 7&8 (east footpath)***	***7 days***	***Thu 23/7/15***	***Wed 29/7/15***
692	*4.12.4.19.3*	*filling works to formation of footpath*	*5 days*	*Thu 30/7/15*	*Mon 3/8/15*
693	*4.12.4.19.4*	*street light crossings at ch760,785*	*7 days*	*Tue 4/8/15*	*Mon 10/8/15*
694	***4.12.4.19.5***	***UU for CLP (lighting)***	***5 days***	***Tue 11/8/15***	***Sat 15/8/15***
695	*4.12.4.19.6*	*sub-base & edging*	*6 days*	*Sun 16/8/15*	*Fri 21/8/15*
696	***4.12.4.19.7***	***UU for ch 580-785 (PCCW/HGC)***	***14 days***	***Sat 22/8/15***	***Fri 4/9/15***
697	*4.20.4.11.10*	*construct edging*	*10 days*	*Sat 5/9/15*	*Mon 14/9/15*
698	*4.12.4.19.9*	*footpath paving*	*14 days*	*Tue 15/9/15*	*Mon 28/9/15*
699	**4.12.4.20**	**Construction of retaining wall RW8 - CH0 to 22 (3 bays)**	**70 days**	**Tue 30/12/14**	**Mon 9/3/15**
700	*4.12.4.20.1*	*Bay 8001 to Bay 8003 (3 bays)*	*70 days*	*Tue 30/12/14*	*Mon 9/3/15*
701	*4.12.4.21*	*Site Formation works for ArchSD Depot (Drg. 1001B)*	*60 days*	*Tue 10/3/15*	*Fri 8/5/15*
702	**4.12.4.22**	**Archaeological survey (Sections T1 to T3)(Drg. 6403A)**	**147 days**	**Thu 24/10/13**	**Wed 19/3/14**
708	4.13	Section XIV of the Works - Trees preservation and protection	730 days	Fri 12/4/13	Sat 11/4/15
716	4.14	Section XV of the Works - Landscape soft works (including transplant trees to permanent locations)	135 days	Fri 11/9/15	Sat 23/1/16
720	4.15	Section XVI of the Works - Establishment works for landscape soft works	365 days	Sun 24/1/16	Sun 22/1/17

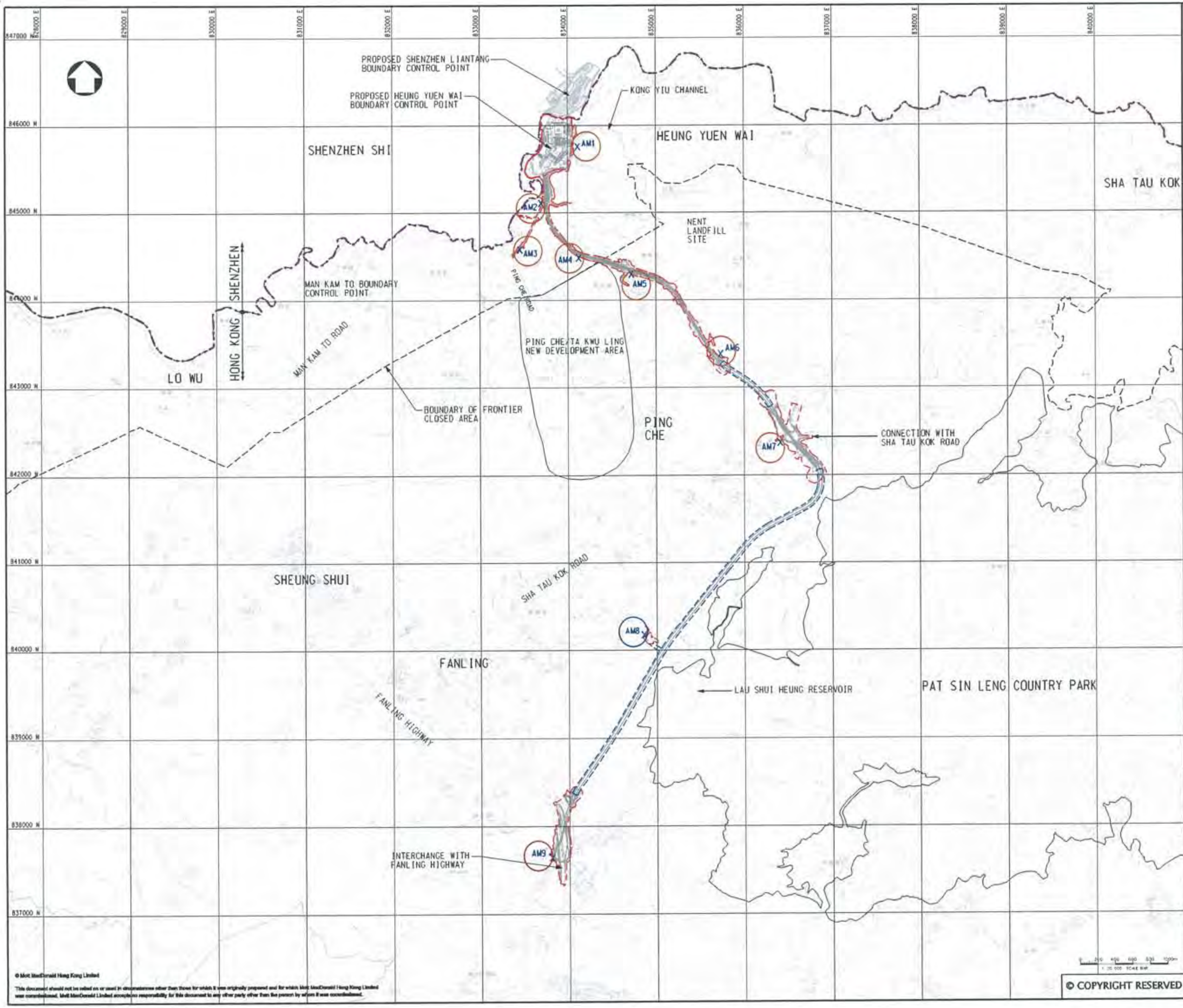


Revision 1
Thu 28/5/15

Task | Milestone | Project Summary | Critical Split | Deadline
Split | Summary | Critical | Progress

Appendix D

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



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

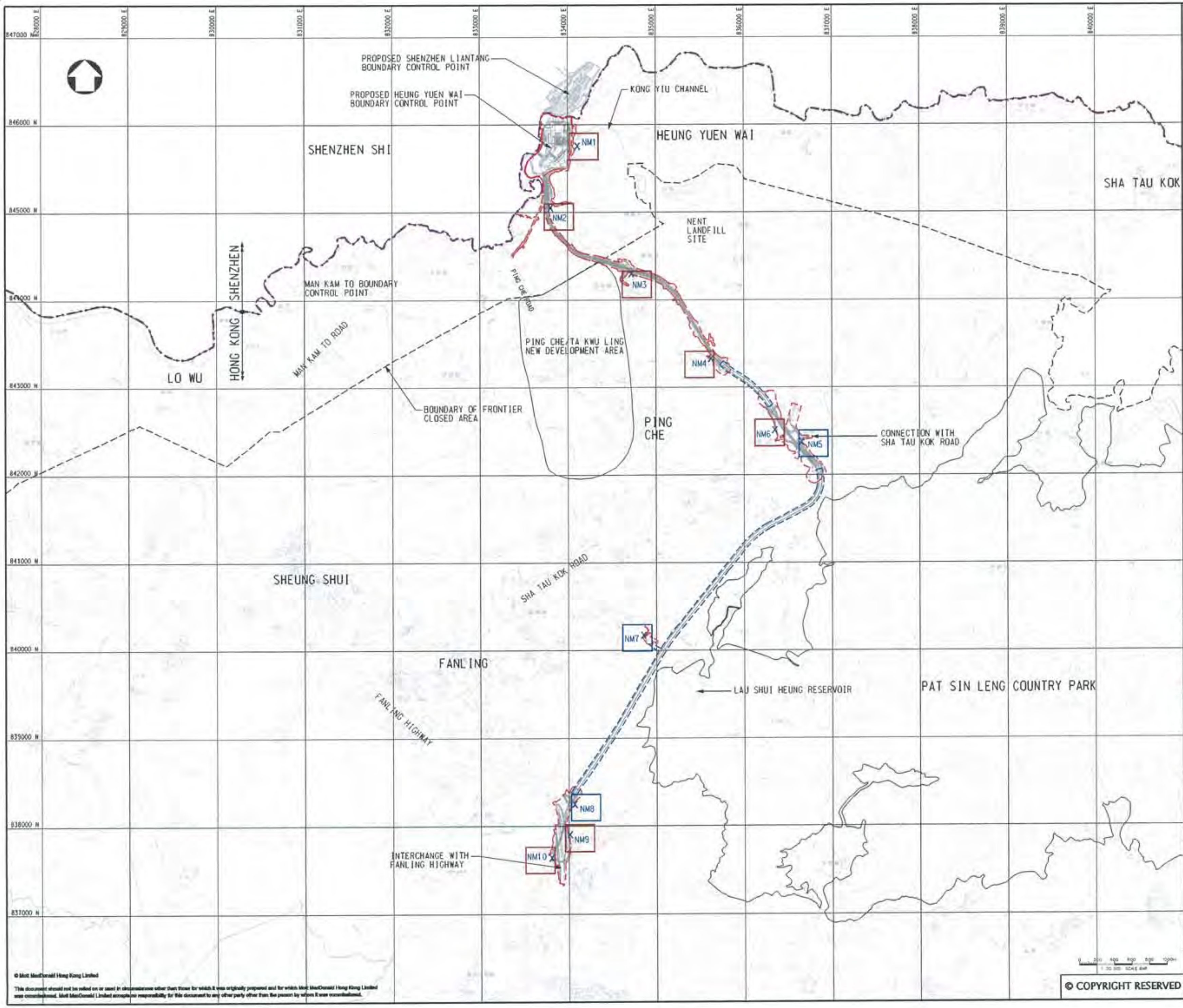
Mott MacDonald

Client: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT (CEDD)

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	WING	Coordination	EC
Dwg.Chk.	DC	Approved	WT
Scale at A1	1:20000	Project	255228
Status	PRE		
Drawing No	FIGURE 2.1	Rev	P1



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

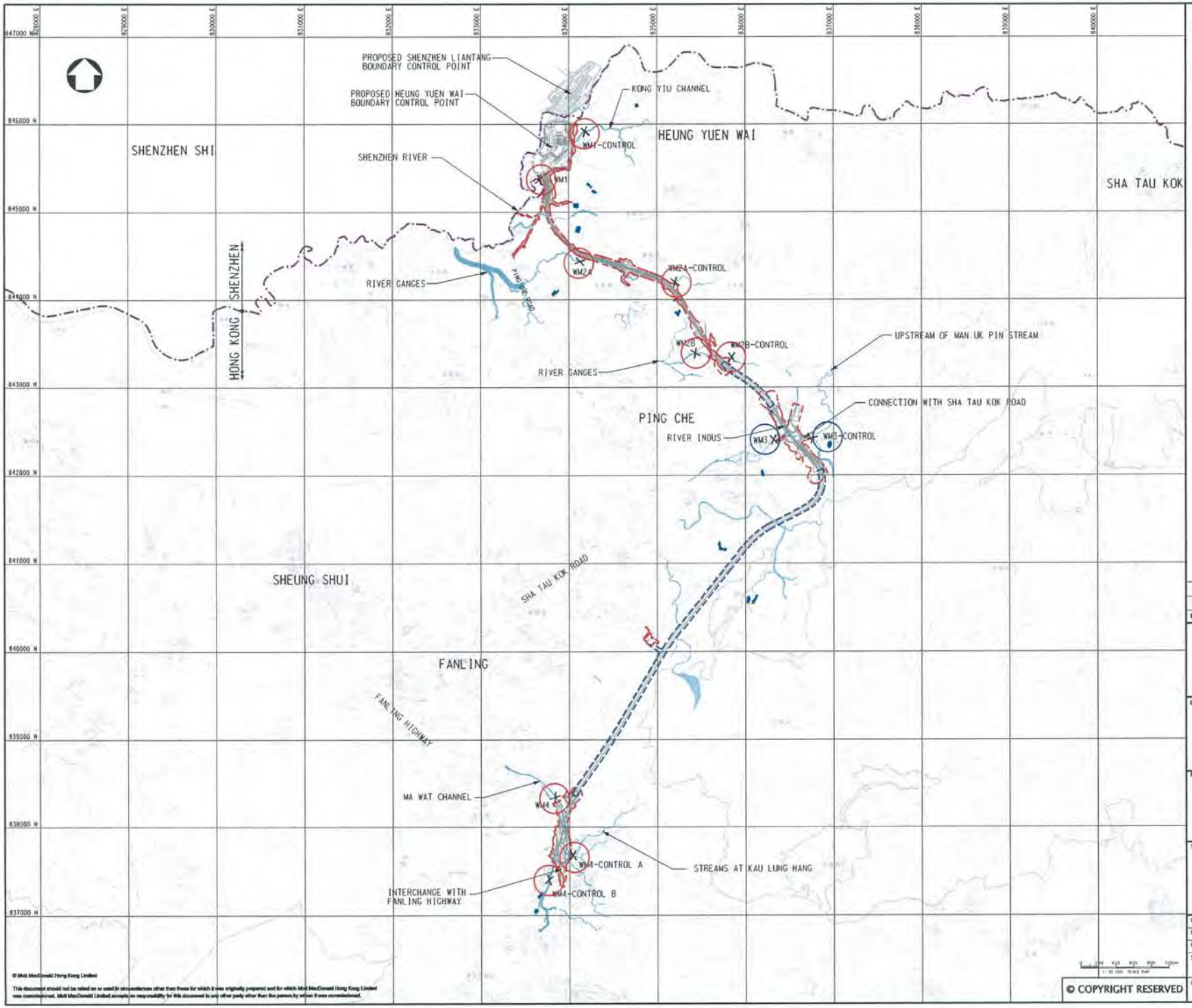
Mott MacDonald

Client: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT (CEDD)

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

Title: PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	DC	Eng Chk.	EC
Drawn	WING	Coordination	EC
Dwg Chk.	DC	Approved	HT
Scale at A1	1:20000	Project	255228
Status	PRE		
Drawing No	FIGURE 3.1	Rev	P1



LEGEND:

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

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

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

Mott MacDonald

Client: CEDD — CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

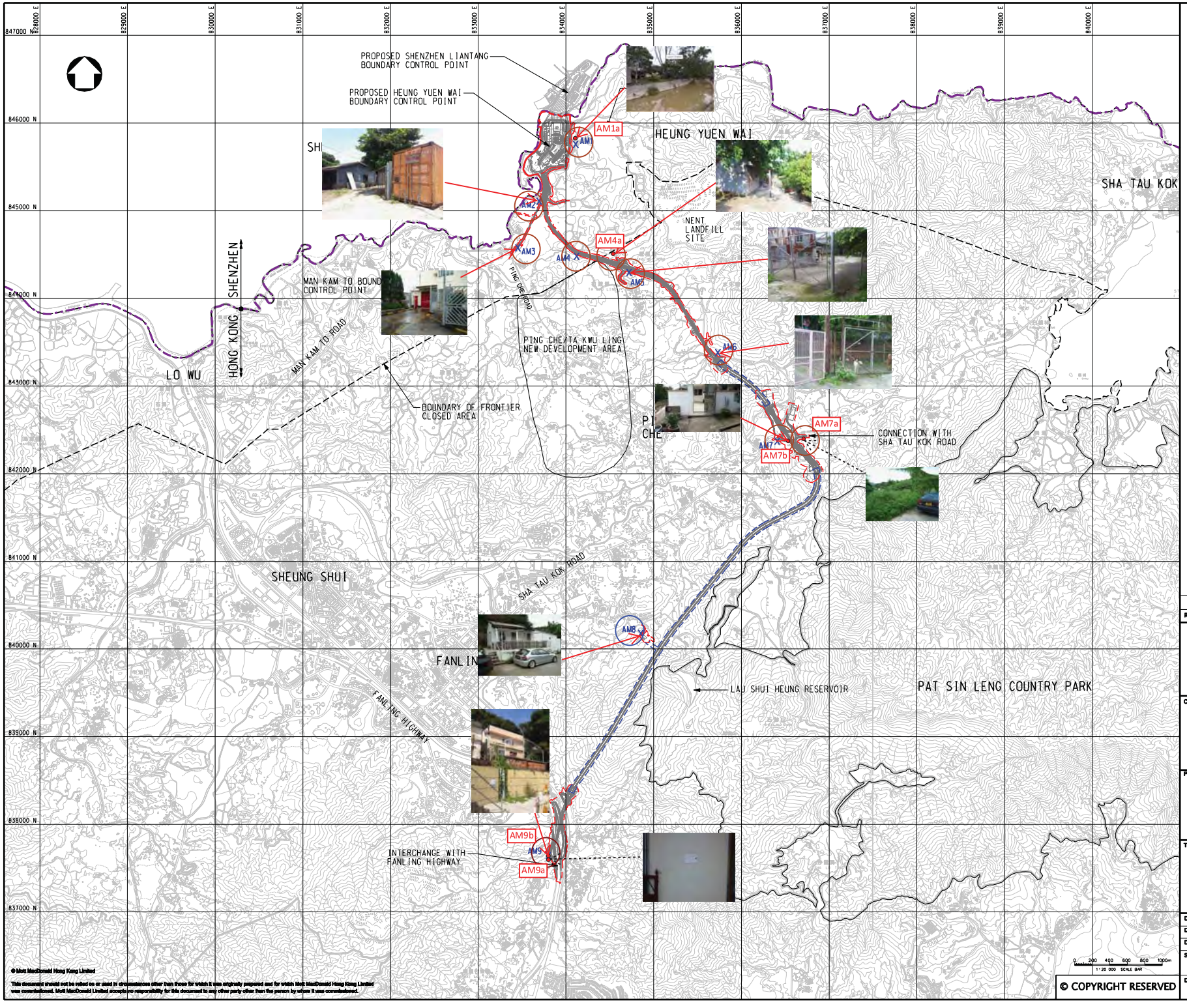
Project: AGREEMENT NO. CE45/2008(CE) LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title: LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

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

Appendix E

Monitoring Locations for Impact Monitoring



LEGEND:

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

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

Mott MacDonald

20/F Two Landmark East
100 How Ming Street
Kwun Tong, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

CEDD

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

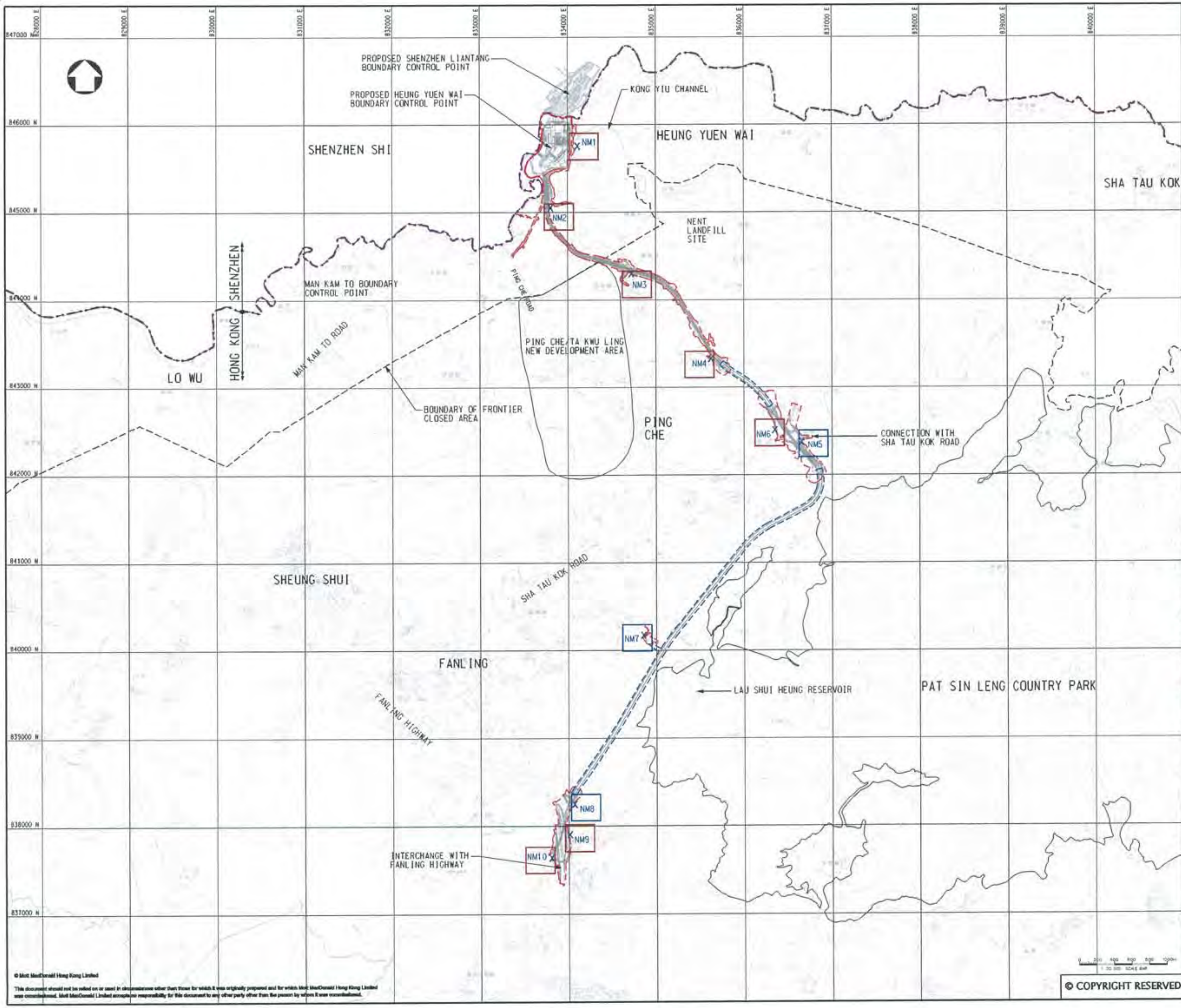
AGREEMENT NO. CE45/2008(CE)
LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title

PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

Designed	DC		Eng.Chk.	EC	
Drawn	MING		Coordination	EC	
Dwg.Chk.	DC		Approved	HT	
Scale at A1	1:20000	Project	255228	Status	PRE
		CAD file	j:\255228\report\env\em&o\00B3\FIG 2-1.dgn		
Drawing No	FIGURE 2.1			Rev	P1

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



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

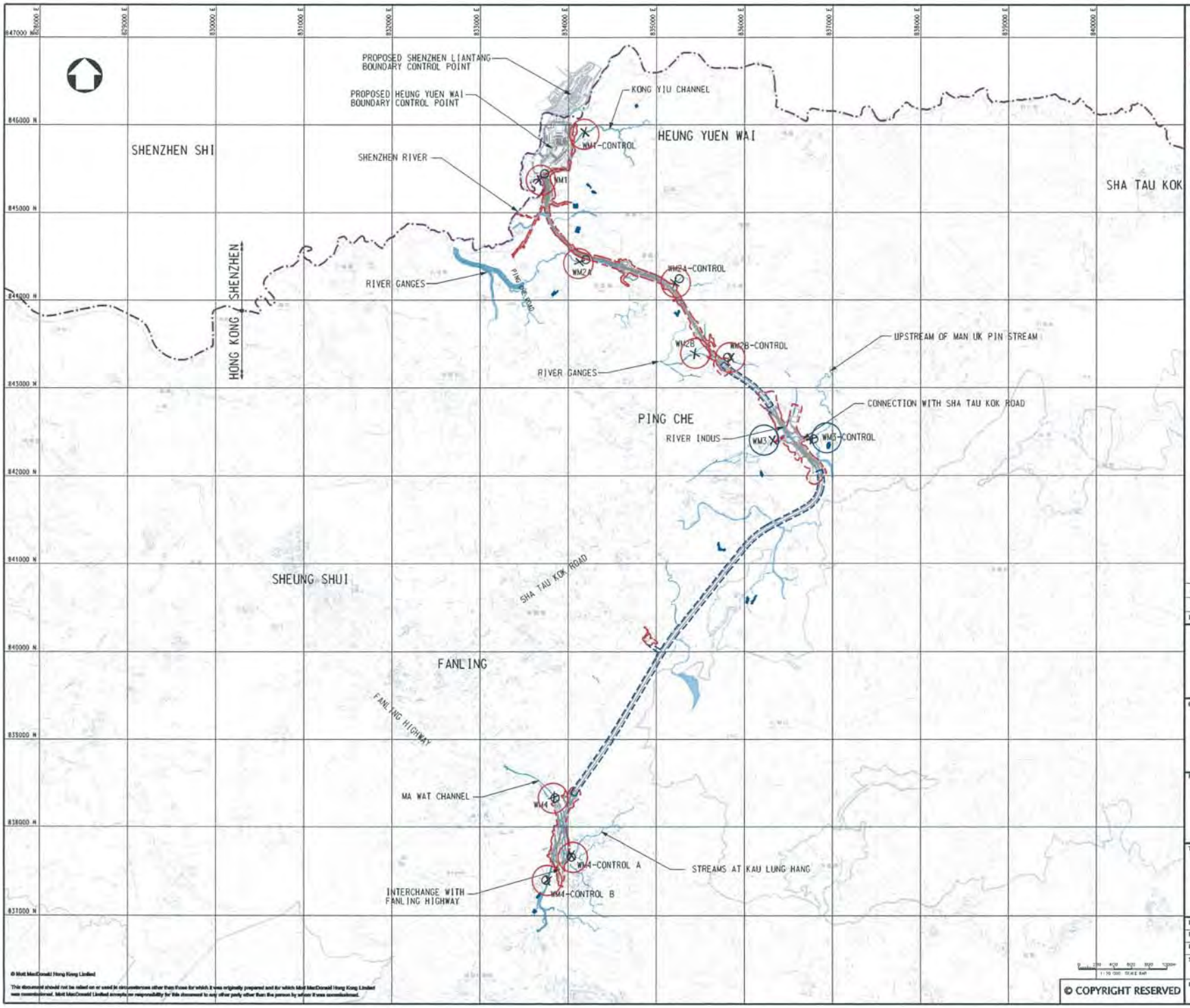
Mott MacDonald

Client: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT (CEDD)

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

Title: PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	DC	Eng Chk.	EC
Drawn	WING	Coordination	EC
Dwg Chk.	DC	Approved	HT
Scale at A1	1:20000	Project	255228
Status	PRE	Drawing No	FIGURE 3.1
Rev	P1		



LEGEND:

- BOUNDARY OF HKSAR
- LAND REQUIREMENT LIMIT (ABOVE GROUND)
- LAND REQUIREMENT LIMIT (TUNNEL)
- X — 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 – Coordinates		Location found during site visit – Coordinates	
	Easting	Northing	Easting	Northing
WM1	833668.635	845371.097	833679	845423
WM1-Control	834185.480	845916.662	834185	845917
WM2A	834132.193	844432.910	834204	844471
WM2A-Control	835205.529	844200.151	835270	844243
WM2B	835434.744	843394.606	835433	843397
WM2B-Control	835845.878	843343.625	835835	843351
WM3	836523.622	842404.977	836524	842407
WM3-Control	836763.419	842425.507	836763	842400
WM4	833840.785	838344.842	833850	838358
WM4-Control A	834038.937	837668.995	834028	837695
WM4-Control B	833769.123	837406.936	833760	837395

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

Mott MacDonald
35/F Two Landmark East
100 How Ming Street
Kwun Tong, Kowloon
Hong Kong
t +852 3638 8787
f +852 3607 1825
w www.mottmac.com.hk

Client

CEDD
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

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

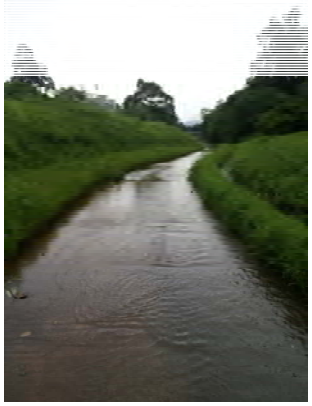
Title

LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

Designed	HC		Eng.Chk.	EC	
Drawn	MING		Coordination	EC	
Dwg.Chk.	HC		Approved	HT	
Scale at A1	1:20000	Project	255228	Status	PRE
		CAD file	A1\255228\REPORT\EMY-EM&A MANUAL\FIG 4-1.dgn		
Drawing No	FIGURE 4.1			Rev	P2

Photographic Records for Water Quality Monitoring Location

	
Alternative Location of WM1	**Co-ordinates of Alternative Location of WM1**
	
Alternative Location of WM1 - Control	**Co-ordinates of Alternative Location of WM1 - Control**
	
Alternative Location of WM2A	**Co-ordinates of Alternative Location of WM2A**
	
Alternative Location of WM2-Control A	**Co-ordinates of Alternative Location of WM2 – Control**

	
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		Date of Calibration:	22/4/2015
Location ID : AM1a		Next Calibration Date:	22/6/2015
		Technician:	Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1017.1	Corrected Pressure (mm Hg)	762.825
Temperature (°C)	23.3	Temperature (K)	296

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.9	5.9	11.8	1.643	49	49.23	Slope = 35.8997
13	4.9	4.9	9.8	1.497	44	44.21	Intercept = -9.5729
10	3.9	3.9	7.8	1.336	38	38.18	Corr. coeff. = 0.9972
7	2.5	2.5	5.0	1.070	30	30.14	
5	1.8	1.8	3.6	0.908	22	22.10	

Calculations :

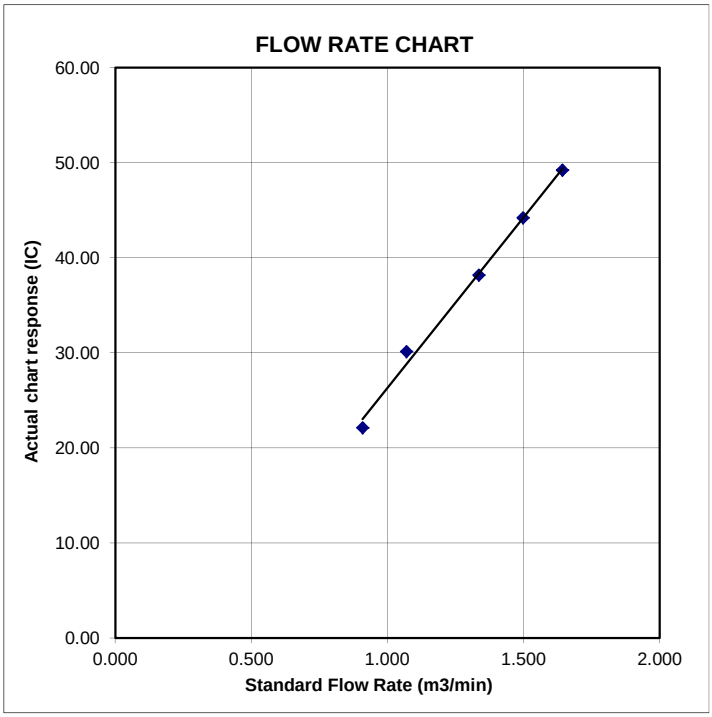
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House near Lin Ma Hang Road
Location ID : AM2

Date of Calibration: 22/4/2015
Next Calibration Date: 22/6/2015
Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1017.1	Corrected Pressure (mm Hg)	762.825
Temperature (°C)	23.3	Temperature (K)	296

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.6	5.6	11.2	1.601	52	52.25	Slope = 33.1201
13	4.4	4.4	8.8	1.419	46	46.22	Intercept = -0.5325
10	3.6	3.6	7.2	1.284	42	42.20	Corr. coeff. = 0.9975
7	2.1	2.1	4.2	0.981	33	33.16	
5	1.3	1.3	2.6	0.772	24	24.11	

Calculations :

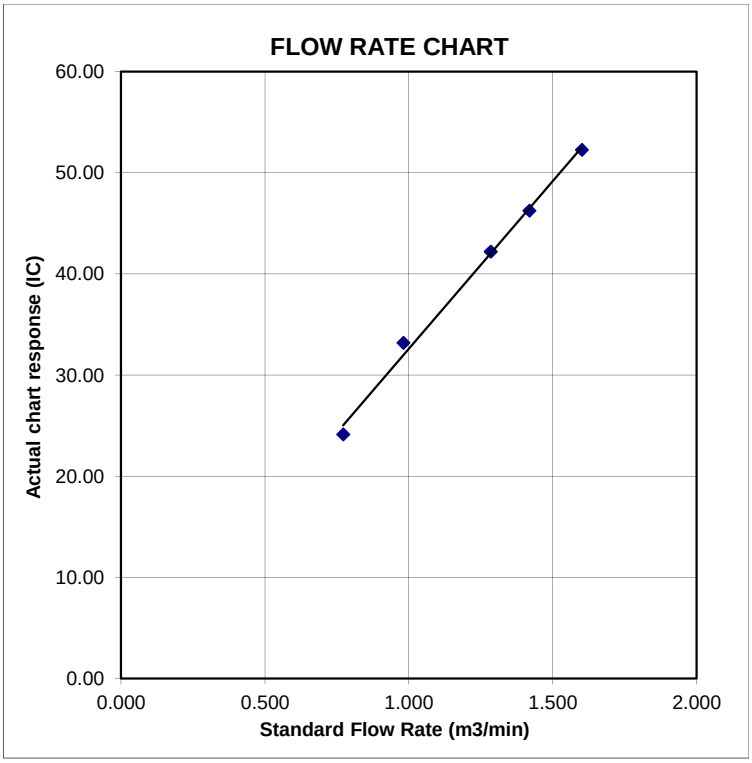
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Ta Kwu Ling Fire Service Station
Location ID : AM3

Date of Calibration: 22/4/2015
Next Calibration Date: 22/6/2015
Technician: Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1017.1	Corrected Pressure (mm Hg)	762.825
Temperature (ºC)	23.3	Temperature (K)	296

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.6	6.6	13.2	1.738	53	53.25	Slope = 29.2449
13	5.1	5.1	10.2	1.528	49	49.23	Intercept = 3.3310
10	4	4	8.0	1.353	43	43.20	Corr. coeff. = 0.9969
7	2.4	2.4	4.8	1.048	33	33.16	
5	1.3	1.3	2.6	0.772	26	26.12	

Calculations :

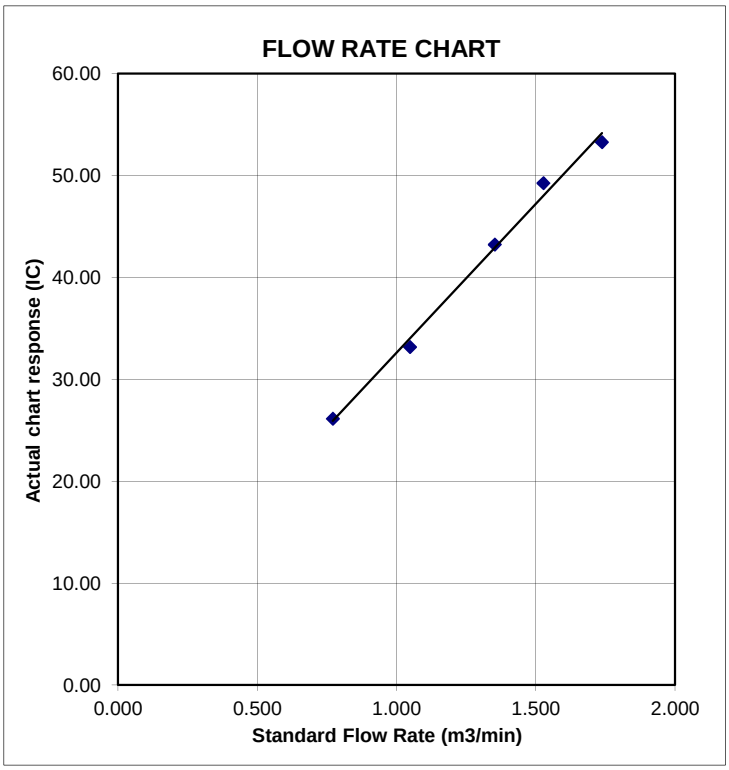
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 22/4/2015
Next Calibration Date: 22/6/2015
Technician: C Y Keung

CONDITIONS

Sea Level Pressure (hPa)	1017.1	Corrected Pressure (mm Hg)	762.825
Temperature (°C)	23.3	Temperature (K)	296

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	4.3	4.3	8.6	1.403	55	55.26	Slope = 31.8269
13	3.4	3.4	6.8	1.248	50	50.24	Intercept = 10.2662
10	2.7	2.7	5.4	1.112	44	44.21	Corr. coeff. = 0.9930
7	1.5	1.5	3.0	0.829	38	38.18	
5	1.0	1.0	2.0	0.677	31	31.15	

Calculations :

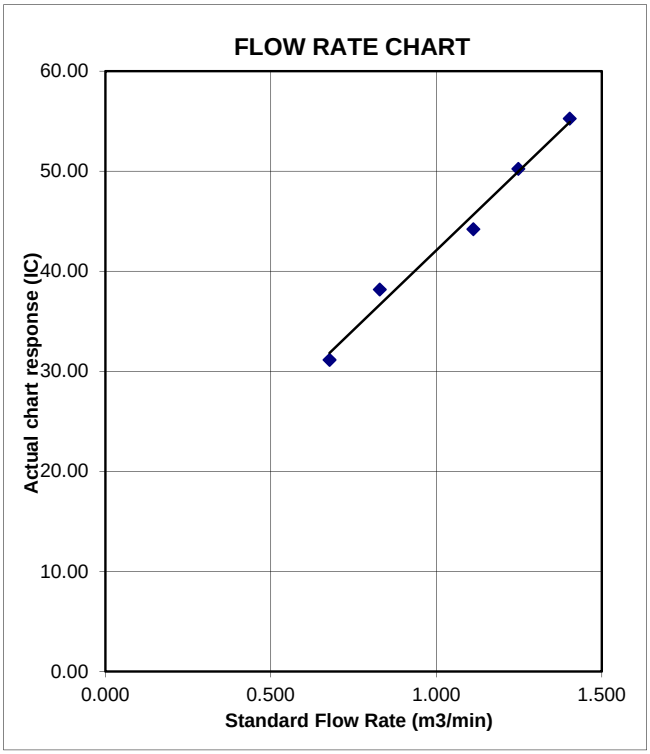
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

Date of Calibration: 22/4/2015
Next Calibration Date: 22/6/2015
Technician: C Y Keung

CONDITIONS

Sea Level Pressure (hPa)	1017.1	Corrected Pressure (mm Hg)	762.825
Temperature (°C)	23.3	Temperature (K)	296

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.5	6.5	13.0	1.724	60	60.28	Slope = 31.8340
13	5.2	5.2	10.4	1.543	54	54.26	Intercept = 5.7014
10	4.1	4.1	8.2	1.370	50	50.24	Corr. coeff. = 0.9975
7	2.6	2.6	5.2	1.091	41	41.19	
5	1.6	1.6	3.2	0.856	32	32.15	

Calculations :

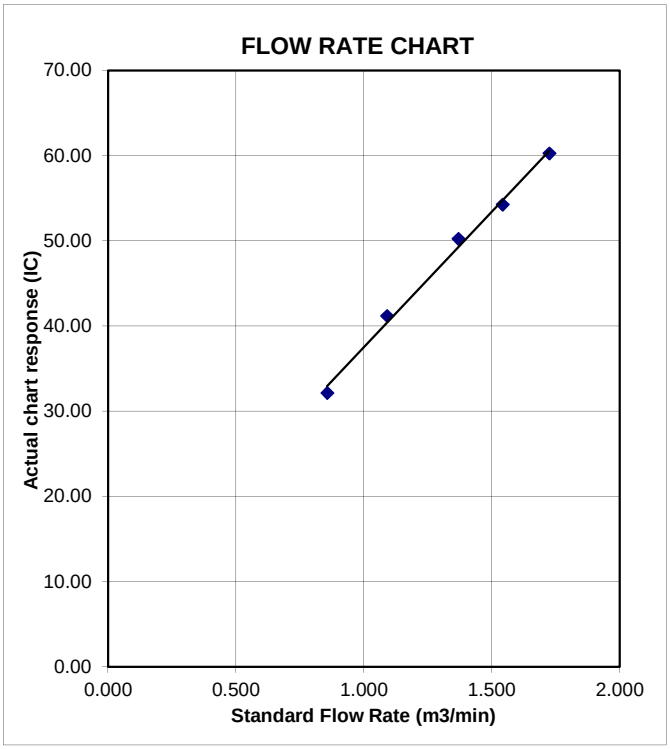
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Nam Wa Po Village House No. 80		Date of Calibration:	22/4/2015
Location ID : AM9b		Next Calibration Date:	22/6/2015
		Technician:	Keung Chi Young

CONDITIONS

Sea Level Pressure (hPa)	1017.1	Corrected Pressure (mm Hg)	762.825
Temperature (ºC)	23.3	Temperature (K)	296

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10265
Model->	5025A	Qstd Intercept ->	-0.00335
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected
18	6.6	6.6	13.2	1.738	55	55.26
13	4.9	4.9	9.8	1.497	47	47.22
10	3.7	3.7	7.4	1.301	43	43.20
7	2.6	2.6	5.2	1.091	35	35.17
5	1.3	1.3	2.6	0.772	26	26.12

LINEAR REGRESSION

Slope = 30.1085
Intercept = 2.8564
Corr. coeff. = 0.9978

Calculations :

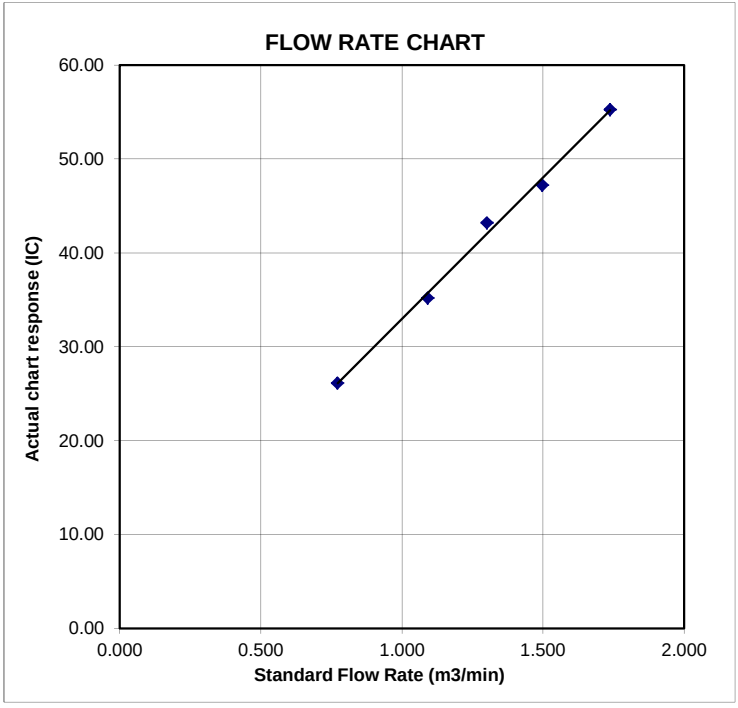
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



TISCH Environmental

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

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 24, 2015 Rootsmeter S/N 0438320 Ta (K) - 292
Operator Tisch Orifice I.D. - 1941 Pa (mm) - 756.92

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	1.4880	3.2	2.00
2	NA	NA	1.00	1.0510	6.4	4.00
3	NA	NA	1.00	0.9360	7.9	5.00
4	NA	NA	1.00	0.8920	8.8	5.50
5	NA	NA	1.00	0.7360	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
1.0121	0.6802	1.4258		0.9958	0.6692	0.8784
1.0078	0.9589	2.0163		0.9916	0.9434	1.2422
1.0057	1.0745	2.2543		0.9895	1.0571	1.3888
1.0046	1.1262	2.3644		0.9884	1.1080	1.4566
0.9993	1.3578	2.8515		0.9832	1.3358	1.7568
Qstd slope (m) =		2.10265		Qa slope (m) =		1.31664
intercept (b) =		-0.00335		intercept (b) =		-0.00206
coefficient (r) =		0.99999		coefficient (r) =		0.99999
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

Equipment Calibration Record

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	2X6146
Equipment Ref:	EQ 106
Job Order	HK1500837

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	10 Nov 2014

Equipment Calibration Results:

Calibration Date: 4 January 2015

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
1hr19min	10:00 ~ 11:19	17.3	1017.0	0.076	2677	33.8
2hr15min	11:25 ~ 13:40	17.3	1017.0	0.111	6875	50.9
2hr06min	15:40 ~ 17:46	17.3	1017.0	0.047	2399	19.0

Sensitivity Adjustment Scale Setting (Before Calibration) 594 (CPM)

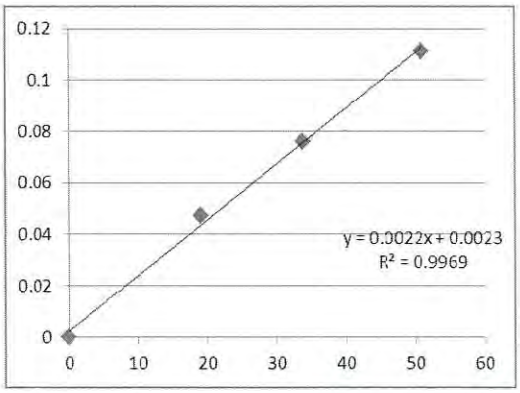
Sensitivity Adjustment Scale Setting (After Calibration) 588 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9969

Date of Issue 6 January 2015



Operator : Donald Kwok Signature : Date : 6 January 2015

QC Reviewer : Ben Tam Signature : Date : 6 January 2015

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	10-Nov-14
Location ID :	Calibration Room	Next Calibration Date:	10-Feb-15

CONDITIONS

Sea Level Pressure (hPa)	1017.3	Corrected Pressure (mm Hg)	762.975
Temperature (°C)	23.3	Temperature (K)	296

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00757
Model->	5025A	Qstd Intercept ->	-0.01628
Calibration Date->	7-Apr-14	Expiry Date->	7-Apr-15

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION	
18	3.6	3.6	7.2	1.351	58	58.28	Slope =	33.8083
13	2.8	2.8	5.6	1.193	54	54.26	Intercept =	12.9642
10	2.2	2.2	4.4	1.058	48	48.23	Corr. coeff. =	0.9976
8	1.5	1.5	3.0	0.875	42	42.20		
5	0.9	0.9	1.8	0.680	36	36.17		

Calculations :

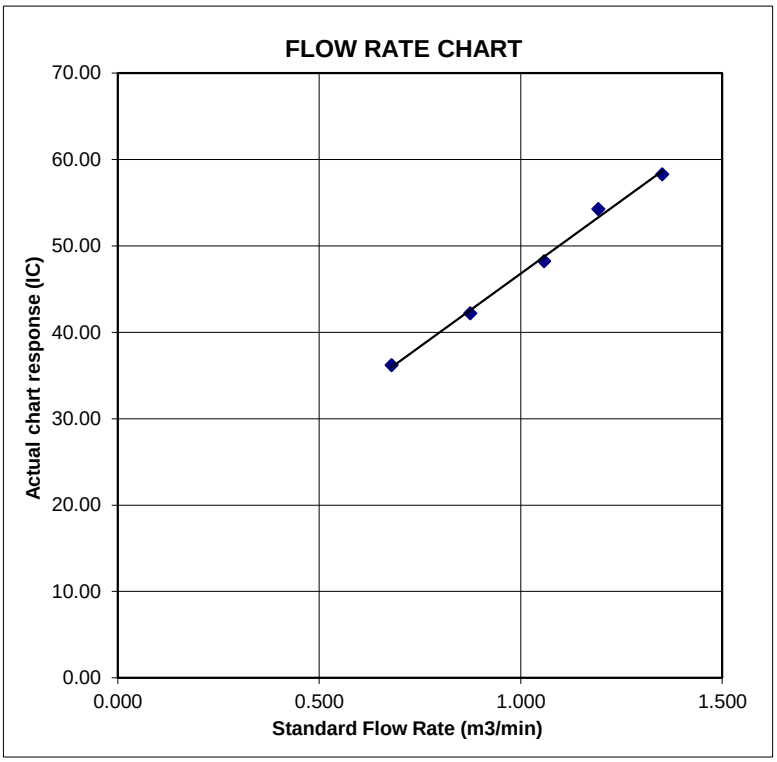
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



Equipment Calibration Record

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	366409
Equipment Ref:	EQ 109
Job Order	HK1500973

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	10 Nov 2014

Equipment Calibration Results:

Calibration Date: 4 January 2015

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
1hr19min	10:00 ~ 11:19	17.3	1017.0	0.076	2615	33.0
2hr15min	11:25 ~ 13:40	17.3	1017.0	0.111	6854	50.8
2hr06min	15:40 ~ 17:46	17.3	1017.0	0.047	2319	18.4

Sensitivity Adjustment Scale Setting (Before Calibration) 538 (CPM)

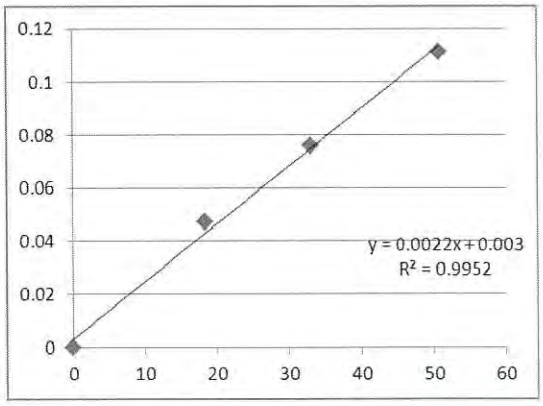
Sensitivity Adjustment Scale Setting (After Calibration) 533 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9952

Date of Issue 6 January 2015



Operator : Donald Kwok Signature : Date : 6 January 2015

QC Reviewer : Ben Tam Signature : Date : 6 January 2015

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	10-Nov-14
Location ID :	Calibration Room	Next Calibration Date:	10-Feb-15

CONDITIONS

Sea Level Pressure (hPa)	1017.3	Corrected Pressure (mm Hg)	762.975
Temperature (°C)	23.3	Temperature (K)	296

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00757
Model->	5025A	Qstd Intercept ->	-0.01628
Calibration Date->	7-Apr-14	Expiry Date->	7-Apr-15

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION	
18	3.6	3.6	7.2	1.351	58	58.28	Slope =	33.8083
13	2.8	2.8	5.6	1.193	54	54.26	Intercept =	12.9642
10	2.2	2.2	4.4	1.058	48	48.23	Corr. coeff. =	0.9976
8	1.5	1.5	3.0	0.875	42	42.20		
5	0.9	0.9	1.8	0.680	36	36.17		

Calculations :

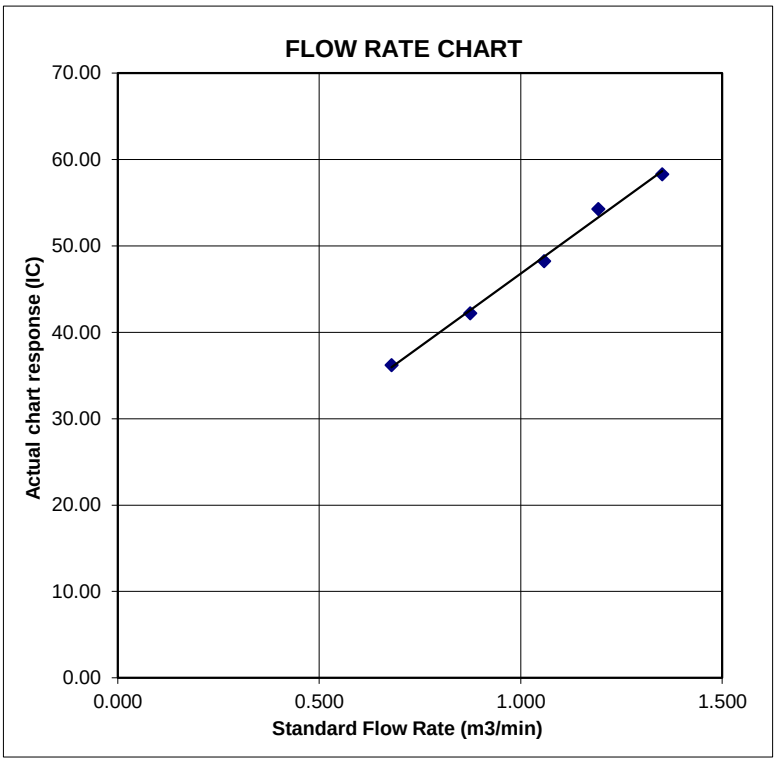
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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

For subsequent calculation of sampler flow:

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

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



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	456660
Equipment Ref:	EQ117
Job Order	

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	6 February 2015

Equipment Verification Results:

Testing Date: 5 April 2015

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr11min	10:00 ~ 12:11	26.0	1011.3	0.041	2344	17.9
2hr21min	12:20 ~ 14:41	26.0	1011.3	0.038	2104	14.9
2hr17min	14:50 ~ 17:07	26.0	1011.3	0.057	3514	25.7

Sensitivity Adjustment Scale Setting (Before Calibration) 607 (CPM)

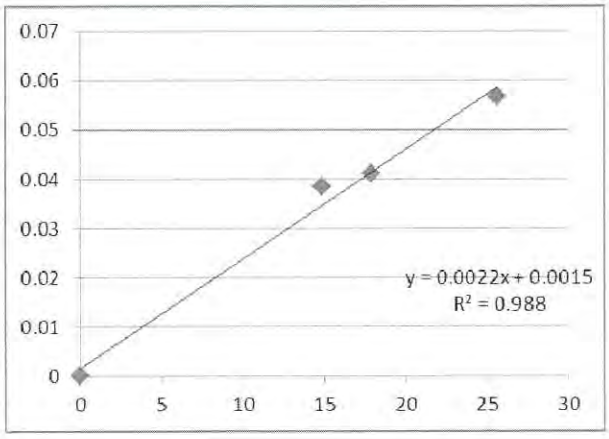
Sensitivity Adjustment Scale Setting (After Calibration) 602 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9940

Date of Issue 20 April 2015



Remarks:

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

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

Operator : Donald Kwok Signature : Date : 20 April 2015

QC Reviewer : Ben Tam Signature : Date : 20 April 2015

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	6-Feb-15
Location ID :	Calibration Room	Next Calibration Date:	6-May-15

CONDITIONS

Sea Level Pressure (hPa)	1024.5	Corrected Pressure (mm Hg)	768.375
Temperature (°C)	13.4	Temperature (K)	286

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00757
Model->	5025A	Qstd Intercept ->	-0.01628
Calibration Date->	7-Apr-14	Expiry Date->	7-Apr-15

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	3.8	3.8	7.6	1.417	56	57.44	Slope = 30.5075
13	3	3	6.0	1.260	52	53.33	Intercept = 14.6821
10	2.3	2.3	4.6	1.104	48	49.23	Corr. coeff. = 0.9974
8	1.7	1.7	3.4	0.950	42	43.08	
5	1.0	1.0	2.0	0.731	36	36.92	

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K

Pstd = actual pressure during calibration (mm Hg

For subsequent calculation of sampler flow:

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

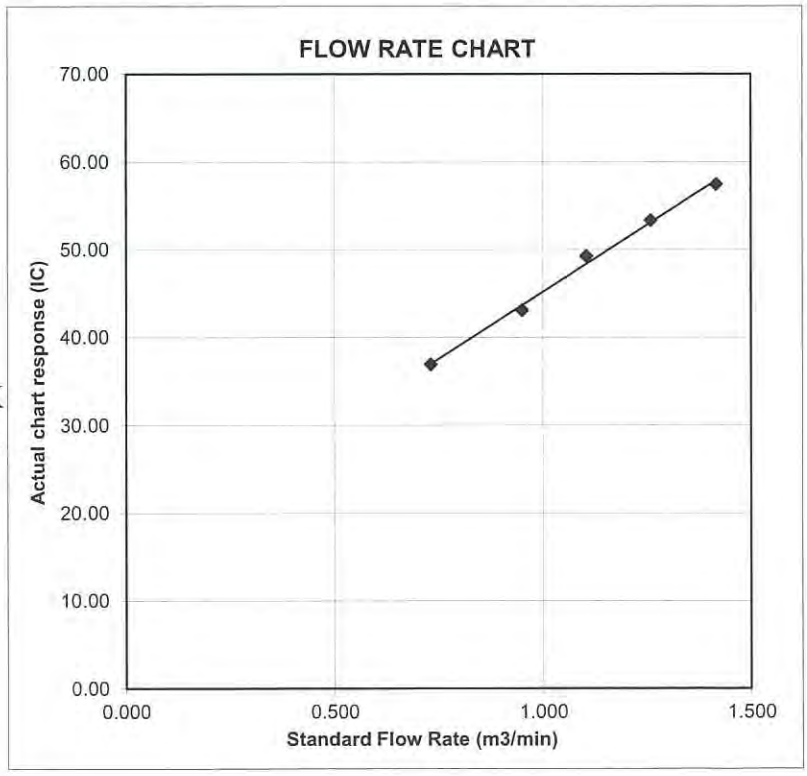
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	456658
Equipment Ref:	EQ115
Job Order	

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	6 February 2015

Equipment Verification Results:

Testing Date: 5 April 2015

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr11min	10:00 ~ 12:11	26.0	1011.3	0.041	2407	18.4
2hr21min	12:20 ~ 14:41	26.0	1011.3	0.038	2219	15.7
2hr17min	14:50 ~ 17:07	26.0	1011.3	0.057	3644	26.6

Sensitivity Adjustment Scale Setting (Before Calibration) 698 (CPM)

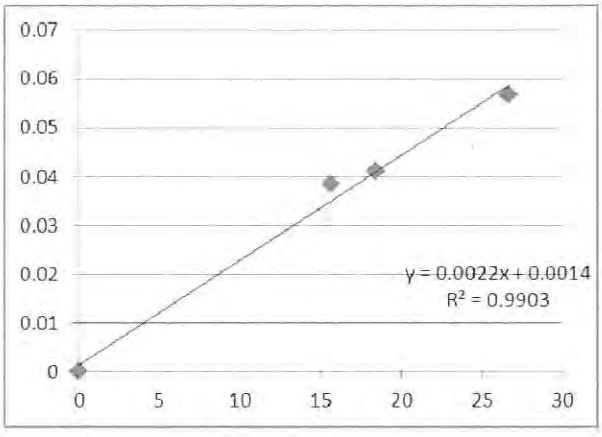
Sensitivity Adjustment Scale Setting (After Calibration) 701 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9951

Date of Issue 20 April 2015



Remarks:

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

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

Operator : Donald Kwok Signature : Date : 20 April 2015

QC Reviewer : Ben Tam Signature : Date : 20 April 2015

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	6-Feb-15
Location ID :	Calibration Room	Next Calibration Date:	6-May-15

CONDITIONS

Sea Level Pressure (hPa)	1024.5	Corrected Pressure (mm Hg)	768.375
Temperature (°C)	13.4	Temperature (K)	286

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00757
Model->	5025A	Qstd Intercept ->	-0.01628
Calibration Date->	7-Apr-14	Expiry Date->	7-Apr-15

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	3.8	3.8	7.6	1.417	56	57.44	Slope = 30.5075
13	3	3	6.0	1.260	52	53.33	Intercept = 14.6821
10	2.3	2.3	4.6	1.104	48	49.23	Corr. coeff. = 0.9974
8	1.7	1.7	3.4	0.950	42	43.08	
5	1.0	1.0	2.0	0.731	36	36.92	

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K

Pstd = actual pressure during calibration (mm Hg

For subsequent calculation of sampler flow:

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

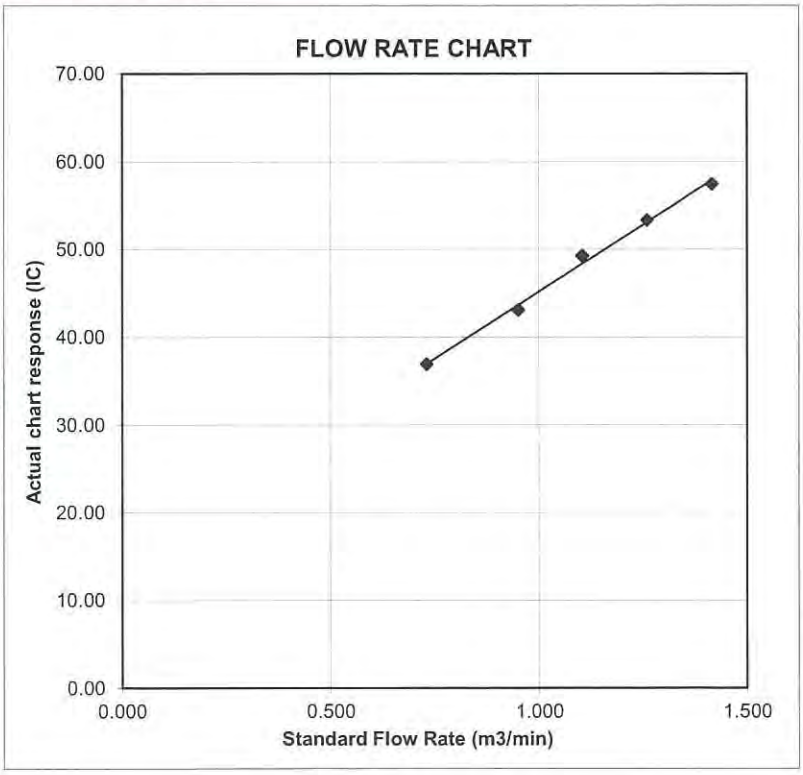
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



SIBATA (EQ111)

SIBATA SCIENTIFIC TECHNOLOGY LTD.
1-1-62, Nakane, Soka, Saitama, 340-0005 Japan
TEL : 048-933-1582 FAX : 048-933-1591

CALIBRATION CERTIFICATE

Date: May 11, 2015

Equipment Name	:	Digital Dust Indicator, Model LD-3B
Code No.	:	080000-42
Quantity	:	1 unit
Serial No.	:	3Y6501
Sensitivity	:	0.001 mg/m3
Sensitivity Adjustment	:	656CPM
Scale Setting	:	April 24, 2015

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

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.

Hong

For Kentaro Togo
Overseas Sales Division

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. : C147594
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-3181) Date of Receipt / 收件日期 : 19 December 2014

Description / 儀器名稱 : Sound Level Meter (EQ015)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 00142581
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 : 21 December 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
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : K C Lee
Project Engineer

Certified By 核證 : H C Chan
Engineer

Date of Issue 簽發日期 : 23 December 2014

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 – 校正及檢測實驗所
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. : C147594
證書編號

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

2. Self-calibration was performed before the test

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

4. Test equipment :

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

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

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

6.1.2 Linearity

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

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

6.2 Time Weighting

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

Certificate of Calibration
校正證書

Certificate No. : C147594
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	85.3	-8.6 ± 1.4
					500 Hz	90.7	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.6
					4 kHz	95.0	+1.0 ± 1.6
					8 kHz	92.9	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.5	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_C	C	Fast	94.00	63 Hz	93.1	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.5
					250 Hz	93.9	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.6
					4 kHz	93.2	-0.8 ± 1.6
					8 kHz	91.0	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.6	-6.2 (+3.0 ; -6.0)

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 06015

- 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.

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 – 校正及檢測實驗所
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

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. : C143325
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 : 21 May 2014

Description / 儀器名稱 : Integrating Sound Level Meter (EQ009)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2238
Serial No. / 編號 : 2285722
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 : 31 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
- Agilent Technologies, USA
- Fluke Everett Service Center, USA
- Rohde & Schwarz Laboratory, Germany

Tested By 測試 : K C Lee, Project Engineer

Certified By 核證 : K M Wu, Engineer

Date of Issue 簽發日期 : 3 June 2014

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 – 校正及檢測實驗所
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. : C143325
證書編號

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

2. Self-calibration using 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_{AFP}	A	F	94.00	1	94.1

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_{AFP}	A	F	94.00	1	94.1	± 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_{AFP}	A	F	94.00	1	94.1 (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.

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 – 校正及檢測實驗所
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. : C143325
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	94.1	Ref.
	L_{ASP}		S			94.1	± 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	54.6	-39.4 ± 1.5
					63 Hz	67.9	-26.2 ± 1.5
					125 Hz	77.9	-16.1 ± 1.0
					250 Hz	85.4	-8.6 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	95.3	+1.2 ± 1.0
					4 kHz	95.1	+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)

Certificate of Calibration
校正證書

Certificate No. : C143325
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	91.0	-3.0 ± 1.5
					63 Hz	93.3	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					250 Hz	94.1	0.0 ± 1.0
					500 Hz	94.1	0.0 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.3	-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
						$1/10^2$		90	90.0	± 0.5
			60 sec.			$1/10^3$		80	79.1	± 1.0
			5 min.			$1/10^4$		70	69.1	± 1.0

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2812707

- 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.

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 – 校正及檢測實驗所
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

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. : C151969
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720) Date of Receipt / 收件日期 : 24 March 2015

Description / 儀器名稱	:	Integrating Sound Level Meter (EQ006)
Manufacturer / 製造商	:	Brüel & Kjær
Model No. / 型號	:	2238
Serial No. / 編號	:	2285762
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 : 11 April 2015

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
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, 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 : 14 April 2015

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 – 校正及檢測實驗所
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. : C151969
證書編號

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

2. Self-calibration using 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	C150014
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_{AFP}	A	F	94.00	1	94.3

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_{AFP}	A	F	94.00	1	94.1	± 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_{AFP}	A	F	94.00	1	94.1 (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.

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 - 校正及檢測實驗所
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. : C151969
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	94.1	Ref.
	L_{ASP}		S			94.1	± 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	104.9	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				500 ms	101.9	-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	55.1	-39.4 ± 1.5
					63 Hz	68.0	-26.2 ± 1.5
					125 Hz	77.9	-16.1 ± 1.0
					250 Hz	85.4	-8.6 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	95.3	+1.2 ± 1.0
					4 kHz	95.1	+1.0 ± 1.0
					8 kHz	93.0	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.9	-4.3 (+3.0 ; -6.0)

Certificate of Calibration
校正證書

Certificate No. : C151969
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	91.4	-3.0 ± 1.5
					63 Hz	93.4	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					250 Hz	94.1	0.0 ± 1.0
					500 Hz	94.1	0.0 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.3	-0.8 ± 1.0
					8 kHz	91.1	-3.0 (+1.5 ; -3.0)
					12.5 kHz	88.0	-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	100.0	± 0.5
						$1/10^2$		90	90.1	± 0.5
			60 sec.			$1/10^3$		80	79.4	± 1.0
			5 min.			$1/10^4$		70	69.2	± 1.0

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2812705

- 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.

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 – 校正及檢測實驗所
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

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. : C152550
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720) Date of Receipt / 收件日期 : 16 April 2015

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 ± 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 : 7 May 2015

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
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, 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 : 12 May 2015

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 – 校正及檢測實驗所
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

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. : C152550
證書編號

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

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

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C143868
CL281	Multifunction Acoustic Calibrator	DC130171
TST150A	Measuring Amplifier	C141558

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 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.

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 – 校正及檢測實驗所
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

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. : C151967
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC15-0720) Date of Receipt / 收件日期 : 24 March 2015

Description / 儀器名稱 : Sound Level Calibrator (EQ084)
Manufacturer / 製造商 : Cesva
Model No. / 型號 : CB-5
Serial No. / 編號 : 030023
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

DATE OF TEST / 測試日期 : 11 April 2015

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification. (after adjustment)
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, 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 : 14 April 2015

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 – 校正及檢測實驗所
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. : C151967
證書編號

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

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

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C143868
CL281	Multifunction Acoustic Calibrator	DC130171
TST150A	Measuring Amplifier	C141558

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

5.1.1 Before Adjustment

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	* 94.4	± 0.3	± 0.2
104 dB, 1 kHz	* 104.4		± 0.3

Out of Mfr's Spec.

5.1.2 After Adjustment

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.3	± 0.2
104 dB, 1 kHz	104.0		± 0.3

5.2 Frequency Accuracy

5.2.1 Before Adjustment

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.002	1 kHz ± 1.5 %	± 1

5.2.2 After Adjustment

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.001	1 kHz ± 1.5 %	± 1

Certificate of Calibration
校正證書

Certificate No. : C151967
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.

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 – 校正及檢測實驗所
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

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T: +852 2610 1044
F: +852 2610 2021
www.alsglobal.com

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

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

WORK ORDER:	HK1509484
SUB-BATCH:	0
LABORATORY:	HONG KONG
DATE RECEIVED:	18/03/2015
DATE OF ISSUE:	25/03/2015

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
Equipment Type:	Dissolved Oxygen Meter
Brand Name:	YSI
Model No.:	YSI 550A
Serial No.:	05F2063AZ
Equipment No.:	--
Date of Calibration:	25 March, 2015

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: HK1509484
Sub-Batch: 0
Date of Issue: 25/03/2015
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: Dissolved Oxygen Meter
Brand Name: YSI
Model No.: YSI 550A
Serial No.: 05F2063AZ
Equipment No.: --
Date of Calibration: 25 March, 2015 Date of next Calibration: 25 June, 2015

Parameters:

Dissolved Oxygen

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.74	2.63	-0.11
4.88	4.78	-0.10
7.38	7.35	-0.03
	Tolerance Limit (mg/L)	±0.20

Temperature

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

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
10.0	10.6	+0.6
20.0	18.7	-1.3
40.0	38.1	-1.9
	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

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T: +852 2610 1044
F: +852 2610 2021
www.alsglobal.com

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1514234
CLIENT:	ACTION UNITED ENVIRO SERVICES	**SUB-BATCH:**	0
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	29/04/2015
		DATE OF ISSUE:	09/05/2015

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:	29 April, 2015

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: HK1514234
Sub-batch: 0
Date of Issue: 09/05/2015
Client: ACTION UNITED ENVIRO SERVICES

Equipment Type: Turbidimeter
Brand Name: HACH
Model No.: 2100Q
Serial No.: 11030C008499
Equipment No.: --
Date of Calibration: 29 April, 2015 Date of next Calibration: 29 July, 2015

Parameters:

Turbidity **Method Ref: APHA 21st Ed. 2130B**

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.42	--
4	4.24	+6.0
40	36.6	-8.5
80	72.5	-9.4
400	366	-8.5
800	792	-1.0
	Tolerance Limit (%)	±10.0

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

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T: +852 2610 1044
F: +852 2610 2021
www.alsglobal.com

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1514254
CLIENT:	ACTION UNITED ENVIRO SERVICES	**SUB-BATCH:**	0
ADDRESS:	RM A 20/F., GOLDEN KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	29/04/2015
		DATE OF ISSUE:	09/05/2015

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.:	212632
Serial No.:	--
Equipment No.:	--
Date of Calibration:	05 May, 2015

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: HK1514254
Sub-batch: 0
Date of Issue: 09/05/2015
Client: ACTION UNITED ENVIRO SERVICES

Description: pH Meter
Brand Name: --
Model No.: 212632
Serial No.: --
Equipment No.: --
Date of Calibration: 05 May, 2015 Date of next Calibration: 05 August, 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	6.8	-0.20
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 -
Greater China & Hong Kong

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T: +852 2610 1044
F: +852 2610 2021
www.alsglobal.com

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1504040
CLIENT:	ACTION UNITED ENVIRO SERVICES	**SUB-BATCH:**	0
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	30/01/2015
		DATE OF ISSUE:	07/02/2015

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, pH, Salinity and Temperature
Description:	Multifunctional Meter
Brand Name:	YSI
Model No.:	Professional Plus
Serial No.:	10G101946
Equipment No.:	--
Date of Calibration:	05 February, 2015

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: HK1504040
Sub-batch: 0
Date of Issue: 07/02/2015
Client: ACTION UNITED ENVIRO SERVICES

Description: Multifunctional Meter
Brand Name: YSI
Model No.: Professional Plus
Serial No.: 10G101946
Equipment No.: --
Date of Calibration: 05 February, 2015

Parameters:

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
4.88	4.79	-0.09
7.03	6.90	-0.13
9.03	9.10	+0.07
	Tolerance Limit (mg/L)	±0.20

pH Value **Method Ref: APHA 21st Ed. 4500H:B**

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	3.95	-0.05
7.0	7.12	+0.12
10.0	9.99	-0.01
	Tolerance Limit (pH unit)	±0.20

Salinity **Method Ref: APHA (21st edition), 2520B**

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	9.76	-2.4
20	18.06	-9.7
30	27.64	-7.9
	Tolerance Limit (%)	±10.0

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	11.6	+0.6
20.0	20.4	+0.4
44.0	42.5	-1.5
	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

Appendix G

Event and Action Plan

Event and Action Plan for Air Quality

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

Event and Action Plan for Construction Noise

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

Event and Action Plan for Water Quality

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

Appendix H

Impact Monitoring Schedule

Impact Monitoring Schedule for the Reporting Period – May 2015

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
Fri	1-May-15				
Sat	2-May-15				C2& C3 & C5
Sun	3-May-15				
Mon	4-May-15				
Tue	5-May-15	C3&C5		C3&C5	C2& C3 & C5
Wed	6-May-15	C2	C2&C3 & C5	C2	
Thu	7-May-15				C2& C3 & C5
Fri	8-May-15	C3&C5			
Sat	9-May-15				C2& C3 & C5
Sun	10-May-15				
Mon	11-May-15				
Tue	12-May-15	C2	C2&C3 & C5	C2	C2& C3 & C5
Wed	13-May-15				
Thu	14-May-15	C3&C5		C3&C5	C2& C3 & C5
Fri	15-May-15				
Sat	16-May-15				C2& C3 & C5
Sun	17-May-15				
Mon	18-May-15	C2	C2&C3 & C5	C2	C2& C3 & C5
Tue	19-May-15				
Wed	20-May-15	C3&C5		C3&C5	C2& C3 & C5
Thu	21-May-15				
Fri	22-May-15				
Sat	23-May-15	C2	C2&C3 & C5		C2& C3 & C5
Sun	24-May-15				
Mon	25-May-15				
Tue	26-May-15	C3&C5		C3&C5	C2& C3 & C5
Wed	27-May-15				
Thu	28-May-15				C2& C3 & C5
Fri	29-May-15	C2	C2&C3 & C5	C2	
Sat	30-May-15				C2& C3 & C5
Sun	31-May-15				

	Monitoring Day
	Sunday or Public Holiday

Monitoring Location

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

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

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

Impact Monitoring Schedule for next Reporting Period – June 2015

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

	Monitoring Day
	Sunday or Public Holiday

Monitoring Location

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

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

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

Appendix I

Database of Monitoring Result

24-hour TSP Monitoring Data

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-HR TSP ($\mu g/m^3$)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m^3/min)	(std m^3)	INITIAL	FINAL	(g)	
AM1a - Garden Farm, Tsung Yuen Ha Village															
6-May-15	27621	9902.23	9926.23	1440.12	34	35	34.5	25	1010.5	1.23	1766	2.7918	2.8602	0.0684	39
12-May-15	27974	9926.23	9950.28	1443.00	35	36	35.5	26	1010.8	1.25	1808	2.7878	2.8640	0.0762	42
18-May-15	27993	9950.29	9974.29	1440.00	35	37	36.0	26.1	1009.1	1.27	1822	2.8020	2.8562	0.0542	30
23-May-15	28015	9976.87	10000.87	1440.00	35	36	35.5	26.2	1008.2	1.25	1801	2.8091	2.8660	0.0569	32
29-May-15	28042	10000.87	10024.87	1440.00	35	37	36.0	29.1	1007.6	1.26	1814	2.7970	2.8594	0.0624	34
AM2 - Village House near Lin Ma Hang Road															
6-May-15	27622	5451.20	5475.02	1429.20	33	34	33.5	25	1010.5	1.03	1467	2.8091	2.9603	0.1512	103
12-May-15	27975	5475.02	5499.01	1439.40	40	44	42.0	26	1010.8	1.28	1843	2.7948	3.0633	0.2685	146
18-May-15	27992	5499.01	5523.50	1469.40	34	34	34.0	26.1	1009.1	1.04	1526	2.8153	2.8972	0.0819	54
23-May-15	28016	5523.50	5547.26	1425.60	35	35	35.0	26.2	1008.2	1.07	1523	2.7918	2.8271	0.0353	23
29-May-15	28023	5547.26	5571.06	1428.00	32	33	32.5	29.1	1007.6	0.99	1411	2.8219	2.9311	0.1092	77
AM3 - Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village															
6-May-15	208921	6436.41	6460.41	1440.00	42	42	42.0	25	1010.5	1.32	1901	2.7635	2.8673	0.1038	55
12-May-15	27994	6563.45	6587.45	1440.00	42	42	42.0	26	1010.8	1.32	1898	2.7836	2.8727	0.0891	47
18-May-15	27990	6587.45	6611.45	1440.00	42	42	42.0	26.1	1009.1	1.32	1896	2.7907	2.8680	0.0773	41
23-May-15	28017	6611.45	6635.45	1440.00	42	42	42.0	26.2	1008.2	1.32	1895	2.7971	2.8352	0.0381	20
29-May-15	28040	6635.46	6659.46	1440.00	41	42	41.5	29.1	1007.6	1.29	1860	2.8121	2.9317	0.1196	64
AM7b - Loi Tung Village House															
6-May-15	27818	13980.90	14004.90	1440.00	44	44	44.0	25	1010.5	1.06	1523	2.8496	2.9840	0.1344	88
12-May-15	27977	14004.90	14028.90	1440.00	44	44	44.0	26	1010.8	1.06	1520	2.7891	2.9100	0.1209	80
18-May-15	27995	14028.91	14052.91	1440.00	44	44	44.0	26.1	1009.1	1.05	1518	2.7868	2.8854	0.0986	65
23-May-15	28020	14052.91	14076.91	1440.00	44	45	44.5	26.2	1008.2	1.07	1540	2.8092	2.8505	0.0413	27
29-May-15	28022	14076.92	14100.92	1440.00	43	44	43.5	29.1	1007.6	1.03	1485	2.8524	2.9927	0.1403	94
AM8 - Po Kat Tsai Village No. 4															
6-May-15	27963	7851.25	7875.25	1440.00	38	39	38.5	25	1010.5	1.03	1481	2.8833	2.9509	0.0676	46
12-May-15	27978	7875.25	7899.25	1440.00	46	49	47.5	26	1010.8	1.31	1884	2.7948	2.8768	0.0820	44
18-May-15	27996	7899.26	7923.26	1440.00	49	50	49.5	26.1	1009.1	1.37	1972	2.8034	2.8820	0.0786	40
23-May-15	28019	7923.27	7947.27	1440.00	49	49	49.0	26.2	1008.2	1.35	1949	2.8078	2.8438	0.0360	18
29-May-15	28041	7947.28	7971.28	1440.00	49	49	49.0	29.1	1007.6	1.35	1937	2.8003	2.8795	0.0792	41
AM9b - Nam Wa Po Village House No. 80															
6-May-15	27964	15390.26	15414.06	1428.00	34	34	34.0	25	1010.5	1.03	1475	2.8837	2.9678	0.0841	57
12-May-15	27979	15414.07	15437.52	1407.00	30	30	30.0	26	1010.8	0.90	1264	2.7869	2.8502	0.0633	50
18-May-15#	27997	15437.52	15441.57	243.00	34	34	34.0	26.1	1009.1	1.03	250	2.8035	2.8282	0.0247	99

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-HR TSP ($\mu g/m^3$)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m^3/min)	(std m^3)	INITIAL	FINAL	(g)	
23-May-15	28018	15441.57	15465.57	1440.00	33	33	33.0	26.2	1008.2	1.00	1435	2.7837	2.8204	0.0367	26
29-May-15	28024	15465.57	15489.05	1408.80	34	34	34.0	29.1	1007.6	1.02	1442	2.8300	2.8897	0.0597	41

Remark: # Monitoring was run for 4 hours only due to power failure.

Construction Noise Monitoring Results, dB(A)

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3rd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30	façade correction
NM1 - Tsung Yuen Ha Village House No. 63																					
5-May-15	10:56	54.6	58.6	47.2	53.9	56.5	46.8	52.1	54.8	47.1	51.2	53.6	47.7	48.7	50.5	46.1	48.6	50.1	45.5	52	NA
14-May-15	10:30	65.4	57.5	49.8	53.1	58.5	47.1	50.1	52.5	47.4	49.4	50.8	46.8	54.3	59.5	46.7	51.3	54.0	46.5	59	NA
20-May-15	10:33	53.5	58.4	45.5	53.9	57.4	45.4	56.5	56.1	46.7	65.7	69.7	51.4	58.7	62.9	49.3	54.4	56.2	49.2	60	NA
26-May-15	13:51	47.7	49.2	46.3	47.9	48.6	45.8	48.3	50.1	46.2	46.7	47.7	45.8	47.2	48.6	45.9	60.1	56.6	47.2	53	NA
NM2 - Village House near Lin Ma Hang Road																					
5-May-15	14:40	57.0	59.5	45.6	54.9	58.8	46.9	60.9	59.0	46.3	61.5	63.9	45.8	61.3	63.8	46.5	58.3	58.1	46.2	60	NA
14-May-15	13:42	60.5	62.1	45.2	61.0	65.6	45.6	59.6	64.1	46.3	57.8	60.5	46.2	62.1	66.2	52.8	58.9	59.9	55.3	60	NA
20-May-15	11:26	59.8	63.1	47.7	61.0	65.6	47.6	57.9	60.8	46.0	62.2	63.4	47.2	53.9	57.4	45.1	62.4	62.8	46.4	60	NA
26-May-15	14:28	59.5	63.1	52.4	57.0	59.0	52.4	57.6	59.6	52.4	56.6	55.4	52.9	57.4	58.4	53.0	53.4	55.7	50.7	57	NA
NM5– Ping Yeung Village House (façade facing northeast)																					
6-May-15	15:14	53.5	57.9	46.1	50.6	53.5	46.0	55.1	58.9	45.9	49.6	53.2	44.4	51.1	53.6	47.3	51.2	55.0	46.0	52	NA
12-May-15	13:32	60.8	56.8	45.5	58.5	54.3	47.0	53.9	55.0	43.9	53.2	56.2	47.6	66.1	56.2	44.3	52.3	55.9	44.8	60	NA
18-May-15	14:04	59.3	61.9	53.2	64.0	66.2	60.2	62.1	65.7	54.6	60.3	64.5	52.8	65.6	68.6	60.1	65.9	69.7	57.8	64	NA
23-May-15	11:26	53.6	56.6	46.6	53.2	56.0	49.4	56.7	58.1	48.7	57.9	58.6	49.0	53.5	56.0	49.5	57.6	60.4	50.8	56	NA
29-May-15	15:58	60.4	55.2	46.0	53.2	55.9	46.6	55.5	58.5	46.2	51.9	54.8	46.4	57.7	61.9	48.8	51.8	54.6	47.4	56	NA
NM6 – Tai Tong Wu Village House 2																					
6-May-15	10:37	60.2	63.4	54.6	59.6	61.9	55.5	58.7	61.9	53.3	60.1	63.5	54.1	60.0	63.3	54.5	60.9	63.4	55.3	60	NA
12-Mar-15	13:05	61.4	63.2	54.6	60.5	62.7	50.2	57.6	61.1	49.5	57.8	61.1	50.7	59.9	62.6	52.7	59.2	62.0	53.3	60	NA
18-May-15	13:02	59.5	63.0	52.6	60.7	63.9	55.2	59.5	62.9	52.9	58.9	62.0	53.2	59.2	61.9	52.9	60.3	63.7	52.8	60	NA
23-May-15	10:23	61.8	65.0	55.5	62.3	64.7	58.7	62.5	65.8	55.8	62.1	64.1	59.0	63.3	65.3	60.1	62.0	65.1	57.2	62	NA
29-May-15	15:09	63.2	66.1	56.2	62.7	66.4	54.4	61.7	65.4	51.5	62.6	65.5	54.1	63.1	67.2	52.0	62.6	66.3	54.2	63	NA
NM7 – Po Kat Tsai Village																					
6-May-15	16:18	68.6	65.0	57.6	58.8	60.3	56.4	58.0	59.1	56.4	68.5	65.9	57.4	67.2	69.2	57.2	68.8	67.2	56.1	67	NA
12-May-15	13:45	61.7	64.5	56.8	69.0	66.4	57.7	60.4	63.8	55.8	59.1	62.5	55.6	59.7	61.5	55.7	64.6	59.0	55.2	64	NA
18-May-15	10:56	68.4	69.3	56.7	61.7	63.2	57.3	58.9	59.4	56.1	56.9	57.5	56.1	60.4	63.0	56.4	62.6	64.4	56.7	63	NA
23-May-15	11:33	60.5	61.6	59.6	62.7	60.9	57.0	58.3	59.1	57.5	58.2	59.0	57.4	62.8	62.7	57.7	60.5	63.2	57.4	61	NA
29-May-15	13:00	57.9	60.7	54.8	58.3	58.3	56.3	68.4	67.1	55.9	59.3	62.8	55.2	62.4	62.4	54.9	68.6	71.4	55.2	65	NA
NM8 - Village House, Tong Hang																					
5-May-15	10:46	59.0	63.5	53.5	59.0	62.5	52.5	57.0	58.5	51.0	59.0	63.0	54.0	57.5	60.0	53.0	59.2	63.5	53.0	59	NA
14-May-15	10:38	59.7	62.0	55.0	56.6	58.5	52.0	59.4	62.0	54.0	56.4	58.5	53.5	58.0	61.0	54.5	58.5	61.0	54.5	58	NA
20-May-15	10:19	59.5	63.1	53.4	59.1	60.1	53.7	56.8	59.5	52.9	59.7	62.8	53.5	58.1	61.1	53.6	58.4	60.7	53.2	59	NA
26-May-15	14:50	64.1	67.5	53.5	65.6	69.5	58.0	63.5	67.5	58.0	70.7	74.4	59.5	64.3	68.5	56.5	66.1	70.0	56.0	67	NA
NM9 - Village House, Kiu Tau Village																					

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3rd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30	façade correction
5-May-15	11:29	66.7	61.5	50.0	53.7	57.0	48.5	55.0	57.0	47.5	52.7	55.5	46.0	51.9	53.5	46.0	53.0	57.0	46.1	60	NA
14-May-15	9:49	60.2	62.5	49.0	55.3	57.0	50.0	55.8	60.0	50.0	53.9	57.0	48.5	56.1	60.6	49.0	57.2	59.5	49.5	57	NA
20-May-15	11:15	59.4	61.4	56.5	59.8	59.3	55.7	58.4	60.4	55.8	59.5	62.8	57.8	60.9	62.3	57.9	60.9	62.8	57.8	60	NA
26-May-15	15:30	61.9	63.5	56.5	62.3	66.5	57.0	63.7	67.5	58.0	57.0	59.5	53.0	56.8	59.0	53.0	58.7	59.5	53.0	61	NA
NM10 - Nam Wa Po Village House No. 80																					
5-May-15	13:01	58.7	60.0	57.0	59.4	60.0	57.5	60.9	62.0	58.5	62.4	63.5	59.0	64.8	66.5	60.5	61.0	62.0	59.0	62	65
14-May-15	13:26	57.6	60.0	54.0	57.1	59.0	53.5	56.3	58.0	53.0	57.1	59.0	54.0	57.7	59.5	55.5	57.4	59.0	54.0	57	60
20-May-15	13:18	59.8	59.9	54.2	60.6	63.2	54.5	59.7	62.4	54.5	59.9	60.2	55.5	56.7	57.5	54.1	56.8	57.8	53.7	59	62
26-May-15	14:09	62.0	64.0	52.5	64.1	67.0	51.5	64.8	66.0	51.5	64.1	62.5	51.0	65.7	68.0	52.0	61.6	59.5	53.0	64	67

Water Quality Monitoring Data for Contract 5

Date	2-May-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:32	0.39	26.6	26.6	3.66	3.7	45.5	45.5	64.2	64.2	7.1	7.1	45	44.5
			26.6		3.64		45.4		64.2		7.1		44	
WM1*	10:56	0.47	25.9	25.9	4.85	4.8	59.8	59.4	79.3	78.9	7.3	7.3	56	54.5
			25.9		4.79		59.0		78.4		7.2		53	

Date	5-May-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:11	0.40	29.1	29.1	6.57	6.6	85.5	86.1	86.6	86.8	8.7	8.7	51	51.5
			29.1		6.66		86.7		87.0		8.7		52	
WM1*	11:43	0.49	28.8	28.8	6.13	6.1	79.6	79.5	113.0	111.5	7.7	7.7	100	100.0
			28.8		6.12		79.4		110.0		7.7		100	

Date	7-May-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:21	0.49	27.3	27.3	5.2	5.2	65.7	65.4	592.0	589.5	7.5	7.5	359	352.0
			27.3		5.18		65.0		587.0		7.5		345	
WM1*	10:53	0.45	27	27.0	6.43	6.5	80.8	81.3	198.0	193.5	7.8	7.8	108	110.5
			27		6.5		81.7		189.0		7.8		113	

Date	9-May-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:01	0.41	29.2	29.2	4.06	4.1	53.1	53.1	48.9	48.4	7.7	7.7	21	21.5
			29.2		4.06		53.1		47.9		7.7		22	
WM1*	11:43	0.27	28.7	28.7	4.78	4.7	61.9	61.4	63.9	63.7	7.8	7.8	25	24.5
			28.7		4.7		60.8		63.4		7.8		24	

Date	12-May-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:10	0.82	27	27.0	6.04	6.0	75.8	75.8	34.4	34.2	7.8	7.8	18	18.5

			27		6.03		75.7		33.9		7.8		19	
WM1	11:46	0.26	27.7	27.7	6.78	6.8	86.2	86.3	>999	**>999**	7.6	7.6	272	**266.0**
			27.7		6.79		86.4		>999		7.6		260	

Date	**14-May-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:00	0.62	28.2	28.2	5.61	5.7	72.4	73.1	20.0	20.4	7.6	7.6	14	14.5
			28.2		5.72		73.8		20.7		7.6		15	
WM1*	11:44	0.29	29.4	29.4	5.74	5.7	75.2	75.2	136.0	132.5	7.7	7.7	80	78.0
			29.4		5.73		75.2		129.0		7.7		76	

Date	**16-May-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	13:49	0.45	26.7	26.7	4.74	4.7	58.7	58.6	59.3	59.2	7.7	7.7	58	57.0
			26.7		4.72		58.5		59.0		7.7		56	
WM1*	13:20	0.30	27.7	27.7	5.56	5.6	69.7	69.9	341.0	344.5	7.7	7.7	169	169.0
			27.7		5.59		70.0		348.0		7.7		169	

Date	**18-May-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	12:08	0.42	28.2	28.2	5.17	5.2	65.6	65.4	36.1	35.9	7.6	7.6	23	23.5
			28.2		5.13		65.1		35.6		7.6		24	
WM1*	12:36	0.29	30.3	30.3	3.13	3.1	41.1	41.0	287.0	283.0	7	7.0	132	135.5
			30.3		3.1		40.8		279.0		7		139	

Date	**20-May-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:04	0.45	28	28.0	4.34	4.3	55.5	55.4	32.9	32.7	7.5	7.5	35	35.5
			28		4.32		55.3		32.4		7.5		36	
WM1*	12:10	0.32	27.5	27.5	5.18	5.2	65.6	66.0	>999	**>999**	7.3	7.3	352	**378.5**
			27.5		5.24		66.4		>999		7.3		405	

Date	23-May-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	13:38	0.57	25	25.0	4.7	4.7	56.9	56.7	>999	>999	7.6	7.6	748	794.0
			25		4.67		56.5		>999		7.6		840	
WM1	13:06	0.38	25	25.0	4.56	4.5	55.5	55.2	>999	>999	7.7	7.7	1860	**1530.0**
			25		4.5		54.9		>999		7.7		1200	

Date	26-May-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	14:00	0.61	25.3	25.3	6.62	6.6	80.6	80.1	257.0	260.5	7.4	7.4	141	139.5
			25.3		6.54		79.6		264.0		7.4		138	
WM1	13:37	0.32	26.2	26.2	6.85	6.8	84.5	84.1	971.0	**969.5**	0.2	3.7	476	**479.5**
			26.2		6.77		83.7		968.0		7.2		483	

Date	28-May-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	15:13	0.41	32.9	32.9	6.25	6.2	86.9	85.8	9.7	9.6	8	8.0	4	4.0
			32.9		6.14		84.7		9.6		8		4	
WM1*	14:37	0.16	32.5	32.5	6.64	6.7	91.6	92.1	77.3	77.7	7.8	7.8	119	114.5
			32.5		6.71		92.5		78.0		7.8		110	

Date	30-May-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	12:16	0.43	31	31.0	5.37	5.3	71.3	70.9	25.7	26.1	7.2	7.2	16	17.0
			31		5.31		70.5		26.4		7.2		18	
WM1*	13:01	0.13	31.9	31.9	6.82	6.8	92.7	92.7	687.0	689.5	7.2	7.2	479	483.5
			31.9		6.81		92.6		692.0		7.2		488	

*Remark: * monitoring was conducted at box culvert 2 for reference.*

Water Quality Monitoring Data for Contract 2 and 3

Date	2-May-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	14:27	0.07	27	27.1	4.12	4.1	51.8	51.6	4.21	4.3	7.3	7.3	5	4.0
			27.1		4.1		51.4		4.44		7.3		3	
WM4-CB	14:53	0.25	27.1	27.1	2.31	2.3	29.1	29.0	5.25	5.3	7.2	7.2	8	8.0
			27.1		2.29		28.8		5.42		7.2		8	
WM4	14:09	0.27	26.2	26.2	5.96	6.0	73.8	74.1	21.8	22.2	7	7.0	29	29.0
			26.2		6		74.3		22.5		7		29	

Date	5-May-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	13:02	0.07	27.9	27.9	6.8	6.8	91.0	91.0	3.0	3.0	8.1	8.1	5	5.0
			27.9		6.79		90.9		3.0		8.1		5	
WM4-CB	13:23	0.23	28.3	28.3	3.12	3.1	38.7	38.8	10.2	10.3	7.7	7.7	8	8.0
			28.3		3.03		38.9		10.4		7.7		8	
WM4	12:40	0.25	28.5	28.5	4.25	4.2	54.9	54.8	12.6	12.4	7.5	7.6	24	24.5
			28.5		4.22		54.6		12.2		7.6		25	

Date	7-May-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	15:57	0.07	27.6	27.6	5.33	5.3	67.6	67.3	11.2	11.6	7.8	7.8	7	8.0
			27.6		5.28		66.9		11.9		7.8		9	
WM4-CB	16:29	0.24	28.9	28.9	3.91	3.9	50.7	50.3	5.6	5.5	7.1	7.1	5	5.5
			28.9		3.84		49.9		5.4		7.1		6	
WM4	15:23	0.27	28.5	28.5	4.18	4.2	54.6	54.5	20.8	21.0	7.3	7.3	21	22.0
			28.5		4.15		54.3		21.1		7.2		23	

Date	9-May-15															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	13:57	0.08	29.4	29.4	6.07	6.1	79.6	79.7	17.3	17.5	7.4	7.4	8	8.5
			29.4		6.09		79.8		17.6		7.4		9	
WM4-CB	14:22	0.24	29.5	29.5	4.59	4.5	60.3	58.8	21.3	21.0	7.2	7.2	12	11.0

			29.5		4.37		57.2		20.7		7.2		10	
WM4	13:24	0.26	30.2	30.2	5.56	5.6	73.9	74.0	24.5	24.1	7.4	7.4	19	19.0
			30.2		5.58		74.1		23.7		7.4		19	

Date	12-May-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	16:51	0.11	26.3	26.3	5.59	5.6	71.7	71.9	8.6	8.5	7.6	7.6	3	3.0
			26.3		5.6		72.0		8.5		7.6		3	
WM4-CB	17:14	0.26	27.8	27.8	2.85	2.8	36.3	186.2	15.3	15.7	7.4	7.4	12	12.0
			27.8		2.83		336.1		16.0		7.4		12	
WM4	16:30	0.29	29	29.0	3.57	3.5	46.5	46.1	18.0	18.3	7.2	7.2	12	12.0
			29		3.51		45.7		18.6		7.2		12	

Date	14-May-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	17:04	0.10	28.7	28.7	6.28	6.3	81.4	81.7	3.1	3.1	7.6	7.6	4	4.0
			28.7		6.32		81.9		3.1		7.6		4	
WM4-CB	17:26	0.23	28.8	28.8	3.78	3.8	49.0	48.8	6.2	6.2	7.3	7.3	6	5.5
			28.8		3.74		48.5		6.3		7.3		5	
WM4	16:43	0.28	30.9	30.9	4.6	4.6	61.7	61.7	11.3	11.4	7.6	7.6	11	11.0
			30.9		4.59		61.7		11.5		7.6		11	

Date	16-May-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:48	0.10	27.3	27.3	5.02	5.1	63.8	64.3	4.5	4.4	8.2	8.2	3	2.5
			27.3		5.1		64.8		4.3		8.2		2	
WM4-CB	10:46	0.21	28.6	28.6	2.93	3.0	38.4	39.2	11.7	12.2	8.8	8.8	14	14.5
			28.5		3.07		39.9		12.6		8.8		15	
WM4	11:20	0.30	28	28.0	3.76	3.8	47.2	47.3	12.5	12.4	8.3	8.3	13	13.5
			28		3.78		47.4		12.2		8.3		14	

Date	18-May-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	

WM4-CA	16:20	0.10	28.3	28.3	5.57	5.5	70.7	70.4	4.4	4.3	7.4	7.4	2	2.5
			28.3		5.46		70.1		4.2		7.4		3	
WM4-CB	16:44	0.23	28.8	28.8	3.72	3.7	47.8	48.1	11.7	11.6	7.3	7.3	10	10.5
			28.8		3.76		48.3		11.4		7.3		11	
WM4	16:00	0.30	29.3	29.3	4.13	4.2	53.2	53.5	17.3	17.1	7	7.0	14	13.5
			29.3		4.18		53.8		16.9		7		13	

Date	**20-May-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	17:22	0.34	26.4	26.4	5.11	5.1	64.5	64.9	267.1	263.9	7.6	7.6	295	254.5
			26.4		5.13		65.2		260.7		7.6		214	
WM4-CB	17:47	0.50	26.8	26.8	5.02	5.0	62.8	62.6	197.2	200.7	7.3	7.3	129	131.5
			26.8		4.96		62.3		204.1		7.3		134	
WM4	17:01	0.53	26.5	26.5	7.61	7.6	93.7	93.8	398.0	**402.0**	7.2	7.2	321	**314.5**
			26.5		7.64		93.9		406.0		7.2		308	

Date	**23-May-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	16:27	0.36	23.9	23.9	6.93	7.0	82.2	82.5	91.9	92.5	7.8	7.8	98	95.5
			23.9		6.98		82.8		93.1		7.8		93	
WM4-CB	16:58	0.52	24	24.0	7.22	7.3	85.4	85.9	184.0	186.5	7.4	7.4	114	111.5
			24		7.28		86.4		189.0		7.4		109	
WM4	16:09	0.55	24.4	24.4	6.47	6.4	77.4	76.5	279.0	**284.0**	7.5	7.5	238	**236.0**
			24.4		6.33		75.6		289.0		7.5		234	

Date	**26-May-15**													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	16:59	0.23	26.3	26.3	7.56	7.6	93.5	93.9	10.7	10.6	6.9	6.9	6	6.0
			26.3		7.61		94.2		10.4		6.9		6	
WM4-CB	17:24	0.49	26.8	26.8	6.39	6.4	79.4	79.8	67.5	67.7	6.9	6.9	46	46.0
			26.8		6.4		80.1		67.8		6.9		46	
WM4	16:27	0.53	26.6	26.6	6.98	7.0	86.3	86.9	33.7	33.4	6.7	6.7	24	24.0
			26.6		7.04		87.4		33.1		6.7		24	

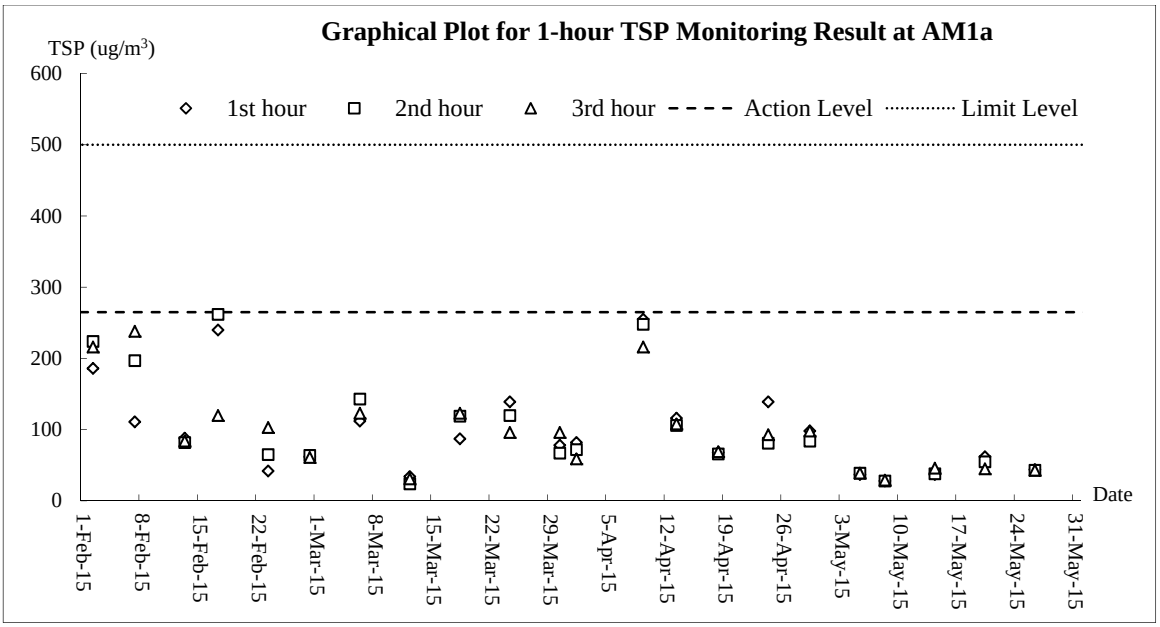
Date	28-May-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	16:57	0.09	30.5	30.5	7.1	7.1	94.5	94.2	5.6	5.5	7.3	7.3	4	3.0
			30.5		7.05		93.8		5.3		7.3		2	
WM4-CB	17:24	0.23	31.4	31.4	4.67	4.7	62.3	62.8	12.1	11.9	7.5	7.5	7	7.5
			31.4		4.74		63.2		11.6		7.5		8	
WM4	16:30	0.28	32.5	32.5	6.39	6.4	88.0	87.7	24.3	24.8	7.5	7.5	14	13.5
			32.5		6.35		87.4		25.2		7.5		13	

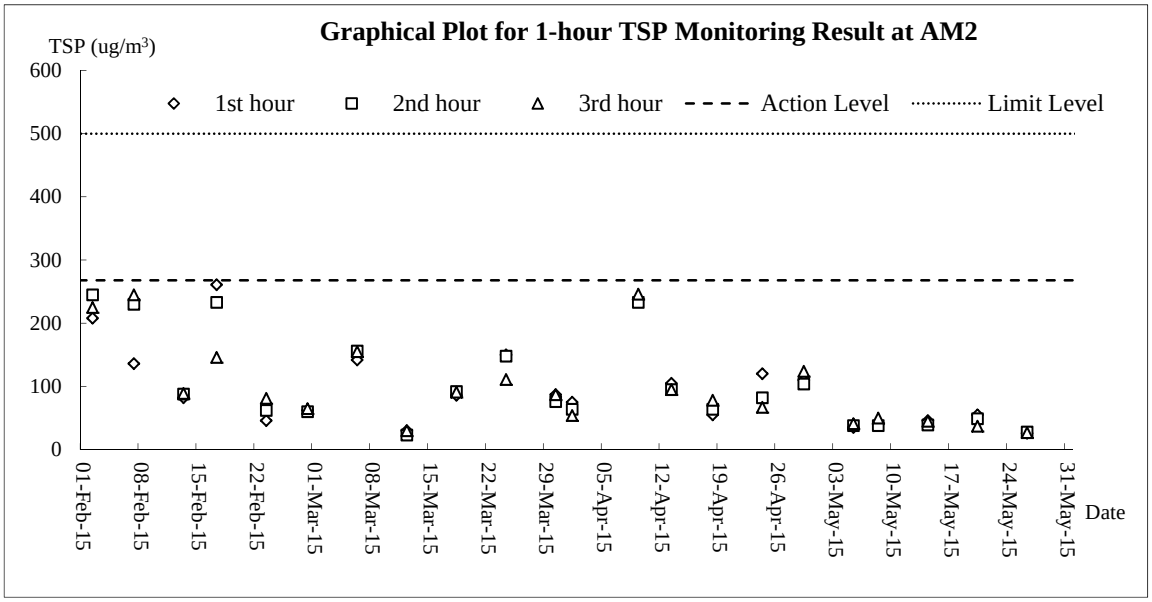
Date	30-May-15													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:19	0.10	31.3	31.3	7.5	7.5	101.7	101.9	5.0	5.0	7.3	7.3	3	3.0
			31.3		7.56		102.0		5.0		7.3		3	
WM4-CB	10:28	0.22	31.9	31.9	7.2	7.2	98.4	98.7	10.8	10.9	7.5	7.5	8	8.0
			31.9		7.24		99.0		10.9		7.5		8	
WM4	10:53	0.28	30.5	30.5	7.26	7.2	96.7	96.5	24.6	24.7	7.3	7.3	23	22.0
			30.5		7.22		96.3		24.8		7.3		21	

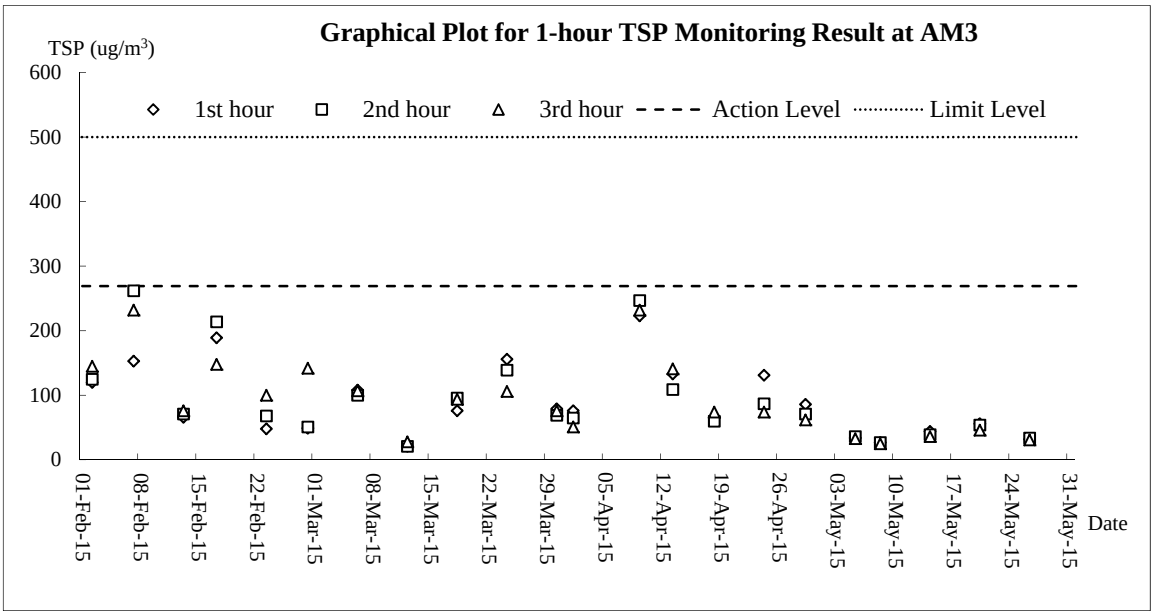
Appendix J

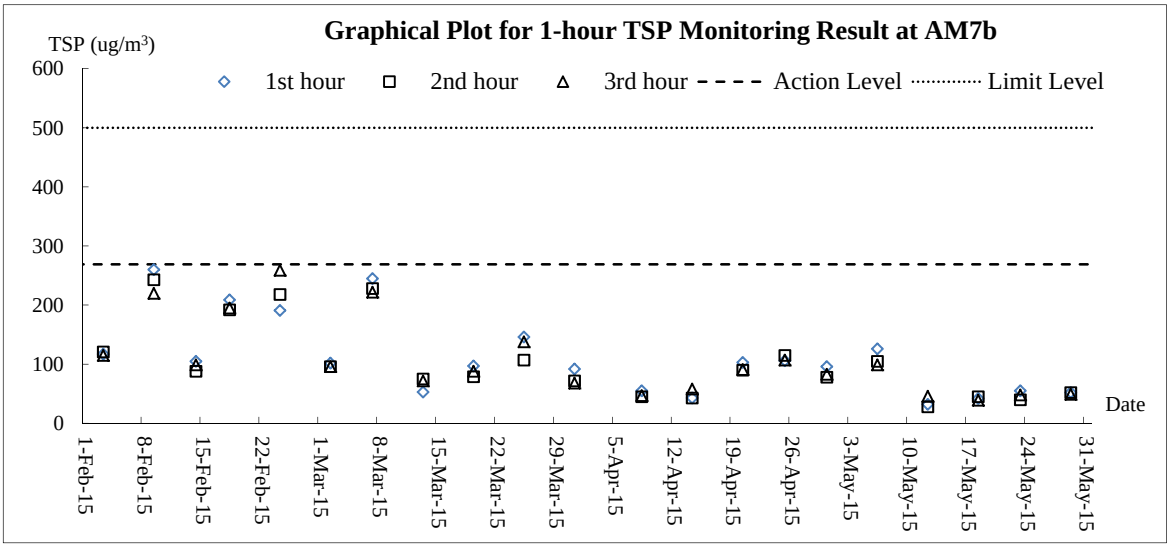
Graphical Plots for Monitoring Result

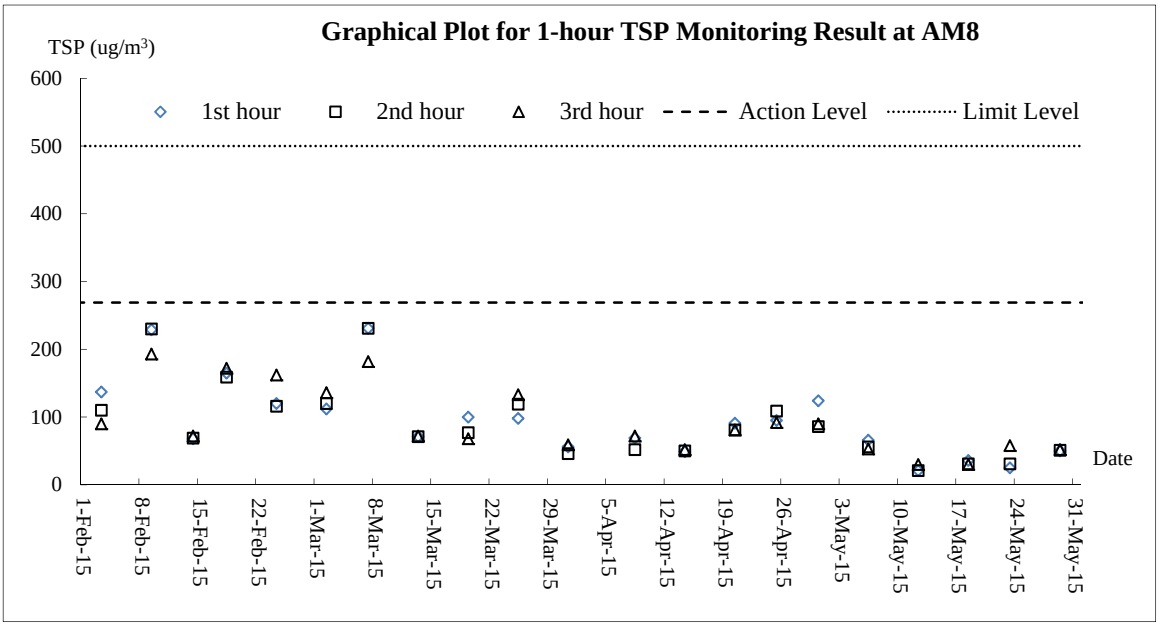
Air Quality – 1-hour TSP

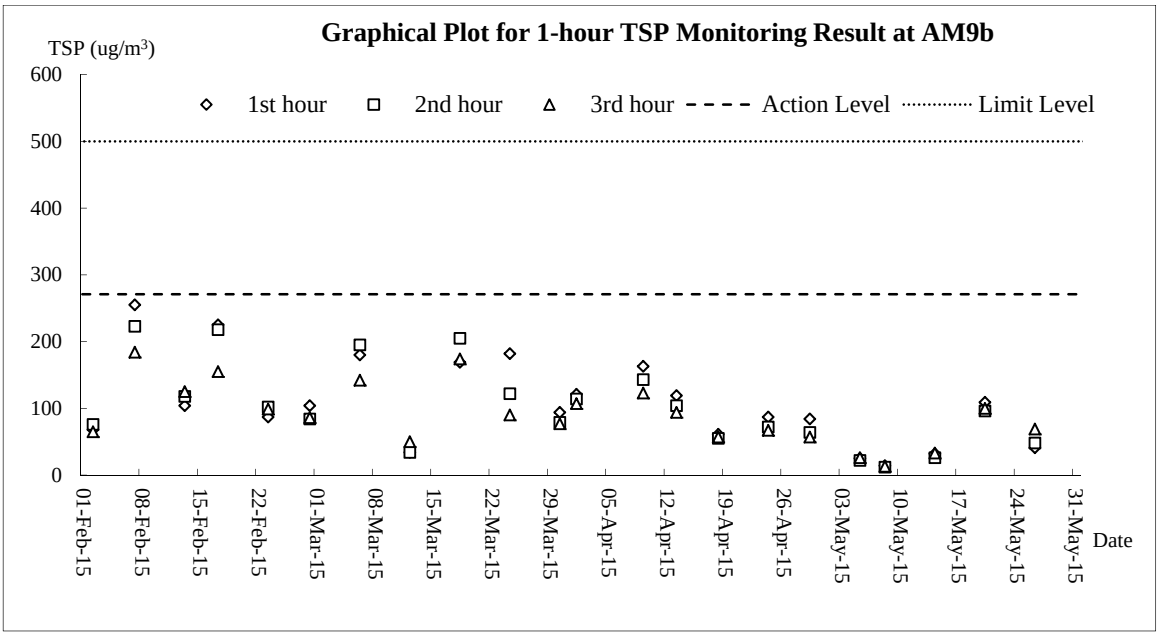




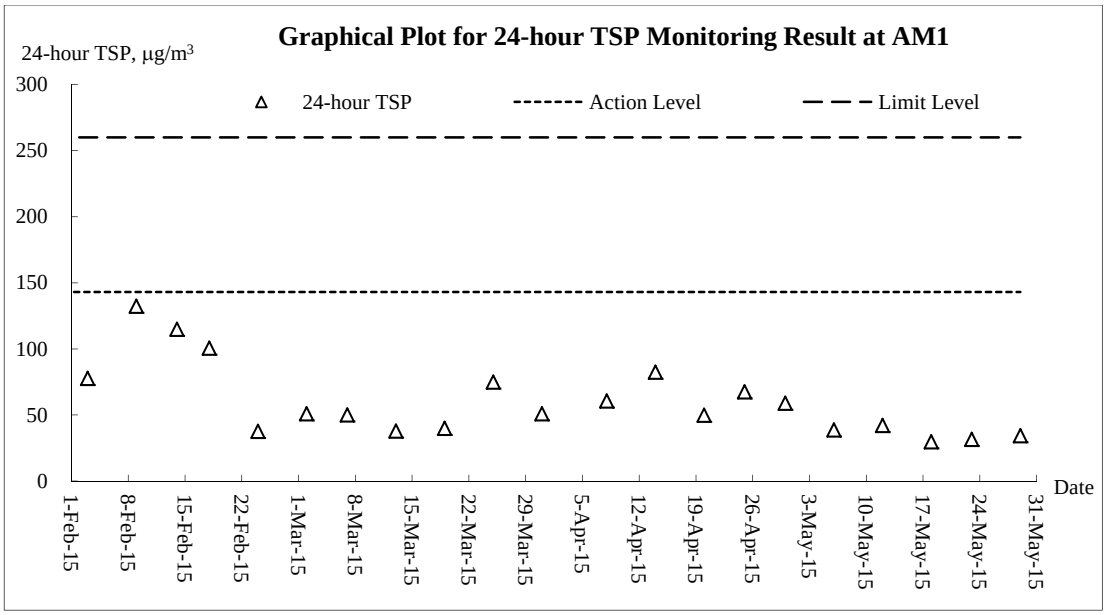


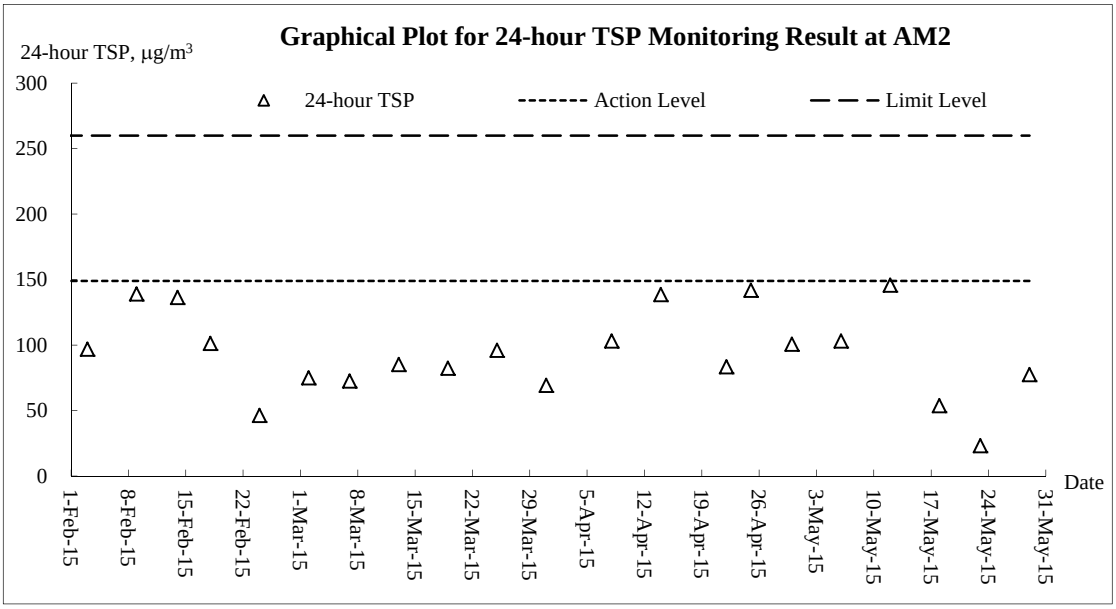

Graphical Plot for 1-hour TSP Monitoring Result at AM7b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15
Date

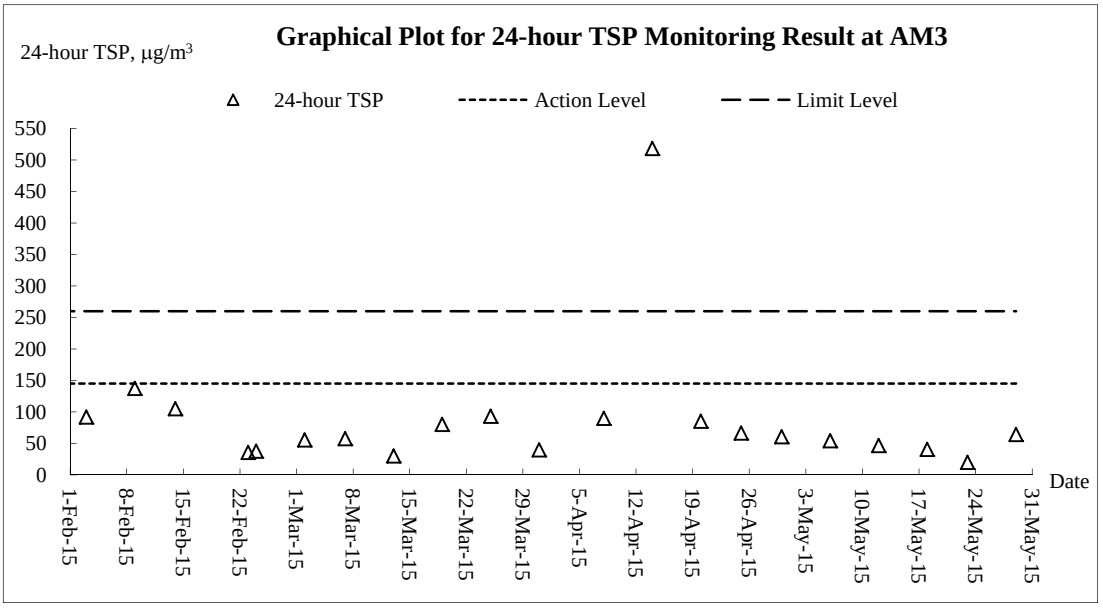

Graphical Plot for 1-hour TSP Monitoring Result at AM8
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15
Date

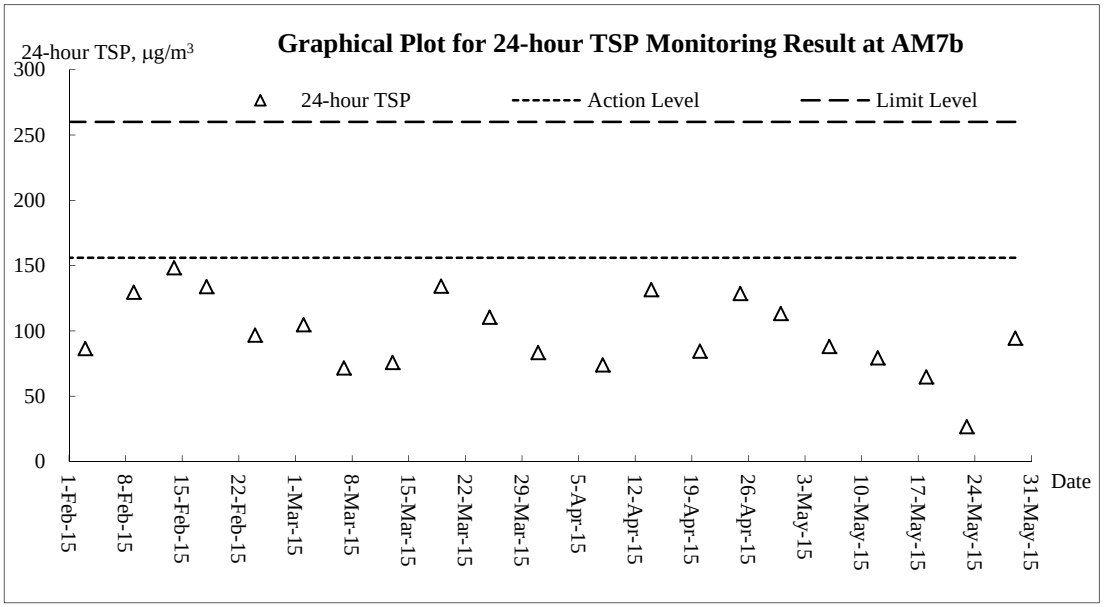

Graphical Plot for 1-hour TSP Monitoring Result at AM9b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
01-Feb-15
08-Feb-15
15-Feb-15
22-Feb-15
01-Mar-15
08-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
05-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
03-May-15
10-May-15
17-May-15
24-May-15
31-May-15
Date

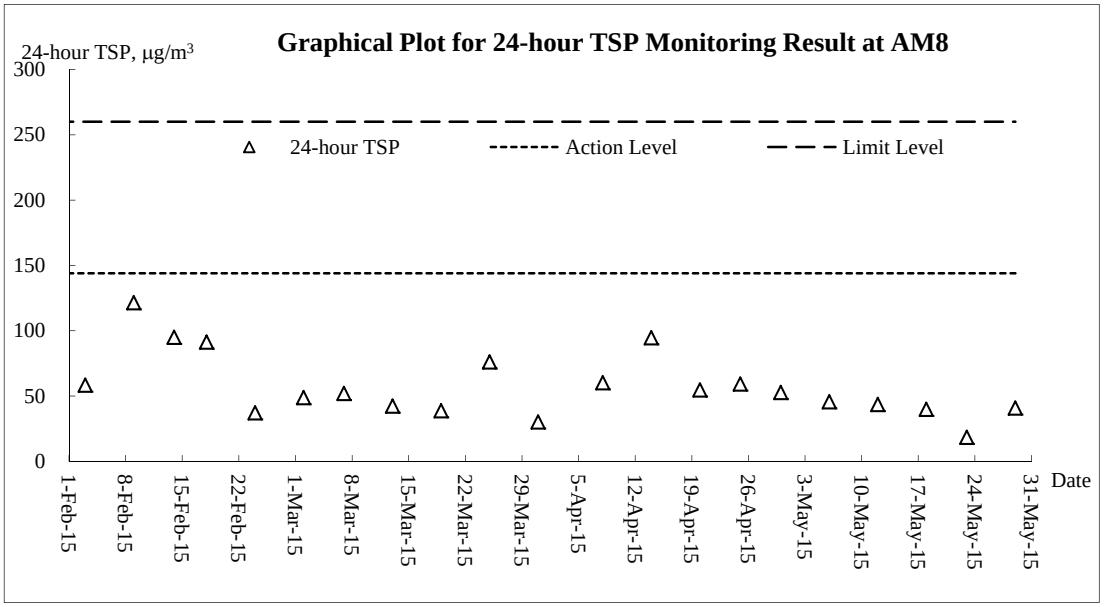
Air Quality – 24-hour TSP

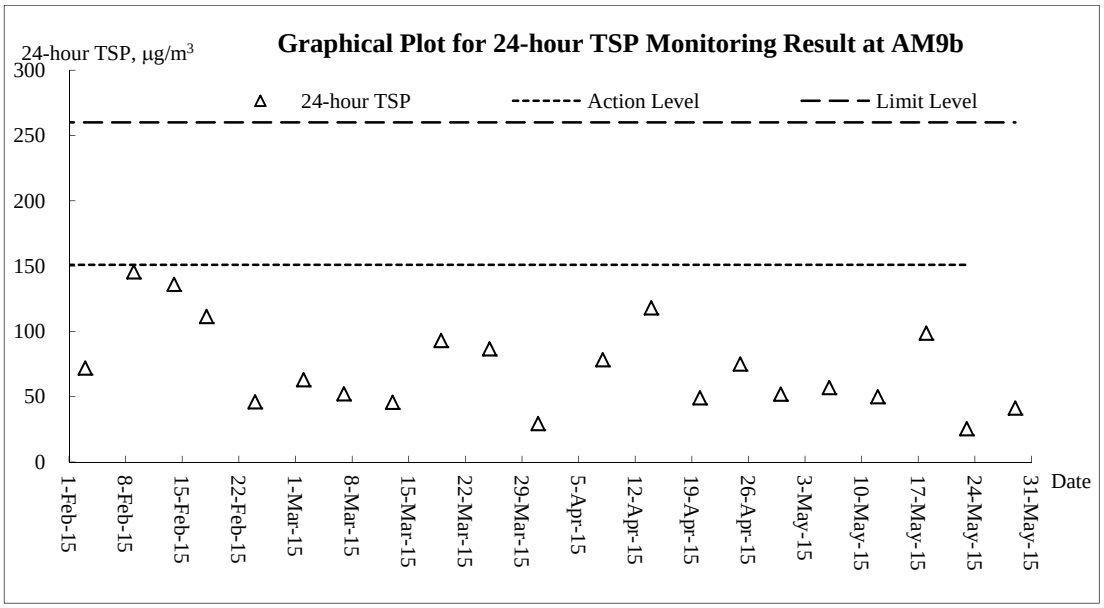




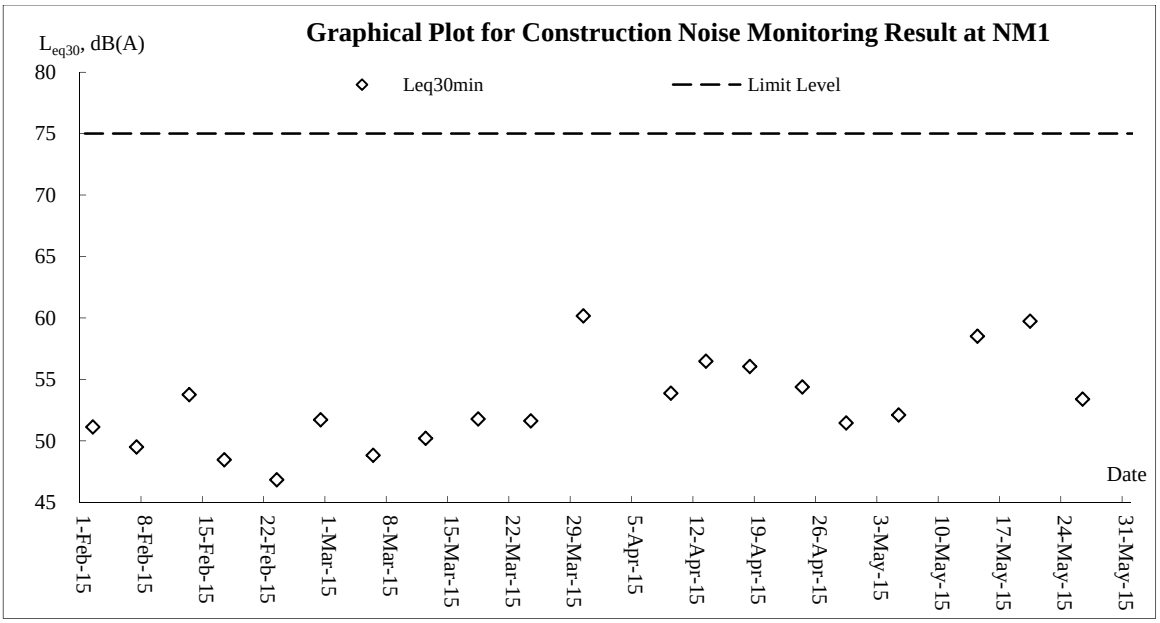


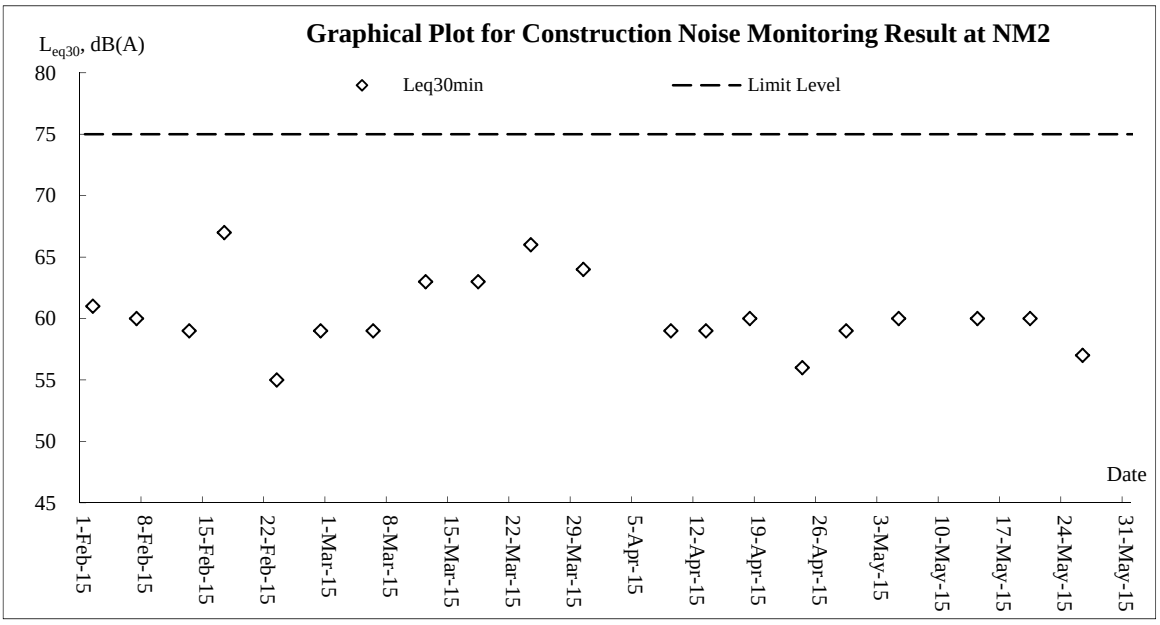

Graphical Plot for 24-hour TSP Monitoring Result at AM7b
24-hour TSP, µg/m3
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15
Date

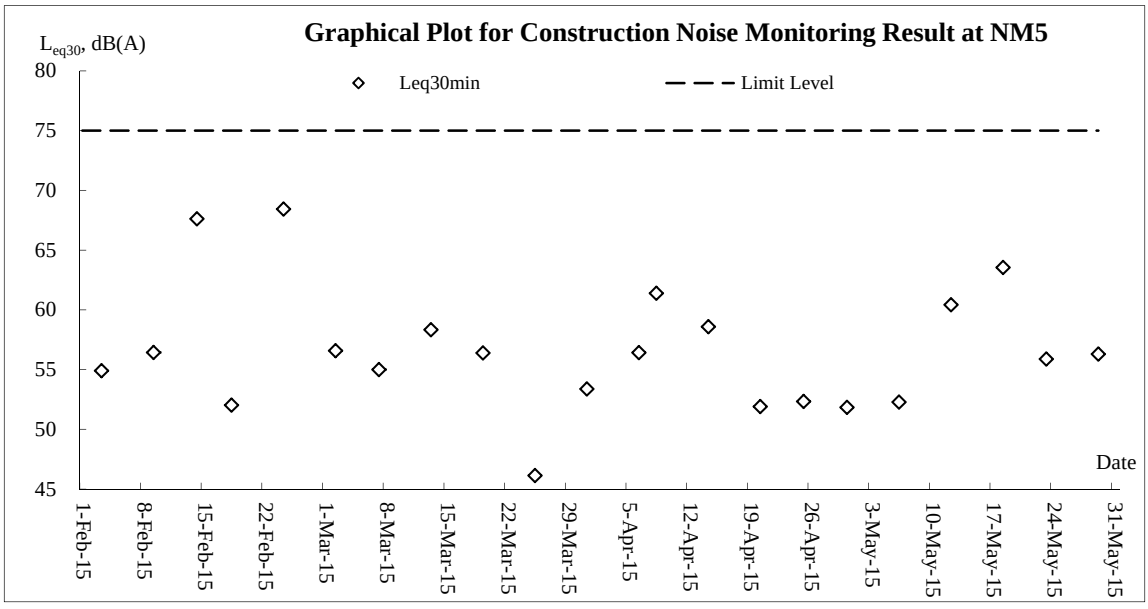

Graphical Plot for 24-hour TSP Monitoring Result at AM8
24-hour TSP, µg/m3
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15
Date

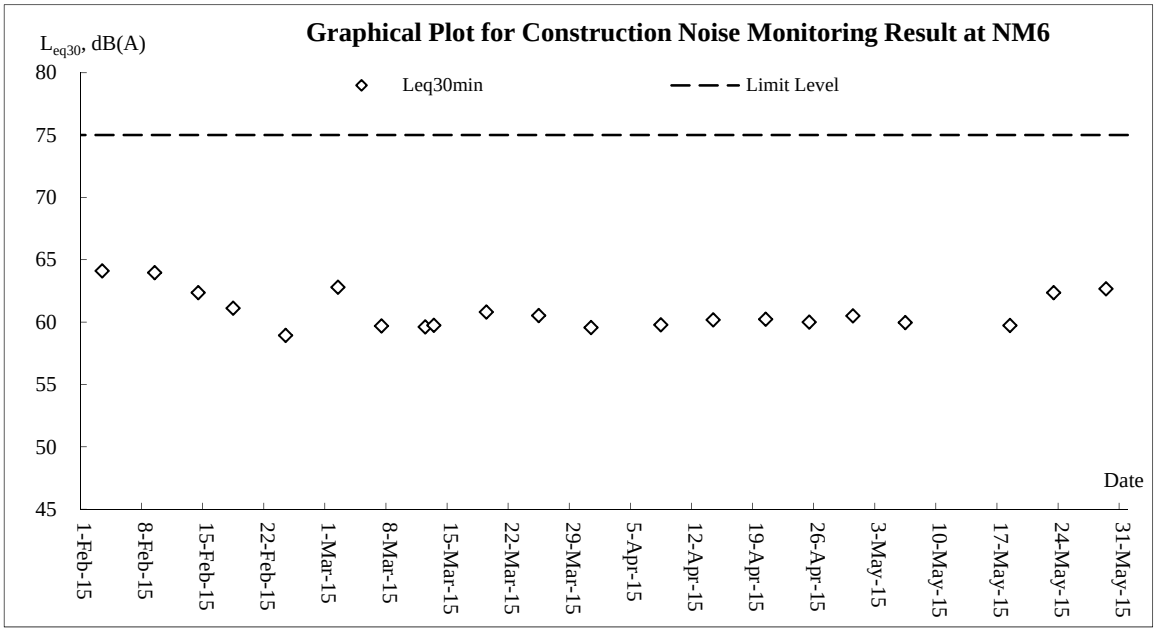

Graphical Plot for 24-hour TSP Monitoring Result at AM9b
24-hour TSP, µg/m3
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15
Date

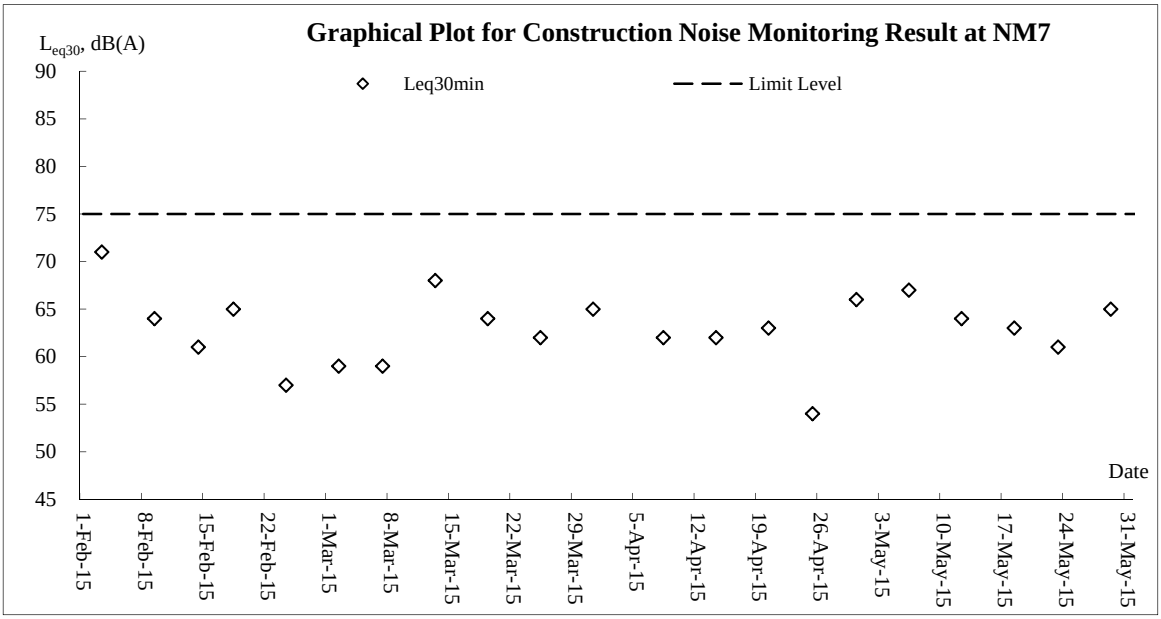
Noise

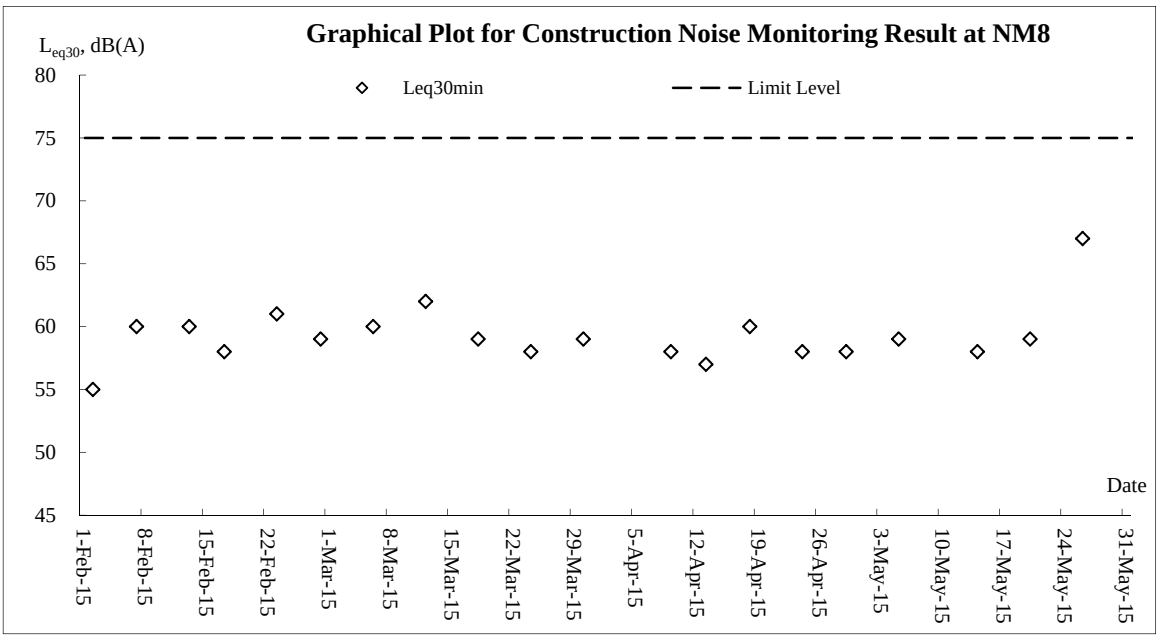

Graphical Plot for Construction Noise Monitoring Result at NM1
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15

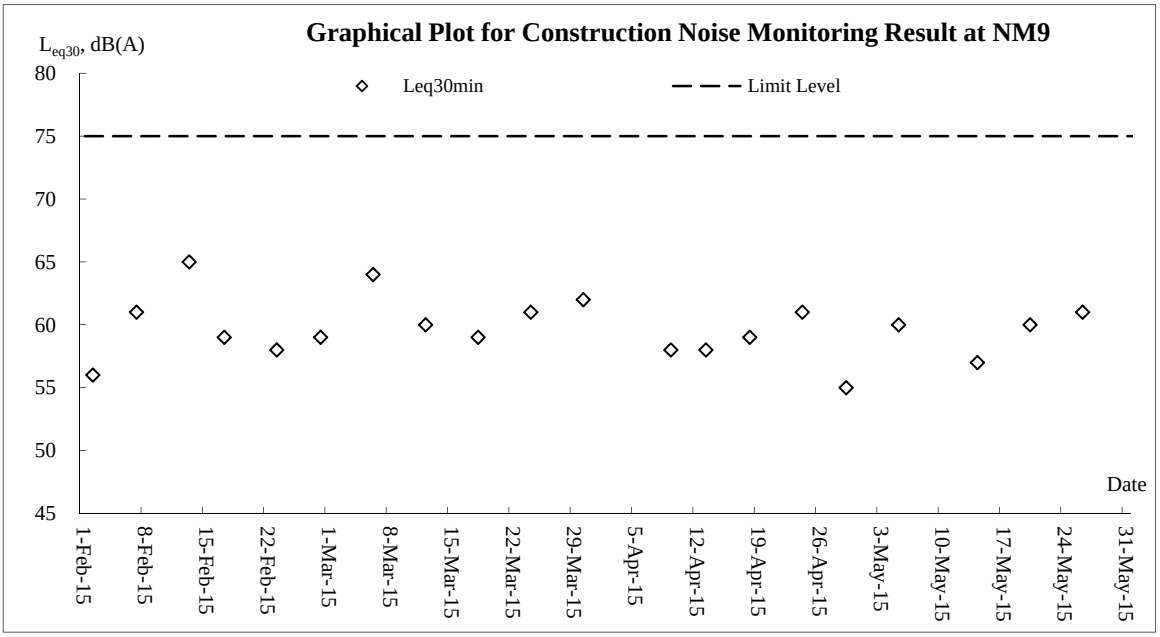

Graphical Plot for Construction Noise Monitoring Result at NM2
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15

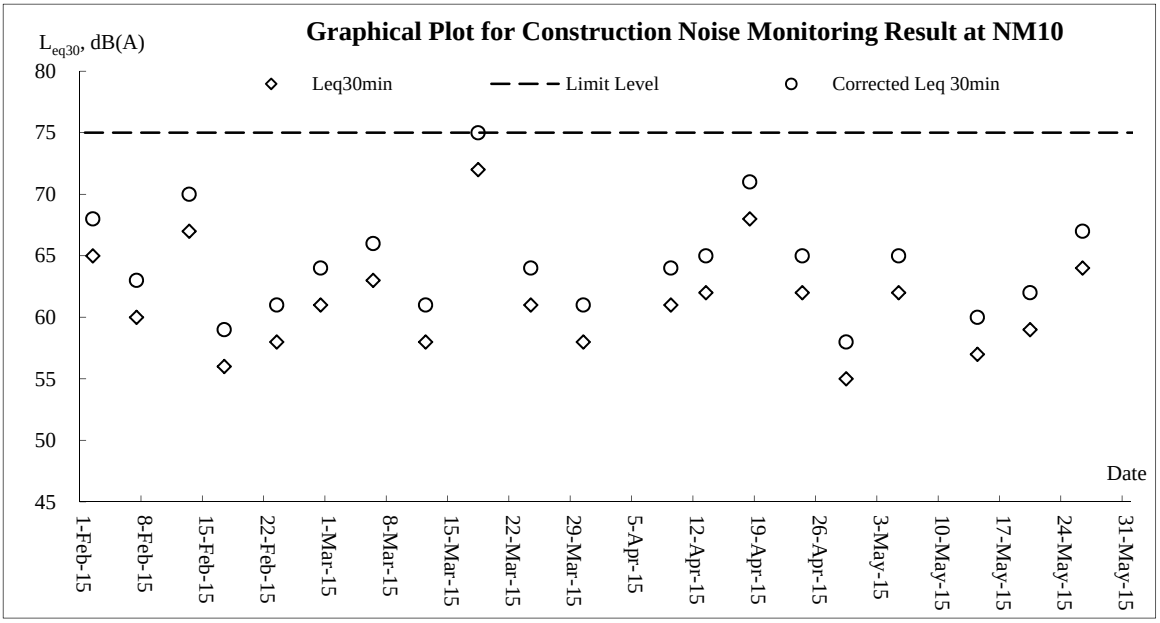

Graphical Plot for Construction Noise Monitoring Result at NM5
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15


Graphical Plot for Construction Noise Monitoring Result at NM6
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15

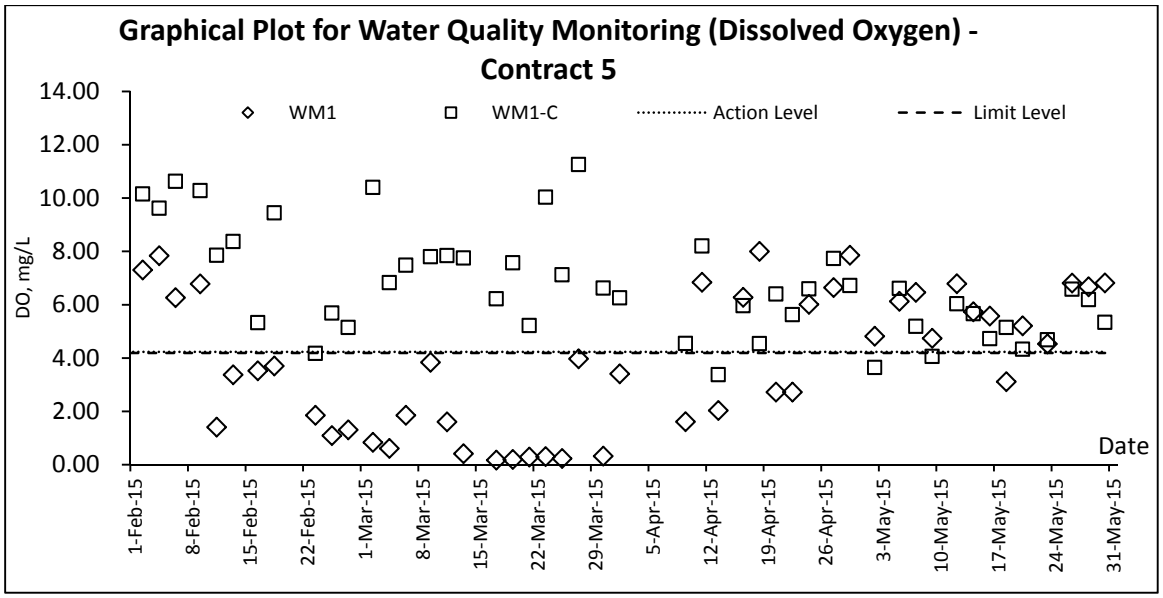

Graphical Plot for Construction Noise Monitoring Result at NM7
L_{eq30}, dB(A)
Leq30min
Limit Level
90
85
80
75
70
65
60
55
50
45
Date
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15

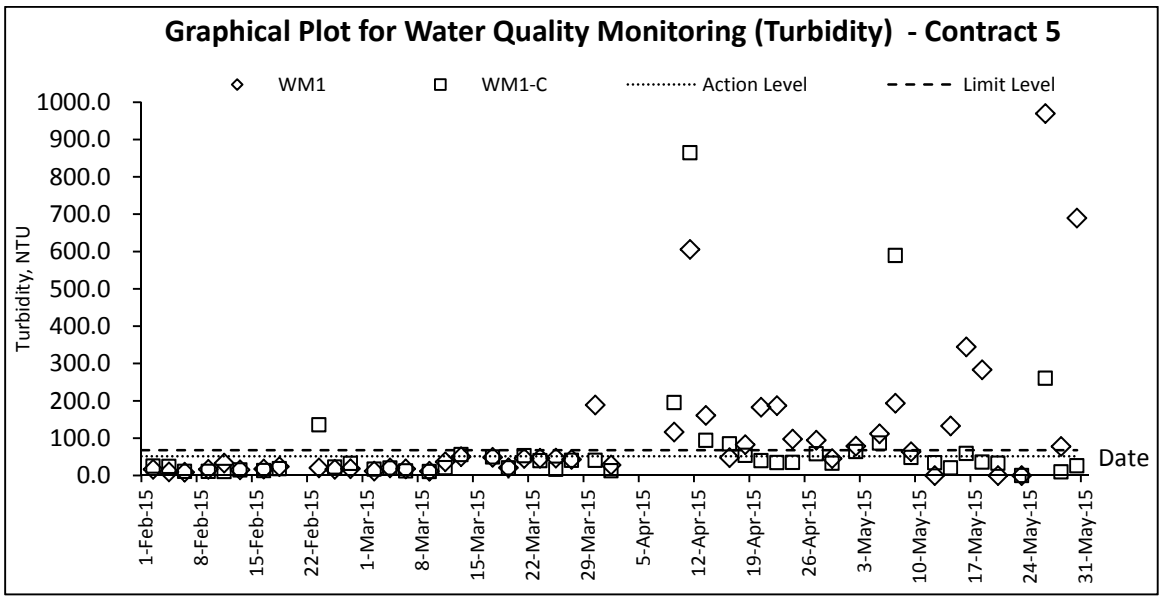

Graphical Plot for Construction Noise Monitoring Result at NM8
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15

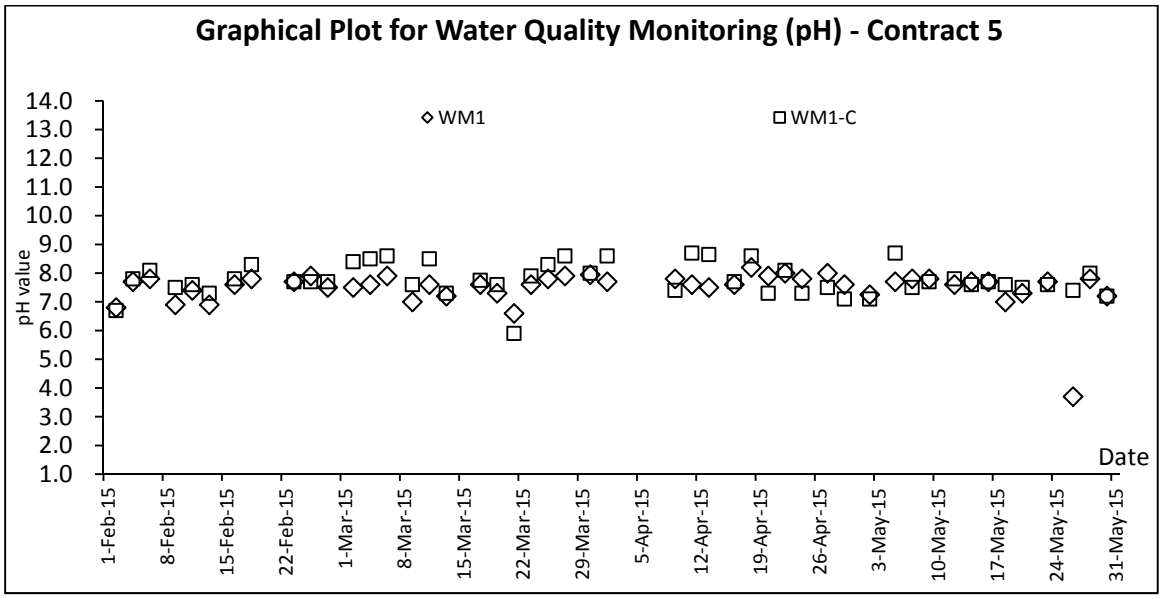

Graphical Plot for Construction Noise Monitoring Result at NM9
L_{eq30}, dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
Date
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15

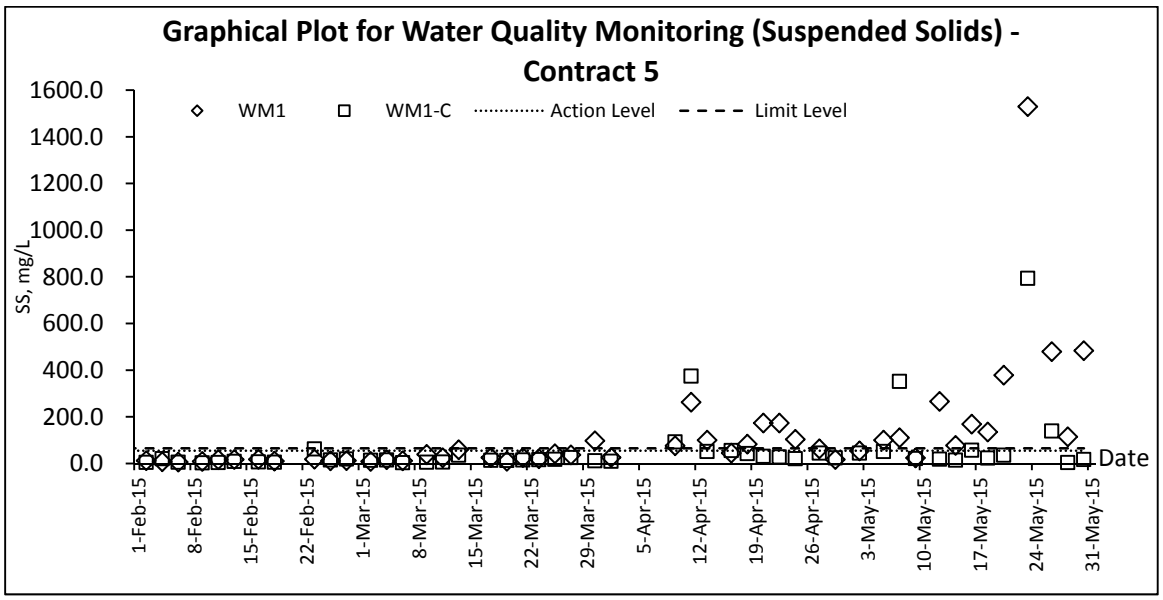

Graphical Plot for Construction Noise Monitoring Result at NM10
L_{eq30}, dB(A)
Leq30min
Limit Level
Corrected Leq 30min
80
75
70
65
60
55
50
45
Date
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15

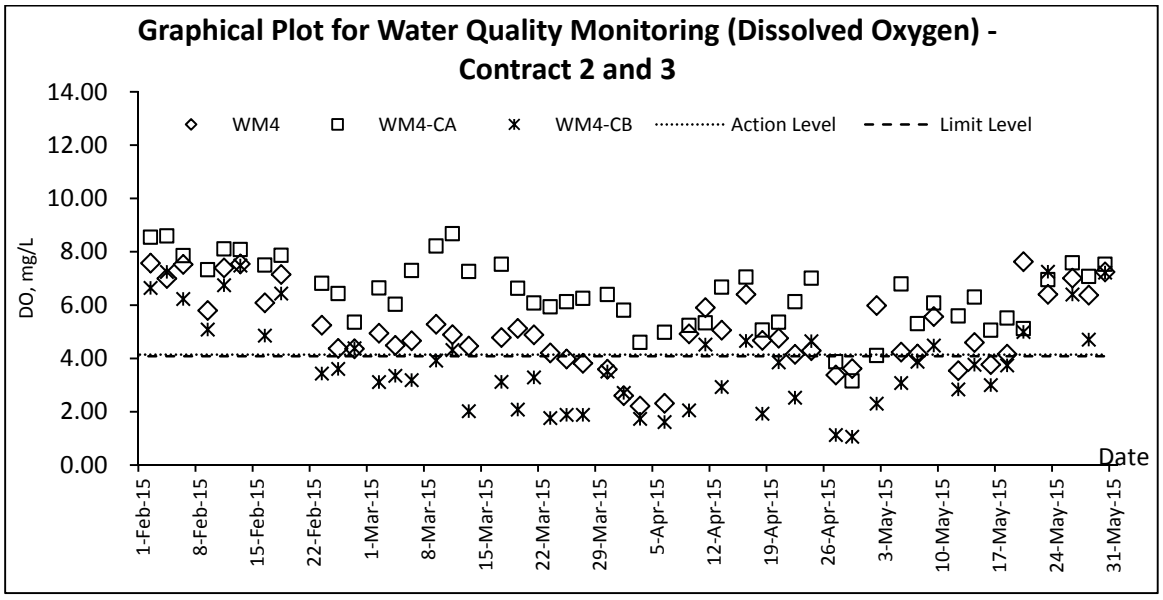
Water Quality

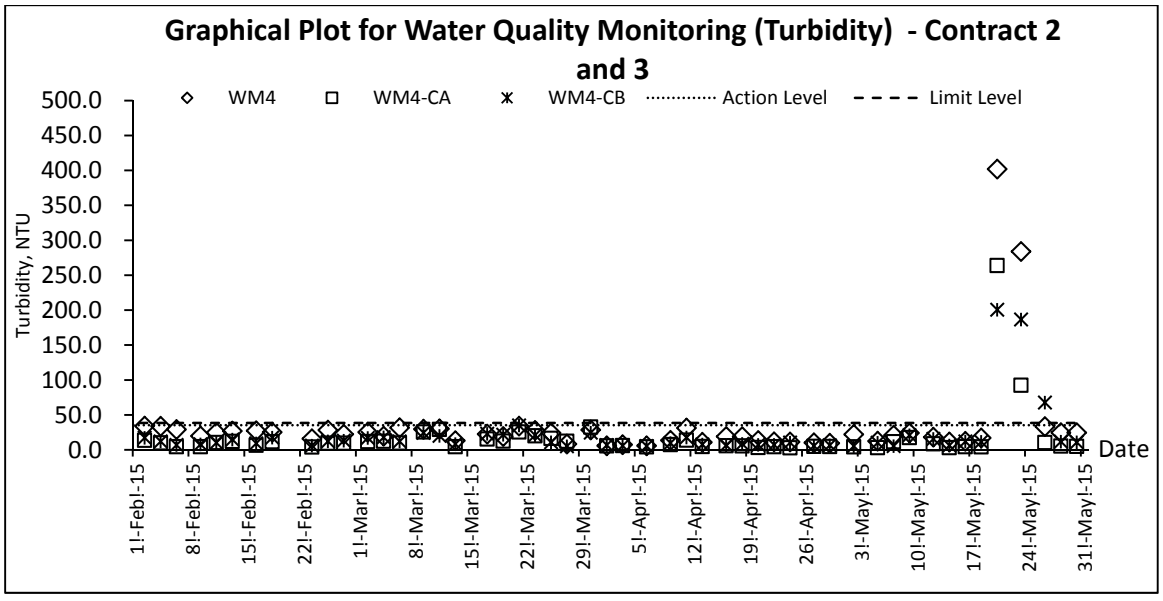


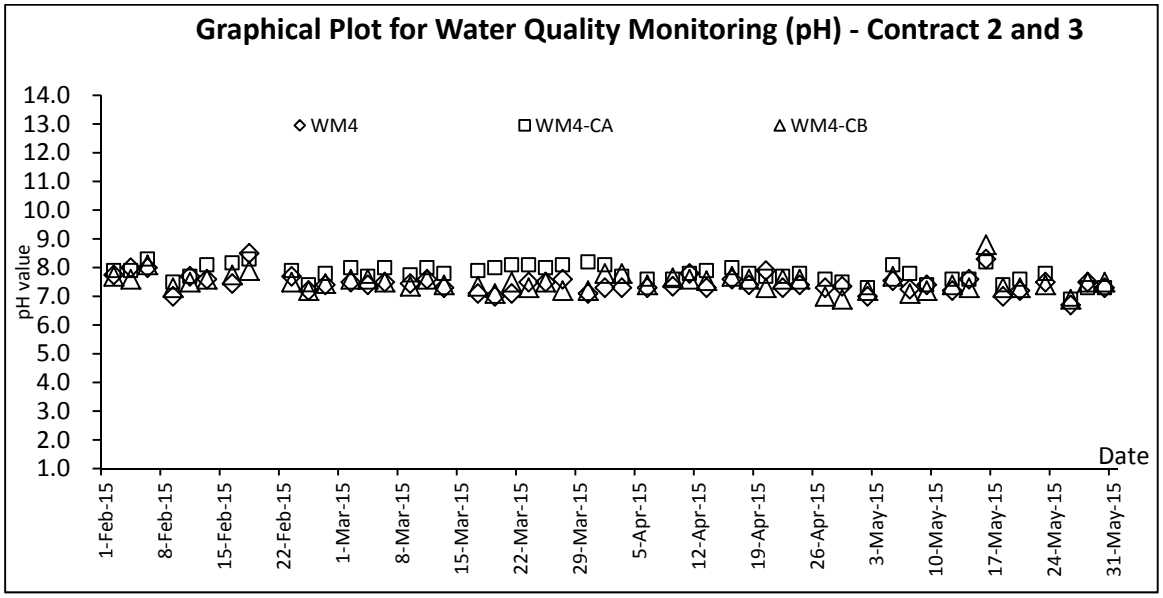


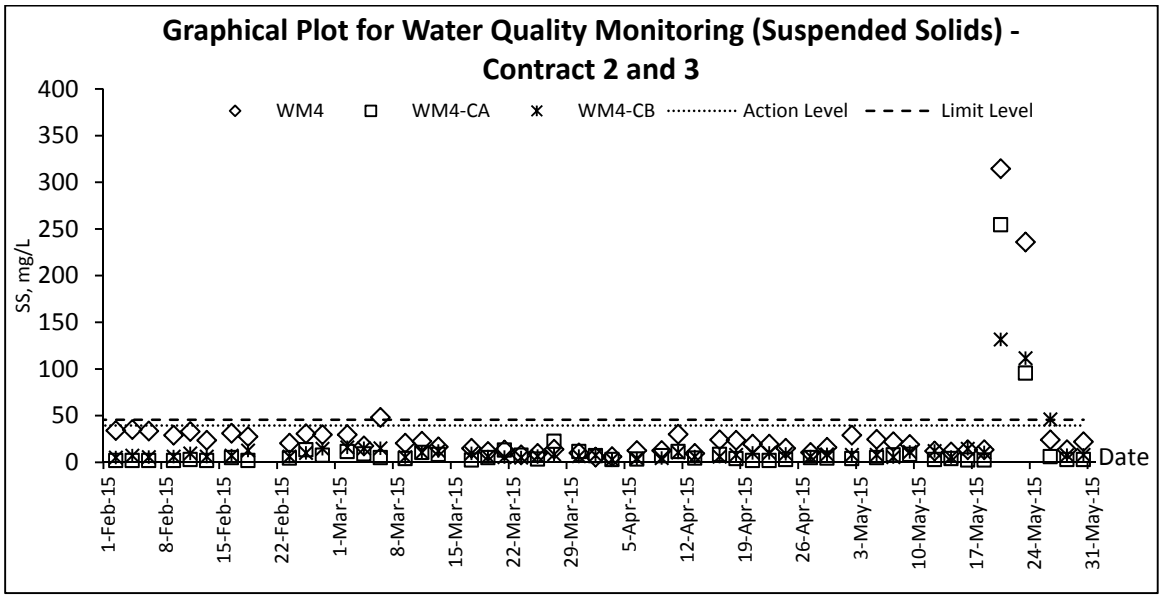



Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contract 5
WM1
WM1-C
Action Level
Limit Level
SS, mg/L
1600.0
1400.0
1200.0
1000.0
800.0
600.0
400.0
200.0
0.0
Date
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15


Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contract 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
DO, mg/L
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Date
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15


Graphical Plot for Water Quality Monitoring (Turbidity) - Contract 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
Turbidity, NTU
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Date
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15


Graphical Plot for Water Quality Monitoring (pH) - Contract 2 and 3
WM4
WM4-CA
WM4-CB
pH value
Date
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contract 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
SS, mg/L
Date
400
350
300
250
200
150
100
50
0
1-Feb-15
8-Feb-15
15-Feb-15
22-Feb-15
1-Mar-15
8-Mar-15
15-Mar-15
22-Mar-15
29-Mar-15
5-Apr-15
12-Apr-15
19-Apr-15
26-Apr-15
3-May-15
10-May-15
17-May-15
24-May-15
31-May-15

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-May-15	Fri	Hot with sunny periods in the afternoon. Mainly cloudy with a few showers tonight. Moderate southerly winds.	0.5	27.7	8.8	73	E/SE
2-May-15	Sat	Sunny periods in the morning. A few showers later. Moderate south to southeasterly winds	Trace	27.9	8.1	71.5	S/SW
3-May-15	Sun	Sunny periods in the morning. A few showers later. Moderate south to southeasterly winds	Trace	29.5	7	73	S/SW
4-May-15	Mon	Sunny periods in the morning. A few showers later. Moderate south to southeasterly winds	Trace	29.5	6	70.5	S/SW
5-May-15	Tue	Mainly cloudy with isolated showers. Moderate south to southeasterly winds.	3.9	27.7	8.2	75	E/SE
6-May-15	Wed	Mainly cloudy. Light to moderate southerly winds.	0.6	26.9	11.1	77.5	E
7-May-15	Thu	Mainly cloudy with isolated showers. Moderate southerly winds.	0.3	28.7	6	74.2	E/SE
8-May-15	Fri	Mainly cloudy with isolated showers. Moderate southerly winds.	0	28.5	10	72.2	S/SW
9-May-15	Sat	Mainly cloudy with isolated showers. Moderate southerly winds.	7.3	28.6	9	78	S/SW
10-May-15	Sun	Mainly cloudy with isolated showers. Moderate southerly winds.	20.1	26.2	8	80.5	E
11-May-15	Mon	Mainly cloudy with a few showers. Moderate east to southeasterly winds.	51	25.8	12.6	85	E
12-May-15	Tue	Sunny periods during the day. Cloudy tonight. Moderate northerly winds.	0	26.2	5.5	73	N
13-May-15	Wed	Mainly cloudy with isolated showers. Moderate easterly winds, becoming southerlies later.	0	26.4	9.5	79	E
14-May-15	Thu	Mainly cloudy. Hot with sunny periods in the afternoon. Moderate south to southeasterly winds.	Trace	28.3	6.9	70	E/SE
15-May-15	Fri	Mainly cloudy with a few showers. Moderate south to southwesterly winds.	0	29	9.1	71.5	S/SW
16-May-15	Sat	Mainly cloudy with a few showers. Moderate south to southwesterly winds.	18.4	25.4	8.5	86.7	N/NW
17-May-15	Sun	Cloudy to overcast with rain and squally thunderstorms.Moderate south to southwesterly winds.	5.7	27	12.5	80	S/SW
18-May-15	Mon	Mainly cloudy with a few showers. Moderate south to southwesterly winds.	0.9	27.4	9	82	S/SW
19-May-15	Tue	Cloudy to overcast with rain and squally thunderstorms. Moderate south to southwesterly winds.	1.2	28	9.6	84	S/SW
20-May-15	Wed	Cloudy to overcast with rain and squally thunderstorms. Moderate south to southwesterly winds.	107.7	27.2	8.2	87.2	S/SE
21-May-15	Thu	Cloudy with showers. There will be a few thunderstorms later. Fresh easterly winds, strong offshore.	12.6	25	12.1	84.7	E/SE
22-May-15	Fri	Cloudy with a few showers. Showers will be more frequent tonight. Moderate easterly winds, fresh at times.	0.7	23.6	12	88.5	E/SE
23-May-15	Sat	Cloudy with a few showers. Isolated thunderstorms at first. Light to moderate southerly winds.	169.4	24.2	7.7	95	E/SE
24-May-15	Sun	Cloudy with a few showers. Isolated thunderstorms at first. Light to moderate southerly winds.	8.2	26.7	8.5	85.2	W/SW
25-May-15	Mon	Cloudy with a few showers. Isolated thunderstorms at first. Light to moderate southerly winds.	29.4	28.6	6.5	77.5	E
26-May-15	Tue	Mainly cloudy with isolated showers. Moderate south to southwesterly winds.	64.6	26.5	7	89.7	E/SE
27-May-15	Wed	Mainly cloudy with isolated showers. Moderate south to southwesterly winds.	0.2	29	9.6	80	S/SW
28-May-15	Thu	Mainly fine and very hot during the day . Moderate south to southwesterly winds.	1.4	30.1	8.4	77.2	S/SW
29-May-15	Fri	Mainly fine apart from isolated showers. Very hot in the afternoon. Moderate south to southwesterly winds.	0	30	8.4	78	S/SW
30-May-15	Sat	Hot with sunny intervals. There will be a few showers. Moderate southerly winds.	7	29	9.7	79	S/SW
31-May-15	Sun	Hot with sunny intervals. There will be a few showers. Moderate southerly winds.	1.9	28.6	7.7	79.5	E/SE

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 2015

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

Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (bottles/containers, plastic sheets/ foams from package material) (in '000kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (in '000m3)
January	66.2666	0.0000	0.0670	65.6529	0.5467	0.1150	0.0000	0.2500	0.0000	0.0000	0.0617
February	57.9980	0.0000	0.0000	57.3858	0.6121	0.3505	3.3200	0.3900	0.0000	0.5280	0.0908
March	66.0198	0.0000	0.3614	65.3359	0.3225	0.0729	0.0000	0.2920	0.0000	0.7040	0.1293
April	49.2562	0.0000	0.2770	48.7725	0.2066	0.1928	0.0000	0.2300	0.0000	0.0000	0.2423
May	41.7957	0.0000	8.7663	32.6095	0.4199	0.8683	0.0000	0.1300	0.0000	2.6400	0.0511
June	0.0000										
Half-year total	281.3362	0.0000	9.4718	269.7566	2.1078	1.5995	3.3200	1.2920	0.0000	3.8720	0.5751
July	0.0000										
August	0.0000										
September	0.0000										
October	0.0000										
November	0.0000										
December	0.0000										
Yearly Total	281.3362	0.0000	9.4718	269.7566	2.1078	1.5995	3.3200	1.2920	0.0000	3.8720	0.5751

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

Year	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (bottles/containers, plastic sheets/ foams from package material) (in '000kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (in '000m3)
2013	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2014	425.4406	0.0000	2.7362	376.3945	46.3099	5.6245	3.2100	0.4390	0.0070	10.8800	2.2609
2015											
2016											
2017											
2018											
Total	425.4406	0.0000	2.7362	376.3945	46.3099	5.6245	3.2100	0.4390	0.0070	10.8800	2.2609

Remark:

1) Density of C&D material to be 2.2 metric ton/m3
2) Density of General Refuse to be 1.6 metric ton/m3
3) Density of Spent Oil to be 0.88 metric ton/m3

Name of Department: CEDD

Contract No.: CV/2012/09

Monthly Summary Waste Flow Table for 2015 (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	3.864	0.105	0.648	0.000	3.216	0.118	0.000	0.000	0.000	0.040	0.080
Feb	2.429	0.049	1.518	0.000	0.911	0.100	0.000	0.000	0.003	0.900	0.070
Mar	3.713	0.029	0.270	0.000	3.443	0.100	0.000	0.000	0.006	0.000	0.080
Apr	3.597	0.115	2.308	0.000	1.289	0.090	2.767	0.000	0.000	0.000	0.065
May	1.357	0.197	0.108	0.000	1.249	0.100	0.000	0.000	0.012	0.000	0.065
Jun											
Sub-total	14.960	0.494	4.852	0.000	10.108	0.508	2.767	0.000	0.021	0.940	0.360
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	14.960	0.494	4.852	0.000	10.108	0.508	2.767	0.000	0.021	0.940	0.360

Note:

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

Name of Department: CEDD

Monthly Summary Waste Flow Table for 2015

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	33.3285	4.16	0.24	0	0	0.42
FEB	0	0	0	0	0	11.82	0.99	0	0	0	0.18
MAR	0	0	0	0	0	8.592	0	0	0	0	0.375
APRIL	0	0	0	0	0	12.81	0	0	0	0	0.04
MAY	0	0	0	0	0	**16.609**	**0**	**0**	**0**	**0**	**0**
JUN											
Sub Total	0	0	0	0	0	83.1595	5.15	0.24	0	0	1.015
JUL											
AUG											
SEP											
OCT											
NOV											
DEC											
Total	0	0	0	0	0	83.16	5.15	0.24	0	0	1.015

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 = 8m 3
- 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	**General Dust Control Measures** The following dust suppression measures should be implemented: ■ Frequent water spraying for active construction areas (4 times per day for active areas in Po Kak Tsai and 8 times per day for all other active areas), including areas with heavy construction and slope cutting activities ■ 80% of stockpile areas should be covered by impervious sheets ■ Speed of trucks within the site should be controlled to about 10 km/hr ■ All haul roads within the site should be paved to avoid dust emission due to vehicular movement	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation
3.6.1.2	2.1	**Best Practice for Dust Control** The relevant best practices for dust control as stipulated in the Air Pollution Control (Construction Dust) Regulation should be adopted to further reduce the construction dust impacts of the Project. These best practices include: *Good site management* ■ The Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. ■ Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimize the release of visible dust emission. ■ Any piles of materials accumulated on or around the work areas should be cleaned up regularly. ■ Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimizing generation of fugitive dust emissions. ■ The material should be handled properly to prevent fugitive dust emission before cleaning. *Disturbed Parts of the Roads* ■ Each and every main temporary access should be paved with	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation

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

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		Site hoarding ■ Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit. *Blasting* ■ The areas within 30m from the blasting area should be wetted with water prior to blasting.					
Air Quality Impact (Operation)							
3.5.2.2	2.2	The following odour containment and control measures will be provided for the proposed sewage treatment work at the BCP site: ■ The treatment work will be totally enclosed. Negative pressure ventilation will be provided within the enclosure to avoid any fugitive odorous emission from the treatment work. ■ Further odour containment will be achieved by covering or confining the sewage channels, sewage tanks, and equipment with potential odour emission. ■ Proper mixing will be provided at the equalization and sludge holding tanks to prevent sewage septicity. ■ Chemical or biological deodorisation facilities with a minimum odour removal efficiency of 90% will be provided to treat potential odorous emissions from the treatment plant including sewage channels / tanks, filter press and screening facilities so as to minimize any potential odour impact to the nearby ASRs.	To minimize potential odour impact from operation of the proposed sewage treatment work at BCP	DSD	BCP	Operation Phase	EIA recommendation
Noise Impact (Construction)							
4.4.1.4	3.1	**Adoption of Quieter PME** Use of the recommended quieter PME such as those given in the BS5228: Part 1:2009 and presented in **Table 4.14**, which can be found in Hong Kong.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and Noise Control Ordinance (NCO)

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.4.1.4	3.1	**Use of Movable Noise Barrier** The use of movable barrier for certain PME can further alleviate the construction noise impacts. In general, a 5 dB(A) reduction for movable PME and 10 dB(A) for stationary PME can be achieved depending on the actual design of the movable noise barrier. The Contractor shall be responsible for design of the movable noise barrier with due consideration given to the size of the PME and the requirement for intercepting the line of sight between the NSRs and PME. Barrier material with surface mass in excess of 7 kg/m^2 is recommended to achieve the predicted screening effect.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
4.4.1.4	3.1	**Use of Noise Enclosure/ Acoustic Shed** The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the GW-TM.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
4.4.1.4	3.1	**Use of Noise Insulating Fabric** Noise insulating fabric can be adopted for certain PME (e.g. drill rig, pilling auger etc). The insulating fabric should be lapped such that there are no openings or gaps on the joints. Technical data from manufacturers state that by using the Fabric, a noise reduction of over 10 dB(A) can be achieved on noise level.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.4.1.4	3.1	**Good Site Practice** The good site practices listed below should be followed during each phase of construction: • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction programme; • Mobile plant, if any, should be sited as far from NSRs as possible; • Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
Noise Impact (Operation)							
		Road Traffic Noise					
Table 4.42 and Figure 4.20.1 to 4.20.4	3.2	Erection of noise barrier/ enclosure along the viaduct section.	To minimize the road traffic noise along the connecting road of BCP	Contractor	Loi Tung and Fanling Highway Interchange	Before Operation	EIAO and NCO
		Fixed Plant Noise					
Table 4.46	3.2	Specification of the maximum allowable sound power levels of the proposed fixed plants during daytime and night-time.	To minimize the fixed plant noise impact	Managing Authority of the buildings / Contractor	BCP, Administration Building and all ventilation buildings	Before Operation	EIA recommendation, EIAO and NCO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.5.2.4	3.2	The following noise reduction measures shall be considered as far as practicable during operation: • Choose quieter plant such as those which have been effectively silenced; • Include noise levels specification when ordering new plant (including chillier and E/M equipment); • Locate fixed plant/louver away from any NSRs as far as practicable; • Locate fixed plant in walled plant rooms or in specially designed enclosures; • Locate noisy machines in a basement or a completely separate building; • Install direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosure where necessary; and • Develop and implement a regularly scheduled plant maintenance programme so that equipment is properly operated and serviced in order to maintain a controlled level of noise.	To minimize the fixed plant noise impact	Managing Authority of the buildings / Contractor	BCP, Administration Building and all ventilation buildings	Before Operation	EIAO and NCO
Water Quality Impact (Construction)							
5.6.1.1	4.1	**Construction site runoff and drainage** The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts: ▪ At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the Contractor prior to the commencement of construction. ▪ The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas.	To control site runoff and drainage; prevent high sediment loading from reaching the nearby watercourses	Contractor	Construction Works Sites	Construction Phase	Practice Note for Professional Persons on Construction Site Drainage (ProPECC Note PN 1/94)

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

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		the erosive potential of surface water flows. ▪ All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. ▪ Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. ▪ Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers. ▪ Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes. ▪ Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.					
5.6.1.1	4.1	**Good site practices for works within water gathering grounds** The following conditions should be complied, if there is any works to be carried out within the water gathering grounds:	To minimize water quality impacts to the water gathering grounds	Contractor	Construction Works Sites within the water gathering	Construction Phase	ProPECC Note PN 1/94

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		▪ Adequate measures should be implemented to ensure no pollution or siltation occurs to the catchwaters and catchments. ▪ No earth, building materials, oil or fuel, soil, toxic materials or any materials that may possibly cause contamination to water gathering grounds are allowed to be stockpiled on site. ▪ All surplus spoil should be removed from water gathering grounds as soon as possible. ▪ Temporary drains with silt traps should be constructed at the site boundary before the commencement of any earthworks. ▪ Regular cleaning of silt traps should be carried out to ensure proper operation at all time. ▪ All excavated or filled surfaces which have the risk of erosion should always be protected form erosion. ▪ Facilities for washing the wheels of vehicles before leaving the site should be provided. ▪ Any construction plant which causes pollution to catchwaters or catchments due to the leakage of oil or fuel should be removed off site immediately. ▪ No maintenance activities which may generate chemical wastes should be undertaken in the water gathering grounds. Vehicle maintenance should be confined to designated paved areas only and any spillages should be cleared up immediately using absorbents and waste oils should be collected in designated tanks prior to disposal off site. All storm water run-off from these areas should be discharged via oil/petrol separators and sand/silt removal traps. ▪ Any soil contaminated with fuel leaked from plant should be removed off site and the voids arising from removal of contaminated soil should be replaced by suitable material approved by the Director of Water Supplies. ▪ Provision of temporary toilet facilities and use of chemicals or insecticide of any kind are subject to the approval of the Director of Water Supplies. ▪ Drainage plans should be submitted for approval by the Director of			grounds		

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		Water Supplies. ▪ An unimpeded access through the waterworks access road should always be maintained. ▪ Earthworks near catchwaters or streamcourses should only be carried out in dry season between October and March, ▪ Advance notice must be given before the commencement of works on site quoting WSD's approval letter reference.					
5.6.1.2	4.1	**Good site practices of general construction activities** Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby stormwater drain. Stockpiles of cement and other construction materials should be kept covered when not being used. Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby stormwater drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.	To minimize water quality impacts	Contractor	All construction works sites	Construction phase	EIA Recommendation
5.6.1.3	4.1	**Sewage effluent from construction workforce** Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.	To minimize water quality impacts	Contractor	All construction works sites with on-site sanitary facilities	Construction phase	EIA Recommendation and Water Pollution Control Ordinance (WPCO)
5.6.1.4	4.1	**Hydrogeological Impact** Grout injection works would be conducted before blasting, for sealing a limited area around the tunnel with a grout of a suitable strength for controlling the potential groundwater inflows. The pre-injection grouting method would be supplemented by post-injection grouting where necessary to further enhance the groundwater inflow control. On-site treatment for the groundwater ingress pumped out would be required to remove any contamination by grouting materials before discharge off-site.	To minimize water quality impacts	Contractor	Construction works sites of the drill and blast tunnel	Construction phase	EIA Recommendation and WPCO
Water Quality Impact (Operation)							
		No mitigation measure is required.					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
Sewage and Sewerage Treatment Impact (Construction)							
6.7	5	The sewage generated by the on-site workforce should be collected in chemical toilets and disposed of off-site by a licensed waste collector.	To minimize water quality impacts	Contractor	All construction works sites with on-site sanitary facilities	Construction phase	EIA recommendation and WPCO
Sewage and Sewerage Treatment Impact (Operation)							
6.6.3	5	Sewage generated by the BCP and Chuk Yuen Village Resite will be collected and treated by the proposed on-site sewage treatment facility using Membrane Bioreactor treatment with a portion of the treated wastewater reused for irrigation and flushing within the BCP.	To minimize water quality impacts	DSD	BCP	Operation phase	EIA recommendation and WPCO
6.5.3	5	Sewage generated from the Administration Building will be discharged to the existing local sewerage system.	To minimize water quality impacts	DSD	Administration Building	Operation phase	EIA recommendation and WPCO
Waste Management Implication (Construction)							
7.6.1.1	6	**Good Site Practices** Adverse impacts related to waste management such as potential hazard, air, odour, noise, wastewater discharge and public transport as mentioned in section 3.4.7.2 (ii)(c) of the Study Brief are not expected to arise, provided that good site practices are strictly followed. Recommendations for good site practices during the construction activities include: ▪ Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site ▪ Training of site personnel in proper waste management and chemical handling procedures ▪ Provision of sufficient waste disposal points and regular collection of waste ▪ Dust suppression measures as required under the Air Pollution Control (Construction Dust) Regulation should be followed as far as practicable. Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by covering trucks or in enclosed containers ▪ General refuse shall be removed away immediately for disposal. As	To minimize adverse environmental impact	Contractor	Construction works sites (general)	Construction Phase	EIA recommendation; Waste Disposal Ordinance; Waste Disposal (Chemical Wastes) (General) Regulation; and ETWB TC(W) No. 19/2005, Environmental Management on Construction Site

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

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		of waste generated and avoid unnecessary generation of waste ▪ In addition to the above measures, specific mitigation measures are recommended below for the identified waste arising to minimise environmental impacts during handling, transportation and disposal of these wastes.					
7.6.1.3	6	**C&D Materials** In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the excavated materials should be reused on-site as backfilling material as far as practicable. The surplus rock and other inert C&D material would be disposed of at the Government's Public Fill Reception Facilities (PFRFs) at Tuen Mun Area 38 for beneficial use by other projects in the HKSAR as the last resort. C&D waste generated from general site clearance and tree felling works would require disposal to the designated landfill site. Other mitigation requirements are listed below: ▪ A Waste Management Plan should be prepared and implemented in accordance with ETWB TC(W) No. 19/2005 Environmental Management on Construction Site; and ▪ In order to monitor the disposal of C&D material and solid wastes at public filling facilities and landfills, and to control fly-tipping, a trip-ticket system (e.g. ETWB TCW No. 31/2004) should be included.	To minimize impacts resulting from C&D material	Contractor	Construction Works Sites (General)	Construction Phase	EIA recommendation; Waste Disposal Ordinance; and ETWB TCW No. 31/2004
7.6.1.4	6	**General refuse** General refuse should be stored in enclosed bins or compaction units separated from other C&D material. A reputable waste collector is to be employed by the Contractor to remove general refuse from the site separately. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' litter.	To minimize impacts resulting from collection and transportation of general refuse for off-site disposal	Contractor	Construction works sites (General)	Construction phase	Waste Disposal Ordinance and Public Health and Municipal Services Ordinance - Public Cleansing and Prevention of Nuisances Regulation
7.6.1.5	6	**Chemical waste** If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical	To minimize impacts resulting from collection and transportation of chemical waste for off-site disposal	Contractor	Construction works sites (General)	Construction phase	Waste Disposal (Chemical Waste) (General) Regulation and Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes